

Canada to Nepal export - Sugarcane processing equipment

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Background information for Nepal:

Location and population: Nepal is one of the least poor countries in the world, which located between China and India in Southern Asia. It is a narrow shape of territory land with 120800 sq km. The population of Nepal is approximately 30 million, which is a similar population number compare with Canada: however, the population density is 172 per sq km(446 per sq mi), and the distribution of this population is also not equal in each area due the diversity of geography. (WEON, 2016)

Topography and Climate: There are three regions in Nepal. Terai is located at the southern part of the country and it has one-third of population. The climate of Terai area is subtropical that includes swamps and forests, so it is pretty humid. The warm season contains continues rain. The second region is mountain area, through from the east to the west. The third region is hill, which is suitable for fruits and off-season vegetables growing. (Chapagain, 2016) The upper Himalayas area has the long winter, and it is extremely cold. (WEON, 2016)

Languages and religions

The official language in Nepal is Neplali that about 47.8% citizens speak, but there are over 50 dialects are spoken in different area. English is also seen as a second language in the country, and it also use in school and business in the country. Hinduism and Buddhism are two main religions in Nepal. They exist with a long period of time. There are thousands of temples and shrines in everywhere, according to a report (2004) shows that around 81% population believe Hindu and 11 % are Buddhist, and the rest is Muslims that contains 4.2%. (WEON, 2016)

Transportation

The ability of transportation is considered among lowest in the world, because most of land transportation is processed by man force and animals. Nepal has 13223

km of road (2002), and there is no waterways in Nepal. India provide the only access of seaport for Nepal. (WEON, 2016)

Agriculture

In the term of agriculture, it contribute 38% of GDP, and only about 7 % of the land can be used for cultivation. Over 70% of population involves in agriculture. (Chapagain, 2016) The most common cereal in Nepal is rice, which is grown more than half of the cultivated land. The Terai region is fit for growing for cash crops include sugarcane, jute, and tobacco which consider the important raw material for output and domestic industry. (WEON, 2016)

Domestic and foreign trade

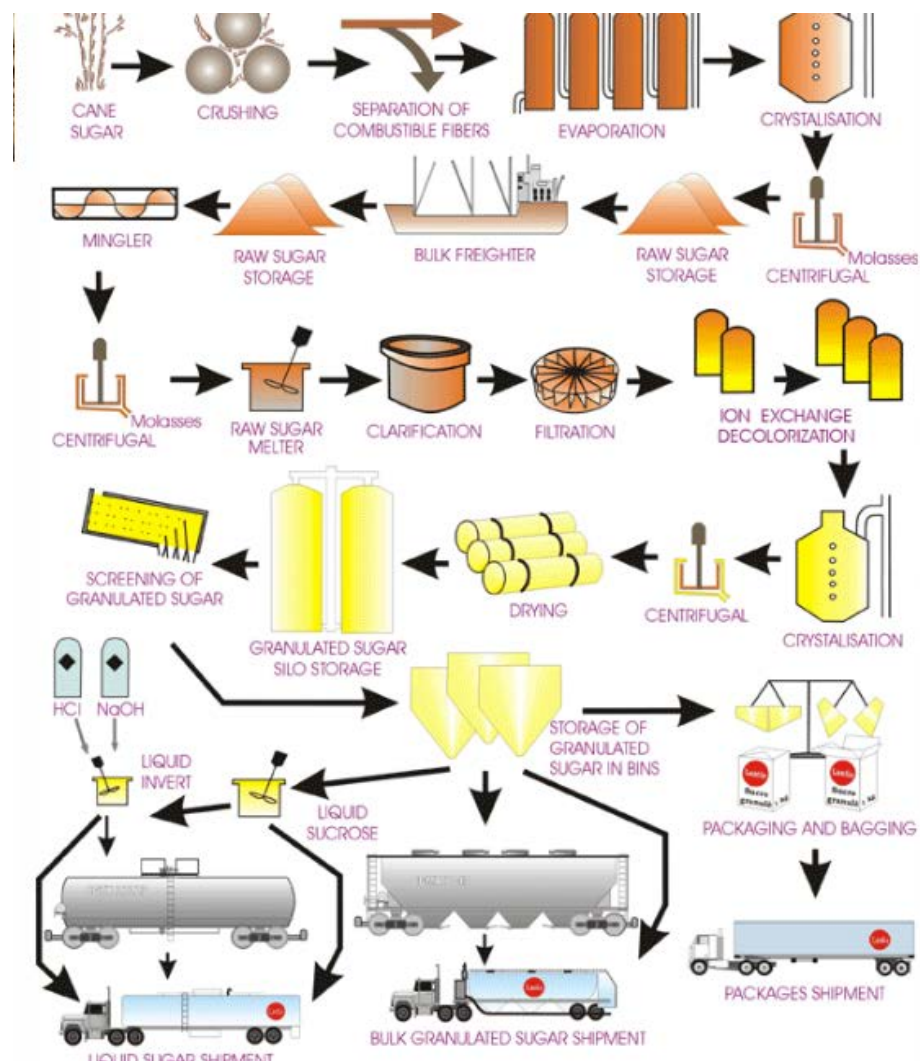
The lack of communication facilities cause the trade between manufacturer to distributor and retailer not works very well. For foreign trade, due to the location which between China and India, Nepal's foreign trade was always limited by those two countries until 1980. China gave a new trade route across the border of Tibet. And until 1989, India and Nepal agreed to a new trade route across the border. These agreements takes significant impact to Nepal's economic and export. (WEON, 2016)

