

Canada-Nepal Export Report: The Use of Canadian Industrial Hemp Fibre to Establish Fences  
Around Agricultural Practices in Nepal.

Ashley-Ann Rutherford

AGR\*1110\*0103

University of Guelph

December 2<sup>nd</sup>, 2015

## **PART I: PRODUCT INFORMATION:**

### **Introduction of Product**

Fences have been used for many generations on agricultural practices to ensure divides and enclosures for livestock and crops. They can be sized to fit any type of land at any altitude or geographic location. Hemp fibre is a rising and versatile material. When it is bound together, it creates an bona fide durable and less expensive means of security for agricultural properties. The used of hemp fibre fences will benefit all means of husbandry in Nepal by minimizing labor outputs, lessening cost due to repairs and contributing to environmental standards by utilizing eco-friendly commodities. This paper will critically analyze the prosperity of implementing Canadian hemp fibre fences into Nepalese agricultural methods and aid in the betterment of the Nepalese agricultural sector, while advancing Canadian economy by providing more jobs while adding market value to Canadian hemp fibre.

### **Description of Companies**

Parkland Industrial Hemp Growers (PIHG) is a producer and processor co-op that grows and processes industrial hemp for fibre located in Dauphin, Manitoba (Parkland, 2015). The co-op was incorporated in 1999 when Hemp was first legally acceptable to grow in Canada, making its members pioneers in generating industrial hemp (Parkland, 2015).

Plains Hemp is North America's leading provider of industrial hemp fibre (Baxter, 2000). The Company has a manufacturing facility located in Gilbert Plains, Manitoba (Plains Hemp, 2013). They have more than 30 years of hemp processing expertise and specialize in manufacturing custom solutions for innovative hemp product applications, hemp fibre fences being an example (Plains Hemp, 2013). Located in Canada's principle industrial hemp growing area, Parkland, approximately 15 minutes away from Parkland Industrial Hemp Growers ensures

that the hemp can be grown, processed and converted into its final production stages in the same province. This ensures that both cost and time management are included to make this product bounteously intriguing for potential buyers.

CGS Transport Limited is a trucking company situated in Gilbert Plains, Manitoba whom specialize in dry bulk haulage (CGS Transport Ltd., 2011). This association was chosen as the best possible transit method due to its location being in the same city of both the producer and processor, as well for its knowledge on transporting material such as hemp fibre.

Below in **Table 1** there is an outline of all the Companies listed above with relevant contact information. In **Appendix A**, there is a chart that demonstrates the main reason why the product was chosen to be produced, processed and shipped from Manitoba.

	Parkland Industrial Hemp Growers	Plains Hemp	CGS Transport Ltd.
Website:	www.pihg.net	www.PlainsHemp.com	www.quicktransportsolutions.com
Email:	info@pihg.net	info@plains hemp.com	n/a
Phone:	1-204-629-4367	1-204-894-7780	1-204-548-2211
Mailing Address:	#3 126 Main St. North. Dauphin, MB, Canada. R2N 1C2	Box 487, Gilbert Plains, MB, Canada. R0L 0X0	100 Turner Rd. Gilbert Plains, MB, Canada. R0L 0X0

**Table 1:** Contact information from all Canadian Companies Involved. Retrieved from PIHG, Plains Hemp and CGS Transport Ltd. official webpages.

### **Description of Product(s):**

Parkland Industrial Hemp Growers have six registered hemp seed varieties, (Alyssa, Delores, Canda, Joey, Petera and Debbie), that are monoecious, high yielding and very suitable for fibre production (Parkland, 2015). These seeds range from about \$2.00 to \$2.50 per pound based on yields of 500lbs/acre (Alberta Ministry of Agriculture and Forestry). Based on growing

statistics, Petera is deemed the most cost efficient choice based on high yields and long maturity end lengths. Seed comparisons can be seen in **Table 2a** below

Plains Hemp processes 5 different categories of hemp stalk fibre, each with reduced hurd levels, higher fibre and variable lengths (Plains Hemp, 2013). Out of the five, two were chosen based on optimal length and strength. These included the HempStalk Bast and HempStalk Custom Blend fibres. The HempStalk Bast has a long fibre length, from 30-60cm, with 10% hurd content (Plains Hemp, 2013). Its estimated production cost is about \$0.12 to \$0.18 per pounds or \$269 to \$396 per tonne (Alberta Ministry of Agriculture and Forestry, 2015). The HempStalk Custom Blend is generated based on the consumers need for specific requirements (Plains Hemp, 2013). This fibre would be especially useful as it can be produced based on the length and thickness desired of the buyer. To obtain pricing on this particular type of fibre choice, Plains Hemp needs to be directly contacted for a quote. In **Table 2b** below, the two fibre choices are demonstrated with information on fibre components, and price options. Lastly, refer to **Table 2c** for hypothetical calculations that compare Parklands seed strains in producing Plain's HempStalk Bast fibres.

