Assessment of the Export Potential of Canadian Manufactured Seed Sieves to Nepal

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This report was formulated to analyze the export potential of a Canadian manufactured seed sieve from Canada to Nepal. This paper will discuss this export opportunity by analyzing the product's functionality, market strategy, the benefits to both Canada and Nepal, and a cost analysis of the product, transportation logistics and global competitors. The primary focus of this report is to outline issues that are currently affecting the agriculture sector in Nepal and assess how a seed sieve can alleviate some of these issues.

Part I: General Overview of the Seed Sieve and Information Related to this Product

i.) Company Description:

Dimo's Labtronics is a Canadian Company who manufactures seed sieves. Their company is located in Winnipeg, Manitoba and they employ seven people directly (Diehl, personal communication, Oct 20, 2015). They are a completely Canadian owned business and have been operating for over fifty years (Labtronics, 2015). Labtronics consists of a newly renovated 16,000 square foot production facility, where they have a full plastic injection molding system with a total of seven injection molding machines (Labtronics, 2015). With this technology, they manufacture their own unique hand-held dockage sieves and other types of agricultural sampling equipment (Labtronics, 2015).

ii.) Product Description:

The Canadian company, Dimo's Labtronics produces versatile seed sieves, which are available for the sorting of several different species of seeds. This company produces sieve sets for the specific use of sorting corn, pea, soybean, canola, cereal and flax seeds (Labtronics, 2015). There are also general sieves, which are categorized by hole sizing; therefore there are three categories of which a seed sieve can be purchased depending on

the size of the seed to be sorted (Labtronics, 2015). There are slotted, canola and buckwheat and round hole sieves, in which each category contains several different sizes of sieves (Labtronics, 2015).

These sieves are designed to sort seeds after previously being used. After harvest, seeds may have an abundance of weeds, dead waste, or other species of seeds mixed in with the seed composition. Furthermore, a seed sieve is an alternative to sorting by hand and is used to sort out the unwanted matter in a quick and efficient way to only extract the desired seed type, these seeds would then be kept to reuse in the next growing season (FAO, 2015).

To further describe this process, the sieving of seeds occurs after harvesting. Furthermore, a farmer will harvest the crop in which he or she would like to save its seeds for the next crop rotation and collect the seeds. The farmer will then place the seeds in a sieve to remove unwanted matter that does not belong with the seed. The sieve will allow for debris to fall through different levels of the sieve, every step refining what it allows through, as the holes get smaller in size, which separates the unwanted matter from the desired seeds. (Heistinger, 2013). After this process is completed, the operator can choose the largest seeds from the batch to then save to plant in the next growing season (Heistinger, 2013).

There are three different sieve types categorized by their hole sizing in addition to "sets" that can be purchased as a full kit. The hole size of the sieves are important in ensuring that a significant amount of the unwanted matter is removed from the seed composition after sieving (Labtronics, 2015). Therefore having the proper hole size for

the type of seed needed to be sorted makes for effective results (Labtronics, 2015). Table 1 examines the sieve set options, exact sizes and prices.

Table 1: Examining Sieve Set Options, Descriptions, Sizes and Prices

Sieve Set	**Description**	**Size**	**Price (Canadian Dollars)**	**Price (Nepalese Rupees)**
Corn Sieve Set	Easily determine dockage in wet or dry Corn.	Consists of 12/64 round hole, 14/64 round holes and bottom pan, injection molded ABS frame system.	139.00	11094.38
Pea Sieve Set	For dockage estimation in Green or Yellow Peas.	Consists of 8/64 slotted, 9/64 slotted and 11/64 slotted and bottom pan.	189.00	15085.16
Soybean Sieve Set	For dockage estimation in Soybeans.	Consists of 8/64 round holes and bottom pan.	99.00	7901.75
Canola Sieve Set	Easily clean canola for green seed testing as well as dockage estimation.	Consists of 6.5/64 round holes, 0.038 slotted and bottom pan, and injection molded ABS frame system.	139.00	11094.38
Cereal Sieve Set	For dockage estimation in wheat, oats, barley and rye.	Consists of 5 buckwheat (triangular cut), 6 buckwheat (triangular) and bottom pan.	139.00	11094.38
Flax Sieve Set		Consists of 4 x 14 wire mesh, 4.5/64 round hole and bottom pan.	139.00	11094.38

