



**IMPROVING STATISTICS DATA ON FOOD PROCESSING AND  
DISTRIBUTION RELATED TO AGRICULTURAL CROPS IN ASEAN  
REGION:**

**FINAL REPORT OF  
SUGARCANE SUPPLY VALUE CHAIN ANALYSIS ON  
SELECTED MILL DISTRICTS OF NEGROS OCCIDENTAL**



Department of Agriculture  
**SUGAR REGULATORY ADMINISTRATION**  
Sugar Center Bldg., North Avenue, Diliman, Quezon City  
[www.sra.gov.ph](http://www.sra.gov.ph)

*A food-secure Philippines*  
*with prosperous farmers and fisherfolk*



---

IMPROVING STATISTICS DATA ON FOOD PROCESSING AND  
DISTRIBUTION RELATED TO AGRICULTURAL CROPS IN ASEAN REGION:  
SUGARCANE SUPPLY-VALUE CHAIN ANALYSIS ON SELECTED  
MILL DISTRICTS OF NEGROS OCCIDENTAL

---



**CRC**

The research and consultancy partner  
of the University of Asia and the Pacific



Republic of the Philippines  
Department of Agriculture

**SUGAR REGULATORY ADMINISTRATION**

Sugar Center Bldg., North Avenue, Diliman, Quezon City, Philippines 1101  
TIN 000-784-336

## Acceptance Sheet

This project acceptance sheet establishes formal acceptance of the document:

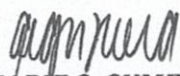
**FINAL REPORT OF THE PROJECT "SUGARCANE SUPPLY-VALUE CHAIN ANALYSIS  
OF SELECTED MILL DISTRICTS OF NEGROS OCCIDENTAL"  
(FIRST FARMERS AND SAN CARLOS MILL DISTRICTS)**

as final deliverable of the project *"Improving Statistics Data on Food Processing and Distribution Related to Agricultural Crops in ASEAN Region: Sugarcane Supply-Value Chain Analysis on Selected Mill Districts of Negros Occidental"*

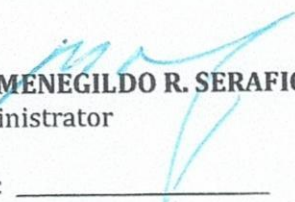
The project management team of Planning, Policy and Special Projects Department (PPSPD) acknowledges that the final report of the project contained herein has met the acceptance criteria defined in the Terms of Reference of the project, hence, recommends for acceptance by the Sugar Regulatory Administration.

Therefore, with the conclusion of the project, the termination of SRA's relationship with the Center for Research and Communication – University of Asia and the Pacific (CRC-UA&P) in this project is also hereby recommended.

**Recommended by:**

  
**ROSEMARIE S. GUMERA**  
Manager III, PPSPD and  
Project Head, AFSIS Project

**Accepted by:**

  
**HERMENEGILDO R. SERAFICA**  
Administrator

Date: \_\_\_\_\_



Management  
System  
ISO 9001:2015  
www.tuv.com  
ID: 0168205567



Website: <http://www.sra.gov.ph> Email Address: [srahead@sra.gov.ph](mailto:srahead@sra.gov.ph)  
Tel. No.: (632)929-3633, (632)455-2135, (632)455-3376



*"A food-secure Philippines with prosperous farmers and fisherfolk"*



REPUBLIC OF THE PHILIPPINES

**PHILIPPINE STATISTICS AUTHORITY**

## Acceptance Sheet

This project acceptance sheet establishes formal acceptance of the document:

### **DRAFT OF SUPPLY-VALUE CHAIN ANALYSIS OF FIRST FARMERS AND SAN CARLOS MILL DISTRICTS**

as deliverables of the project *"Improving Statistics Data on Food Processing and Distribution Related to Agricultural Crops in ASEAN Region: Sugarcane Supply-Value Chain Analysis on Selected Mill Districts of Negros Occidental"*

The project team of Planning, Policy and Special Projects Department (PPSPD) acknowledges that the draft supply value chain analysis (SVCA) of First Farmers and San Carlos mill districts contained herein have met the acceptance criteria defined in the Terms of Reference of the project.

The draft SVCA was already presented to the following venues and audience:

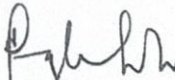
- December 10, 2019 - Project Management Team and selected officers and personnel of the Sugar Regulatory Administration
- December 12, 2019 – selected officers of the First Farmers Holding Corporation

Therefore, the Center for Research and Communication – University of Asia and the Pacific (CRC-UA&P) is instructed to finalize the SVCA report with respect to the comments during presentations and submit to the Sugar Regulatory Administration thru the Project Management Team in Planning, Policy and Special Projects Department.

Recommended by:

  
**ERMINA V. TEPORA**  
Chief Statistical Specialist  
Crops Statistics Division,  
Economic Sector Statistics Service

Accepted by:

  
**DIVINA GRACIA L. DEL PRADO**  
Assistant National Statistician  
Economic Sector Statistics Service

Date: 30 January 2020



Management  
System  
ISO 9001:2015  
[www.tuv.com](http://www.tuv.com)  
ID 9108640991



PSA Complex, East Avenue, Diliman, Quezon City, Philippines 1101  
Telephone: (632) 8938-5267  
URL: <https://psa.gov.ph/>  
Email: [info@psa.gov.ph](mailto:info@psa.gov.ph)

## **TABLE OF CONTENTS**

	<u>Page</u>
<b>Executive Summary</b>	1
I. Methodology	11
A. Research Approach	11
B. Data Collection	12
C. Data Sample	13
D. Data Analysis	13
E. Limitations of the Study	14
II. Supply-Value Chain Analysis	
<b>First Farmers Mill District</b>	15
A. Structural Analysis	15
B. Economic Analysis	16
C. Sugar Value Chain Analysis	36
<b>San Carlos Mill District</b>	
A. Structural Analysis	33
B. Economic Analysis	33
C. Sugar Value Chain Analysis	36
<b>References</b>	43
<b>Annexes</b>	

## **LIST OF FIGURES**

<b><u>No.</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
1	Procedure for sugarcane value chain analysis pilot study	12
2	Elements of a basic value chain map	14
3	Concept of value-added	15
4	Value chain map of raw and refined sugar, First Farmers Mill District, Negros Occidental	17
5	Raw sugar value chain, plant crop, First Farmers Mill District, Negros Occidental, CY 2018-2019	28
6	Raw sugar value chain, ratoon crop, First Farmers Mill District, Negros Occidental, CY 2018-2019	29
7	Refined sugar value chain, plant crop, First Farmers Mill District, Negros Occidental, CY 2018-2019	30
8	Refined sugar value chain, ratoon crop, First Farmers Mill District, Negros Occidental, CY 2018-2019	31
9	Distribution of value-added along the sugar value chain, plant crop, First Farmers Mill District, Negros Occidental, CY 2018-2019	32
10	Distribution of value-added along the sugar value chain, ratoon crop, First Farmers Mill District, Negros Occidental, CY 2018-2019	32
11	Value chain map of sugar, San Carlos Mill District, Negros Occidental	34
12	Sugar value chain: Farmer's chain, plant crop, San Carlos Mill District, Negros Occidental, CY 2018-2019	41
13	Sugar value chain: Farmer's chain, ratoon crop, San Carlos Mill District, Negros Occidental, CY 2018-2019	41
14	Sugar value chain: Farmer's chain, plant/ratoon crop, San Carlos Mill District, Negros Occidental, CY 2018-2019	42

## **LIST OF TABLES**

<b><u>No.</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
1	Sugarcane production costs and returns small-sized farms, First Farmers Mill District, Negros Occidental, CY 2018-2019	18
2	Sugarcane farm production costs, plant crop, First Farmers Mill District, CY2018-2019	19
3	Sugarcane farm production costs, ratoon crop, First Farmers Mill District, CY 2018-2019	19
4	Sugarcane farm production costs, plant/ratoon crop, First Farmers Mill District, CY 2018-2019	19
5	Sugarcane farm production costs, profit, and value-added, plant crop, First Farmers Mill District, CY 2018-2019	20
6	Sugarcane farm production costs, profit, and value-added, ratoon crop, First Farmers Mill District, CY 2018-2019	21
7	Sugarcane farm production costs, profit, and value-added, plant/ratoon crop, First Farmers Mill District, CY 2018-2019	22
8	Sugar processing costs, profit, and value-added, plant crop, First Farmers Mill District, CY 2018-2019	23
9	Sugar processing costs, profit, and value-added, ratoon crop, First Farmers Mill District, CY 2018-2019	24
10	Sugar processing costs, profit, and value-added, plant/ratoon crop, First Farmers Mill District, CY 2018-2019	24
11	Trading costs, profit, and value-added, plant and ratoon crop, First Farmers Mill District, CY 2018-2019	26
12	Sugar logistics costs, First Farmers Mill District, CY 2018-2019	27
13	Sugarcane production costs and returns small-sized farms, San Carlos Mill District, Negros Occidental, CY 2018-2019	35
14	Sugarcane farm production costs, plant crop, San Carlos Mill District, CY 2018-2019	37
15	Sugarcane farm production costs, ratoon crop, San Carlos Mill District, CY 2018-2019	37
16	Sugarcane farm production costs, plant/ratoon crop, San Carlos Mill District, CY 2018-2019	37
17	Sugarcane farm production costs, profit, and value-added, plant crop, San Carlos Mill District, CY 2018-2019	39
18	Sugarcane farm production costs, profit, and value-added, ratoon crop, San Carlos Mill District, CY 2018-2019	39
19	Sugarcane farm production costs, profit, and value-added, plant/ratoon crop, San Carlos Mill District, CY 2018-2019	40

## **ANNEXES**

<b><u>No.</u></b>	<b><u>Title</u></b>
1	Study questionnaires
2	List of key informants, November 5, 2019 to December 4, 2019
3	Sugar supply/value chain: Cost structure, profit margin, and value-added, plant crop, First Farmers Mill District, Negros Occidental, CY 2018-2019
4	Sugar supply/value chain: Cost structure, profit margin, and value-added, ratoon crop, First Farmers Mill District, Negros Occidental, CY 2018-2019
5	Sugar supply/value chain: Cost structure, profit margin and value-added, plant/ratoon crop, First Farmers Mill District, Negros Occidental, CY 2018-2019
6	Sugar supply/value chain: Cost structure, profit margin, and value-added, plant crop, First Farmers Mill District, Negros Occidental, CY 2018-2019
7	Sugar value chain: Farmer's chain, plant crop, San Carlos Mill District, Negros Occidental, CY 2018-2019
8	Sugar value chain: Farmer's chain, ratoon crop, San Carlos Mill District, Negros Occidental, CY 2018-2019
9	Sugar value chain: Farmer's chain, plant/ratoon crop, San Carlos Mill District, Negros Occidental, CY 2018-2019

## **EXECUTIVE SUMMARY**

The Sugar Regulatory Administration commissioned the Center for Research and Communication to conduct a study on improving statistics data on food processing and distribution focusing on sugarcane. The purpose of the study is to conduct the sugar supply-value chain analysis of selected mill district-corridors in Negros Occidental. The mixed-method approach was applied, thus, by combining the qualitative and quantitative methods, the results provided a situation analysis of the sugar value chain.

The study employed value chain (VC) concepts and tools. The value chain is a key idea in economic development, which is a precondition for poverty alleviation. It also provides a framework for knowing the structural, social and ecological implications of economic growth. This pilot study utilized the two basic elements in value chain analysis – structural analysis and economic analysis. The study used primary and secondary data to gather information from players across the VC. The supply-value chain analysis pilot study focused on Negros Occidental mill districts namely, First Farmers (in Talisay City) and San Carlos (in San Carlos City).

The sugar value chain map of First Farmers Mill District presents the stages that bring the end products, raw, and refined sugar, from input supply to production to processing to trading and markets in a linear sequence. The functions of every chain actor linked the sugar value chain.

In the study, raw material suppliers sold farm inputs to individual farmers or to SRA, which facilitated bidded input supplies to block farm beneficiaries. Goldstar Farm Trading in Banago, Bacolod City was identified as one key input supplier to sugarcane farmers. Farmers cultivated sugarcane, which was eventually delivered in trucks to mills and was paid by based on the sucrose content or Lkg per ton cane (TC) of their produce. The farmer-respondents belonged to the Alasigan Agrarian Reform Communities (ARC) in Talisay, Negros Occidental. The Alasigan ARC is not yet under the block farming scheme, hence, the individual farmers planted sugarcane on dispersed small farms. The processors converted sugarcane to raw sugar and refined sugar, and then deal sugar to traders. Farmers delivered sugarcane to Sugar Mill A<sup>1</sup>, which processed sugarcane to produce raw and refined sugar. Sugar traders handled the distribution and selling to local and export buyers. Sugar Mill A traded most of its sugar to Sugar Trader X<sup>2</sup> which mainly catered to the Manila market.

The key service providers mentioned by the stakeholders were SRA for policy formulation and RD&E provision; Mill District Development Council for private sector involvement and participation; Philippine Sugar Millers Association for development promotion; DA-DAR-SRA National Convergence for improving sugarcane productivity through block farming; Don Hermanas Multipurpose Cooperative and Land Bank of the Philippines for credit assistance; JSY Transport and First Farmers Unlimited Services Inc. for trucking services; and BREDCO and Port of Manila for port services.

---

<sup>1</sup> For confidentiality purposes, the real name of the sugar mill was not revealed. The mill covered in the study shall be pertained to as "Sugar Mill A" from here onwards.

<sup>2</sup> For confidentiality purposes, the real name of the sugar trader was not revealed. The trader covered in the study shall be pertained to as "Sugar Trader X" from here onwards.

Value chain map of raw and refined sugar, First Farmers Mill District, Negros Occidental



The VC analysis involves attaching numbers to the elements of the value chain map. It illustrates the distribution of income, profits and value added between the various chain actors. The unit of reference used for the sugar value chain stages is PhP per Lkg.

A basic requirement in the sugar VC analysis is the farm production costs and returns of sugarcane. In the study, farm costs are broken down into inputs, labor, logistics and other costs for plant and ratoon cropping. For crop year (CY) 2018-19, the costs incurred by small-sized farms (less than 10 hectares) totaled PhP122,400 per hectare during plant crop (new planting) and PhP92,090 per hectare in the ratoon crop. It revealed that the bulk of the total cost was labor (57%) followed by inputs (26-29%), other costs (11-15%) and logistics (2-4%). Given the average price of raw sugar B at PhP1,500 per Lkg during the period, this generated gross farm incomes of PhP130,368 per hectare in plant crop and PhP152,096 per hectare in ratoon crop. This then translated to profit margins (including costs of land rent and own labor) of PhP34,968 in plant crop and PhP87,006 in ratoon crop.