<b>Seed Variety</b>	<b>Yield</b>	<b>Maturity (cm)</b>
<i>Alyssa</i>	High: 1110-1200 lbs/acre.	180cm
<i>Delores</i>	High: 11% higher than Alyssa (1,221-1,332 lbs/acre).	157cm
<i>Petera</i>	High: 13,000-17,500 lbs/acre.	304-366cm
<i>Canda</i>	High: 29% higher than Alyssa (1,431-1,458 lbs/acre).	140cm
<i>Joey</i>	High: 45% higher than Alyssa (1,600-1,740 lbs/acre).	151cm
<i>Debbi</i>	High.	150cm

**Table 2a:** A comparison of Parkland Industrial Hemp Growers seed varieties. Based on maturity length and yield, Petera would be the most cost efficient choice based on high yield and long maturity length. Information retrieved from Parkland Industrial Hemp Growers official webpages.

Fibre Variety	Length (cm)	Hurd	Price
<i>HempStalk Bast</i>	30-60cm	10%	\$0.12-\$0.18/lb
<i>HempStalk Custom Blend</i>	any	any	Quoted by contacting <a href="mailto:info@plains hemp.com">info@plains hemp.com</a> ** assumed more expensive due to customization.

**Table 2b:** Comparison of Plains Hemp processed fibre varieties. Quotes on the Custom Blend were attempted by contacting the email above but no responses were received before the deadline of this paper. Since HempStalk Bast fibres already has a predetermined price, it is deemed a more reliable source to generate estimated production costs for the fibre fences. This information was retrieved from Plains Hemp official webpages.

Seed Variety	Low end price (\$0.12 x lowest yield in lbs)	High end price (\$0.18/lb x highest yield in lbs).
<i>Alyssa</i>	\$0.12/lb x 1,100lbs = \$132.00	\$0.18/lb x 1,200lbs = \$216.00
<i>Delores</i>	\$0.12/lb x 1,221lbs = \$146.52	\$0.18/lb x 1,332lbs = \$239.76
<i>Petera</i>	\$0.12/lb x 13,000lbs = \$1,560	\$0.18/lb x 17,500lbs = \$3,150
<i>Canda</i>	\$0.12/lb x 1,431lbs = \$171.72	\$0.18/lb x 1,458lbs = \$262.44
<i>Joey</i>	\$0.12/lb x 1600lbs = \$192.00	\$0.18/lb x 1,740lbs = \$ 313.20
<i>Debbi</i>	n/a.	n/a.

**Table 2c:** Estimated calculation of production costs using Parkland Industrial Hemp Grower's seed collections. These were appraised by multiplying the low or high end price of producing fibres with the actual yield of each seed strain. Petera seems more expensive, but you are actually getting more for your dollar since yield per acre of this strain is significantly higher resulting in less money being spent on seeds and can then be used on producing costs.

### **Final Product Description and Marketing Name:**

The end product is trade marketed as Fencey-Hemp. It will involve the Parkland Petera seed that has been processed into Plains HempStalk Bast fibres, which then is bound together to generate a comparable rope device. This can then be strung up along agricultural practices to generate divides and enclosures for animals and/or crops. This means that the only labour input needed from potential buyers would be to string up the fences by hand using available resources

as stacks, such as scrap pieces of wood or metal. This means the final product comes fully intact, minimizing both time and labor needed to entirely install the hemp fibre fence in its new designated quarters.

**Inputs Required:**

As previously stated the industrial hemp seeds are cultivated at Parkland Industrial Hemp Growers co-op. There are many inputs required to grow the plants to full maturity before they can be cut down and processed into fibre. Some specifics that need to be taken into consideration for why the hemp seeds are \$2.00 to \$2.50/lb would include production costs such as fertilizer uses, fuel costs, storage costs, labour costs, and crop insurance (Government of Manitoba, 2015). Refer to **Table 3** below for all input costs pertaining to the overall cost of hemp seeds and plant production.

Once the seeds have been cultivated they will be sent to Plains Hemp to be processed into fibre composites and bound together to create the final product. Processing of the fibre composites ranges from \$0.12 to \$0.18 per pound (Alberta Ministry of Agriculture and Forestry, 2015). This is due to the extensive process of decorticating the hemp stalks for fibre production (USDA, 2015). This mechanism includes water retting, drying and then mechanical separation that involves labor and fuel inputs (USDA, 2015). Retting is the process of partially breaking down the gummy substances, especially pectin, that bind the fibers together in bundles and to the plant core (Alberta Ministry of Agriculture and Forestry, 2015). For an eco-friendly approach drying and retting can both be done in the fields, biologically, which also minimizes costs (Alberta Ministry of Agriculture and Forestry, 2015).

