

Export Potential of Hillside Trams from Canada to Nepal

Bernard Wierenga

Part I: Product Information

Hillside Tram Systems

Hillside Tram Systems (HTS) are simple incline elevators. They are built for residential use, therefore they are built as inexpensive and with the least amount of product possible. Target market for the system is people who own lake homes or cottages where it is difficult to climb up an intense slope (Marine Innovations Inc, 2016). The main purpose of the product is to move people and other products from one elevation to another elevation in an area with a hilly terrain. HTS can be built up to 160 feet if conditions are acceptable, for example slope of the terrain has to be under 50 degrees for this length (Marine Innovations Inc, 2016). The product's price fluctuates based on consumer's desires, as length or structure can be different from system to system. For a base model at 150 feet, no installation or transportation included, the approximate price would be 60,000 Canadian dollars (Steckle, C. Personal communication. November 28, 2016).



Figure 2: A functional residential Hillside Tram System (Marine Innovations Inc, 2016).

Materials of the HTS

The system consists of a structure, rail, cable system, a basket platform, and a motor.



Figure 2: Hillside Tram (Marine Innovations Inc, 2016).

The structures components are 2 inch galvanized SS30 or SS40 pipe (Marine Innovations Inc, 2016). This steel pipe has to be pounded in the ground 7 to 10 feet for the support of the whole system. Steel used for the rail part of the HTS is 2 inch by 3 inch galvanized 11 gauge enclosed tubing (Marine Innovations Inc, 2016). Because, not all terrains are flat slopes, the steel rails can be produced to contour any changing gradient of a hill. The cable used is a 5/16-inch cable that has a strength rating for up to 9,800 pounds (Marine Innovations Inc, 2016). Therefore, a Hillside Tram is very safe, there will never be more than 9,800 kilograms of weight in the basket that needs moving. The basket is made of aluminum, so it is compact but durable. Finally, to move the basket up and down a motor is required. The motor used is a 3 horsepower four stroke gas motor (Marine Innovations Inc, 2016).

Galvanized steel used for the support structure, rails, and cables on the Hillside Tram System. Steel is dipped in molten zinc to become “galvanized”. The zinc coating protects the steel underneath from corrosion (Galvanized Iron and Steel, 2016). Therefore, all the steel on this system should be rust free against natural elements because of the galvanized steel and aluminum.

Description of Companies

Cobble Design Inc. is based out of Zurich, Ontario, which is one hour northwest of London, Ontario (Cobble Design Inc. n.d.). The company was established in 1988 by two brothers as a paving stone and wall stone contactor service and now employ thirteen workers through the busy months (Steckle, C. Personal communication. November 28, 2016). The business was doing well so it expanded to take on landscaping jobs for both residential and commercial customers, which 10% of these jobs are related to Tram units (Cobble Design Inc. n.d.).

However, Cobble Design does not actually produce Hillside Tram Systems, the product is imported in from the United States, then Cobble Design distributes and installs this system. Marine Innovations Inc. is the companies which produces each HTS, this company is based out of Frazee, Minnesota (Marine Innovations Inc., 2016), which is about a 15-hour drive from its Canadian distributor. Marine Innovations has been specializing in making all kinds of inclined elevators for the residential, commercial and industrial industries since 1987 (Marine Innovations Inc., 2016). The company will custom build an elevator unit and send it to one of the multiple distributors the company has.

Required Inputs

A HTS requires little input but since it is a mechanical machine, maintenance is required. Inspection of all moving parts should be done annually, this includes checking for any friction two metal components are creating. If this is done the life of the unit will increase, lowering repair and overall cost for the consumer.

The most input is required for the 3 horsepower motor. Every year the oil should be changed as well the air filter. The engine needs gasoline to run as well so, fuel level should be checked regularly.

Direct Benefits for Canada for Exporting Hillside Tram Systems

Today, the direct impact of exporting Hillside Tram Systems from Canada to Nepal would be particularly small. First of all, the product is not currently being manufactured in Canada therefore, the number of additional jobs that could be created would be very low.