Sugarcane production costs and returns, First Farmers Mill District, Negros Occidental, CY 2018-19, (PhP per hectare)

Item	Plant crop	Ratoon crop
	PhP per hectare	
1. Inputs	28,910	18,170
2. Labor	57,580	40,740
3. Logistics	3,910	1,180
4. Other Costs	32,000	32,000
<b>TOTAL COST</b>	<b>122,400</b>	<b>92,090</b>
<b>TOTAL RETURNS</b>	<b>130,396</b>	<b>152,096</b>
<b>NET INCOME</b>	<b>7,968</b>	<b>60,006</b>
<b>NET INCOME</b> (include land rental and own labor)	<b>34,968</b>	<b>87,006</b>

Based on an average sugar yield of 111 Lkg per hectare (60 tons/hectare and 1.85 Lkg/TC), the total input costs (cane points and fertilizer) for small-sized farms during plant crop was estimated at PhP260 per Lkg. It comprised of cane points (PhP81 per Lkg) and fertilizers (PhP179 per Lkg).

The logistics costs shouldered at the farm level were the hauling of cane points and inputs. It reached PhP35 per Lkg, which accounted for four percent of total cost. Other inputs totaled PhP636 per Lkg included labor cost, comprising of land preparation, crop maintenance and harvesting (PhP519 per Lkg); other costs such as overhead cost and interest expense (PhP99 per Lkg); and coop fees (PhP18 per Lkg). All in all, total farm production cost amounted to PhP914 per Lkg. Using the raw sugar B price of PhP1,500 per Lkg, the expected profit of the farmer is PhP118 per Lkg.

The milling fee of PhP450 per Lkg was assumed to be 30 percent of the raw sugar B price. The total cost incurred in milling was PhP555 per Lkg, which was made up of cane supply, milling operations, depreciation, and other costs. Of the total cane cost, bulk went to cane hauling (PhP211 per Lkg). The sugar milling incurred losses of about PhP105 per Lkg.

The wholesale price of raw sugar last cropping season averaged PhP1,700 per Lkg. The profit margin of traders to wholesalers was PhP98 per Lkg.

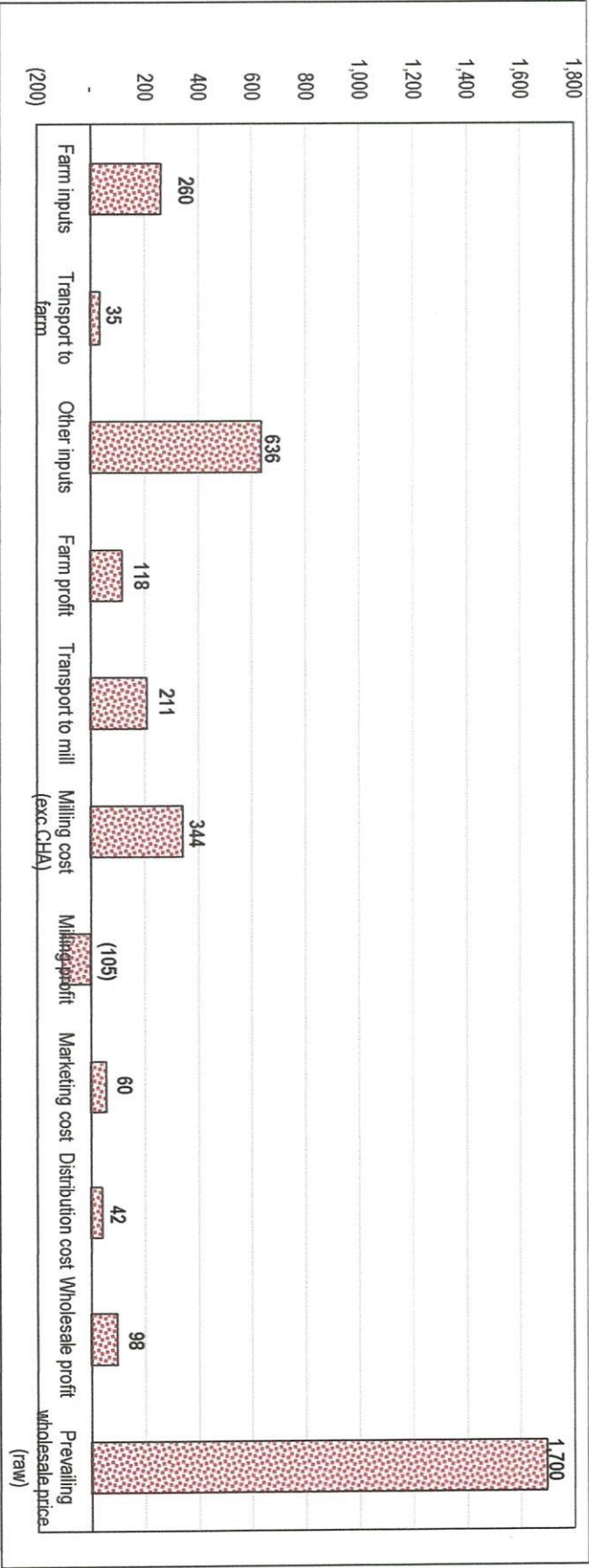
For refining, Sugar Mill A charged a tolling fee of PhP200 per Lkg. The expenses were presumed to compose of materials/supplies (20%), labor (15%), repairs/maintenance (15%) and others. The estimated total refining cost was PhP70 per Lkg while the profit margin was PhP130 Lkg. Overall, the processing cost was estimated at PhP625 per Lkg.

The overall marketing cost of sugar shouldered by Sugar Trader X from Sugar Mill A to wholesalers in Manila was around PhP64 per Lkg. The cost of money and taxes in refining was estimated at PhP167 per Lkg. The average wholesale price of refined sugar last cropping season was PhP2,200 per Lkg. Traders earned a profit margin of PhP131 per Lkg.

The distribution of value added, a measure for the economic value created in an economy, is presented to show the sources of economic growth. The value-added per Lkg at each stage of the chain are as follows: farm production level valued at PhP736; processing valued at PhP84 at the milling segment and PhP152 (refined sugar equivalent) at the refining segment; and trading amounted to PhP98 and PhP131 (refined sugar equivalent), respectively.

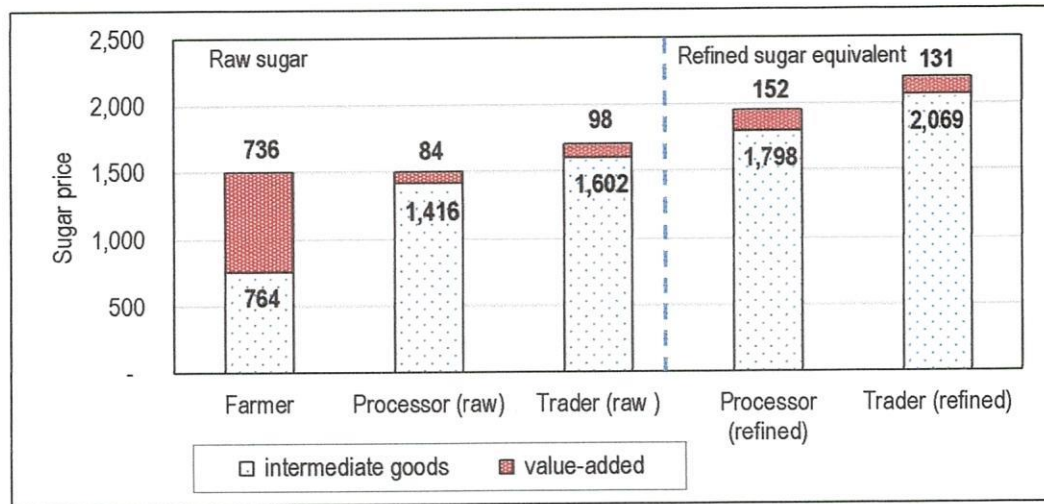
The study also examined the VC analysis for ratoon and plant/ratoon cropping. The detailed results are presented in the main report showing the cost build-up, profit as well as the value-added in every stage of the raw and refined sugar VC in First Farmers Mill District across cropping system.

Raw sugar value chain, First Farmers Mill District, Negros Occidental, CY 2018-2019  
(Php per Lkg, small-sized farms, plant crop)

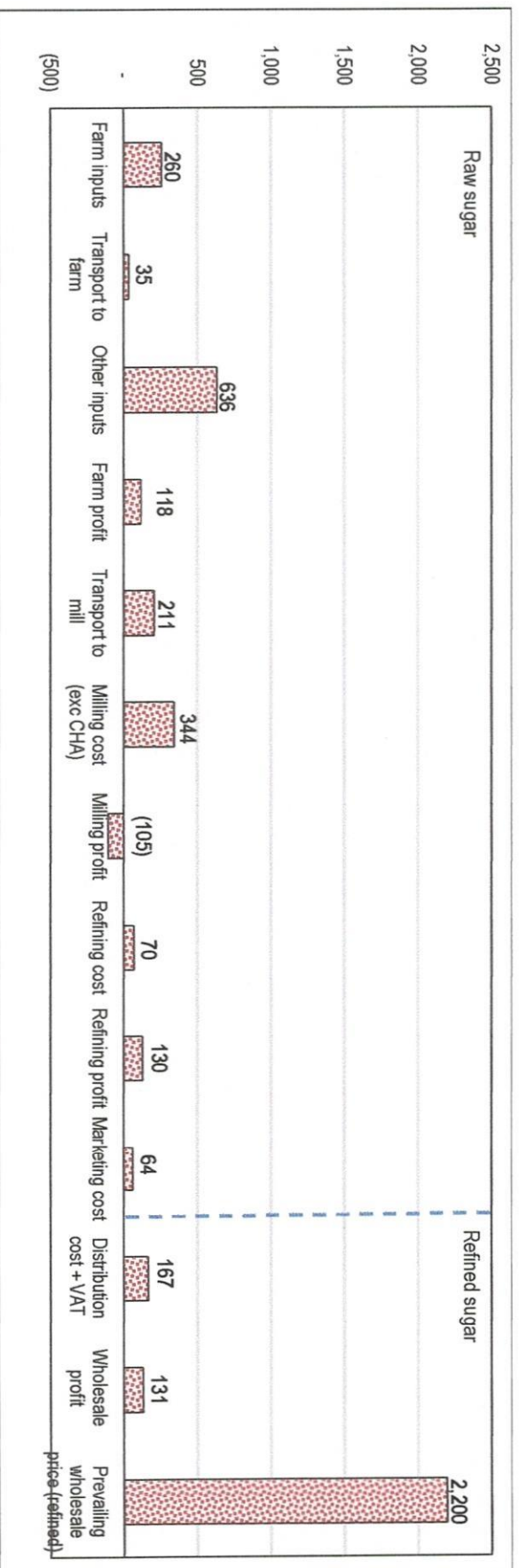


Note: Numbers may not add up due to rounding

Distribution of value-added along the sugar value chain, First Farmers Mill District, Negros Occidental, CY 2018-2019, (Php per Lkg, small-sized farms, plant crop)



Refined sugar value chain, First Farmers Mill District, Negros Occidental, CY 2018-2019  
(Php per Lkg, small-sized farms, plant crop)

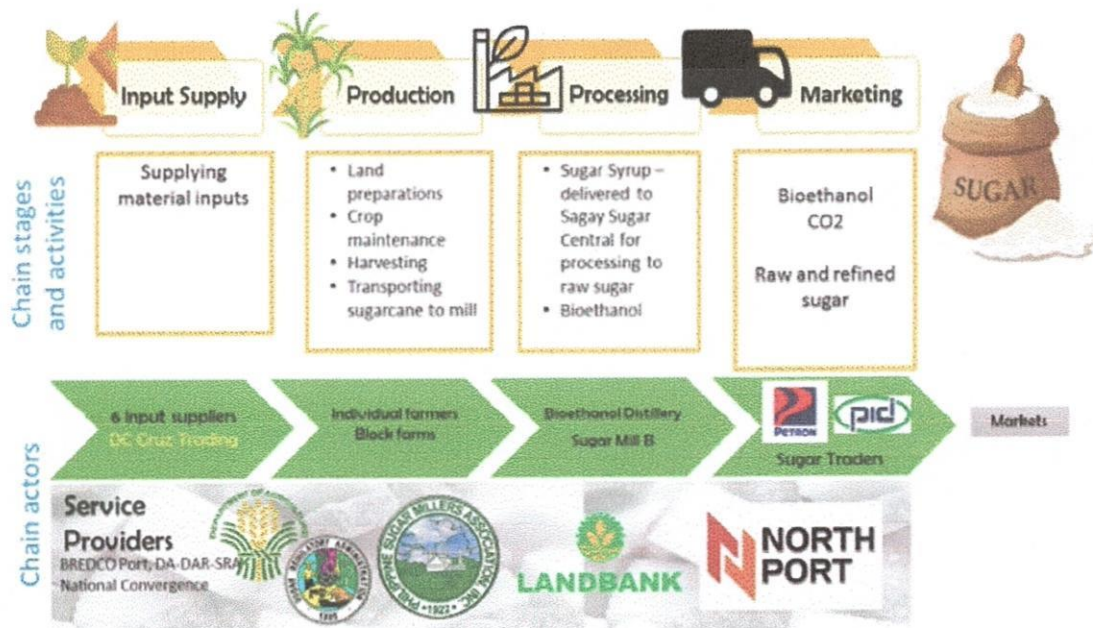


Note: Numbers may not add up due to rounding

The sugarcane value chain map of San Carlos Mill District shows the flow of sugarcane produced by farmers, from input supply to production to processing to trading and markets. Major inputs used are cane points and fertilizers. Canepoints are supplied by a private farm from Sagay City while fertilizer requirements are supplied by SRA through the block farm or farmers can buy from the agricultural supply store. There are six agricultural supply stores in San Carlos mill district but the DC Cruz Trading in San Carlos City is identified as the major source of inputs of the farmers interviewed. Sugarcane farmers interviewed are members of block farm with a few that are not yet members but are already encouraged to join. Farmers deliver their canes to Sugar Mill B<sup>3</sup> which processed their sugarcane into raw sugar. Some used to deliver to Bioethanol Distillery A<sup>4</sup>, a bioethanol company in San Carlos City but it was mentioned that it ceased operation so farmers opted to deliver to Sugar Mill B. Bioethanol Distillery A is designed to process sugarcane into bioethanol. However, it was found out during the conduct of the study that Bioethanol Distillery A purchased sugarcane from farmers and process it into a sugar syrup. The sugar syrup produced by Bioethanol Distillery A is sold to select millers while the bioethanol produced are sold to Petron Corporation. The by-product - CO<sub>2</sub> is sold to Philippine Industrial Carbonics Inc. (PICI).

Among the key service providers are SRA for the management and support to block farm, sugar policies and RD&E provision; Mill District Development Council for private sector involvement and participation; and DA-DAR-SRA National Convergence for improving sugarcane productivity through block farming.

Value chain map in San Carlos Mill District, Negros Occidental



<sup>3</sup> For confidentiality purposes, the real name of the sugar mill was not revealed, thus, shall be pertained to as "Sugar Mill B" from here onwards.

<sup>4</sup> For confidentiality purposes, the real name of the distillery was not revealed. The distillery covered in the study shall be pertained to as "Bioethanol Distillery A" from here onwards.