Seed & Treatment cost/ acre	Fertilizer cost/acre	Fuel cost/acre	Crop insurance cost/acre	Labour cost/acre	Drying cost/acre	Land taxes/acre	Storage cost/acre
\$40.00	\$56.32	\$17.32	\$33.62	\$30.00	\$20.00	\$2.00	\$30.00

**Table 3:** Hemp production costs guidelines (dollars per acre). This gives a detailed representation of how much money goes into cultivating the industrial hemp. Prices will vary depending on amount of acres being used and how much seed is being propagated. This was retrieved from the Government of Manitoba's official information agronomy webpages.

### **Machinery Required and Cost:**

For the production and management of the hemp stalks, seeding, tilling, irrigation and harvesting equipment is required. All of these machines are possessed by Parkland Industrial Hemp Growers (Parkland, 2015). If you refer to **Table 4**, all types of machinery and costs are demonstrated. If you refer to **Appendix B**, illustration of some machinery used in the process of growing hemp can be noted.

When it comes to processing the hemp stalk into fibre, a decorticating facility is needed. Plains Hemp is a manufacturing facility that has all machines required to turn stalk into fibre composites (Plains Hemp, 2013). Refer to **Appendix C** for a picture of a decorticating facility.

By using companies that already possess equipment for the cultivation and production of hemp fibre, cost is minimized by only having to purchase the final products. Extra prices of land, labour and machines are eliminated since they are already incorporated in the company who is producing the final product. In the end, money is only being spent on plant agronomy and processing of stalks into fibre composites which bind together to form the final merchandise.

<b>Machine Type:</b>	<b>Market Value (CAN \$):</b>
4WD Tractor 375HP	\$175,000
Swather 35ft	\$75,000
Combine	\$200,000
Cultivator	\$25,000
SP Sprayer	\$100,000
Water Tanks	\$2,500
Auger 8x35	\$4,000

**Table 4:** A list of machines and their market value, which are needed to grow hemp stalks for fibre. If PIHG was not being used as a company, and we were just shipping the seed to be used in Nepal, or trying to grow the hemp ourselves to utilize, machine costs would come to about \$581,500 CAN and that is without labor, land, fuel and processing costs of the stalks into fibre. By using a company knowledgeable in producing industrial hemp, time and money is being guarded. This information was retrieved from the Government of Manitoba's official agricultural webpages.

### **Environmental Sustainability:**

Using hemp for fibre contributes to environmental sustainability. No registered pesticides are associated with hemp and it is a crop that can be grown chemically free (Bouloc & Werf, 2013). Also by specifically growing hemp in Canada, it can be labelled as organic and biodegradable due to the biological ways it is cultivated (Canadian Hemp Trade Alliance, 2015). As stated previously, to generate a more sustainable means of processing hemp stalks into fibre, the retting and drying can be done outside biologically by microorganisms and solar rays (Alberta Ministry of Agriculture and Forestry, 2015). Lastly, to ensure this product is eco-friendly on all levels, companies were chosen based on location to cut back transportation time and minimize carbon footprints.

### **Market Opportunity and Benefits to Canada:**

The Canadian agricultural sector has been experiencing a decline in the overall net income over the past few years (Stats Canada, 2015). There is also a 7.0% unemployment rate present in all of Canada (Stats Canada, 2015). By establishing this product on the market, job openings will become available since more hemp and manufacturing of fibre will be needed. If this product becomes successful, there will be a higher demand for Canadian hemp, meaning larger export values. Right now farmers net between \$620-\$1,240 per hectare of hemp, where as canola is only \$495/ hectare (Stats Canada, 2015). Parkland Industrial Hemp Growers is a co-op and allows for new members to join if they are approved by board members (Parkland, 2015). This allows Canadian farmers easy access to grow hemp which would increase their farm receipts. Overall, this product would help increase the Canadian economy and lower unemployment rates by creating more jobs for Canadian citizens. This product would also set Canadian hemp on a larger scale throughout the global market increasing its profitability, potentially leading to other countries, besides Nepal, using Canadian hemp resulting in heightened sales in foreign markets.

### **PART II: EXPORT POTENTIAL TO NEPAL**

#### **Brief Description of Nepal**

Nepal is a country located between China and India, the capital city being Kathmandu (Do & Lyer, 2010). In 2014, Nepal's population reached to 28.17 million (World Bank, 2014). Of that population, 80% live in rural areas, establishing the fact that 70% of Nepalese people rely on agriculture for livelihood (The World Factbook, 2014). In fact, agriculture contributes to 40% of Nepal's GDP (The World Factbook, 2014). Nepal is divided into three distinct regions: Terai, Hilly region and the Himalayan mountains (Do & Lyer, 2010). Most of the country is made up of

mountainous regions, which makes transportation and farming a challenging task. Since agriculture is a large portion of income to most Nepalese people, the development and growth of it's agricultural sector is central to sustaining economy and overcoming poverty of the nation (Ghimire, 1998).