I. Product information

Introduction to sugarcane and sugarcane refining process

Sugar can be produced by mainly two types of practical sources which are sugarcane and beet. Sugar is produced within over 120 countries and globally 120 tonnes per year. The approximately 80% sugar is produced by sugarcane. Sugar cane is one kind of grass and similar with bamboo, and it fits the area where the average temperature is 25 degree, so it mainly produces in Brazil and southern Asian countries.

Nepal is one of the countries which abounds in sugarcane. (CSI, 2016) figure 1



In figure 1. According to the company of Lantic Rogers, the process of cane refining is from raw sugar, cleaning, filtering, crystallization, drying and packaging. (Lantic, 2016) The raw sugar is always operated at sugar mills before it is transported

to the manufactory. Firstly, sugarcane is cut and exacted to the juice. The juice would be heated and purified to the sugar crystallization. This is what we called raw sugar. After coming into manufactory, raw sugar is melted and then it should be filtered into liquor. This process makes sure to remove all the plant and soil residues. Now the clarified sugar should also remove some suspended residues through filter, as a result, the remaining is color sugar. In the term of crystallization, the water of sugar liquor is evaporated from the vacuum pans, and finally remaining is sugar crystals and syrup in the vacuum pans. The crystals are separated from the syrup by using centrifugal. Finally, those crystals are dried and ready to pack into different sizes. (Lantic, 2016).

Input requirement

After raw sugar come into manufacturer, the main process is called double solicitation process, and usually the factory is divided into the following main stations: Mill house, boiler house, power house, clarification, evaporation house and boiling and curing house. Mill house is a place where cane crushing, which include the process of cane carrier and cane cutting. Unloaders and feeder tables work as transporting cane. While the cane is moving, two sets of cutter cut the cane into the same piece of size which called cane preparation. Then those same size of cane would be transported to mills and ready for extraction. The rest of bagasse is residue. The boiler house works for burning those bagasse and the steam is required by Sulphitation, which 42%-45% on cane crushing each hour. The power house is used for power production because of high pressure steam. In clarification and boiling house, juice flow system control the juice extraction. There are two stages for measured juice. Primary heating uses milk and Sulphur-di-oxide into coagulate, and those would be sent to the second heating. When heated juice flowed through to clarifier, the remaining would be clear. Then clear juice is ready for evaporator. There are around 75-80% water in juice, which are evaporated. After this process is called syrup, and it is usually measured as 60% of total solids. The final station is boiling and curing house. There are three massecuite boiling system are called A, B and C

massecuites. Massecuites boil the syrup until it can be dropped into crystallizers for drying. After separating the sugar crystals, and it can be bagged. (RSC, 2016)

