

Sugar Beet Seeds to Nepal

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The motive of this paper is to explore the possibility of exporting sugar beet seeds to Nepal in hopes of aiding the Canadian economy. Nepal is the chosen country because it is ranked as one of the world's most poverty-stricken countries. While agriculture is a central component of this country, it's an amenable way to try and enhance their financial system (CIA, 2015).

Nepal measures approximately 147 000 square kilometers and is situated in Asia between China and India (CIA, 2015). This country is privileged to three different types of topographies, making it possible to grow a variety of crops. The Mountain area of Nepal is the most elevated region where the weather conditions are mostly cool and dry. The Terai sector is the lowest in altitude and it is composed of flat lands accompanied by sub-tropical and tropical climates, making it suitable for a variety of crops. Lastly, the Hills are leveled between the Terai sector and the Mountain area, in both weather and elevation (Pariyar, 2002).

The Nepalese's main language is Nepali (CIA, 2015) and their currency is the Nepalese Rupee, which is equivalent to 0.0125 Canadian dollars (The Money Converter, 2015). As mentioned previously, Nepal is a poor country and agriculture constitutes roughly one third of the country's Gross Domestic Product and provides a form of income for almost three quarters of its population (CIA, 2015). Nepal's most produced crops (see Appendix 1, Image 1), require a large amount of area in hectares, and are produced in metric tons as well as measured by kilograms per hectare (Sharma K.C., 2015).

In April 2015, the capital of Nepal, Kathmandu, was hit by a 7.8 magnitude earthquake (Global Affairs Canada, 2015). A few weeks later, another earthquake took place, amplifying the losses of the Nepalese. Along with all the damage, many lost their food, stored seeds for future

growing seasons, crops, animals and essential farming equipment (FAO, 2015). Any strategy to collaborate with Nepal is therefore beneficial in order to improve their economy and help them recuperate from Mother Nature's misadventure.

Section 1-Product Information

About Sugar Beets

Sugar beets are a product of the 1700's: archaic extra sweet beets selective breeding (Morrison, 2009). Sugar beet has many uses, such as providing nutritional values for humans and animals (Hertsburg, 2010), producing sugar and it can even be used on icy roads in lieu of street salt that can be damaging (Morrison, 2009).

How Sugar Beets Are Grown

Sugar beet thrives best in temperate climates that offer these root crops warm days and cool nights (Morrison, 2009). The cooler nights are not harmful to this crop as they have a superior frost tolerance (Canadian Sugar Institute, 2015). Due to frigid winters, in Canada, sugar beets are treated as annual plants. The cold makes it impossible for the beets to persevere as it would in a temperate climate environment like Nepal, where the sugar beets can be grown as the biennial plant that they in truth are. Sugar beets are highly fastidious to moisture levels in their environment. A lack of or a surplus of water, may have negative impacts on the crop if the matter is not looked after (Morrison, 2009). Sugar beets can however prosper in different types of soils as long as it is well drained and has a pH no lower than 5.5 (FAO Water, 2015). It is also recommended to incorporate sugar beet harvesting in crop rotations in order to avoid disease and pests. The precise applications of herbicides, insecticides and additional nutrients are contingent

on the location of the crop as the soils and climatic conditions alter (Canadian Sugar Institute, 2015).

Required Inputs For Sugar Beet Production

In order to grow sugar beets there are individual inputs required that are field specific; what is needed for one crop is not necessarily needed for another. For that reason it is vital to assess one's environment and soil to ensure proper inputs are being applied and also to avoid waste of any futile inputs. Nitrogen is a significant input that must be applied at the proper growth stages and in accurate dosages. Failing to properly apply Nitrogen to the crops can result in a decrease of sugar production, which is the crop's main yield, therefore losing profit (FAO Water, 2015). Phosphorous is another component that is necessary in the crop's soil. Without it the roots do not entirely mature, which does not allow the sugar beet to grow to its full potential to maximize product and profit. It should also be applied to soils that contain less than 25ppm. Potassium and macronutrients are equally important to the development of sugar beets and should only be applied if the soil is lacking nutrients; otherwise a surplus of nutrients could lead to opposite desired effects (Steinke, K., 2015). As with any other agricultural system, labor is required and the duties have to be adjusted according to the available tools. For example, a beet drill can be hastened to a tractor in order to produce evenly spaced holes for planting (Canadian sugar institute, 2015). However, one could decide to plant the seeds manually. The cost and amount of labor required will therefore reflect on the farmer's plan of action. The newest machine in sugar beet harvesting is the Ropa System, which amalgamates the functions of several machines into one that results in time efficient harvesting (Glen, B., 2013). Nevertheless, the cost of this machinery could be too costly for an underprivileged country like Nepal. If manual labor is decided on, the sugar beets must be freed of leaves, and then it is dug up from

the ground and transported for cleaning and processing (Glen, B, 2013). In addition, if sufficient water is not available than an irrigation system will perhaps be needed to ensure adequate moisture for proper growth (Canadian Sugar Institute, 2015). Developed countries could have different inputs and need different amounts of each input according to their needs (Laate, E.A., 2013). (See Appendix 1, Image 2)