### **Brief Description of Agricultural Fences in Nepal:**

The remoteness and difficult geography of Nepal has lead to continued use of wild plants for livelihood (Bhattarai, Chaudhary & Taylor, 2009). Local people, for many years, have recorded using common parts of plants for fences such as stems and branches (Bhattarai, Chaudhary & Taylor, 2009). Plant species are planted live or cut and used as dead fence around agricultural fields to protect the crops from damage by livestock and wild animals as well as prevent soil erosion by wind (Bhattarai, Chaudhary & Taylor, 2009). This may seem like a reliable resource to use but there are many down faults. Since the plants are used dead or alive, the risk of the fence decomposing is prevalent, making labor intensive since the fence continuously needs to be fixed or replanted (Lawrance, 1995).

### **Potential Nepalese Buyers:**

Nepali Tea Traders is a sustainable tea company based out of Nepal whose mission is to improve the quality of life of their workers. By incorporating Fencey-hemp into their agricultural practices, such as divisions and barriers, they will add to their eco-friendly image, while generating new jobs for their people. They are already exporting tea to the United States, so the means of resources and transportation is already close in proximity, making our product more accessible for export. (refer to **Table 5** below for contact information).

Ostrich Nepal is the largest Ostrich farm in Asia. Its target is to implement more resources to export 7.5 billion in meat leather, fat and feathers to the international market. Since they are

already reaching out for trade supporters, it would not be hard to make an exporting deal with them. Fencey-Hemp would be used to create pens for the ostriches on the farm and in return we could import some of their products. Even if this deal could not occur, they are always looking for new sustainable practices on their farm, which Fencey-Hemp defines in itself. (Refer to **Table 5** below for contact information).

<b>Company:</b>	<b>Nepali Tea Traders</b>	<b>Ostrich Nepal</b>
Phone:	1-855-360-1449	1-977-985-702-0517
Email:	contact@nepaliteatraders.com	ostrich.nepal@gmail.com
Website:	www.nepaliteatraders.com	www.ostrichnepal.com
Address:	n/a	Madhawaliya-Bhutahawa Rd., Gangoliya 32903, Nepal

**Table 5:** Contact information for potential Nepalese buyers. Information retrieved from Nepali Tea Traders and Ostrich Nepal official webpages.

### **Needs and Benefits to Importing Nation:**

Landslides and soil erosion are main causes of environmental hazards and defects in Nepal's crop production, especially in the hilly regions (Gardner & Gerrard, 2013). By providing strong and durable agricultural hemp fences, Nepal's crop revenue will increase and soil erosion can be prevented. Considering how Nepal has a range of geographic locations, with most being very remote and elevated, a versatile fence is needed (Bhattarai, Chaudhary & Taylor, 2009). Hemp fibre fences are very functional at any earthly altitude, making them very universal (Canadian Hemp Trade Alliance, 2015). Along with being versatile they are very sturdy and would only need to be placed up once with minimal labor inputs. This would allow Nepalese farmers to invest more time and money into crop production rather than into the construction and maintenance of fences.

Since the Nepalese have already used plants in fence production before, the idea of acquiring Canadian hemp made fences wouldn't be hard to implement, especially with the

enhancement of durability and expanded life-span to the products value. Lastly, by incorporating fibre hemp fences into eco-friendly companies and establishments in Nepal, the products they create there will become more valuable since Canadian hemp is certified organic and chemical free (Bouloc & Werf, 2013). By adding value to their companies, more jobs will become available with higher demands for merchandise. A great example of this would be from the Nepali Tea Traders company which was chosen as a potential buyer. Their mission is to reinvest in the tea industry and to help the children of Nepal, improving their health, education and the quality of life by providing more jobs by selling sustainable, fair priced tea (Nepali Tea Trader, 2015). Using hemp fibre fences around their grow-ops would only add to their products value, demonstrating the true meaning of their overall goal.

Overall, the adoption of Canadian hemp fibre fences will benefit the Nepalese agricultural sector by providing a high quality and adaptable product which requires less labor versus normal manual fence making and allow more jobs to become available which in return will excel the nations overall economy.