Since only thirteen people work at Cobble Design's Zurich shop during the busiest time of year it is not big enough. Also only three total units get sold a year by the business (Cobble Design Inc. n.d.), making the Tram side not so important aspect for the owners. Therefore, the company is a small business and never could keep up with the amount of workload if Canada were to send over multiple units. This would lead to an increase in sales jobs at the Zurich location. The design of these systems is complicated, an educated employee is the only person who can order the correct unit, which would lead to an additional job or jobs.

Furthermore, the goods need to be transported across Ontario. So exporting would help the Canadian trucking industry and this industry is of crucial importance for the Canadian economy. For road transportation the GDP is projected to increase by 28% over the next 10 years from the \$17 billion in GDP in 2014 (McDonough, Howard, Angeles, Dolovich, Marzanek-Lefebvre, Riva, & Laryea, 2014). An increase in jobs to help move heavy steel elevators can certainly assist in reaching this projection. An increase in the amount of truckers will certainly benefit Canadas economy.

Potential Benefits for Canada for Exporting Hillside Tram Systems

The steel industry is definitely a large industry in Canada. It employs over 130 000 well-paying jobs for people living in Canada (Canada's new steel industry key to industrial future:

New study, 2010). Not only jobs are produced, but contributions to the economy are present as well. Steel produces about fourteen billion dollars in Canadian sales plus another seven billion dollars in export sales (Canada's new steel industry key to industrial future: New study, 2010).

Needless to say, steel is not a small sector within Canada and therefore, it has the potential to handle the production of HTS. According to the Statistics Canada, the employment rate is at seven percent with 1.37 million Canadian citizens unemployed as of October 2016 (Statistics Canada, 2016). If there is sufficient demand in exporting HTS, Canadian based Cobble Design Inc. could start manufacturing product rather than just distributing them. This idea would assist in the problem of unemployed citizens and increase the overall economy.

The uses for Hillside Tram Systems for agriculture in Canada is minimal since machinery is used so in Canada most farms would not need a HTS. Only benefit to Canadian made systems is to interested residential customers. The reason is a decrease in cost per unit, and therefore an increase of units sold in Canada as well. But a dozen extra units could be sold ever year and twelve units could never affect the company in a way that would justify for a large manufacturing plant.

Comparing HTS to Similar Products

The tram market is a small market. There are no other comparable systems on the market and Marine Innovations Inc. manufactures the lone brand of trams in North America.

Part II: Export Potential of Canadian Hillside Tram Systems to Nepal

Introduction to Nepal

Nepal is a small landlocked country in southeast Asia, between China and India. Population as of July 2016 is 29,033,914 people (CIA, 2016), very close to Canada's: 36,286,400 (Statistics Canada, 2016). The country has a total of 147,181 squared kilometres, in which about 30% of that area is used for agriculture purposes (CIA, 2016). For Nepal, agriculture is extremely important, 68% of the population is working in the agriculture and forestry sector (U.S. Agency for International Development, 2016). Agriculture in Nepal contributes for 34% of the country's GDP (U.S. Agency for International Development, 2016). There are three distinct

agro-ecological zones throughout Nepal. Zones are divided from the north side of the country to the south, and the regions are mountain, hill, and terai regions respectively (FAO, 2002). In the mountain region, elevation is above 2000 metres and temperature is the coolest of the country because of this agricultural production is extensive (FAO, 2002). Land in this area is extremely remote because of terrain and limited roadways. During the months of June and July temperature averages between 9-10 degrees Celsius (FAO, 2002).

Hill agro-ecological zone in Nepal is located in between the mountain. Climate is subtropical with significantly higher temperatures: between 13 to 27 degrees Celsius in the summer months (FAO, 2002). 44% of the Nepalese population have settled in the hill region as it covers a total of 61 816 squared kilometres, approximately 42% of the land (Tiwari, Sitaula, Nyborg, & Paudel, 2008). Of that area 64% is covered with terraces for farming (Tiwari, 2008). Crop rotation is key for terrace farms to reduce soil erosions or leeching, a maize and millet crop rotation is most popular (Tiwari, 2008)

Crops are most intensively farmed in the terai region, the area accounts for 54% of total cultivated land and mostly flat land (Chaudhury, 2001). Majority of Nepalese people have settled in the terai which is 45% of the total population (Chaudhury, 2001). The region is extremely important to agriculture since the most intensive farms operate in the region (Chaudhury, 2001).