Utilizations For Sugar Beets

Sugar beet seeds yields have multiple uses in Nepal. Following sugar cane, sugar beets are the main producers of sugar. They are at the helm of roughly one quarter of the world's sugar production (Morrison, S., 2009). The sugar from sugar beets is extracted the same way as it is with sugar cane. The crops are washed before being sliced or diced and then they are placed into boiling water to allow the sugar to extract itself, leaving behind a sugary liquid and molasses. The molasses are then seeped and left to thicken before they undergo various separating maneuvers to isolate the crystallized sugars. Finally, the end products are dried in order to remove any moisture and the sugars are then either sold or stored (SIBC, 2015). Although Nepal does not currently produce any sugar beet sugar (see Appendix 1, Image 3) (Index Mundi, 2015), they do produce sugar cane sugar (see Appendix 1, Image 4) and would therefore have the appropriate equipment to process sugar from the sugar beets as well (Index Mundi, 2015).

The entire sugar beet remains from the sugar processing and all the leaves and other remnants can be re-utilized. These leftovers are a great feed for livestock (Morrison, S., 2009). Feed consisting of sugar beet is comparable to one of corn (see Appendix 1, Image 5) (Lackey, R., 2013).

Not only are sugar beet crops being utilized by feeding livestock, but they also help by reducing deforestation, which is a current obstacle in Nepal. Trees are cut down to provide feed for certain animals and this results to unavailability of food for other wild animals who will eventually eat the farmer's crops (SAK Nepal, 2015). The sugar beet rinds will consequently aid at slowing the deforestation rate because not as much wood is needed as fodder. As for humans, sugar beet can also be consumed and incorporated within many different everyday recipes (Recipe Land, 2015).

Finally, sugar beet molasses can be used on icy roads (Morrison, S., 2009). In the Mountain region of Nepal, it is not uncommon for them to be the recipient of a snowfall. Due to colder temperatures, it is possible for ice to form which can make it even more difficult for livestock and humans alike to travel in the already strenuous terrains (Visit Nepal, 2012). The molasses can be applied to icy roads on their own or they can be applied in conjunction with street salts to make it even more potent. This also helps in decreasing the corrosiveness of salt that can cause surface damages (Morrison, S., 2009).

Benefits to Canada

Sugar beet seeds are currently being bought from our American neighbours (Alberta Sugar Beet Growers, 2015). Canadian companies such as Alberta Sugar Beet Growers could therefore purchase a surplus of seeds to export to Nepalese farmers, acting as the 'middleman'. This could create new employment opportunities, as more workers would be needed to handle the incoming shipments and to export the products. Existing Canadian companies could also start producing and selling their own sugar beet seeds in order to obtain more profit and this could

also create employment opportunities. In the latter, Canada would also be utilizing its own product, helping out its own economy.

Section 2- Export potential to Nepal

Benefits of Sugar Beets Seeds to Nepal

If Nepal gained access to sugar beet seeds, it would provide them with an opportunity to grow their own sugar beets in order to produce additional sugar, have a new fresh market product, create employment, generate income and produce feed for their livestock, which would help minimize deforestation. As previously mentioned, there is no sugar production from sugar beets in Nepal. Therefore, their only competitor would be sugar cane sugar (Index Mundi, 2015). There is also very limited information on sugar beet sales in Nepal. This proving that this would be a new fresh market product that would be beneficial to markets who decide to sell this root crop. By having a new sugar producing method, employment would be created as workers would be needed to plant, harvest and process the sugar beets. This new producing system would also pilot new income; either to the families or markets that would sell fresh sugar beets, who would sell more sugar. This could possibly influence a new company idea or even a new plant in the future. Lastly, all livestock owners would benefit from sugar beets, as it would provide feed for their animals (Hertsburg, 2010). This access to feed allows farmers to curtail on deforestation, which gradually helps resolve that Nepal challenge.