Canada operators and producers

In Canada, because the sugarcane processing equipment is too complex and not common for individual using, there is no available supplier for selling sugarcane processing equipment; however, there are three sugarcane processing manufacturers and one sugar beet refiner. Lantic Inc. operates manufactures in Montreal, Quebec and Vancouver, British Columbia. Redpath sugar Ltd has a manufacture in Toronto, Ontario. (CSI, 2016) By the way, 90% of the Canada's refined sugar is produced from raw cane which mainly come from the south and Central America. (CSI, 2016)The country's only sugar beet is operated by Lantic Inc in Taber, Alberta. In all, Lantic Inc is one properly company which I considered for equipment assistant and technique assistance. This company has been in Canada since the late 1800s. One of the cane sugar factory is located at 123 Rogers Street, PO Box 2150, Vancouver, BC V6A 3N2. The Tel: 604-253-1131. (CSI, 2016)The optional transportation method is water transport, so this manufacture can provide the most convenient access to port.

Benefits to Canada

If Canada provided the access of sending sugarcane equipment to Nepal, there would be several benefits for both Canadian company and middle class. When transported the equipment to other countries, although the labor force are from local areas, the relevant technique engineer should go with the machines together. In the term of technique engineer is called manufacturing engineer, who can handle different manufacturing practices which include design, research, operation of system, machines, tools and some relevant equipment. Generally a manufacturing engineer can make \$66017-\$80253 annually (Salary, 2016), so it would increase the income for middle class and increasing the working opportunity It can also expand the market in southern Asia and Pacific area countries which takes direct benefit to Trans-pacific partnership (TPP), because Canada is one of the TPP counties that can provide an

convenient pathway for markets, and corporation between these countries. (GAC, 2016) In the term of transportation, one of the Canadian shipment company can operate the whole transportation from Vancouver, Canada to Nepal. On the other hand, the shipping cost would be extremely high which include the transportation from Canada to Nepal, taxes, tariffs. No exact cost for shipping fee calculated due to the different weight of the equipment and volume that cannot control exactly. (CRA, 2016) To sum up, the cost of shipment directly from Canada manufactures is overweigh the benefits for Nepal.

Optional method

There is one available company called Shangyu Guanfeng in Zhejiang, China (mainland), which is found at Alibaba business website. The sugarcane processing machine is valued around \$50,000-250,000 per set. (SGFM. Ltd, 2016) Here is a quick details and website.

https://www.alibaba.com/product-detail/China-Goods-Wholesale-sugarcane-processing-machine_60445960291.html?s=p

Quick Details

Condition:	New	Type:	sugarcane processing ma...	Place of Origin:	Zhejiang, China (Mainland)
Brand Name:	Guanfeng	Model Number:	GLZ	Voltage:	220C/380V
Power(W):	sugarcane processing ma...	Dimension(L*W*H):	13.6*4.1*3.7m	Weight:	sugarcane processing ma...
Certification:	CE ISO	Warranty:	one year easy damage pa...	After-sales Service Provided:	Engineers available to ser...
Product name:	China Goods Wholesale s...	Output:	2000kg/h	OEM:	YES
Freezer length:	12m	width of screen belt:	1.2m	Input material temperature:	+15C
Output material temperature:	-18C	Freezing temperature:	-36C	Freezing time:	5-50(Continually adjustab...

The available port is shanghai or Ningbo port and shipped in around 55 days. In India, there are several private companies are available for selling full set of sugarcane processing machine. First one is called Nippon engineers which is located 5, Vishal Apartment, 2nd Floor ,S.V.Patel Road, Kandivali(West) Mumbai 400067,India. The fax is +912228085940. Second company called Delta Time Private Limited which is "DELTA HOUSE", G-401 G.I.D.C. Metoda, Tal: Lodhika, Rajkot 360005, India. And the fax is +912827287256.