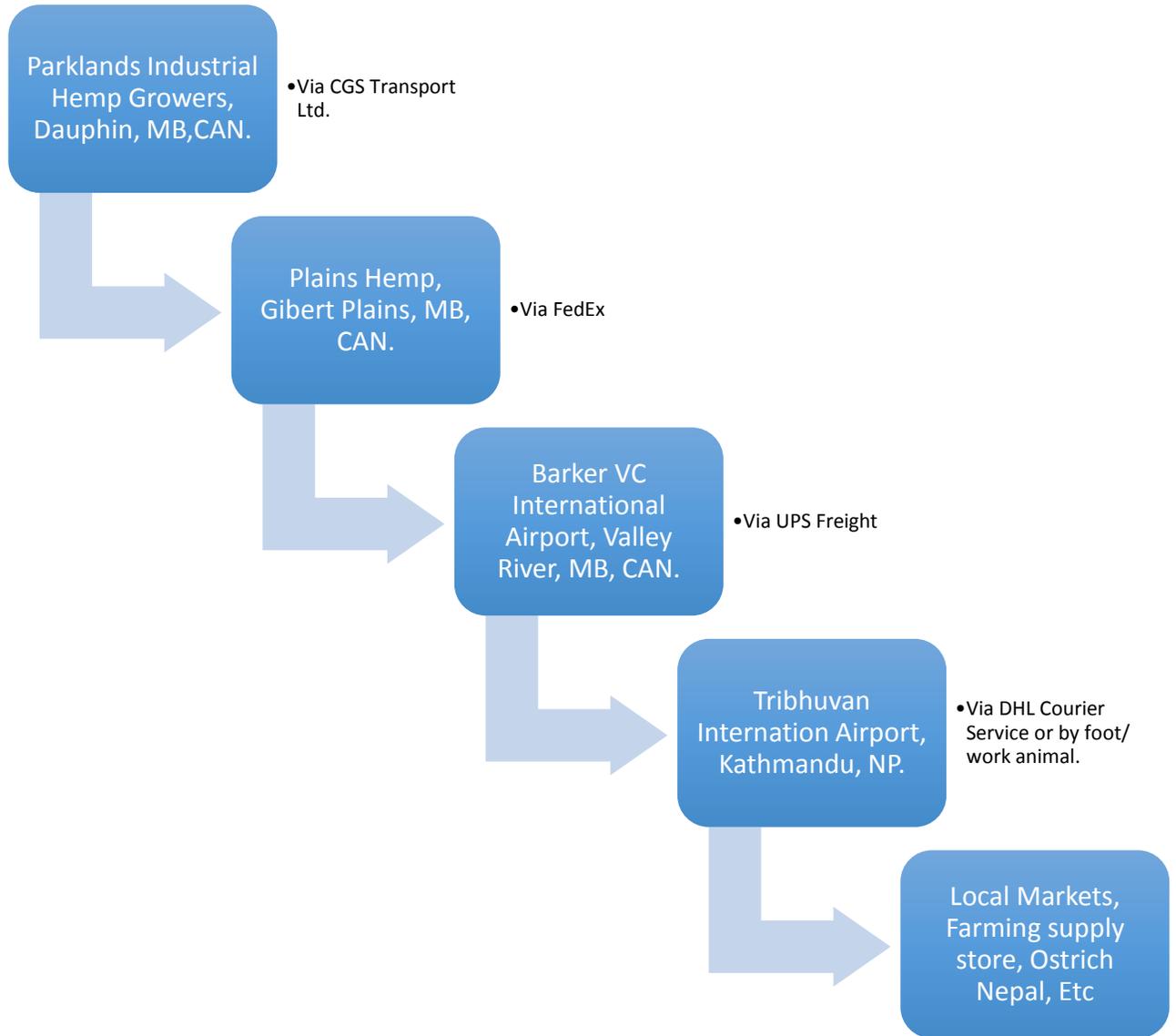
### **Transportation Logistics:**

The beginning of transportation starts with the use of a CGS Trucking limited, a local transportation company, to deliver hemp stalks from Parkland Industrial Hemp Growers to Plains Hemp manufacturing company. They have no estimator online and so quotes are done via phone or email. Contact was almost established but due to increased demands of transportation, a quote on the transportation of this hypothetical product could not be obtained. A phone meeting was to be set up but dates were pushed back after this due date of this report. Below in **Table 6** other transportation logistics can be seen with estimated relevant costs.

<b>Transportation #2 : FedEx</b>	<b>Transportation #3: UPS</b>
<p><b>From Gilbert Plains, Manitoba, CAN (Plains Hemp Facility) to Barker VC International Airport in Valley River, Manitoba, CAN</b></p> <p>Quantity: 5 boxes containing 40 Fencey-hemp fences  Weight: 20lbs/each  Dimensions: 15"x 20"x 25"  = 200 fences priced at \$20.00 each (Refer to <b>Appendix D</b> for full cost calculation of one Fencey-hemp.</p> <p><b>Costs:</b>  Base rate: \$236.57  Fuel surcharge: \$15.20  Canada GST: \$15.53</p>	<p><b>From Barker VC International Airport in Valley River, Manitoba, CAN to Tribhuvan International Airport, Kathmandu, NP.</b></p> <p>Quantity: 5 loose items  Dimensions: 15"x 20"x 25"  Weight (each): 9kg  Actual Weight: 45 kg  Billable Weight: 230kg  = 200 fences priced at \$20.00 each (Refer to <b>Appendix D</b> for full cost calculation of one Fencey-hemp.</p>
<b>= \$267.30CAN</b>	<b>=\$721.86 CAN</b>
<b>Total Cost: ~\$989.16 CAN (not including CGS Trucking Ltd. quota)</b>	

**Table 6:** *Estimated costs* in shipping and handling Canadian hemp fibre fences (Fencey-Hemp), to Nepal. This information was retrieved and calculated on the FedEx and UPS official estimated calculator webpages.