Transportation in Nepal

Poverty in Nepal in addition to the extreme terrain make it difficult to construct a good transportation system. Therefore, most transportation by the Nepalese occurs on community made trails on mules. Community built road equals community built bridges as well (Thapa Magar, 2016). Homemade bridges lack safety and are not up to code. In Nepal 83% of the country is covered with hills and mountains (Thapa Magar, 2016). To add on, seasons where heavy monsoon rainfall occur erode any bare earth. For these reasons, Nepal cannot afford a proper road transportation system throughout the entire country.

However, there are some other means of transportation in the less extreme regions. For example, there is a total of 10,844 kilometres of roadways throughout the entire country (CIA, 2016). There are other transportation methods as well: a total of 11 airports with paved runways, and 53 kilometres of railway (CIA, 2016). All three modes of transportation still close to the bottom on the world scale (CIA, n.d.).

Economic State in Nepal

Nepal is one of the worlds developing countries, in 2010 the estimated Gross Domestic Product (GDP) was 15.84 billion dollars and 32.8% of this amount comes from the agriculture industry (Nepal, 2012). The average yearly income of a Nepalese person each is 490 dollars (Nepal, 2012). In comparison, in 2015 Canadians income per capita earned 37,316 dollars (Ontario Ministry of Finance, 2016), an average Canadian has a 76 times higher income than the Nepalese. As for GDP, Canada has a 763.276 billion dollar GDP (Ontario Ministry of Finance, 2016). Overall, Nepal is a much poorer country than Canada.

Transportation of Hillside Tram Systems to Nepal

Because of the sheer weight of steel in addition to the size of an entire Hillside Tram unit, the transportation of the product is problematic. The weight of common steel is 7850 kilograms per cubic metre (KV Steel Services Ltd, 2009), where multiple cubic metres of steel is required for the construction of an elevator. A Hillside Tram System would have to be transported from Cobble Design Inc. in Zurich, Ontario by truck to the cargo ship yard in Montreal, Quebec. In a container the product will be carried overseas to an Indian port in the city of Kolkata. Kolkata's port is the closest to Nepal and would mean the least amount of road transport required through the low maintenance Indian and Nepalese roadways. Transportation on the two countries roadways would again require a transport truck to a large city such as Katmandu and finally distributed to the customer.