For crop year (CY) 2018-19, the costs incurred by small-sized farms (less than 3 hectares) totaled PhP109,970 per hectare for plant crop (new planting) and PhP77,720 per hectare for ratoon crop. Total labor cost was 43-45% of the total cost for plant and ratoon, respectively, followed by inputs (28%), other costs (14-19%) and logistics (10-13%). Given the average price of raw sugar B at PhP1,500 per Lkg during the period, this generated gross farm incomes of PhP129,192 per hectare in plant crop and PhP150,724 per hectare in ratoon crop. The total profit margins (including costs of land rent and own labor) were PhP34,172 in plant crop and PhP87,954 in ratoon crop.

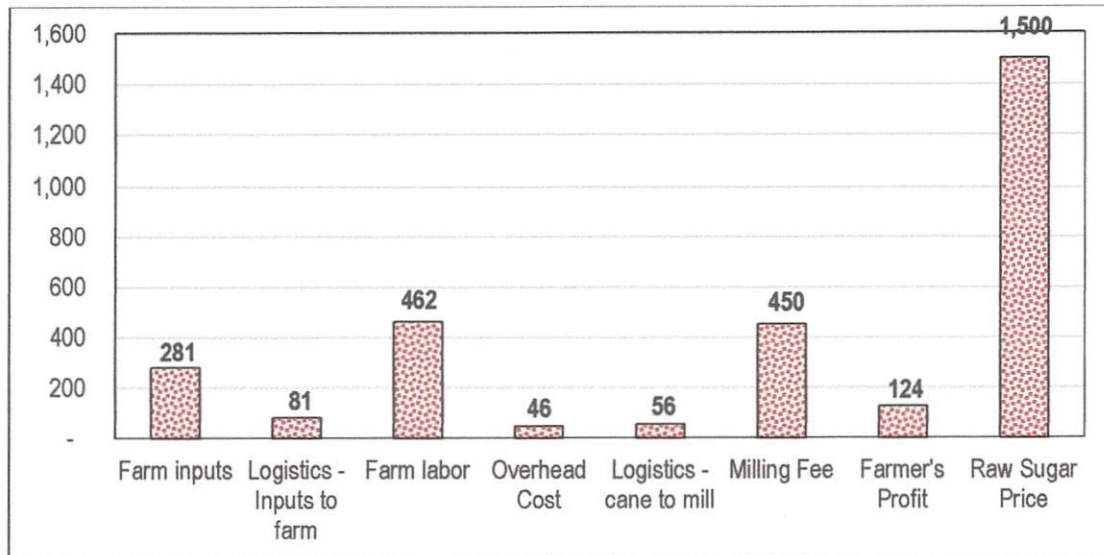
The imputed cost of farm owner's labor of 33 mandays was included in the total cost to also value the contribution of the owner's labor. Moreover, the land rental cost of PhP8,000 per hectare was also considered in place of the value of the land to cover for the overhead cost of the farmer. The land rental cost in San Carlos during the last cropping was PhP8,000 per hectare for rolling farmlands and PhP10,000 per hectare per year for flatlands for a 5 years contract.

Sugarcane production costs and returns, San Carlos Mill District, Negros Occidental  
CY 2018-19 (PhP per hectare)

Item	Plant crop	Ratoon crop
	PhP per hectare	
<b>1. Inputs</b>	30,380	21,380
<b>2. Labor</b>	49,900	33,750
<b>3. Logistics</b>	14,740	7,640
<b>4. Other Costs</b>	12,950	12,950
<b>TOTAL COST</b>	<b>107,970</b>	<b>75,720</b>
<b>TOTAL RETURNS</b>	<b>129,192</b>	<b>150,724</b>
<b>NET INCOME</b>	<b>21,222</b>	<b>75,004</b>
<b>NET INCOME</b> (include land rental and own labor)	<b>34,172</b>	<b>87,954</b>

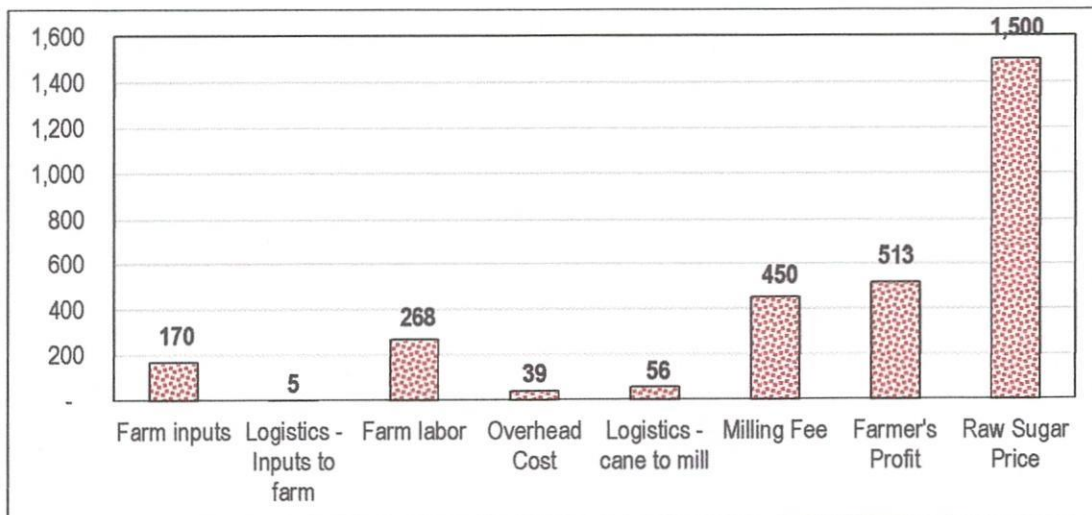
The sugar value chain in San Carlos Mill District shows the cost component of a 50-kilogram bag of raw sugar. Total input cost (inputs and logistics) costs totaled PhP362 per Lkg. Farm labor was a major cost contributor which cost at PhP462 per Lkg. Overhead cost contributed PhP46 per Lkg. The logistics of cane to mill represented the farmers share to total transport cost of cane from the farm to the mill. The trucking allowance provided is already excluded in the VC computation. The computed farmer's logistics cost was PhP56 per Lkg. The 70:30 sharing is an indication that the farmer is paying 30 percent of its harvest to the mill to process the cane into raw sugar. At the prevailing price of P1,500, the farmers milling fee was PhP450 per Lkg. The calculated farmer's profits is PhP124 per Lkg for an average yield of 60 tons per ha or 108 Lkg per hectare.

Sugar value chain: Farmer's Chain, San Carlos Mill District, Negros Occidental, CY 2018-2019  
(PhP per Lkg, small-sized farms, plant crop)



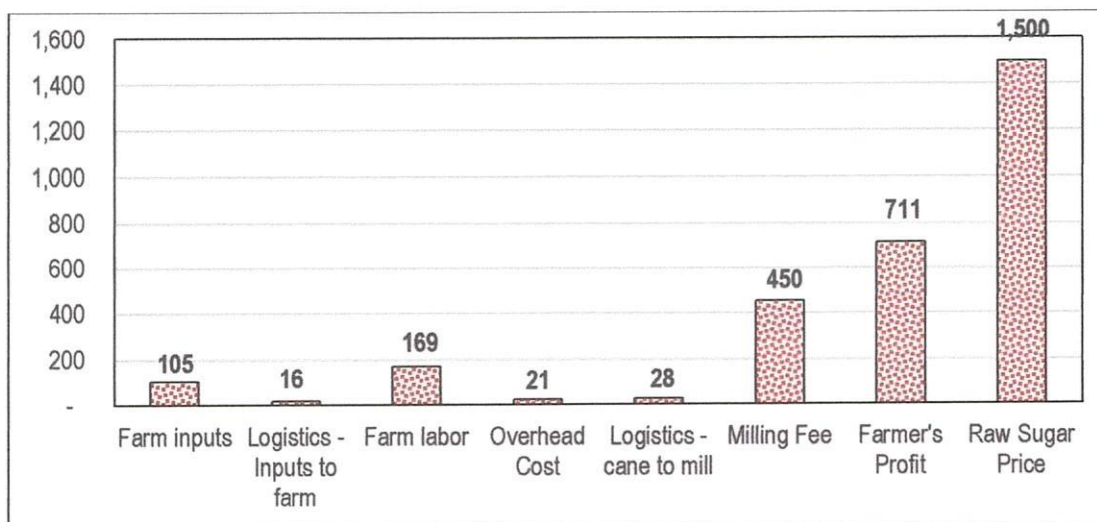
Ratoon cropping is commonly practiced in San Carlos mill district with three to four ratoon crops as common practice. The management of a ratoon crop is similar to new planting except for land preparation and planting. Farmers earned higher profit from ratoon cropping. The computed farmer's profit was PhP513 per Lkg.

Sugar value chain: Farmer's Chain, San Carlos Mill District, Negros Occidental, CY 2018-2019  
(PhP per Lkg, small-sized farms, ratoon crop)



For plant/ratoon of 40:60 combination, the average farm production cost was PhP312 per Lkg, with labor accounting for PhP169 per Lkg, other costs at seven percent and logistics costs was PhP16 per Lkg (inputs to farm) and PhP28 per Lkg (sugarcane to mill). The calculated farmer's profits is PhP711 per Lkg for an average yield of 65 tons per hectare or 119 Lkg per hectare.

Sugar value chain: Farmer's Chain, San Carlos Mill District, Negros Occidental, CY 2018-2019  
(PhP per Lkg, small-sized farms, plant/ratoon crop)



## **IMPROVING STATISTICS DATA ON FOOD PROCESSING AND DISTRIBUTION RELATED TO AGRICULTURAL CROPS IN ASEAN REGION: SUGARCANE SUPPLY-VALUE CHAIN ANALYSIS ON SELECTED MILL DISTRICTS OF NEGROS OCCIDENTAL**

The Sugar Regulatory Administration (SRA) commissioned the Center for Research and Communication (CRC) to conduct a study on improving statistics data on food processing and distribution focusing on sugarcane. The purpose of the pilot study is to conduct the sugar supply-value chain analysis of selected mill-corridors in Negros Occidental. The study is divided into two parts: methodology and supply-value chain analysis. The methodology section outlined the research approach, data collection procedure, sample selection process, data analysis and limitations of the study. The analysis of the sugar supply-value chain examined the structural and economic elements covering the VC mapping, performance of chain operators, cost build-up and value-added.

### **I. Methodology**

#### **A. Research Approach**

The mixed-method approach was applied in the study. By combining the qualitative and quantitative methods, the results provided a situation analysis of the sugar value chain. The qualitative data were gathered using focused group interviews and key informant interviews (KIIs) with sugar stakeholders. It provided textual data that described the VC setting.

On the other hand, the quantitative data were collected during focused group interviews using a quantitative technique mainly questionnaires. This approach was also referred to as the quantitative methodology (QQM) or the mixture of quantitative techniques into a qualitative method. It is a parsimonious approach in obtaining immediate quantitative findings (Grim et al., 2006). The modal values were used to determine the quantitative information of the value chain map. The triangulation method was applied to cross-check data obtained with other sources to examine for regularities in the estimation.

The study employed value chain (VC) concepts and tools. The value chain is a key idea in economic development, which is a precondition for poverty alleviation. It also provides a framework for knowing the structural, social and ecological implications of economic growth. This pilot study utilized the two basic elements in value chain analysis – structural analysis and economic analysis<sup>5</sup>.

The structural analysis consisted of value chain mapping. It is a visual representation of product flow from source to market. The maps identified products and markets, business functions, chain operators and their linkages, including the chain supporters. Value chain mapping is the core of any value chain analysis. The structural description is also the foundation of value chain analysis as subsequent analyses are built upon the VC map.

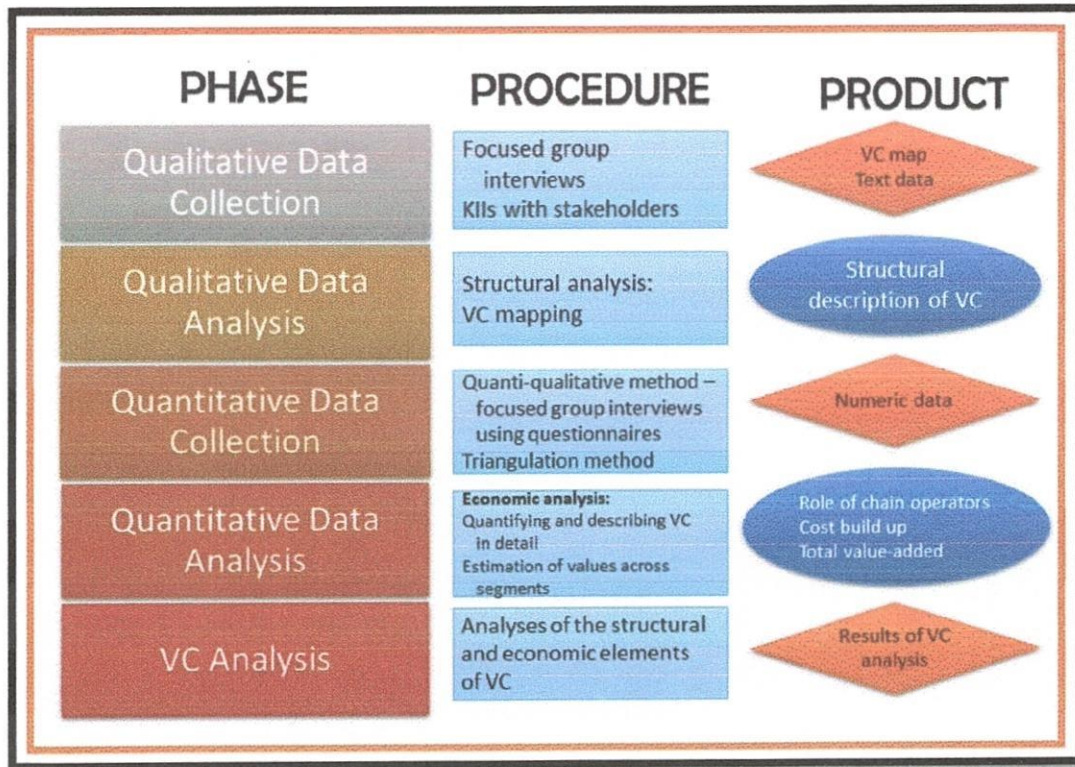
The economic analysis quantified market prices, unit costs, volume of production and the market shares of every stage in the chain. The information obtained aid the estimation of the value-added

---

<sup>5</sup> Discussions on VCA are heavily drawn from ValueLinks 2.0 Manual on Sustainable Value Chain Development by Andreas Springer-Heinze (2017).

along the segments. The chain competitiveness was assessed by its cost of production and marketing. The analysis included the performance of chain operators, cost build up and total value-added.

Figure 1. Procedure for sugarcane value chain analysis pilot study



## B. Data Collection

The study used primary and secondary data to gather information from players across the VC.

Qualitative and quantitative methods were used in the collection of primary data of the study. It is rather analogous to methodological triangulation or the use of more than one option to gather data like interviews and questionnaires. Focused group interviews (FGIs) and key informant interviews (KIIs) with selected chain actors were conducted to get a picture of the activity and relevant information for the sugarcane VC. The participants were selected purposively to cover input suppliers, farmers, traders, sugar millers/refiners, and government agencies. Moreover, the strategies for value chain development and interventions were done with the intensive participation of the value chain operators. A set of questionnaires and guide questions were used to gather information from players in the VC (Annex 1). The interviews with the VC actors were arranged through the assistance of the Sugar Regulatory Administration (SRA). The FGIs and KIIs were carried out from November 5 to December 4, 2019 in Negros Occidental and Manila.