Once the hemp fibre fences reach Nepal, they will be picked up by DHL courier services which is situated beside Tribhuvan International Airport and distributed directly to farming supply stores, markets and potential buyer headquarters, such as Ostrich Nepal. If terrain of certain parts of Nepal makes transportation of this product unavailable, the size of the package and weight can easily be carried on foot, wagon or by working animals such as horses and donkeys. DHL courier services does not have an online estimator for the location in Kathmandu, Nepal. A direct quote would need to be made to analyze logistics of the product to reach its final destination.



**Figure 1:** Illustrated demonstration of transportation routes from beginning to end, Canada to Nepal.

<p><b>Exporting Goods From Canada (What is Required):</b></p>	<p><b>Importing Good Into Nepal (What is Required):</b></p>
---	---

<p><u>The documents are:</u></p> <ul style="list-style-type: none"> <li>• Export Declaration Form (Once you have determined that the goods may be exported and that submitting an export declaration is required, you must classify the goods. Depending on your method of reporting, either the Statistics Canada eight-digit Canadian Export Classification number or the ten-digit Canadian Tariff Classification number is used.</li> <li>• Certificate of Origin (Once you have determined that the goods may be exported and that submitting an export declaration is required, you must classify the goods. Depending on your method of reporting, either the Statistics Canada eight-digit Canadian Export Classification number or the ten-digit Canadian Tariff Classification number is used.)</li> <li>• Packing List</li> </ul> <p><b>**Keep all records pertaining the export for six years.</b></p> <p>You must keep all records pertaining to your exportations for six years following the exportation of good(s) in either electronic or paper format.</p> <p>For more information on the keeping of books and records pertaining to exports please consult <u>Memorandum D20-1-5, Maintenance of Records and Books in Canada by Exporters and Producers.</u></p>	<p><u>The documents are:</u></p> <ul style="list-style-type: none"> <li>• Declaration Form</li> <li>• Invoice</li> <li>• Packing List</li> <li>• Bills of Lading or Airway Bill</li> <li>• CTD for the land route</li> <li>• Banking transaction document (L/C /T.T/ Draft)</li> <li>• Document of Insurance</li> <li>• Country of Origin</li> <li>• Firm or company registration certificate</li> <li>• Industry registration certificate for industry</li> <li>• VAT registration certificate</li> <li>• Papers relating to customs agent appointment, if appointed</li> <li>• Delivery Order (DO) of concerning airlines in air route transportation</li> <li>• Type Approval (TA) and Conformity of Production (COP) in case of vehicle</li> <li>• Load/ Unload certificate of recognized surveyor in case of chemical fertilizer</li> <li>• License for those goods which required license for importation</li> <li>• Recommendation letter for those goods which can be imported only on the recommendation of certain institution.</li> <li>• Letter of full or partial exemption in case of government decision on such exemption.</li> <li>• Document of bank guarantee issued by the bank or finance company which is authorized by Nepal Rastra Bank to uses such guarantee, on the importation of goods under bank guarantee provision.</li> <li>• Certificate of Bonded Warehouse in case of importation of goods under bonded warehouse provision.</li> </ul>
---	---

**Import/Export Documentation Required:**

**Table 7:** The above table demonstrates documentation required to export out of Canada and import into Nepal. Retrieved from Government of Canada and Nepal Official Webpages.

**Regional and Global Competition:**

Presently, it is illegal to buy, sell or cultivate cannabis in Nepal (Fisher, 2012). This means that regionally in Nepal there are no legitimate hemp fibre grow-ops that could compete with the Canadian hemp fibre fences. Thus meaning, because of its unavailability within the country, Nepal would need to reach out to other countries, such as Canada, to ship such products to them. Canadian Hemp is low in THC and once converted into fibre composites serves no narcotic effect, it is allowed to be imported into the nation of Nepal with said documentation listed in **Table 7** above (Fisher, 2012).

When dealing with neighboring countries such as India and China, legal permits put constraints on possible competition. India is dealing with controversy over the growing of industrial hemp due to possible THC levels (Desai, 2014). In China there are industrial hemp companies, such as Yunnan Industrial Hemp Inc., but they only provide seeds to farmers, meaning Nepalese people would have to cultivate the hemp stalk themselves, process the fiber and then construct fences out of it. Fencey-hemp comes fully intact so no means of labor is needed and can be used right away. There is a similar company in India that has the same idea of manufacturing industrial hemp seed varieties but not hemp fibre composites for fence productions (IIHA, 2015).