Note: All sieves are 3lbs, 14” x 14” x 4” tall (Labtronics, 2015)

For the purpose of exporting these products to Nepal, it is more convenient to export the sieves in these "sets" listed in Table 1. Furthermore, this will also improve shipping costs, for example, instead of shipping the many sieves under each "hole" category; it will be easier to ship six "sets" of sieves, which come equipped with every item needed for the process of sieving. By doing this, local Nepalese farmers will only have to know what type of seed they are looking to sieve, and will not have to know specific hole sizes, which may be complex. This will make the purchasing process a lot easier for subsistence farmers in Nepal. For example, Table 2 lists sizing and pricing for slotted sieves, from this table, it can be seen that choosing a sieve by this process may be difficult for a Nepalese farmer as there are many measurements to consider. Therefore the product that will be exported from Canada to Nepal is the six different sieve sets manufactured by Dimo's Labtronics as an alternative to exporting their sieves separately.

Figure 1: Corn and Cereal Sieve Set (Labtronics, 2015)

Table 2: Slotted Sieve's Sizes and Prices

Slotted Sieves

3.5s	3.5/64 x 3/4 slot sieve/tamis a encoches	$51.00
4s	4/64 x 3/4 slot sieve/tamis a encoches	$51.00
4.5s	4.5/64 x 3/4 slot sieve/tamis a encoches	$7100
5s	5/64 x 3/4 slot sieve/tamis a encoches	$51.00
5.5s	5.5/2 x3/4 slot sieve/tamis a encoches	$51.00
6s	6/64 x 3/4 slot sieve/tamis a encoches	$51.00
6.5s	6.5/64 x 3/4 slot sieve/tamis a encoches	$71.00
7s	7/64 x 3/4 slot sieve/tamis a encoches	$71.00
7.5s	7.5 x 3/4 slot sieve/tamis a encoches	$71.00
8s	8/64 x 3/4 slot sieve/tamis a encoches	$51.00
8.5s	8.5 x 3/4 slot sieve/tamis a encoches	$71.00
9s	9/64 x 3/4 slot sieve/tamis a encoches	$51.00
10s	10/64 x 3/4 slot sieve/tamis a encoches	$51.00
11s	11/64 x 3/4 slot sieve/tamis a encoches	$51.00
12s	12/64 x 3/4 slot sieve/tamis a encoches	$51.00
13s	13/64 x 3/4 slot sieve/tamis a encoches	$51.00
14s	14/64 x 3/4 slot sieve/tamis a encoches	$71.00
15s	15/64 x 3/4 slot sieve/tamis a encoches	$71.00
16s	16/64 x 3/4 slot sieve/tamis a encoches	$71.00
17s	17/64 x 3/4 slot sieve/tamis a encoches	$71.00
19s	19/64 x 3/4 slot sieve/tamis a encoches	$71.00

(Labtronics, 2015)

iii.) Other Manufactures and Suppliers of this Product in Canada

There are other manufactures and suppliers located in Canada who also produce and sell seed sieves for the same purpose. There are different types of sieves available for purchase. There are hand held and there are motorized sieves. Table 3 illustrates alternative Canadian brands and models compared to Labtronics'.