Figure 2 shows a details of main technical parameter of sugarcane processing machine

Main technical parameters of sugarcane processing machine:

Model	GLZ-500	GLZ-1000	GLZ-2000	GLZ-3000	GLZ-4000	GLZ-5
Parameters						
Capacity (kg/hr)	500	1000	2000	3000	4000	500
Overall dimensions (m)	7.1x3.9x3.7	9.1x4.1x3.7	13.6x4.1x3.7	15.6x4.2x3.7	16.6x4.5x3.7	17.6x4.5x3.7
Tunnel length (m)	5.5	7.5	12	14	15	16
Mesh belt width (m)	0.9	1.1	1.1	1.3	1.3	1.3
Input Temp. (°C)	+15					
Output Temp. (°C)	-18					
Freezing Temp. (°C)	-36 +/- 2					
Freezing time (Min.)	5~50 min. frequency control					
Cold load (KW)	92	165	300	450	540	630
Installation power (KW)	24.6	33.7	44.7	57.4	81	92
Coolant	R717 / R22 / R404a					

II. Export potential to Nepal.

Sugarcane in Nepal

Sugarcane is one of the conventional commodity in Nepal. According to Karobar daily (May 30, 2013), nearly 200,000 farmers in Nepal participate in cultivating sugarcane. The production of sugar increase annually by 170000 ton from 165,000 tons by the year of 2013. (Econity, 2013) sugarcane is considered to be the most essential cash crop in Nepal. It is grown below 76863 ha of land, and also it contains of production of 331539 metric tons. 43141 kg is produced by per hectare of land. (MOAD 2013/2014) (Khanal, 2015) There are twelve sugar mills in Nepal, and most of sugar mills only produce raw sugar. Two or three of this also touches ethanol production, but the rest only produce sugar. (Khanal, 2015) Due to the poor machine in sugarcane production, most producers rely on the labor to operate the process of sugar producing, so it can increase the cost of production because of the low labor force. (Khanal, 2015) Disease and pest are also the major problem for sugarcane production, farmers used to use chemical pesticides to protect the sugarcane. As a result, and these chemical pesticides would remain on refined sugar. According to the survey from the farmer, they all hope government should protect the fairness of marketing price.

Lack of local sugar mills:

One of the largest sugar company called Lumbini Sugar Industries. The company is operated by two countries which is supported by the government of China and the government of Nepal due to the agreement signed on October 1, 1978. China side has responsibility for designing the factory, providing all mechanism and equipment that needed for producing. The construction and building materials are also directly from China, and the whole process of installing and training local manpower. The side of Nepalese has responsibility of supplying electricity, water, the land, gardens and all the arrangements for maintain machines. All the labor force are from local areas expect some technical engineers from China. (LSI Ltd, 2016) In the introduction of the company, it shows that modern Nepalese sugar company still rely on the foreign techniques and assistance for the sugar producing. According to the policy of Nepalese business, local government welcome the foreign investments. (WEON, 2016)