Getting Sugar Beet Seeds to Nepal

Sugar beet seeds are very small, therefore; they do not weigh a lot. One pound of sugar beet seeds contains anywhere from 20 000 to 30 000 individual seeds depending on their size

(High Mowing Organic Seeds, 2015). Hancock Seed Company in Florida for example, sells a 50lb bag for approximately \$245 American dollars (26 063 Nepalese Rupees) and an acre requires approximately 10 to 15lbs (Hancock Seed Company, 2015). The seeds should be kept in a cool and humid area for the best outcome and if stored in such environment, the seeds can stay healthy for up to six years. (High Mowing Organic Seeds, 2015). Since the seeds are not very large and heavy, they could be transported by ship or airplane to Kathmandu, Nepal. From Kathmandu, the seeds could be delivered by transport to the appropriate markets, however; the prices for shipping are higher than the actual seeds which might make it difficult for Nepalese farmers to acquire. For instance, in order to ship one 50lb bag of seeds from Calgary to Kathmandu, it would cost approximately \$345 Canadian dollars, which is equivalent to 27 497 Nepalese Rupees (A1 Freight forwarding, 2015). (See Appendix 1, Image 6)

Targeted Market

Sugar beet seeds are available in a variety of weighted bags (Hancock Seed Company, 2015). Smaller bags are suitable for farmers with little land or for families simply looking to produce sugar beets for their own. The larger bags are beneficial for farmers with large amounts of land or for markets and companies who would like to sell seeds and crops within their communities. The market is therefore open and available to anyone who has land and the desire to grow sugar beets.

Recommendation

While it might be too pricey for Nepalese farmers to individually purchase their own sugar beet seeds; it would be beneficial for larger companies or big groups of farmers to purchase a higher number of seeds and portion them amongst everyone in order to allow

everyone to have beet seeds or a small crop. Since seeds are not costly for more privileged countries, perhaps seed donations could be made to help out our fellow country in need.

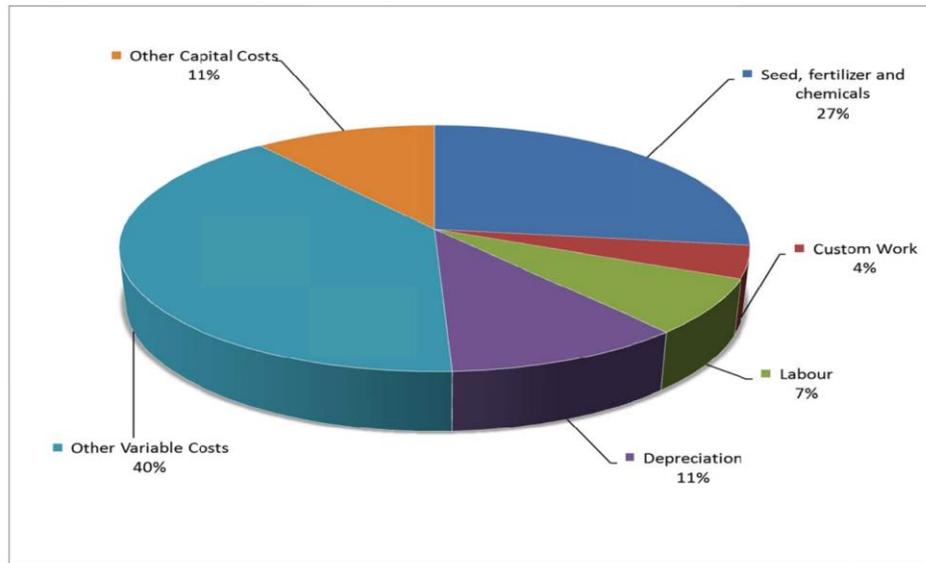
Appendix A

Image 1. Nepal's top yields

	Crops	Area (ha)	Production (MT)	Yield (kg/ha)
1.	Paddy	1514210	3709770	2450
2.	Maize	802290	1345910	1678
3.	Millet	263950	291370	1104
4.	Wheat	640802	1086470	1695
5.	Barley	31843	31798	999
6.	Oilseeds	190429	119731	629
7.	Potato	118043	1091218	9244
8.	Sugar cane	53894	1971646	36584
9.	Pulses	308008	228840	743