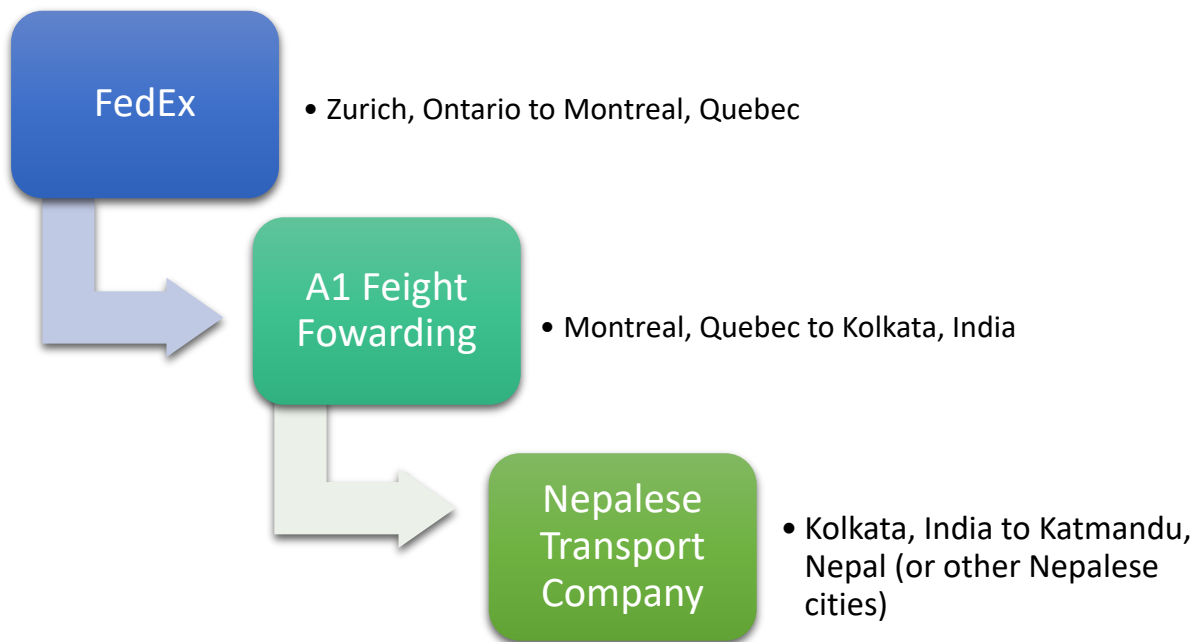


Figure 3: A diagram representing the journey that the product has to endure.

Seen in figure 3 is the long path required to reach the final destination. FedEx is the first company needed for transportation. FedEx estimates to bring the product on flatbed truck to Montreal the cost will be 500 dollars for one 150-foot unit (World Freight Rates, 2016). From there, A1 Freight Forwarding will ship it to Kolkata and this will be about 2500 dollar for oversea delivery (A1 Freight Forwarding, 2016). A Nepalese transport company can be in charge of bringing the product to Nepal, creating new jobs for the country. This delivery amount from Kolkata to Nepal is unknown because of limited resources from these companies.

Nevertheless, total transport cost will be in the area of 3000 dollars or slightly above this rate.

Target Market for HTS

Current transportation of crops and products from up and down terraces is currently carried by mule or by Nepalese farmers. The target market for the Hillside Tram system is in the hill region where farmers practice terrace farming. A HTS would then be the method for moving

from one elevation to another and essentially the system would take away the work of a mule or farmer in the transport part of farming.

However, the HTS will possibly be affordable only if a large group of farmers, within the same farming village, came together and shared a system.

Marketing the Product

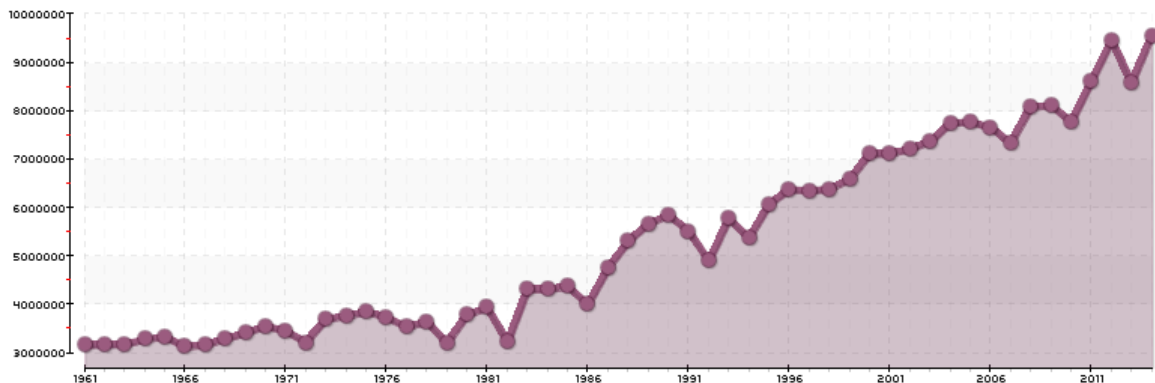
Nepal is behind in a technology advancing world. Advertising has evolved to become the primary method to sell a product in the developing world. Back in 2005, companies from United States spent 10 billion dollars to advertise on the internet (McCoy, Everard, Polak, & Galletta, 2007). Which was 5.3% of all of US's and a 30% increase from the previous year (McCoy et al, 2007). However, over the last decade technology has continued to advance therefore if the number for 2016 would be much larger than of data from 2005. Nepal cannot utilize this beneficial industry because of remote communities and limited communication.