Meanwhile, secondary data were collected from organizations such as the SRA and Philippine Millers Sugar Association, Inc. (PSMA). It involved a review of statistics on sugarcane areas, yield, production, costs and returns, among others.

### **C. Data Sample**

The supply-value chain analysis pilot study focused on two sugarcane mill districts in Negros Occidental. The two pre-identified mill districts were First Farmers (in Talisay City) and San Carlos (in San Carlos City).

For each of the mill district, an assessment of the major sugarcane suppliers of the mill was undertaken to determine the locality covered by the study. The criterion for area selection was the volume of sugarcane supplied. The farmer-respondents have farm practices and performance falling within the typical (modal) farm size in the area. The selected respondents provided a good representation of the sugarcane farming in the major supplying locale.

From the sugarcane farmers, the flow of the commodity was then traced backwards to the input suppliers, and forward to the pre-identified sugar miller and traders. These upstream and downstream chain actors were vertically linked with the sugar mill and were identified by chain referral, also referred to as the snowballing technique.

Other stakeholders in the industry were covered such as government agencies. The sample captured representation of the common practices and performance of the VC players. In the study, five key informants were interviewed while two focus group interviews were conducted with 10 to 20 participants (Annex 2).

### **D. Data Analysis**

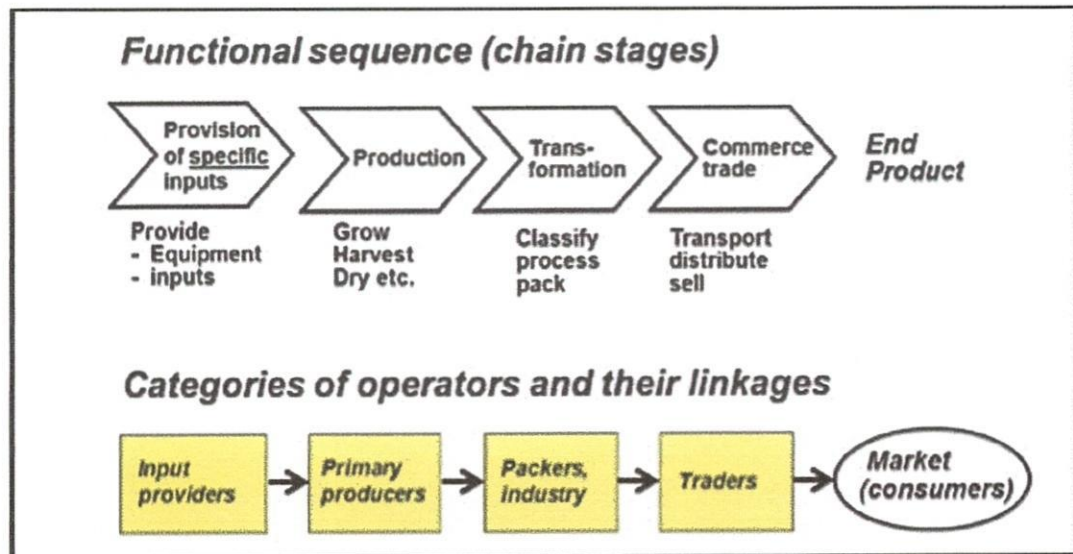
The VC concept is utilized to show the socio-economic reality. Oftentimes, it is juxtaposed with the supply chain.

Agribusiness is a value chain that recognizes the set of operators and functions that bring a "basic agricultural product from production in the field to final consumption where at each stage value is added to the product. A value chain can be a vertical linking or a network between various independent business organizations and can involve production, processing, packaging, storage, transport and distribution" (FAO, 2005). It is a strategic partnership among inter-dependent businesses that collaborate to progressively create value for the final consumer resulting in a collective competitive advantage ([www.omafra.gov.on.ca](http://www.omafra.gov.on.ca)).

The basic elements of VCA that were applied in the sugar value chain analysis study were structural analysis and economic analysis. VC analysis always begins with the present state description of a value chain. The diverse functions, multiple stakeholders, interdependencies and relationships are reduced to a comprehensible visual model by the chain maps. A basic value chain map is shown in Figure 2.

For the structural description of a VC, the steps are: 1) determine the end product; 2) identify and segment markets; 3) define the sequence of stages of the value chain; 4) depict operators and business models; 5) map business linkages; 6) differentiate the chain into several channels; 7) map operational service providers; and 8) map support service providers and government institutions.

Figure 2. Elements of a basic value chain map



Source: Andreas Springer-Heinze (2017)

Another important input into the decision on development objectives and the upgrading strategy is the economic analysis of the value chain. It begins with quantifying and describing VC in detail. The basic chain map, which is the descriptive conceptual model of the value chain, becomes useful for decision making and planning when accompanied by information that allows comparing the current condition (baseline) of the chain with potential alternative conditions. Thus, the elements (e.g. volumes, prices, sales, process recoveries) of the chain map are treated as variables that are changing over time (GTZ ValueLinks Manual, 2007).

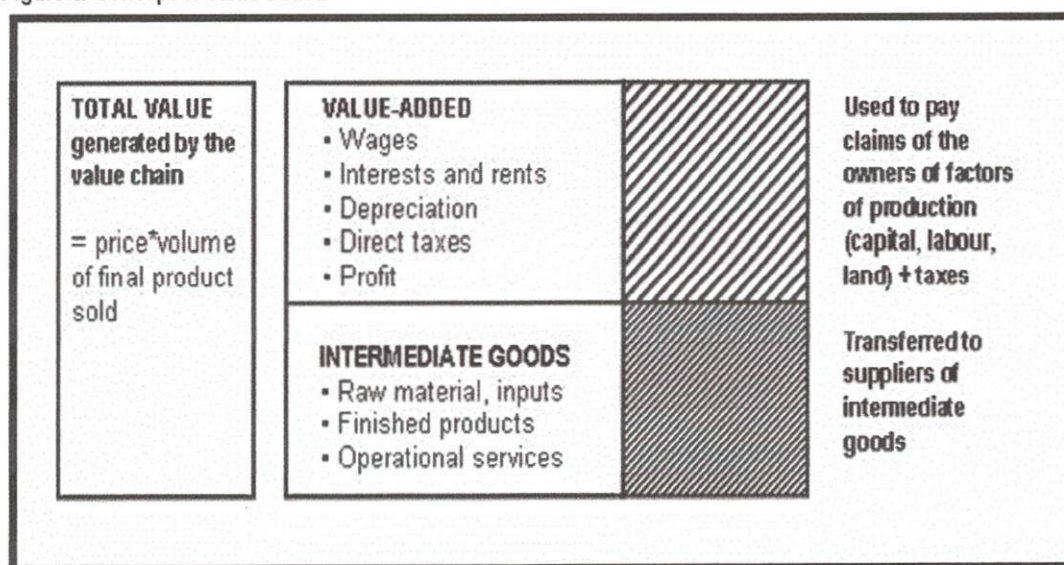
Economic analysis includes assessing the performance of operators (e.g. utilization of productive capacity, productivity, profitability); the production and marketing costs at each stage of the chain, and the cost structure along the chain stages; and overall value-added generated by the chain and shares of the different stages (GTZ ValueLinks Manual, 2007). The value-added, a measure for the wealth created in the economy, is generated for a value-chain. It is defined as the difference in the sales value and the cost of bought-in materials, components, and services.

VC analysis is not an end in itself but a pace in the value chain development process. While the direct growth objective of value chain development is to increase value-added, this means, higher sales volume or better prices in final markets, it should equally consider ecological sustainability and social inclusion. Enterprises and government agencies use VC analysis to develop a vision of change, determine collaborative strategies identify and plan supportive action and monitor impact founded on a shared view of the VC state.

### E. Limitations of the Study

The scope of the study was two mill districts in Negros Occidental. The benchmarking to competitor value chains was not covered due to time constraints. Further, the value chain used figures/data from the most recent cropping season in the area. The economic analysis of the value chain was limited in so far as the data can be generated.

Figure 3. Concept of value-added



Note: Components of total value generated by a value chain:  
 (Value-added) = (Total sales value) - (Value of intermediate goods)  
 Source: ValueLinks Manual, GTZ (2007)

## II. SUPPLY-VALUE CHAIN ANALYSIS

### FIRST FARMERS MILL DISTRICT CORRIDOR

#### A. Structural Analysis

The sugar value chain map of First Farmers Mill District describes the stages that bring the end products, raw, and refined sugar, from input supply to production to processing to trading and markets in a linear sequence (Figure 4). The functions of every chain actor linked the sugar value chain.

**Input supply.** Raw material suppliers sell farm inputs to individual farmers or to SRA, which facilitates bidded input supplies to block farm beneficiaries. Goldstar Farm Trading in Banago, Bacolod City was identified as one key input supplier to sugarcane farmers. The input suppliers in Talisay are small-scale thus, farmers go to Banago for more options.

**Farm production.** Farmers cultivate sugarcane, which is eventually delivered in trucks to mills and is paid by based on the sucrose content or Lkg per ton cane (TC) of their produce. The farmer-respondents belonged to the Alasigan Agrarian Reform Communities (ARC) in Talisay, Negros Occidental. The Alasigan ARC is not yet under the block farming scheme, hence, the individual farmers planted sugarcane on dispersed small farms. Most farmer respondents indicated that their area planted with sugarcane was about one ha.

**Processing.** The processors convert sugarcane to raw sugar and refined sugar, and then deal sugar to traders. Farmers delivered sugarcane to Sugar Mill A, which processed sugarcane to produce raw and refined sugar. Sugar Mill A employs a planter-miller sugar sharing scheme of 70/30.

**Trading.** Sugar traders handle the distribution and selling to local and export buyers. Sugar Mill A usually traded 70 to 80 percent of its sugar to Sugar Trader X, which mainly catered to the Manila market. The other markets included Cebu, Iloilo, Cagayan de Oro, and Davao.

**Service providers.** Among the key service providers mentioned by the stakeholders were SRA for policy formulation and RD&E provision; Mill District Development Council for private sector involvement and participation; Philippine Sugar Millers Association for development promotion; DA-DAR-SRA National Convergence for improving sugarcane productivity through block farming; Don Hermanas Multipurpose Cooperative and Land Bank of the Philippines for credit assistance; JSY Transport and First Farmers Unlimited Services Inc. for trucking services; and BREDCO and Port of Manila for port services.

## **B. Economic Analysis**

The VC analysis involves attaching numbers to the elements of the value chain map. It illustrates the distribution of income, profits and value added between the various chain actors. The unit of reference used for the sugar value chain stages is PhP per Lkg.

### **Sugarcane costs and returns**

The farm production costs and returns of sugarcane are basic requirements in the sugar VC analysis. In this study, the farm costs were broken down into inputs, labor, logistics, and other costs. The major material inputs used for sugarcane production include planting material or cane points (*patdan*) and fertilizer (*abono*). The labor costs comprised of land preparation, crop management, and harvesting. The logistics costs included hauling of inputs to the farm. Other costs covered overhead costs and interest expense.

For crop year (CY) 2018-19, the costs incurred by small-sized farms (less than 3 hectares) totaled PhP122,400 per hectare (ha) during plant crop (new planting) and PhP92,090 per ha in the ratoon crop. It revealed that the bulk of the total cost was labor (57%) followed by inputs (26-29%), other costs (11-15%) and logistics (2-4%). Given the average price of raw sugar B at PhP1,500 per Lkg during the period, this generated gross farm incomes of PhP130,368 per ha in plant crop and PhP152,096 per ha in ratoon crop. This then translated to profit margins (including costs of land rent and own labor) of PhP34,968 in plant crop and PhP87,006 in ratoon crop.

Figure 4. Value chain map of raw and refined sugar, First Farmers Mill District, Negros Occidental



**Table 1. Sugarcane production costs and returns small-sized farms, First Farmers Mill District Negros Occidental, CY 2018-19, (Php per hectare)**

ITEM	PLANT CROP	RATOON CROP
<b>1. INPUTS</b>		
Canepoints	9,000	1,500
Fertilizers	19,910	16,670
<b>Sub-total</b>	<b>28,910</b>	<b>18,170</b>
<b>2. LABOR</b>		
Land Preparation & Cultivation	33,780	13,140
Harvesting	23,800	27,600
<b>Sub-total</b>	<b>57,580</b>	<b>40,740</b>
<b>3. LOGISTICS</b>		
Hauling of canepoints	3,000	500
Hauling of fertilizer (1)	910	680
<b>Sub-total</b>	<b>3,910</b>	<b>1,180</b>
<b>4. OTHER COSTS</b>		
Overhead (2)	6,000	6,000
Interest (3)	5,000	5,000
Land rental (4)	21,000	21,000
<b>Sub-total</b>	<b>32,000</b>	<b>32,000</b>
<b>TOTAL COST</b>	<b>122,400</b>	<b>92,090</b>
<b>TOTAL RETURNS (5)</b>	<b>130,368</b>	<b>152,096</b>
Raw Sugar		
Molasses		
<b>NET INCOME</b>	<b>7,968</b>	<b>60,006</b>
<b>NET INCOME</b> (include land rental and own labor)	<b>34,968</b>	<b>87,006</b>

*Notes:*

(1) Includes P150 for cart hauling of inputs to farm

(2) Imputed cost for owner's labor

(3) Php10,000 per hectare at 5% per month

(4) Per hectare per year

(5) Raw sugar B at 1.85Lkg/TC; Molasses 3.5%; and 70% planter's share

## Sugar value chain analysis

### Input supply

The institutions that develop the sugarcane varieties being planted are SRA and Philippine Sugar Research Institute (PHILSURIN). The farmers revealed that the commonly planted variety among individual and block farms was VMC 84-524. The variety is known to be as early maturing and has good germination. The potential cane tonnage is 94-TC per hectare with sucrose content of 2.12 Lkg per TC, and probable sugar yield of 196 Lkg per hectare (PCARRD, 2006). Farmers indicated a planting density of four to five *lacsas* (40,000 to 50,000 cane points) per hectare. The planting materials were normally sourced from top points taken from the young tops of the matured canes and measure about 10 to 12 inches long with three to four buds or eyes. Farmers paid Php800 to Php1,000 per *lacsas* for cane point slashing (*papatdan*) and bought each *lacsas* for Php1,500.

The fertilizers for sugarcane cultivation were diammonium phosphate (DAP) (18-46-0), urea (46-0-0) and muriate of potash (0-0-60). DAP was generally applied as a basal dose (*pa-unong*) before planting. On the other hand, urea and potash were applied during tillering stage. The estimated number of fertilizer bags utilized by small farms were three for DAP, 13 for urea

and three for potash or a total of 19 bags per hectare (basal to tillering). As of CY 2018-19, the buying prices of farmers were PhP1,620 per bag for DAP, PhP920 per bag for urea and PhP1,030 per bag for potash.

Based on an average sugar yield of 111 Lkg per hectare, the total input costs (cane points and fertilizer) for small-sized farms during plant crop was estimated at PhP260 per Lkg or 28 percent of total farm cost. It comprised of cane points (PhP81 per Lkg) and fertilizers (PhP179 per Lkg).