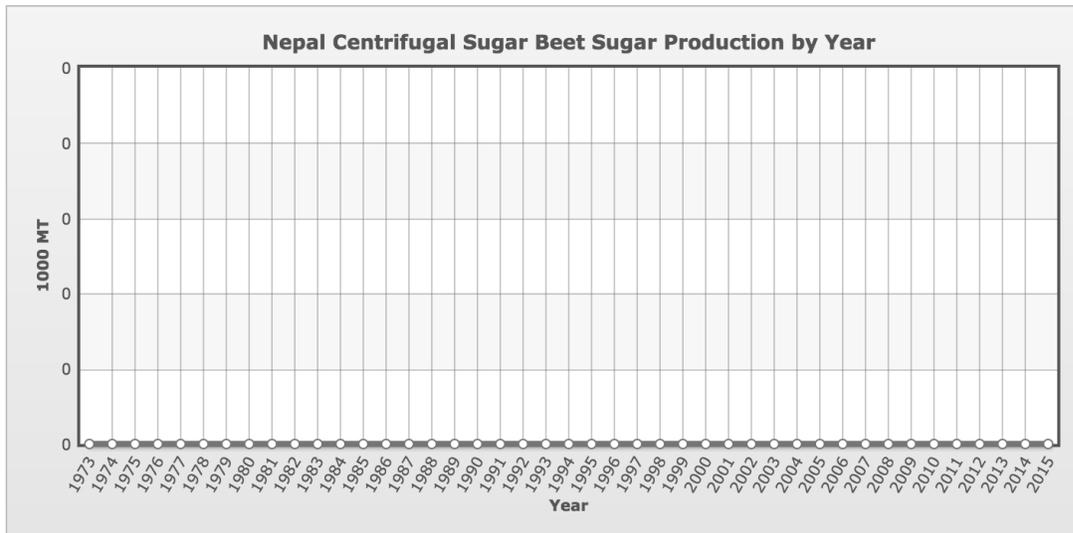
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Image 2. Alberta sugar beet input costs in 2011



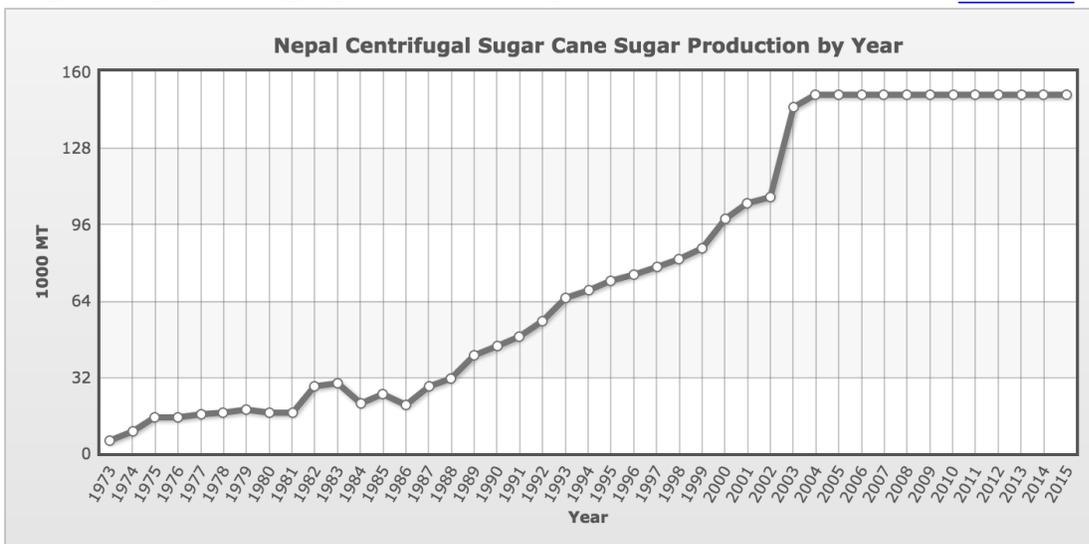
[http://www1.agric.gov.ab.ca/\\$Department/deptdocs.nsf/all/agdex12666/\\$FILE/171_821-5.pdf](http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agdex12666/$FILE/171_821-5.pdf)

Image 3. Sugar beet sugar production in Nepal



<http://www.indexmundi.com/agriculture/?country=np&commodity=centrifugal-sugar&graph=beet-sugar-production>

Image 4. Sugarcane sugar production in Nepal



<http://www.indexmundi.com/agriculture/?country=np&commodity=centrifugal-sugar&graph=cane-sugar-production>

Image 5. Sugar beet feed comparison

	Dry Matter	Crude Protein	Energy (TDN)	Ca	P
Whole Sugar Beets	20%	6.8%	81%	.24%	.24%
Sugar Beet Pulp (moist)	25%	9.0%	72%	.72%	.20%
Corn and Cob Meal	87%	9.0%	82%	.10%	.24%
Corn Silage	35%	8.0%	69%	.30%	.20%
Shelled Corn	87%	9.5%	88%	.01%	.30%

<http://www.omafra.gov.on.ca/english/livestock/beef/facts/sugarbeets.htm>

Image 6. Sugar beet seeds 7



<http://www3.syngenta.com/country/us/en/agriculture/seeds/sugarbeet/Pages/Sugarbeet-Agronomy-Resource.aspx>

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