Table 3: Comparing Canadian Manufactures of Seed Sieves

Company Name	Description	Price (Canadian Dollars)	Price (Nepalese Rupees)	Company Contact Information
Dimo's Labtronics	-Six sieve sets available (corn, pea, soybean, canola, cereal, flax) -Can be sold separately as well -Handheld	~ 51.00 (individual) 99.00-189.00 (sets)	~ 4068.64 (individual) 7901.75-15085.16 (sets)	Telephone: (204) 772-6998 Email: halross@halross.com Location Winnipeg, MB
Can Seed Equipment Ltd.	-Sold in sets (canola, cereal, flax, sunflower, soybean, corn) -Sold individually as well -Handheld	85.00 (individual) 160.00 (sets)	6781.07 (individual) 12764.37 (sets)	Telephone: 1(800) 644-8397 Email: sales@canseedequip.com Location: Saskatoon, SK
Farmtronics	-Sold separately (blank tray) -Sets available (canola, cereal, flax, slotted hole, round hole etc.) -Handheld	41.00 (individual) 149.00 (sets)	3270.66 (individual) 11886.06 (sets)	Telephone: 1(800) 667-8001 Email: customerservice@farmtronics.com Location: Regina, SK
M & L Testing Equipment	-Small, simple shaker for use with 3" sieves -Vibrates at 2000vpm and produces a sieving action -Motorized	1675.00	133328.86	Telephone: (905) 689-7327 Email: info@mltest.com Location: Dundas, ON

(Labtronics, 2015) (Can Seed Equipment, 2015) (Farmtronics, 2015) (Mizener, personal communication, Dec 1, 2015)

From Table 3 it can be seen that Labtronics provides seed sieves that are less expensive compared to the other Canadian companies. It can also be noted that a handheld sieve is the best option because of its large size and price difference compared to the motorized sieve. Therefore the models of sieve "sets" that Dimo's Labtronics produces is the most practical and efficient product that can be exported from Canada to Nepal.

iv.) Benefits to Canada from Exporting the Seed Sieve to Nepal

When considering the export opportunity from Canada to Nepal, the benefits to Canada will be very small when compared to the benefits the product will have on the Nepalese economy. Increased exports will benefit the Canadian economy and promote Dimo's Labtronics company name, as well as increase their company's sales in Canada and around the world (Diehl, personal communication, Nov 27, 2015). However, among all of the exports made by Canada each day, this will be a small addition to the large export sector of the Canadian economy and will not bring significant benefits to Canada directly. However, in contrast, this is a unique opportunity for the agricultural sector of the Canadian economy and may open doors to other innovations to assist agriculture in developing countries.

v.) Market Opportunity for the Seed Sieve in Nepal

There is a great amount of market opportunity for the seed sieve in Nepal. Nepal relies heavily on imports as they imported a total of $7.72 billion in 2014 (CIA, 2015). The products that are mainly imported to Nepal are petroleum products, machinery and equipment, gold, electrical goods and medicine (CIA, 2014). Therefore the seed sieve would have great market potential in Nepal.

The largest market in which the sieve could be sold is in farm cooperatives. Farm supply cooperatives are very important for the dependable supply of farm inputs such as farm machinery, equipment, fertilizers, housing materials, livestock feed, seed, and petroleum products (Poudel, 2007). These cooperatives are often established at the local, regional, or the national level depending on the nature of farm supply needs (Poudel, 2007). In this case, this product can be exported to farm machinery cooperatives, which often run on a local level (Poudel, 2007). By shipping seed sieves to many locally operated cooperatives around the country, local farmers will be able to easily access this product.

Part II: The Export Potential of Canadian Manufactured Seed Sieves to Nepal

i.) Introduction to Nepal

Nepal is a small land locked country, situated between Tibet to its north and India to its east, west and south (CIA, 2015). Nepal occupies just 0.1% of the earth's surface but is one of the richest countries in the world, in terms of biodiversity as a result of its unique geographical position and altitude variation (CIA, 2015). Nepal has distinct land use patterns, influenced by climatic variation, altitude and relief. Land use in the hill region is different from that of the plains (Pariyar, 2008). Nepal is comprised of three ecological regions, the Mountains, Hills and Terai regions (Kayastha, 2012). Nepal has a population of 31,551,305 people and has a population growth rate of 1.79% (CIA, 2015).