Table 2. Sugarcane farm production costs, plant crop, First Farmers Mill District  
CY 2018-19, (PhP per Lkg)

Chain Node	Cost
<b>Input supply</b>	
Cost of inputs	
cane points	81
fertilizers	179
<b>Total cost of inputs</b>	<b>260</b>

During ratoon cropping, one *lacs*a was used for replanting to fill the gap areas. The fertilizer usage of the farmers was lesser in the ratoon crop. The total input costs amounted to PhP140 per Lkg or 26 percent of total farm cost for sugar yield of 130 Lkg per hectare.

Table 3. Sugarcane farm production costs, ratoon crop, First Farmers Mill District  
CY 2018-19, (PhP per Lkg)

Chain Node	Cost
<b>Input supply</b>	
Cost of inputs	
cane points	12
fertilizers	129
<b>Total cost of inputs</b>	<b>140</b>

Assuming a sugarcane plant and ratoon crop area of 40:60, the average input costs was PhP92 per Lkg with 122 Lkg per hectare.

Table 4. Sugarcane farm production costs, plant/ratoon crop, First Farmers Mill District  
CY 2018-19, (PhP per Lkg)

Chain Node	Cost
<b>Input supply</b>	
Cost of inputs	
cane points	18
fertilizers	74
<b>Total cost of inputs</b>	<b>92</b>

## Farm Production

In Negros Occidental, sugarcane planting time starts in September while harvest season set-offs in October. The material inputs were normally prepared one week before planting. The major VC activities performed in sugarcane production can be grouped into land preparation, crop management, and harvesting.

Land preparation consisted of plowing (*arado*), harrowing (*rastilyo*) and furrowing (*iras*). These farm activities were generally tractor-drawn. In Talisay, the contract price for land preparation services, including tractor operator and gasoline, was PhP12,000 per hectare as of CY 2018-19. The land preparation cost, for small-sized farms in plant crop, was PhP108 per Lkg or about 12 percent of the total farm costs.

Crop management included planting and crop maintenance of sugarcane. The key cost items were weeding (6% of total cost), cutting of cane points (5%), planting (5%), fertilization (3%) and cultivation (3%). The existing contract price for weeding was PhP2,000 per hectare and performed three to four times every crop cycle. The cutting of cane points and planting services were valued at PhP800 per *lacsá*. Fertilization was rated per bag at PhP120 with two applications (excluding basal dose) in a crop cycle. Cultivation activities (*buka*, *sandig*, *hulog*) were at PhP400 per manday. The estimated expenses of farmers per Lkg for crop management amounted to PhP196 or 22 percent of the total cost.

Harvesting included cutting and loading of cane and hauling of cane from the farm to the truck. It begins on the 11<sup>th</sup> month after planting. The average yield for plant crop was 60 tons per hectare or an estimated sugar yield of 111 Lkg per ha for a sucrose content of 1.85 Lkg per TC. The cutting and loading services were priced at PhP250 per ton while hauling by cart was PhP120 per ton. Harvesting costs totaled PhP214 per Lkg or 23 percent of total cost.

The overall labor costs comprising of land preparation, crop maintenance and harvesting valued at PhP519 per Lkg or about 57 percent of average total cost. The logistics costs shouldered at the farm level were the hauling of cane points and inputs. It reached PhP35 per Lkg, which accounted for four percent of total cost. Meanwhile, other costs such as overhead cost and interest expense summed to PhP99 per Lkg, adding 11 percent to total cost. All in all, total farm production cost amounted to PhP914 per Lkg.

Using the raw sugar B price of PhP1,500 per Lkg, the expected profit of the farmer is PhP118 per Lkg. The value-added at the farm production level was valued at PhP736 per Lkg.

During the interviews, the farmers also identified interventions for the value chain enhancement. These were barangay farm-to-market roads in Talisay and Murcia, farm equipment such as tractors, "*hayab*" or mechanical loader and production capital.

**Table 5. Sugarcane farm production costs, profit and value added, plant crop**  
First Farmers Mill District, CY 2018-2019, (PhP per Lkg)

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Farm Production</b>			736
Farmer's sugar selling price (a)		1,500	
- total cost of inputs	260		
- logistics cost (b)	35		

Chain Node	Cost	Price/ Profit Margin	Value-added
- cost of farm labor	519		
- overhead cost (c)	54		
- interest expense (d)	45		
- milling fee (e)	450		
- coop fees (f)	18		
<b>= Profit Margin</b>		<b>118</b>	
<b>Farmgate Cost (g)</b>	<b>914</b>		

Notes:

(a) Average price of raw sugar B

(b) Includes costs of delivery of inputs to farmgate

(c) Imputed cost for owner's labor (30 days)

(d) Php10,000 at 5% per month interest rate

(e) 30% of farmer's selling price

(f) P120 per month membership fee and P600 one-time payment

(g) Excludes transport cost from farm to mill

See Annex 3

Three ratoon crops were commonly practiced by the farmer-respondents, with five ratoon crops at most. Like plant crop, the management in sugarcane production during ratoon cropping is also very imperative. Ratoon management operation was almost the same with plant crop except for land preparation. Before planting, activities such as stubble shaving, and trash piling were performed by the farmers themselves.

In terms of farm production costs, the total cost of labor (land preparation, crop management, and harvesting) was PhP315 per Lkg (57% of total), other costs (overhead and interest expense) was PhP85 per Lkg (15%), and logistics costs was PHP9 per Lkg (2%). The total farm production cost reached PhP549 per Lkg. With an average yield of 70 tons or 130 Lkg per hectare, farmers earned a profit of PhP485 per Lkg. The value-added was estimated at PhP885 per Lkg.

Table 6. Sugarcane farm production costs, profit and value-added, ratoon crop  
First Farmers Mill District, CY 2018-19 (PhP per Lkg)

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Farm Production</b>			885
Farmer's sugar selling price (a)		1,500	
- total cost of inputs	140		
- logistics cost (b)	9		
- cost of farm labor	315		
- overhead cost (c)	46		
- interest expense (d)	39		
- milling fee (e)	450		
- coop fees (f)	16		
<b>= Profit Margin</b>		<b>485</b>	
<b>Farmgate Cost (g)</b>	<b>549</b>		

Notes:

(a) Average price of raw sugar B

(b) Includes costs of delivery of inputs to farmgate

(c) Imputed cost for owner's labor (30 days)

(d) Php10,000 at 5% per month interest rate

(e) 30% of farmer's selling price

(f) P120 per month membership fee and P600 one-time payment

(g) Excludes transport cost from farm to mill

See Annex 4

Meanwhile, the plant/ratoon cropping entailed a farm production cost of PhP341 per Lkg, with labor accounting for 57 percent, other costs at 13 percent and logistics, three percent. The calculated profit margin was PhP693 per Lkg for an average yield of 65 tons per hectare of 122 Lkg per hectare. The value-added was PhP932 per Lkg.

Table 7. Sugarcane farm production costs, profit and value added, plant/ratoon crop  
First Farmers Mill District, CY 2018-19, (PhP per Lkg)

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Farm Production</b>			932
Farmer's sugar selling price (a)		1,500	
- total cost of inputs	92		
- logistics cost (b)	9		
- cost of farm labor	194		
- overhead cost (c)	25		
- interest expense (d)	20		
- milling fee (e)	450		
- coop fees (f)	17		
<b>= Profit Margin</b>		<b>693</b>	
<b>Farmgate Cost (g)</b>	<b>341</b>		

Notes:

(a) Average price of raw sugar B

(b) Includes costs of delivery of inputs to farmgate

(c) Imputed cost for owner's labor (30 days)

(d) PhP10,000 at 5% per month interest rate

(e) 30% of farmer's selling price

(f) P120 per month membership fee and P600 one-time payment

(g) Excludes transport cost from farm to mill

See Annex 5

## Processing

The country has 28 sugar mills and 12 sugar refineries. In Negros Island, Sugar Mill A is one of the 13 sugar mills and one of the six refineries. The milling season commences in October. The processing operations include cane reception and preparation, extraction (milling), clarification, evaporation, crystallization, centrifugation, and refining.

At Sugar Mill A, the cane preparation involved weighing, sample analysis, and unloading. The cane was either moved directly to the unloader or was initially piled on the ground. The milling process began with chopping and breaking the cane and then grinding the cane. The performance of the factory was measured by certain indicators such as the cane preparation index, which was used to indicate the degree of cane preparation. Sugar Mill A attained 85 to 90 percent relative to its target of 94 percent. Other major efficiency measures are extraction (from cane to juice); boiling house recovery (BHR, from juice to raw sugar) and overall recover (OAR = extraction x BHR). The latest performance indicators showed that Sugar Mill A has a pol extraction of 92.71 percent and an actual BHR of 91.07 percent with an OAR of 84.43 percent, which was above the 82.31 percent average OAR of the mills in Negros. Sugar Mill A operated with four milling lines. In its first mill, the first juice extraction reached at least 50 percent. In the last mill, the sucrose content of the bagasse should be as low as possible, where it got less than two percent. It is deemed that the performance of the processor is largely influenced by the availability and quality of the cane.

As of CY 2018-19, Sugar Mill A operated at 249 milling days, of which 183 were grinding days. It milled around 850,000 tons of cane, accounting for six percent of the total cane milled in Negros. In terms of cane quality, Sugar Mill A indicated a sugar yield of 1.85 Lkg per TC, producing a total of about 1.6 million Lkg of raw sugar. Sugar Mill A also converted raw sugar to refined sugar at an average recovery rate of 92.5 percent. It produced about 620,200 Lkg of refined sugar during the period.

In terms of price and cost structure, the milling fee of PhP450 per Lkg was assumed to be 30 percent of the raw sugar B price. The total cost incurred in milling was PhP555 per Lkg, which was made up of cane supply, milling operations, depreciation, and other costs. Of the total cane cost, bulk went to cane hauling. The sugar milling incurred losses of about PhP105 per Lkg.

For refining, Sugar Mill A charged a tolling fee of PhP200 per Lkg. The expenses were presumed to compose of materials/supplies (20%), labor (15%), repairs/maintenance (15%) and others. The estimated total refining cost was PhP70 per Lkg while the profit margin was PhP130 Lkg.

Overall, the processing cost was estimated at PhP625 per Lkg while the value-added was PhP84 per Lkg for raw sugar and PhP141 per Lkg for refined sugar, across cropping system. Meanwhile, a reduction in the total processing cost to PhP500 per Lkg and an unchanged refining cost showed that profit in milling will increase to about PhP20 per Lkg. (Annex 6). An imperative key intervention that was recognized to enhance the processing segment is ensuring that the selling price of raw sugar is constantly above PhP1,500 per Lkg.

Table 8. Sugar processing costs, profit and value added, plant crop, First Farmers Mill District CY 2018-19, (PhP per Lkg)

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Processing</b>			
<b>Milling</b>			84
Milling fee (e)		450	
- cost of cane	250		
- cost of milling	216		
- depreciation	50		
- others	39		
<b>= Profit Margin</b>		(105)	
<b>Total Milling Cost (i)</b>	<b>555</b>		
<b>Total Raw Sugar Cost (e + f + g)</b>	<b>1,382</b>		
<b>Refining</b>			141
Tolling fee		200	
- materials/supplies	14		
- labor cost	11		
- repairs and maintenance	11		
- others	35		
<b>= Profit Margin</b>		130	
<b>Total Refining Cost (j)</b>	<b>70</b>		
<b>Total Refined Sugar Cost (k)</b>	<b>1,950</b>		

## Notes:

(e) 30% of farmer's selling price

(f) P120 per month membership fee and P600 one-time payment

(g) Farm costs excluding transport cost from farm to mill

(i) Average total direct cost of milling canes to raw sugar

(j) Average direct cost of refining raw sugar

(k) Farmer's selling price + tolling fee + SRA monitoring fee converted to refined sugar equivalent + VAT

See Annex 3

Table 9. Sugar processing costs, profit and value-added, ratoon crop, First Farmers Mill District CY 2018-19, (PhP per Lkg)

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Processing</b>			
<b>Milling</b>			84
Milling fee (e)		450	
- cost of cane	250		
- cost of milling	216		
- depreciation	50		
- others	39		
<b>= Profit Margin</b>		<b>(105)</b>	
<b>Total Milling Cost (i)</b>	<b>555</b>		
<b>Total Raw Sugar Cost (e + f + g)</b>	<b>1,015</b>		
<b>Refining</b>			141
Tolling fee		200	
- materials/supplies	14		
- labor cost	11		
- repairs and maintenance	11		
- others	35		
<b>= Profit Margin</b>		<b>130</b>	
<b>Total Refining Cost (j)</b>	<b>70</b>		
<b>Total Refined Sugar Cost (k)</b>	<b>1,950</b>		

## Notes:

(e) 30% of farmer's selling price

(f) P120 per month membership fee and P600 one-time payment

(g) Farm costs excluding transport cost from farm to mill

(i) Average total direct cost of milling canes to raw sugar

(j) Average direct cost of refining raw sugar

(k) Farmer's selling price + tolling fee + SRA monitoring fee converted to refined sugar equivalent + VAT

See Annex 4

Table 10. Sugar processing costs, profit and value added, plant/ratoon crop, First Farmers Mill District, CY 2018-19, (PhP per Lkg)

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Processing</b>			
<b>Milling</b>			84
Milling fee (e)		450	
- cost of cane	250		
- cost of milling	216		
- depreciation	50		

Chain Node	Cost	Price/ Profit Margin	Value-added
- others	39		
<b>= Profit Margin</b>		<b>(105)</b>	
<b>Total Milling Cost (i)</b>	<b>555</b>		
<b>Total Raw Sugar Cost (e + f + g)</b>	<b>807</b>		
<b>Refining</b>			<b>141</b>
Tolling fee		200	
- materials/supplies	14		
- labor cost	11		
- repairs and maintenance	11		
- others	35		
<b>= Profit Margin</b>		<b>130</b>	
<b>Total Refining Cost (j)</b>	<b>70</b>		
<b>Total Refined Sugar Cost (k)</b>	<b>1,950</b>		

Notes:

(e) 30% of farmer's selling price

(f) P120 per month membership fee and P600 one-time payment

(g) Farm costs excluding transport cost from farm to mill

(i) Average total direct cost of milling canes to raw sugar

(j) Average direct cost of refining raw sugar

(k) Farmer's selling price + tolling fee + SRA monitoring fee converted to refined sugar equivalent + VAT

See Annex 5

## Trading

The trading (distribution and selling) of raw and refined sugar of Sugar Mill A was largely handled by Sugar Trader X. Transactions with Sugar Trader X were normally done by phone calls, sugar was picked up on the next day and paid with check or cash. Sugar Mill A also provided payment terms on some occasions. Color (whiteness) and moisture content were among the quality considerations when buying sugar.

The expenses incurred by traders like Sugar Trader X were the cost of sugar, cost of money, and marketing cost. The cost of sugar was the ex-mill price of sugar. The cost of money covered the 83-day holding period. Marketing involved delivery from mill to Manila to wholesalers.