To market HTS in a developing county a salesman from Cobble Designs would have to go from village to village promoting the product. This is a less effective method than an internet advertising. Yet it is the only method to get the Nepalese farmers aware of a HTS is to speak face to face with them. There is even the potential for a Nepalese sales man who would be more knowledgeable and trustful in Nepal than a stranger to the country.

Benefits for Nepal for Exporting HTS

HTS can be extremely beneficiary to Nepalese farmers because of the decreased amount of labour needed to complete everyday agricultural tasks. Walking up or down each level of terrace can be physically exhausting and even cause damage to your body. Now walking on terraced farm with tools or harvested crops would get even more dangerous. Approximately 3.2 million hectares of cereal crops are grown in between the country's two most productive regions: hills and terai (Ransom, Paudyal, & Adhikari, 2003).

Nepal - Cereals production (tons)



Source : FAO
Date : 2015
Creation: Actualitix.com - All rights reserved



Figure 4: Cereal production in the entire country (Actualitix. 2016).

figure 4 shows the total tonnage of cereals produced in the entire production, most of which are in hills and terai.

Maize and millet are the two most popular cereal crops in the hill region (Tiwari, 2008), but on the whole countries scale maize is the most important on because 75% of Nepal's maize is grown on terraces (Ransom, 2003). The total area of maize harvested every year in this region is about 600,000 hectares, and since 1984 the country has managed to grow maize to yield 1800 kilograms per hectares of grain (Ransom, 2003). In total, each year 1.08 billion kilograms of maize crop must be moved from field to farm by Nepalese farmers. A quicker means of transporting product with minimal effort from the field being harvested to the farmer's home is using an elevator system. Quicker transportation can account for more to be finished in a day's work such as amount of land harvested in a day.

Potential job increase in jobs is also beneficiary to Nepal. These jobs can come in many different sectors including: sales, installation, and trucking industries. The sales jobs needed would be a door to door sales man that knows the geography of Nepal. Jobs in the form of installation is also necessary because knowledgeable people will have to set up the system. Transport to the customer is needed as well and this requires extra drivers.

Because, Nepalese people would be safer but also be more productive and more jobs are created, Nepal would definitely benefit from a Hillside Tram System.

Conclusion

In conclusion, Nepal would certainly benefit if Canada exports Hillside Tram Systems to Nepal. Much more production could be accomplished with efficiency with this system in place. Also economically, Nepal's condition would increase because of more crops and an increase of jobs.

However, to actually export the product to this third world country is not feasible. Farmers in Nepal simply cannot afford a pricy elevator system. The average income per capita of a Nepalese person is 490 dollars (Nepal, 2012) and the base price of a HTS is 60,000 Canadian dollars (Steckle, C. Personal communication. November 28, 2016). So take a yearly income of at least 122 different farmers to afford the product. This is a very unrealistic number of people because farmer villages are not this large. Therefore, to send over Hillside Tram Systems is not a good idea.

References

Part I

Canada's new steel industry key to industrial future: New study. (2010, May 31). *Canada*

NewsWire Retrieved from

<http://sfx.scholarsportal.info/guelph/docview/347834096?accountid=11233>

CIA. (2016, November 10). The World Factbook- Nepal. Retrieved from

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

Cobble Design Inc. (n.d.). About Us. Retrieved from <http://www.cobbledesign.ca/about-us.html>

Galvanized Iron and Steel. (2016, July 13). Retrieved from

<http://www.gsa.gov/portal/content/111758>

Marine Innovations Inc. (2016). About Us. Retrieved from <http://marineinnovations.com/about-us/>

Marine Innovations Inc. (2016). Frequently Asked Questions. Retrieved from

<http://marineinnovations.com/frequently-asked-questions/>

Marine Innovations Inc. (2016). Residential Incline Tram Models. Retrieved from

<http://marineinnovations.com/residential/incline-tram-models/>

McDonough, B., Howard, M., Angeles, R., Dolovich, L., Marzanek-Lefebvre, F., Riva, J. J., & Laryea, S. (2014, May 14). Lone workers attitudes towards their health: views of Ontario truck drivers and their managers. Retrieved from