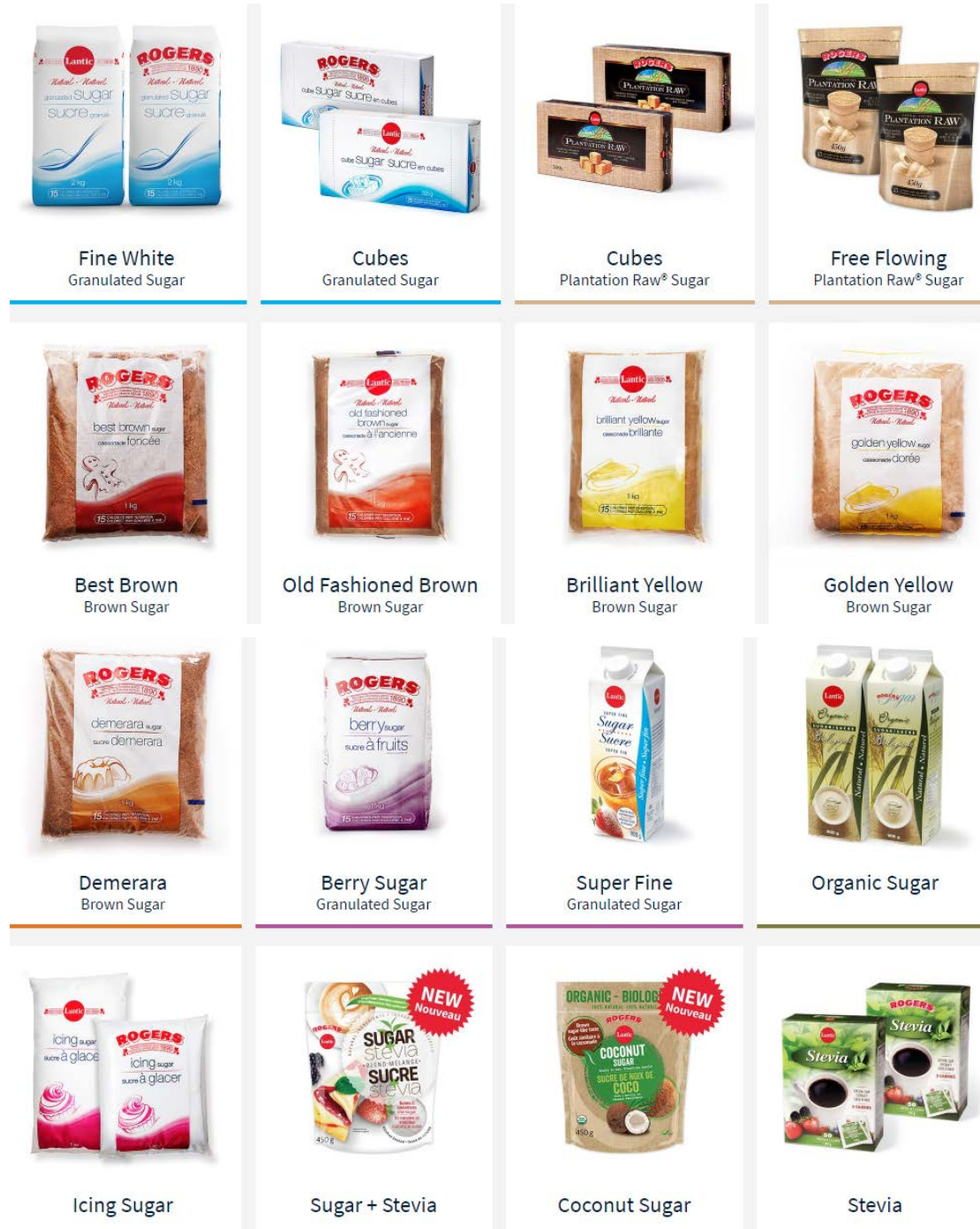
Market demand

There are twelve sugar mills in Nepal, and most of sugar mills only produce raw sugar. Two or three of this also touches ethanol production, but the rest only produce sugar. (Khanal, 2015) Although there are a few of big sugar mills, most of them are worked as International Corporation with other countries. A lot of pressure for small sugar mills and factories which causes unfair marketing price. Whole set of sugarcane processing equipment can sell to those small sugar mills which in the lack of technology and machines. Not only these processing equipment, but technique engineers are in need.

Benefits to Nepal

The benefits of shipping sugarcane processing equipment to Nepal can be divided into several parts. Firstly, it can improve the production of refined sugar. There are twelve sugar mills in Nepal (Khanal, 2015), but most of these mills can only produce raw sugars. Due to the cost of producing, Labor force is still a major force. As mentioned that marketing price is not equal (Khanal, 2015), when sugarcane processing equipment transport to the Nepal, hopefully it can get the support from the

local government to make sure producers can afford and use it. Secondly, it would improve the product diversity. Based on the section of product in most of sugar mills, refined sugar, high grade liquor are most common and normal products. Below figure 3 is what section of product of Lantic Rogers Ltd. (Lantic,2016)



The section of product between the countries of Canada and Nepal, there is a significant difference in field of varieties. Beyond the conventional sugar products.