Lastly it has been documented that on the Alibaba Global Trade website, there are no fully intact hemp fibre fences to be purchased that are light in weight like that of Fencey-hemp making this product one of a kind and more valuable to potential buyers in Nepal. The only product that could possibly be considered a competition was a peeled reed fence but is used to decorate gardens not confine crops or livestock. It was priced at about \$15.00/6ft resulting in a more expensive product than that of Fencey-Hemp.

When it comes to competition within Canada, there is quite a few hemp producing companies. Using hemp in textiles and industrial work had just started to surface in the last couple of years, so most companies pertain to food and oil production only (Canadian Hemp Trade Alliance, 2015). This does not mean that they cannot start generating hemp for fibre composites. Hemp Oil Canada is one company that is well known and has the means of resources to start manufacturing fibre from their hemp seed varieties (Hemp Oil Canada, 2015). As of right now there are no competing products or companies in Canada but once this product starts to take off, due to the amount of hemp processing plants in Canada, regional competition could strike a future problem.

### **PART III: FUTURE STUDIES AND CONCLUSIONS**

#### **Unknown/Future Studies:**

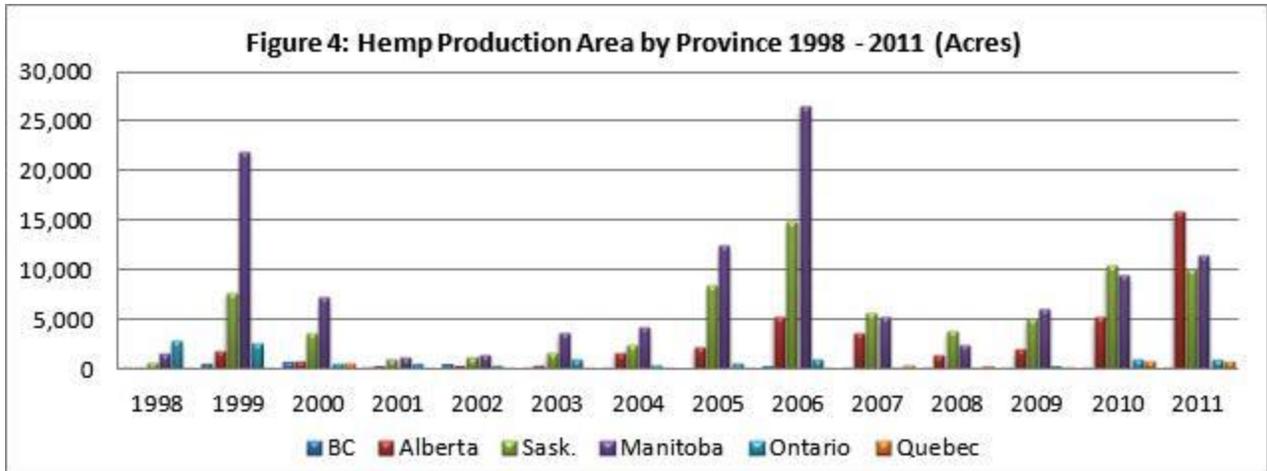
Through this in-depth investigation on the use of Canadian hemp fibre fences in agricultural practices, more studies will need to be done to accurately analyze cost to maximize profitability. Actual quotes from residential transportation companies, such as CGS Transport Limited in Manitoba and DHL in Kathmandu, will need to be discussed to draw conclusions on factual transportation logistics. Also potential buyers would need to conclude product sizes that they require for their businesses to ensure the price of the final product being shipped is adjusted accordingly to dimensions. This could eventually lead to hemp fibre fences to have specific sizes so that buyers can accordingly, making purchasing easier.

Another study that could be assessed to ensure Fencey-hemp succeeds on the market, would be to test if animals would try to consume the fence while being housed inside. If this problem arises, uses of chemicals to ward of animals from consuming it might need to be incorporated in the production process.

Lastly, it is heavily recommended that the Canadian Agricultural Loans Act Program is contacted to identify if there is any available funding to go towards the production of this product, such as production and marketing costs.

**Conclusions:**

This paper has provided a detailed report on the potential to export Canadian hemp fibre fences to Nepal. Exporting this product will benefit the Canadian agricultural sector by increasing revenue, expanding international trade markets, increasing the profitability of Canadian hemp fibre, and increasing employment rates by providing new job opportunities. By implementing Fencey-Hemp into Nepalese husbandry practices, safer means of livestock enclosures and crop divides will become available. By incorporating an eco-friendly product into Nepalese business' higher market value is added, and more jobs will be present to the Nepalese people. By providing Nepal with new means of cultivation practices, new possibilities are created for improvement within the agricultural sector. Trades between Canada and Nepal will assert the value of not just sustainable agricultural methods, but fair trade and eco-friendly products.



**Appendix A:** Graph demonstrating hemp production area by province with Manitoba in red. Retrieved directly from Alberta Ministry of Agriculture and Forestry official webpages.



**Appendix B:** Some machinery used to cultivate hemp plants. (Photo left) combine in hemp field, (photo right) aeration bins. Retrieved directly from Alberta Ministry of Agriculture and Forestry official webpages.