The average ex-mill price of raw sugar B was PhP1,500 per Lkg during the last cropping period. The cost of money was estimated between PhP42 and PhP55 per Lkg. Sugar was usually transported from the mill to the port using 10-wheeler trucks with a capacity of 500 Lkg bags. Sugar Trader X distributed the bulk of the sugar to the domestic market, specifically, Manila. It was estimated that 15,000 to 20,000 bags of raw sugar per week were purchased from Sugar Mill A. It also availed of the tolling services of Sugar Mill A, which processed 15,000 to 20,000 Lkg-bags of refined sugar every week for Sugar Trader X. The overall marketing cost of sugar shouldered by Sugar Trader X from Sugar Mill A to wholesalers in Manila was around PhP60 per Lkg and PhP64 per Lkg in refined sugar equivalent.

The customers at the local market were wet markets and industrial users. The wholesale prices of raw and refined sugar last cropping season were PhP1,700 per Lkg and PhP2,200 per Lkg, respectively. The corresponding profit margins of traders to wholesalers were PhP98 per Lkg for raw sugar and PhP131 per Lkg for refined sugar. The overall estimated value-added (raw

and refined) at the minimum in the trading stage was PhP98 per Lkg for raw sugar and PhP131 per Lkg for refined sugar. Meanwhile, the entry of smuggled sugar from neighboring countries remained a major concern to traders.

Table 11. Trading costs, profit and value-added, plant and ratoon crop, First Farmers Mill District, CY 2018-19, (PhP per Lkg)

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Trading</b>			
<b>Raw Sugar</b>			98
Prevailing wholesale price raw sugar		1,700	
- ex-mill selling price	1,500		
- cost of money (m)	42		
- marketing cost (n)	60		
<b>= Profit Margin (o)</b>		<b>98</b>	
<b>Total Trader's Cost (raw sugar)</b>	<b>1,602</b>		
<b>Refined Sugar</b>			131
Prevailing wholesale price refined sugar		2,200	
- cost of refined sugar	1,950		
- cost of money (m)	55		
- marketing cost (n)	64		
<b>= Profit Margin (o)</b>		<b>131</b>	
<b>Total Trader's Cost (refined sugar)</b>	<b>2,069</b>		
<b>Market (q)</b>			
Prevailing wholesale price raw sugar		1,700	
Prevailing wholesale price refined sugar		2,200	

Notes:

(m) Cost of money (83-day holding period)

(n) Includes costs of delivery from mill to Manila to wholesale market

(o) Combined profit margin from trading to wholesale market

(q) Prevailing wholesale price of raw and refined sugar, MM, CY 2018-2019

See Annex 3-5

## Logistics

Logistics involve the delivery of goods between the point of origin to point of consumption. In the study, these involved movements of inputs to farm, cane to mills, sugar to Manila port and sugar to wholesale markets. Inputs like fertilizers were transported in Talisay using jeepneys and farmers paid a transport cost of PhP40 per bag, ranging from PhP9 to PhP35 per Lkg for different cropping systems. It was assumed that the cane hauling allowance supplied by the mill to farmers was PhP390 per ton, thus, for CY 2018-19, the average logistics cost in delivering cane to mills was PhP211 per Lkg. However, the assumed cost may be lower than the supposed cost due to the overloading practice of most trucking activities.

In the transport of sugar from the mill to the market, Sugar Trader X paid items such as hauling of sugar to trucks (PhP5.25 per Lkg), delivery of sugar from mill to BREDCO (PhP9 per Lkg), shipping permit (PhP1.50 per Lkg) and transport of sugar from mill to Manila port (PhP43 per Lkg). The total cost of moving sugar from the mill to Port of Manila was estimated at PhP43 per Lkg with travel time from Bacolod to Manila of less than 24 hours. The distribution cost from Manila warehouse to wholesalers was estimated at PhP17 per Lkg.

Table 12. Sugar logistics costs, First Farmers Mill District, CY 2018-19  
(PhP per Lkg)

Chain Node	Cost
Cost of delivery of inputs to farm	9 - 35
Cost of delivery of canes to mill (h)	211
Cost of delivery from mill to Manila (l)	43
Cost of delivery to market (p)	17

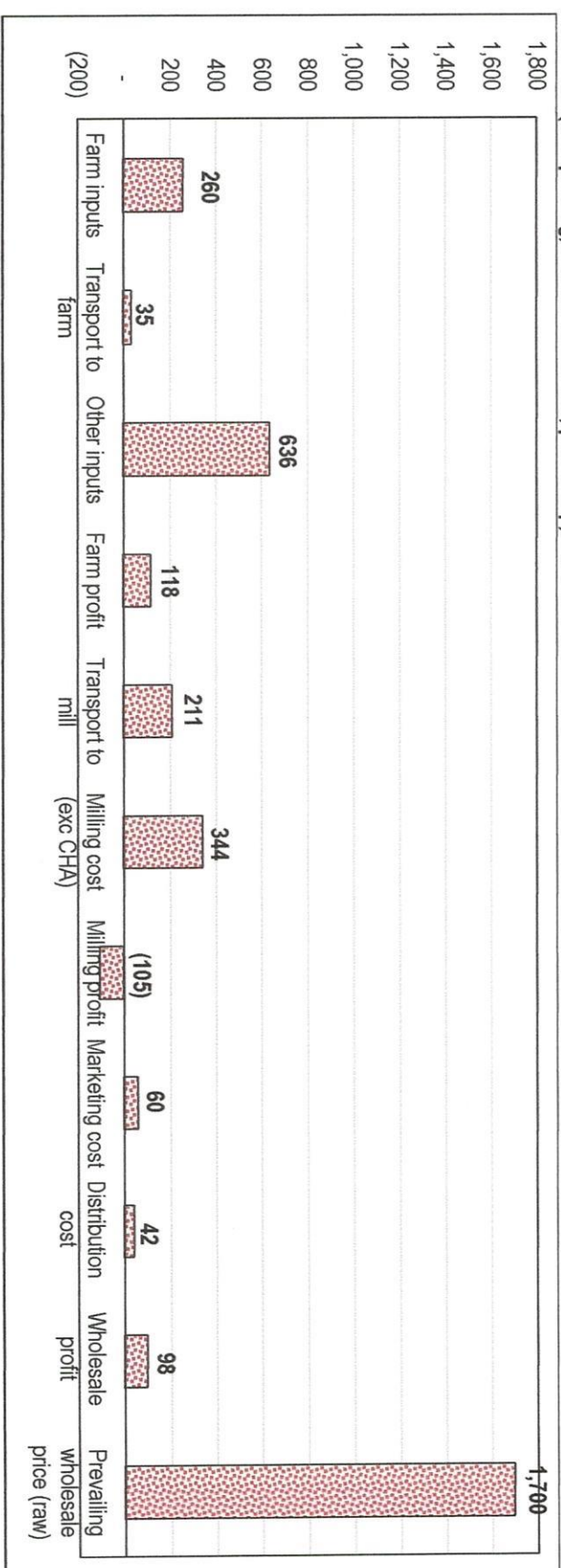
Notes:

(h) Assumed PhP390/ton transport cost from farm to mill

(l) Mill to port to Manila port

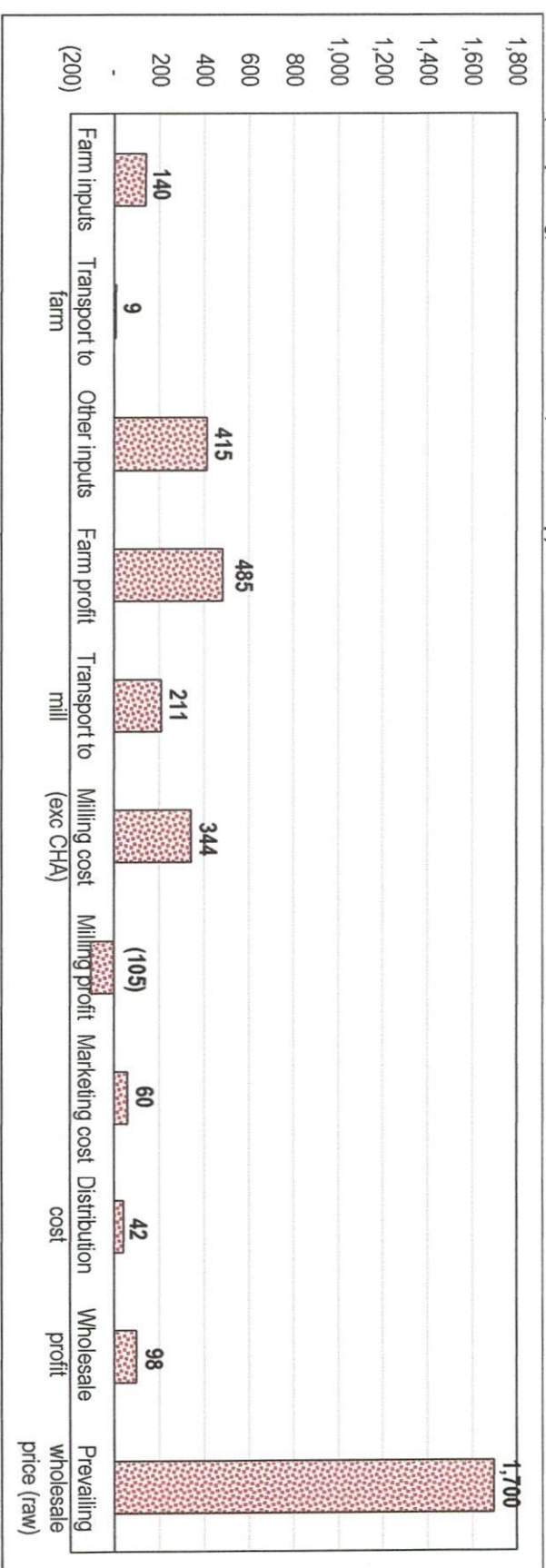
(p) Manila warehouse to market

**Figure 5. Raw sugar value chain, First Farmers Mill District, Negros Occidental, CY 2018-2019**  
(PHP per Lkg, small-sized farms, plant crop)



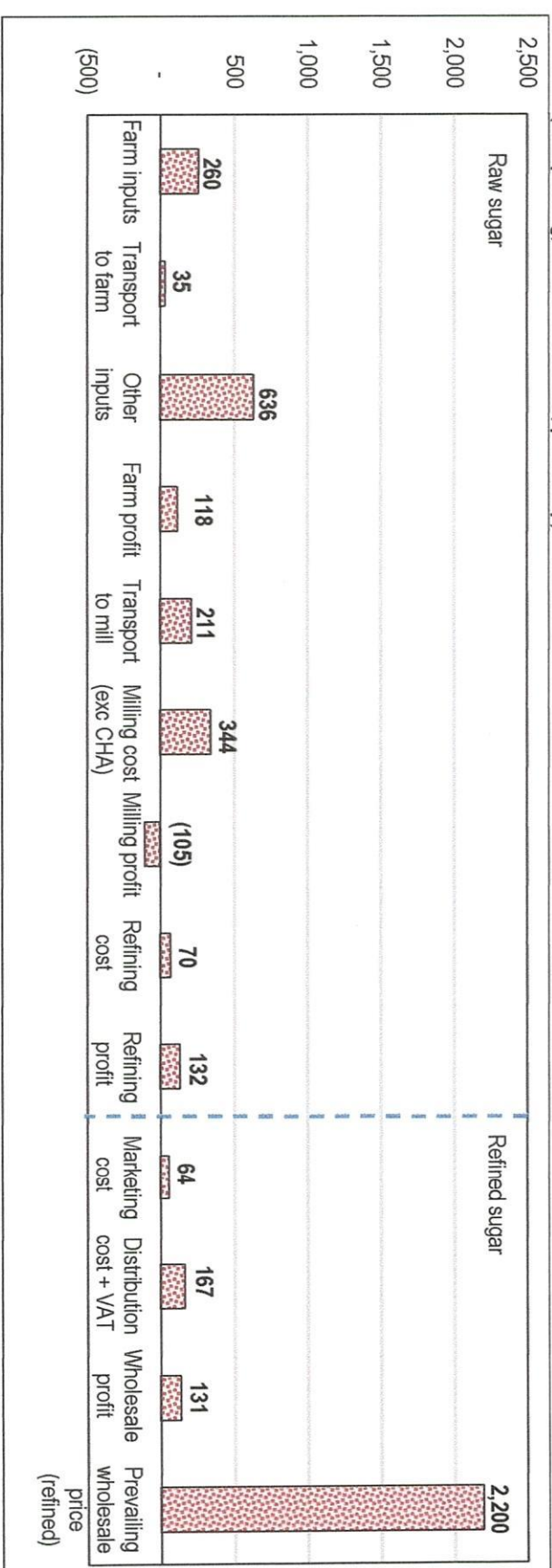
Note: Numbers may not add up due to rounding

**Figure 6. Raw sugar value chain, First Farmers Mill District, Negros Occidental, CY 2018-2019**  
(Php per Lkg, small-sized farms, ratoon crop)



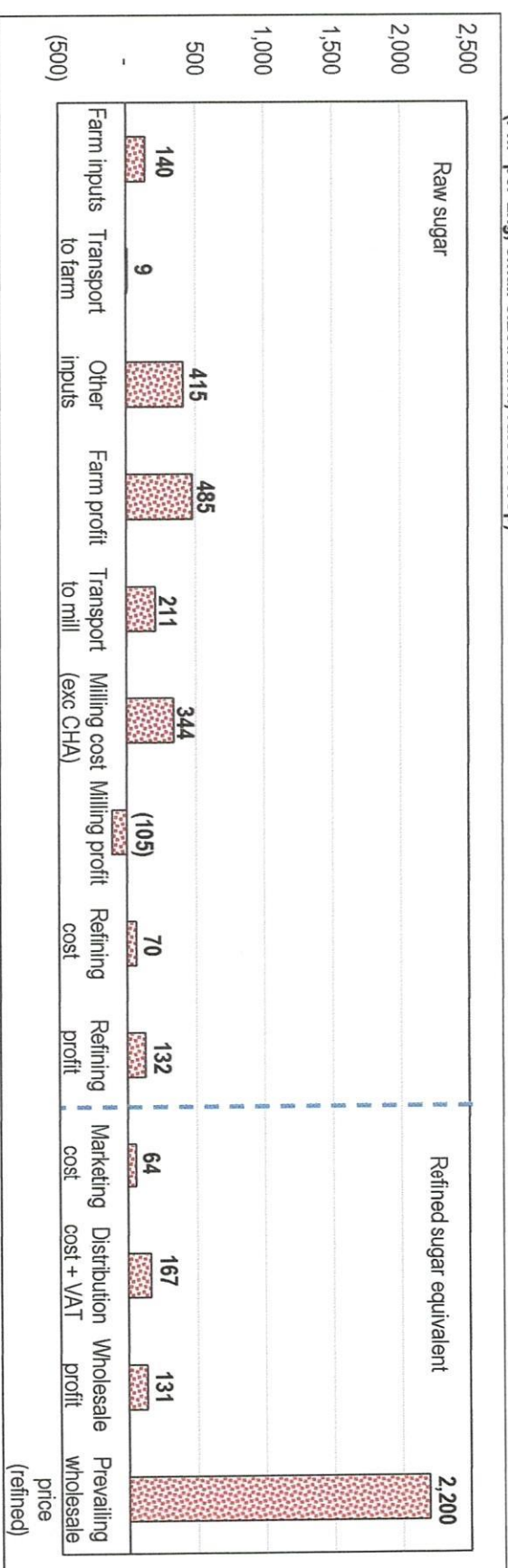
Note: Numbers may not add up due to rounding

**Figure 7. Refined sugar value chain, First Farmers Mill District, Negros Occidental, CY 2018-2019**  
(Php per Lkg, small-sized farms, plant crop)



Note: Numbers may not add up due to rounding

**Figure 8. Refined sugar value chain, First Farmers Mill District, Negros Occidental, CY 2018-2019**  
(Php per Lkg, small-sized farm, ratoon crop)



Note: Numbers may not add up due to rounding

The distribution of value added, a measure for the economic value created in an economy, is presented to show the sources of economic growth.