Organic sugar is one of the popular type of sugar in North America since people focus more on sustainable and health. The definition of organic sugar which is the processing of sugarcane or sugar beet consider free chemical pesticides (OSM, 2014). The comparison between organic sugar and refined sugar are actually pretty similar. Organic sugar looks more brown than the traditional refined sugar. One difference that is white sugar contains glycemic index about 80 higher than the organic sugar which contains 47. (SS, 2013) The average cost for organic sugar is about \$3-4 for 1 pound or\$ 10 for a 4 pound bag. The conventional sugar cost around \$1.5 to 2 per bound and 4-pound bag. (SS, 2013) Although the price of organic sugar is double than conventional sugar, it still not cost a lot for people. In the term of organic sugar, it claims the sugarcane breeding in sustainability also. This can also be a new topic for Nepal's domestic. According to the organization of sugarcane sustainable (2016), Brazil shows a positive experience on sugarcane sustainability breeding. Firstly, low soil erosion. It enhance the field of sugarcane which no other plants are allowed in the same field with sugarcane. Secondly, using less agrochemicals. Organic sugarcane claims fewer chemical when compare with traditional fertilizer abuse in Nepal. It can actually reduce chemical pesticide on sugarcane. To sum up, when sort of products lick organic sugar come into Nepal market, it can actually improve the quality and variety of sugar products.

Improve Export marketing competition

India and China are the second and third largest sugar producing countries. In china, there are 270 operating sugar mills which include 233 sugarcane and 3 sugar beet. The total sugar production of reached into 14.82MT in milling year 2013-2014, and it contributes to the most economy in southern china. The average sugar price is 5853 yuan (value around 820USD) per ton (Tech, 2015) According to the USDA foreign Agriculture service, India is the second largest producer of sugar in the world, and the largest sugar consumer. From the source of Ministry of Food&Government of India, Indian sugar industry contributes to RS.500billion per year and contributes RS.22.5 billion to the government which includes tax cess and excise duty. There are 453 operating sugar mills. The 252 mills from the cooperation and 134 mills are from

the privates. Total 571 sugar factories in India has a production of 19.2million tonnes, and involve nearly 50 million sugarcane farmers and an enormous number of labour force. (IM, 2016). To sum up, traditional export sugar products are limited by two countries which India and China. The lack of machine, technology and labor force cause the production and quality of sugar can not compete with those two countries: however, Nepal can improve their product competitiveness by promoting facilities and technology.

Other suggestions

Based on the existing situation of Nepal's sugarcane process. It is recommend that Nepal try to work on sustainable sugarcane breeding in order to protect the environment and produce organic sugar. Not only enhancing the problem of soil erosion, but reduce the chemical use on crops. (Organization of Sugarcane Sustainable, 2016)Sugarcane is one of the biggest cash crops in Nepal, there are a lot of disputes between farmers, suppliers and sugar mills and government has no effectively solutions to deal with it, it cause the sugar price unstable and many sugar mills use too much labor force to produce sugar. (Khanal, 2015)In all, if Canada can provide access of equipment and technique engineering for assistance in Nepal, governments should give small sugar mills some relevant privileges and welfares.

Conclusion

To sum up, after criticizing the product of sugarcane processing equipment. It is not recommend transport from Canada to Nepal directly because of high cost of transportation (CRA, 2016). Although Canada has a developed system and management of sugar industry, sugarcane processing equipment is still not fit for individual groups because the whole set of system is too complex. As a result, there is no available machine supplier in Canada except sugar manufactures. As two neighbors next to Nepal, China and India have several available companies for machine selling and providing the most convenient transportation. (WEON, 2016) Based on the comparison on the process of sugar producing between Nepal and other countries, Nepal can gain some successful experience of sustainable breeding which

“sustainable” becomes popular in the world in nowadays. (Organization of Sugarcane Sustainable, 2016).

There would be extreme amount of benefits for both Canada and Nepal. It can improve the corporation between Canada and Nepal when Nepalese small sugar seek for effectively assistance. As a result, it would improve the quality of their products and competitive power in southern Asia. It also can increase the number of employment which helps for middle class. In all, the supplier of machines can be various, however, there will be alternative plans for both sugar process and sugarcane processing equipment.