**Appendix C:** Decortication facility in Vegreville, Alberta. Retrieved directly from the Alberta Ministry of Agriculture and Forestry official webpages.

<p><b>Cost of Seeds (Peters \$2.00 to \$2.50):</b> 5lb x \$2.00 = \$10.00 for 5lbs of Peters Seed which yield about 12,000-17,500 lbs/acre.</p>
---

<p><b>Fibre Production:</b> If 12,000lbs is yielding and the production cost is \$0.12/lbs the overall cost would be \$1,440 to process 12,000lbs of hemp stalk (<math>\\$0.12/\text{lb} \times 12,000\text{lbs} = \\$1,440</math>)</p>
---

<p><b>Fencey Hemp Final Product Price:</b> 12,000lbs of processed hemp stalk can generate about 100 fences that are about 50ft-100ft long. Based on this the price of one Fencey-hemp product cost about \$14.40 but the price was bumped to \$20.00 to cover shipping costs (<math>\\$1,440/100 = \\$14.4</math>)</p>
--

**Appendix D:** Calculation made to show the process in how the final Fencey-Hemp product was priced. Prices of seed and fibre production were retrieved from the Alberta Ministry of Agriculture and Forestry official webpages.

**References:**

Alberta Ministry of Agriculture and Forestry. (2015). *Industrial Hemp Enterprise*. Retrieved

from: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex126](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex126)

Baxter, W.J., & Gordon, S. (2000). Growing Industrial Hemp in Ontario. *Ontario Ministry of Agriculture, Food and Rural Affairs*. Retrieved from :

<http://www.omafra.gov.on.ca/english/crops/facts/00-067.htm#description>

Bhattarai, S., Chaudhary, R.P., Taylor, R.SL. (2009). The Use of Plants for Fencing and Fuel wood in Mustang District, Trans-Himalayas, Nepal, 7(7), 59-63. Retrieved from:

<http://www.nepjol.info/index.php/SW/article/viewArticle/3827>

Bouloc, P., & Werf, H. M. G. van der. (2013). *Hemp: Industrial production and uses*. UK:

CABI.

CGS Transport Ltd. (2011). Quick Transport Solutions. Retrieved from:

<http://www.quicktransportsolutions.com/truckingcompany/manitoba/c-g-s-transport-ltd-usdot-592489.php>

Do, Q. T., & Iyer, L. (2010). Geography, poverty and conflict in Nepal. *Journal of Peace Research*, 47(6), 735-748.

Fisher, James. (2012). *Cannabis in Nepal: An Overview*. Retrieved from:

<http://www.drugtext.org/Cannabis-and-Culture/cannabis-in-nepal-an-overview.html>

Gardner, R. A. M., & Gerrard, A. J. (2003). Runoff and soil erosion on cultivated rainfed terraces in the Middle Hills of Nepal. *Applied Geography*, 23(1), 23-45.

Ghimire, K. (1998). *Forest or farm? The politics of poverty and land hunger in Nepal*. Manohar Publications.

Government of Canada. (2014). Canada Border Services Agency. Retrieved from:

<http://www.cbsa-asfc.gc.ca/export/guide-eng.html>

Government of Manitoba. (2015). *Guildlines for Estimating Crop Production in Manitoba in*

*2016*. Retrieved from: [https://www.gov.mb.ca/agriculture/business-and-economics/financial-management/pubs/cop\\_crop\\_production.pdf](https://www.gov.mb.ca/agriculture/business-and-economics/financial-management/pubs/cop_crop_production.pdf)

Government of Nepal. (2015). Ministry of Finance and Department of Customs. Retrieved from :

<http://www.customs.gov.np/en/faq.html>

Hemp Oil Canada. (2015). Services. Retrieved from: <http://www.hempoilcan.com/services/>

Indian Industrial Hemp Association. (2015). Products. Retrieved from:

<http://iihaindia.org/Contact-Us.aspx#>

Lawrance, C. J. (1995). Low cost engineering and vegetative measures for stabilising roadside slopes in Nepal. In *Proceedings of the International Conference on Vegetation and Slopes: Stabilisation, Protection and Ecology*(pp. 142-151).

Parkland Industrial Hemp Growers. (2015). What is Industrial Hemp? Retrieved from:

<http://www.pihg.net/what-is-industrial-hemp/>

Plains Hemp. (2013). About Company. Retrieved from: <http://plainshemp.com/about-company/>

Statistics Canada. (2014). Farm Income (Catalogue no: 11-001-X). Ottawa, ON: Minister of Industry.

The World Bank. (2014). Nepal. Retrieved from <http://www.worldbank.org/en/country/Nepal>

The World Factbook. (2014). Washington, DC: Central Intelligence Agency. Retrieved from:

<https://www.cia.gov/library/publications/the-world-factbook/index.html>