<http://bmcrenotes.biomedcentral.com/articles/10.1186/1756-0500-7-297>

Statistics Canada. (2016, November 4). Labour force characteristics, seasonally adjusted, by province (monthly). Retrieved from <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/lfss01a-eng.htm>

Statistics Canada. (2016, September 28). Population by year, by province and territory. Retrieved from <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo02a-eng.htm>

Part II

A1 Freight Forwarding. (2016). Ocean Freight Estimate. Retrieved from <http://www.a1freightforwarding.com/quote/rate2.php>

Actualitix. (2016). Nepal - Statistics Agriculture. Retrieved from <http://en.actualitix.com/country/npl/statistics-agriculture-nepal.php>

Chaudhury, N. (2001). *Efficiency and productivity of nepalese agriculture* (Order No. 3036661). Available from ABI/INFORM Global; ProQuest Dissertations & Theses A&I. (304703187). Retrieved from <http://sfx.scholarsportal.info/guelph/docview/304703187?accountid=11233>

CIA. (2016, November 10). The World Factbook: Nepal. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/np.html>

CIA. (n.d.). The World Factbook: Country Railway Comparison. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2121rank.html#np>

FAO. (2002, November). Nepal. Retrieved from <http://www.fao.org/ag/agp/agpc/doc/counprof/nepal.htm#2>

KV Steel Services Ltd. (2009). Weight of Engineered Metals. Retrieved from kvsteel.co.uk/steel/weights2.html

McCoy, S., Everard, A., Polak, P., & Galletta, D. F. (2007, March). The Effects of Online Advertising. Retrieved from http://delivery.acm.org/10.1145/1230000/1226740/p84-mccoy.pdf?ip=131.104.23.27&id=1226740&acc=ACTIVE%20SERVICE&key=FD0067F557510FFB%2E53FA6D451CB5D924%2E4D4702B0C3E38B35%2E4D4702B0C3E38B35&CFID=869644158&CFTOKEN=12994041&__acm__=1480303265_c063288db5446a111286cfe21cb739f7

Nepal. (2012). Washington: Superintendent of Documents. Retrieved from

- <http://sfx.scholarsportal.info/guelph/docview/1545082487?accountid=11233>
- Ontario Ministry of Finance. (2016, November 21). Ontario Fact Sheet November 2016. Retrieved from www.fin.gov.on.ca/en/economy/ecupdates/factsheet.html
- Ransom, J. K., Paudyal, K., & Adhikari, K. (2003). Adoption of improved maize varieties in the hills of Nepal. *Agriculture Economics*, 29, 299-305. Retrieved from http://journals2.scholarsportal.info/subzero.lib.uoguelph.ca/pdf/01695150/v29i0003/299_aoimvithon.xml
- Statistics Canada. (2016, October 9). Population by year, by province and territory. Retrieved from <http://www.statcan.gc.ca/tables-tableaux/sum-som/101/cst01/demo02a-eng.htm>
- Thapa Magar, R. (2016). *Gravity goods ropeways: A sustainable solution for rural transportation in hilly and mountainous regions of nepal* (Order No. 10142186). Available from ProQuest Dissertations & Theses A&I. (1823247089). Retrieved from <http://sfx.scholarsportal.info/guelph/docview/1823247089?accountid=11233>
- Tiwari, K. R., Sitaula, B. K., Nyborg, I. L., P., & Paudel, G. S. (2008). Determinants of farmers' adoption of improved soil conservation technology in a middle mountain watershed of central nepal. *Environmental Management*, 42(2), 210-22. doi:<http://dx.doi.org/10.1007/s00267-008-9137-z>
- U.S. Agency for International Development. (2016, April 15). Agriculture and Food Security-Nepal. Retrieved from <https://www.usaid.gov/nepal/agriculture-and-food-security>
- World Freight Rates. (2016). Freight Calculator. Retrieved from <http://worldfreightrates.com/freight>