Figure 9. Distribution of value-added along the sugar value chain, First Farmers Mill District, CY 2018-2019, (PhP per Lkg, small-sized farm, plant crop)

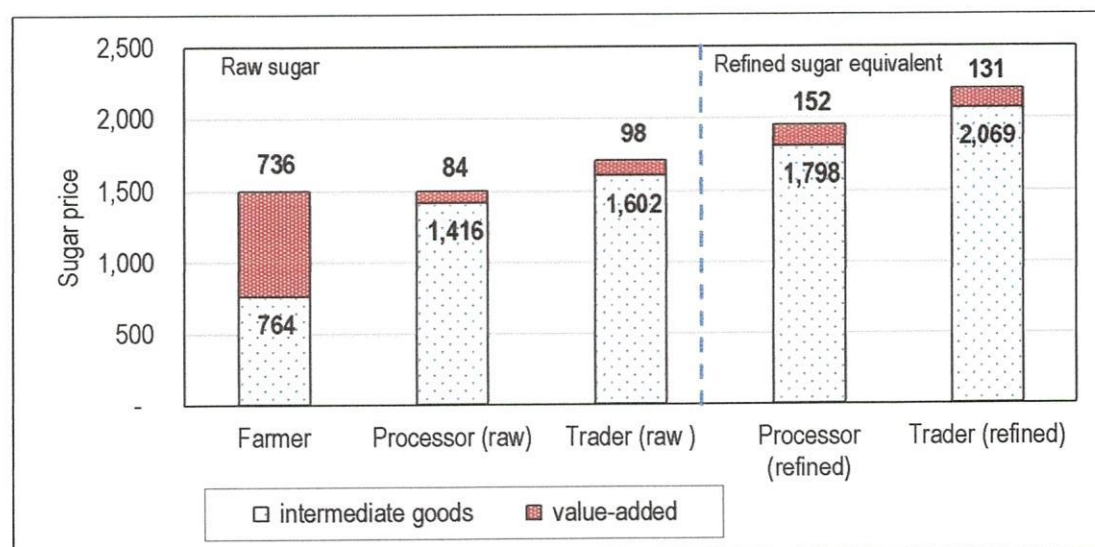
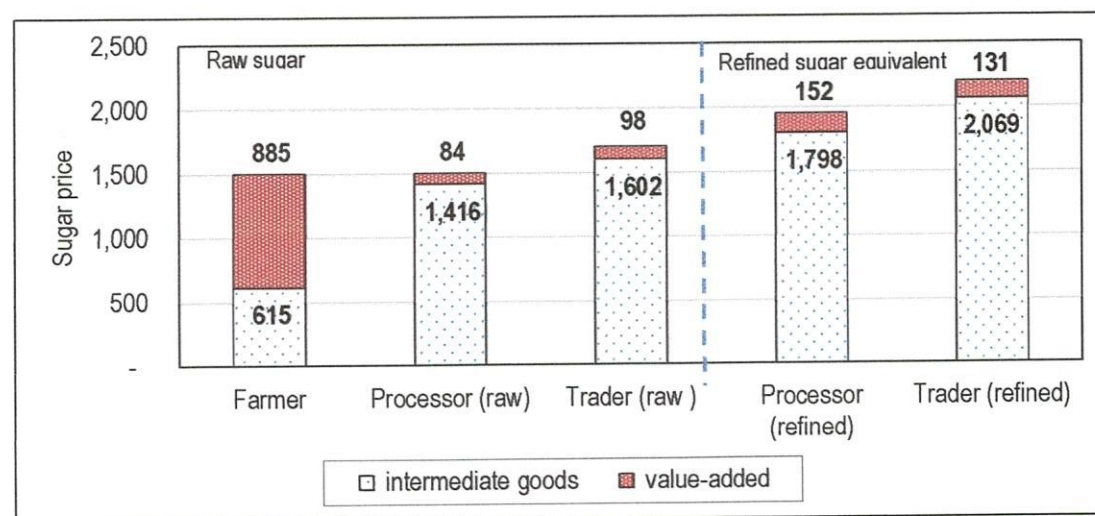


Figure 10. Distribution of value-added along the sugar value chain, First Farmers Mill District CY 2018-2019, (PhP per Lkg, small-sized farms, ratoon crop)



## **SAN CARLOS MILL DISTRICT CORRIDOR**

### **A. Structural Analysis**

The sugarcane value chain map of San Carlos Mill District is shown in Figure 11. It shows the flow of sugarcane produced by farmers, from input supply to production to processing to trading and markets. The functions of every chain actor are critical in the value chain link.

**Input Supply.** Major inputs used are cane points and fertilizers. Canepoints are supplied by a private farm from Sagay while fertilizer requirements are supplied by SRA through the block farm or farmers can buy from the agricultural supply store. There are six agricultural supply stores in San Carlos but the DC Cruz Trading in San Carlos City is identified as the major source of inputs of the farmers interviewed.

**Farm Production.** Sugarcane farmers interviewed are members of block farm with a few that are not yet members but are already encouraged to join. Areas planted to sugarcane are small and mostly one hectare only. Farmers are mainly supported through block farming.

**Processing.** Sugarcane farmers deliver their cane to Sagay Central Incorporated which processed their sugarcane into raw sugar. Some used to deliver to Bioethanol Distillery A, a bioethanol company in San Carlos City but it was mentioned that it ceased operation so farmers opted to deliver to Sagay Central. Distillery A is designed to process sugarcane into bioethanol. However, it was found out during the conduct of the study that Distillery A purchased sugarcane from farmers and process it into a sugar syrup. The sugar syrup is then sold to select millers for processing into raw sugar. Distillery A purchased molasses as feedstock for its bioethanol production.

**Marketing.** Sugarcane farmers also delivered the cane to Sagay Central Incorporated. The Sagay Central employs a planter-miller sugar sharing scheme of 70/30. Distillery A follows the same payment scheme to farmers using Lkg per TC of 1.80 on the average. The sugar syrup produced by Distillery A is sold to select millers while the bioethanol produced are sold to Petron Corporation. The by-product - CO<sub>2</sub> is sold to Philippine Industrial Carbonics Inc. (PICI).

**Service Providers.** Among the key service providers mentioned by the stakeholders are SRA for the management and support to block farm, sugar policies and RD&E provision; Mill District Development Council for private sector involvement and participation; and DA-DAR-SRA National Convergence for improving sugarcane productivity through block farming.

### **A. Economic Analysis**

#### **Sugarcane costs and returns**

The sugarcane costs and returns are the starting point in the conduct of the sugarcane VC analysis. In this study, the farm costs are broken down into input supply, logistics of inputs to farm, cost of land preparation, planting, crop management, harvesting and logistics of sugarcane to mill.

For crop year (CY) 2018-19, the costs incurred by small-sized farms (less than 3 hectares) totaled PhP109,970 per hectare for plant crop (new planting) and PhP77,720 per hectare for ratoon crop. Total labor cost was 43-45% of the total cost for plant and ratoon, respectively,

Figure 11. Value chain map of sugar, San Carlos Mill District, Negros Occidental



followed by inputs (28%), other costs (14-19%) and logistics (10-13%). Given the average price of raw sugar B at PhP1,500 per Lkg during the period, this generated gross farm incomes of PhP129,192 per hectare in plant crop and PhP150,724 per hectare in ratoon crop. The total profit margins (including costs of land rent and own labor) were PhP34,172 in plant crop and PhP87,954 in ratoon crop.

The imputed cost of farm owner's labor of 33 mandays was included in the total cost to also value the contribution of the owner's labor. Moreover, the land rental cost of PhP8,000 per hectare was also considered in place of the value of the land to cover for the overhead cost of the farmer. The land rental cost in San Carlos mill district during the last cropping was PhP8,000 per hectare for rolling farmlands and PhP10,000 per hectare per year for flatlands for a five year-contract.

**Table 13. Sugarcane production costs and returns small-sized farms, San Carlos, Negros Occidental, CY 2018-19 (PhP per hectare)**

ITEM	UNIT	QTY	UNIT PRICE	PLANT CROP	QTY	UNIT PRICE	RATOON CROP
<b>1. INPUTS</b>							
Canepoints	lacsas	4	3,000	12,000	1	3,000	3,000
Fertilizers							
18-46-0 (basal)	bags	5	1,475	7,375	5	1,475	7,375
46-0-0	bags	6	980	5,880	6	980	5,880
0-0-60	bags	5	1,025	5,125	5	1,025	5,125
<b>Sub-total</b>				<b>30,380</b>			<b>21,380</b>
<b>2. LABOR</b>							
Land Preparation							
Land Clearing/shaving/trash piling	contract	1	5,000	5,000	1	1,000	1,000
Plowing "Arado" (1)							
1st plowing (5MAD x 6 days)	MAD	30	300	9,000			
2nd plowing (5MAD x 3 days)	MAD	15	300	4,500			
Furrowing "Tudling"	MAD	4	300	1,200			
Crop Management							
Planting "Tanum" (2) / Replanting	lacsas	4	150	600	1	150	150
Fertilization	bags	16	200	3,200	16	200	3,200
Weeding "Pahilamon" (3)	contract	2	3,000	6,000	2	3,000	6,000
Cultivation							
Off-barring/Hilling-up/Closing	MAD	8	300	2,400	8	300	2,400
Harvesting "Tapas"							
Cut and load	ton	60	300	18,000	70	300	21,000
<b>Sub-total</b>				<b>49,900</b>			<b>33,750</b>
<b>3. LOGISTICS</b>							
Hauling of canepoints	lacsas	1	7,000	7,000			
Driver's tip		1	500	500			
Driver's meals		1	200	200			
Unloading of canepoints		4	100	400			

ITEM	UNIT	QTY	UNIT PRICE	PLANT CROP	QTY	UNIT PRICE	RATOON CROP
Hauling of fertilizer	bags	16	40	640	16	40	640
Hauling by truck to mill (4)	ton	60	100	6,000	70	100	7,000
<b>Sub-total</b>				<b>14,740</b>			<b>7,640</b>
<b>4. OTHER COSTS</b>							
Overhead (5)	mandays	33	150	4,950	33	150	4,950
Land rental (6)	per hectare year	1	8,000	8,000	1	8,000	8,000
<b>Sub-total</b>				<b>12,950</b>			<b>12,950</b>
<b>TOTAL COST</b>				<b>107,970</b>			<b>75,720</b>
<b>TOTAL RETURNS (7)</b>				<b>129,192</b>			<b>150,724</b>
Raw Sugar		76	1,500		88	1,500	
Molasses		2	9,400		2	9,400	
<b>NET INCOME</b>				<b>21,222</b>			<b>75,004</b>
<b>NET INCOME</b> (include land rental and own labor)				<b>34,172</b>			<b>87,954</b>

Notes:

- (1) P300 if without meals, P250 if with meals
- (2) P200 if without meals, P150 if with meals
- (3) Depending on weeds, sometimes P5,000 per hectare
- (4) Total is P300/ton, with incentives of P200/ton within 50 km radius
- (5) Imputed cost for owner's labor
- (6) Per hectare per year
- (7) Raw sugar - B; At 1.80Lkg/TC and 70% planter's share; Molasses - 4% per TC

## Sugar value chain analysis

### Input supply

Farmers used a planting density of four *lacsas* (40,000 cane points) per hectare. The cane points were purchased from a private farm in Sagay City. Farmers paid PhP3,000 per *lacsas* of cane points ready for planting. It is the supplier who prepared the cane points from the young tops of the matured canes measuring about 10 to 12 inches long with three to four buds or eyes. The commonly planted variety is VMC 84-524. Other varieties planted were 88-354, PHIL 991793.

The fertilizers used were diammonium phosphate (DAP) (18-46-0), urea (46-0-0) and muriate of potash (0-0-60). A total of 16 bags of fertilizers were used during the last cropping season: five bags of DAP, six bags of urea and five bags of muriate of potash. As of CY 2018-19, the buying prices of farmers were PhP1,475 per bag for DAP, PhP980 per bag for urea and PhP1,025 per bag for muriate of potash. The first fertilization is done 30 days after planting (DAP) and the second application is 3.5 to 4 months after planting.

Based on an average sugar yield of 111 Lkg per ha, the total input costs (cane points and fertilizer) for small-sized farms during plant crop is estimated at PhP281 per Lkg or 32 percent of total farm

cost. This means that for every 50-kilogram bag of raw sugar, PhP111 of the total cost was cane points and PhP170 was for fertilizer cost.

**Table 14. Sugarcane farm production costs, plant crop  
San Carlos Mill District, CY 2018-19, (PhP per Lkg)**

Chain Node	Cost
<b>Input supply</b>	
Cost of inputs	
Cane points	111
Fertilizers	170
<b>Total cost of inputs</b>	<b>281</b>

During ratoon cropping, farmers do replanting to fill the gap or missing hills. One *lacs*a was used for replanting with cane points taken from the previous harvest. For the purpose of this VC analysis, the one *lacs*a was also costed out. For the ratoon crop, farmers used the same amount of fertilizer. The total input costs amounted to PhP170 per Lkg or 35 percent of total farm cost.

**Table 15. Sugarcane farm production costs, ratoon crop,  
San Carlos Mill District, CY 2018-19, (PhP per Lkg)**

Chain Node	Cost
<b>Input supply</b>	
Cost of inputs	
Cane points	24
Fertilizers	146
<b>Total cost of inputs</b>	<b>170</b>

Assuming a sugarcane plant and ratoon crop area of 40:60, the average input costs was PhP105 per Lkg.

**Table 16. Sugarcane farm production costs, plant/ratoon crop  
San Carlos Mill District, CY 2018-19, (PhP per Lkg)**

Chain Node	Cost
<b>Input supply</b>	
Cost of inputs	
Cane points	28
Fertilizers	77
<b>Total cost of inputs</b>	<b>105</b>

### **Logistics of inputs**

The logistics costs of delivering inputs to the farm were also considered in the value chain analysis. It included the cost of hauling of cane points and unloading of cane points to farm and hauling of fertilizers. Total logistics costs reached PhP81 per Lkg for plant crop which accounted for nine percent of the total farmgate cost.

### **Farm production**

The major VC activities performed in sugarcane production can be grouped into land preparation, crop management, and harvesting.