Reference

- Canadian sugar institute. (2016). *Canadian sugar manufacturers*. Retrieved October 17, 2016 from <http://www.sugar.ca/International-Trade/Canadian-Sugar-Industry/Canadian-sugar-manufacturers.aspx>.
- Canadian sugar institute. (2016). *Global sugar trade*. Retrieved October 17, 2016 from [http://www.sugar.ca/International-Trade/Global-Sugar-Trade-\(WTO\).aspx](http://www.sugar.ca/International-Trade/Global-Sugar-Trade-(WTO).aspx)
- Canadian sugar institute. (2016). *Canadian Sugar Industry Statistics*. Retrieved October 17, 2016 from <http://www.sugar.ca/International-Trade/Canadian-Sugar-Industry/Canadian-Sugar-Industry-Statistics.aspx>
- Canadian sugar institute. (2016). *Cane Sugar refining*. Retrieved October 17, 2016 from <http://www.sugar.ca/Nutrition-Information-Service/Educators-Students/The-Purification-Process-of-Sugar/Cane-Sugar-Refining.aspx>.
- Canadian sugar institute. (2016) *Geography of sugar*. Retrieved October 16, 2016 from <http://www.sugar.ca/Nutrition-Information-Service/Educators-Students/Geography-of-Sugar.aspx>

- Canada Affairs. (2016). *GST/HST - Imports and exports*. Retrieved November 29, 2016, from
<http://www.cra-arc.gc.ca/tx/bsnss/tpcs/gst-tps/gnrl/txbl/mprtxprts/menu-eng.htm>
- 1
- Global Affairs Canada. (2016) *Trans-Pacific Partnership (TPP)*. Retrieved November 29, 2016, from
<http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/tpp-ptp/index.aspx?lang=eng>
- Indian Sugar Industry. (2016) *Indian Mirror* Retrieved November 29, 2016, from
<http://www.indianmirror.com/indian-industries/sugar.html>
- Lantic Rogers. (2016) *Facilities*. Retrieved Oct 17, 2016 from
<http://www.lanticinc.com/en/facilities>
- Lantic Rogers. (2016). *Cane refining process*. Retrieved Oct 17, 2016 from
<http://www.lantic.ca/en/about-sugar/>
- Lumbini Sugar Industries(2016).*Introduction*. Retrieved November 29, 2016, from
<http://lumbinisugar.com.np/sugar/introduction>
- "Nepal." *Worldmark Encyclopedia of Nations*. Retrieved October 11, 2016 from
Encyclopedia.com:<http://www.encyclopedia.com/history/encyclopedias-almanacs-transcripts-and-maps/nepal-0>
- Naveen K, (2015). *Sugarcane: A miracle crop: myth or reality in the context of Nepal*. Retrieved November 29, 2016, from
<https://www.linkedin.com/pulse/sugarcane-miracle-crop-myth-reality-context-nepal-naveen-khanal>
- Organic Sugar. (2016). *Clear Your Misconceptions*. Retrieved November 29, 2016, from
<http://www.organic-sugar.com/organic-sugar-clear-your-misconceptions/>
- Sugarcane Disputes. *Not so sweet!* (2013) Retrieved November 29, 2016, from
<http://economynepal.com/tag/sugarcane-production-nepal/>
- Southern Savers (2016) *Organic living journal; is organic sugar better than white sugar*. Retrieved November 29, 2016, from
<http://www.southernsavers.com/organic-living-journey-organic-sugar/>

- Sugarcane organization. (2016). *Sugarcane Best Cultivation Practices*. Retrieved November 29, 2016, from <http://sugarcane.org/sustainability/best-practices>
- Sugar production. (2016). *Jaishare sugars & chemicals limited*. Retrieved November 29, 2016, from http://www.rajshreesugars.com/index.php?option=com_content&view=article&id=30&Itemid=16
- Tech, S., Li, Y., Academy, G., & Sciences, A. (2015). *Sugarcane Agriculture and Sugar Industry in*. Retrieved November 29, 2016, from <http://doi.org/10.1007/s12355-014-0342-1>