Land preparation consists of land clearing and trash piling, plowing (*arado*), harrowing (*rastilyo*) and furrowing (*tudling*). Because of the rolling condition of sugarcane farm areas in San Carlos, land preparation is mostly done with carabao. Land clearing is contracted out and cost PhP5,000 per hectare. One man-animal day (MAD) costs PhP300 per day if without meals and PhP250 per day if with meals. To plow a hectare would require about 30 MAD for first plowing and 15 MAD for second plowing. The land preparation cost, for small-sized farms in plant crop was about PhP20,000 per hectare. Additional labor costs are incurred for crop management and harvesting.

Crop management includes the planting of cane points and crop maintenance. Planting was paid per number of *lacsas* at PhP150 per *lacsas*. Fertilization was paid per number of bags of fertilizer applied at PhP200 per bag while weeding (*pahilamon*) is contracted out and laborers are paid PhP3,000 per hectare. Generally, manual weeding is done twice per cropping cycle or depending on the quantity of weeds. First weeding is done 65 DAP and the second weeding in 90 DAP. A few farmers mentioned doing manual weeding three times a year while others only once per cropping. A few mentioned spraying as an alternative but this is not a common practice in San Carlos. Spraying is done 60 DAP using two liters of 2-4D. Spraying is paid per barrel at PhP300 per barrel using two barrels of sprays per hectare.

Harvesting includes cutting and hauling of cane from the farm to truck piling. It is done on the 11<sup>th</sup> month after planting. The average yield for plant crop is 60 tons per hectare or an estimated sugar yield of 111 Lkg per ha for a sucrose content of 1.80 Lkg per TC. The cutting and loading services were priced at PhP300 per ton. Harvesting costs totaled PhP167 per Lkg or 19 percent of the farmgate cost.

The overall labor costs comprising of land preparation, crop maintenance, and harvesting were valued at PhP462 per Lkg or about 53 percent of the total farmgate cost.

The overhead cost which is the imputed cost of farm owner's labor was about PhP46 per Lkg. The farm owner visited the farm to monitor, manage the operations and do some farm activities.

The total farm production cost amounted to PhP870 per Lkg. Using the raw sugar B price of PhP1,500 per Lkg, the expected profit of the farmer was PhP124 per Lkg. The value-added at the farm production level was valued at PhP632 per Lkg which means that in the total value price of PhP1,500 per Lkg, the farm production activities were able to generate an added value of PhP632 per Lkg.

**Table 17. Sugarcane farm production costs, profit, and value-added, plant crop  
San Carlos Mill District, CY 2018-19, (PhP per Lkg)**

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Farm Production</b>			632
Farmer's sugar selling price (a)		1,500	
- total cost of inputs	281		
- logistics cost (b)	81		
- cost of farm labor	462		
- overhead cost (c)	46		
- milling fee (d)	450		
<b>= Profit Margin</b>		<b>124</b>	
<b>Farmgate Cost (e)</b>	<b>870</b>		
<b>Logistics – Farmer's Share (f)</b>			
Cost of delivery of canes to mill	56		

Notes:

(a) Raw sugar B domestic price

(b) Includes costs of delivery of inputs to farmgate

(c) Imputed cost for owner's labor (33 days)

(d) 30% of farmer's selling price

(e) Includes cost of inputs, logistics, labor and overhead

(f) Includes farmer's transport cost from farm to mill. Trucking allowance excluded

See Annex 6

Ratoon cropping is commonly practiced in San Carlos with three to four ratoon crops as common practice. The management of a ratoon crop is similar to new planting except for land preparation and planting. Ratoon cropping preparation starts with stubble shaving and trash piling which are performed by the farm owner or contracted out at PhP1,000 per hectare.

The total cost of labor involved in land preparation, crop management, and harvesting was PhP268 per Lkg (56% of total), the overhead cost was PhP39 per Lkg (1%), and logistics costs was PhP5 per Lkg (inputs to farm) and PhP56 per Lkg (sugarcane to mill). The total farm production cost reached PhP482 per Lkg. With an average yield of 70 ton-cane or 126 Lkg per hectare at 1.80 Lkg per TC, farmers earned a profit of PhP513 per Lkg. The value added is computed at PhP820 per Lkg.

**Table 18. Sugarcane farm production costs, profit, and value-added, ratoon crop,  
San Carlos Mill District, CY 2018-19, (PhP per Lkg)**

Chain Node	Cost	Price/ Profit Margin	Value-added
<b>Farm Production</b>			820
Farmer's sugar selling price (a)		1,500	
- total cost of inputs	170		
- logistics cost (b)	5		
- cost of farm labor	268		

Chain Node	Cost	Price/ Profit Margin	Value- added
- overhead cost (c)	39		
- milling fee (d)	450		
<b>= Profit Margin</b>		<b>513</b>	
<b>Farmgate Cost (e)</b>	<b>482</b>		
<b>Logistics – Farmer's Share (f)</b>			
Cost of delivery of canes to mill	56		

Notes:

- (a) Raw sugar B domestic price  
 (b) Includes costs of delivery of inputs to farmgate  
 (c) Imputed cost for owner's labor (33 days)  
 (d) 30% of farmer's selling price  
 (e) Includes cost of inputs, logistics, labor and overhead  
 (f) Includes farmer's transport cost from farm to mill. Trucking allowance excluded  
 See Annex 7

For plant/ratoon of 40:60 combination, the average farm production cost was PhP312 per Lkg, with labor accounting for 54 percent, other costs at seven percent and logistics costs was PhP16 per Lkg (inputs to farm) and PhP28 per Lkg (sugarcane to mill). The calculated profit margin was PhP711 per Lkg for an average yield of 65 tons per hectare or 119 Lkg per hectare. The value added was PhP901 per Lkg.

**Table 19. Sugarcane farm production costs, profit, and value-added, plant/ratoon crop San Carlos Mill District, CY 2018-19, (PhP per Lkg)**

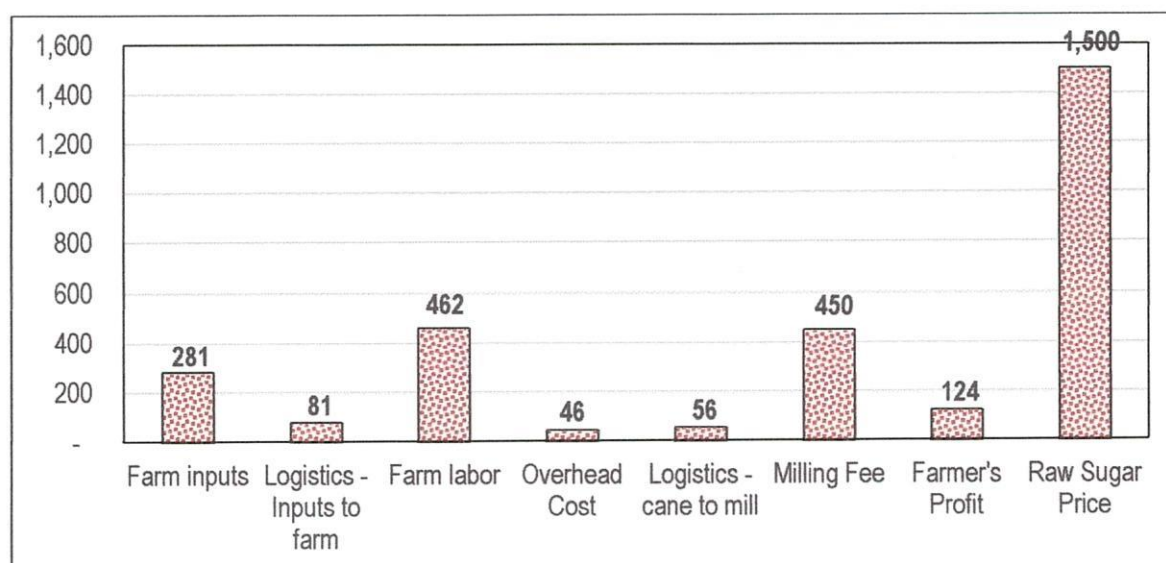
Chain Node	Cost	Price/ Profit Margin	Value- added
<b>Farm Production</b>			901
Farmer's sugar selling price (a)		1,500	
- total cost of inputs	105		
- logistics cost (b)	16		
- cost of farm labor	169		
- overhead cost (c)	21		
- milling fee (d)	450		
<b>= Profit Margin</b>		<b>711</b>	
<b>Farmgate Cost (e)</b>	<b>312</b>		
<b>Logistics – Farmer's Share (f)</b>			
Cost of delivery of canes to mill	28		

Notes:

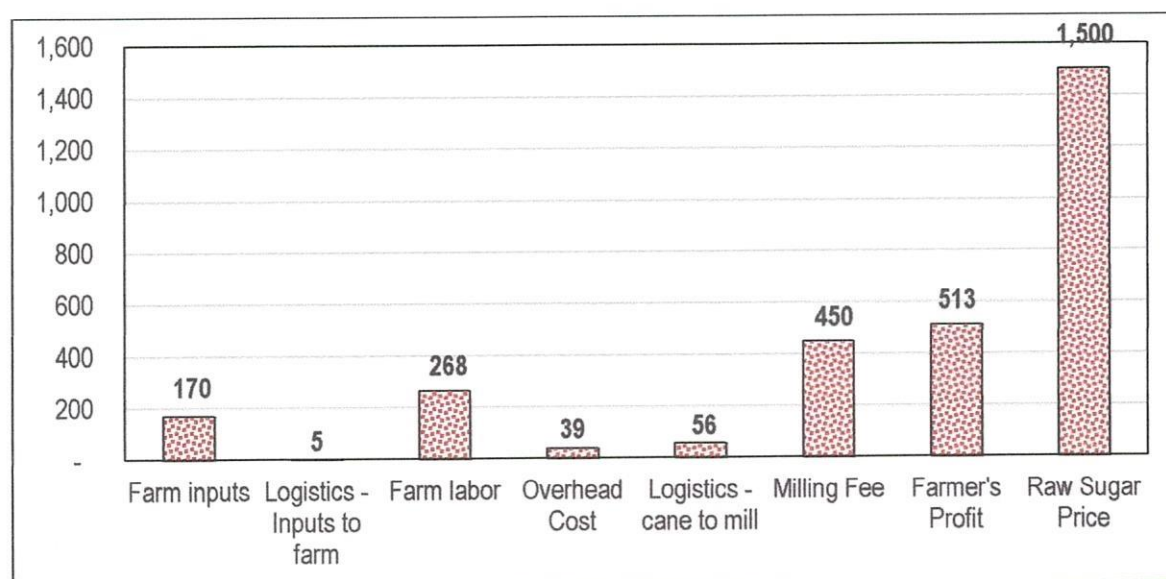
- (a) Raw sugar B domestic price  
 (b) Includes costs of delivery of inputs to farmgate  
 (c) Imputed cost for owner's labor (33 days)  
 (d) 30% of farmer's selling price  
 (e) Includes cost of inputs, logistics, labor and overhead  
 (f) Includes farmer's transport cost from farm to mill. Trucking allowance excluded  
 See Annex 8



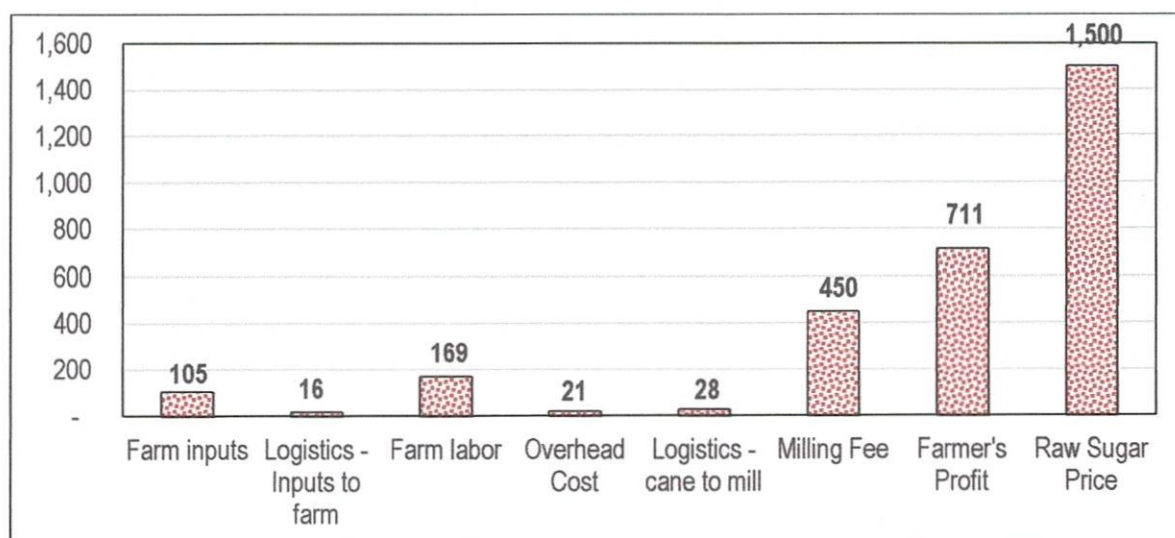
**Figure 12. Sugar Value Chain: Farmer's Chain, San Carlos Mill District, Negros Occidental, CY 2018-2019 (PhP per Lkg, small-sized farms, plant crop)**



**Figure 13. Sugar Value Chain: Farmer's Chain, San Carlos Mill District, Negros Occidental, CY 2018-2019 (PhP per Lkg, small-sized farms, ratoon crop)**



**Figure14. Sugar Value Chain: Farmer's Chain, San Carlos Mill District, Negros Occidental, CY 2018-2019 (PhP per Lkg, small-sized farms, plant/ratoon crop)**



### Processing

The value chain analysis is intended to cover the bioethanol processing in San Carlos City. However, it was found out during the conduct of the study that the bioethanol company in San Carlos is not directly using sugarcane for its bioethanol production. The sugarcane delivered by farmers are processed in sugar syrup which the company sells to sugar millers for raw sugar processing. The bioethanol company buys molasses as feedstocks for bioethanol production.

During the conduct of the study, the bioethanol plant is not operational and is scheduled to resume operation in January 2020.

## References

- All Asian Countertrade, Inc. (<http://www.aaci.ph/>)
- FAO. (2010). Bolzani, D., de Villard, S. & Dey de Pryck, J. *Agricultural value chain development: Threat or opportunity for women's employment? Gender and Rural Employment Policy Brief* 4. Rome.
- GTZ. (2007). ValueLinks Manual. The methodology of value chain promotion. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). Eschborn, Germany.
- Grim, B. J., Harmon, A. H., & Gromis, J. C. (2006). Focused group interviews as an innovative quanti- qualitative methodology (QQM): Integrating quantitative elements into a qualitative methodology. *The Qualitative Report*, 11(3), 516-537. Retrieved from <https://nsuworks.nova.edu/tqr/vol11/iss3/5>.
- Philippine Council for Agriculture Forestry and Natural Resources Research and Development (PCARRD). (2006). Sugarcane high-yielding varieties. Los Baños, Laguna: PCARRD.
- Springer-Heinze, A. (2017). ValueLinks 2.0 Manual. Sustainable value chain development Volume 1 Value chain analysis, strategy and implementation. Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), Eschborn.
- Sugar Regulatory Administration (<https://www.sra.gov.ph/>)