Agriculture, like a great number of developing countries plays an important role in Nepal in meeting the basic needs of the majority of the people (Kayastha, 2012). This agricultural production accounts for 30.7% of Nepal's gross domestic product and their main agricultural commodities are pluses, rice, corn, wheat, sugarcane, jute, root crops,

milk and water buffalo meat. In addition, the agricultural labor force is comprised of 75% of Nepal's population (CIA, 2015). However, declining agricultural production in Nepal has depressed rural economies and increased widespread hunger and urban migration (USAID, 2015). Nearly 50% of Nepal's population is undernourished and almost half of all children under five are chronically malnourished as well (USAID, 2015). Figure 2 illustrates the geographical region of Nepal and Figure 3 illustrates the different levels of poverty severity throughout Nepal.

Figure 2: Map of Nepal with Ecological Regions (Manthali Savings and Credit Cooperative Society, 2012)

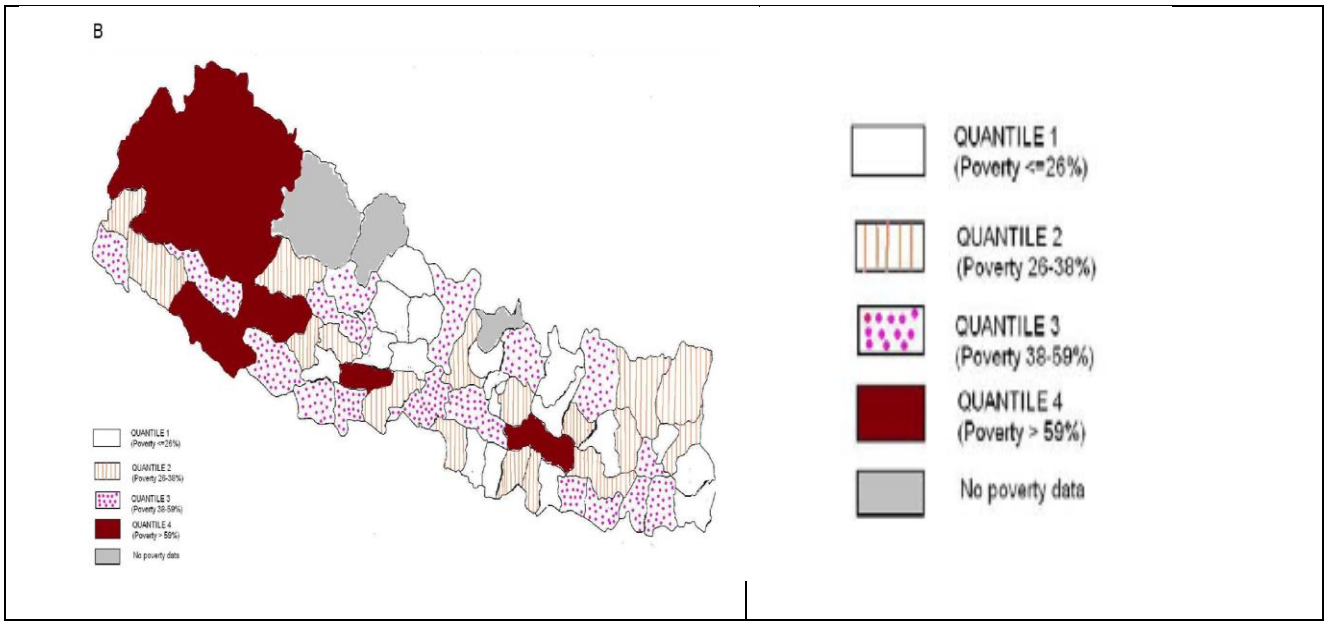

Figure 3: Poverty Distribution in Nepal (Do & Iyer, 2010)

ii.) Current Situation of Nepal's Agricultural Sector

When analyzing the information and statistics in the section above, it can be noted that Nepal's agricultural sector is in need of major assistance. Of the 143,351 square kilometers of land in Nepal, only 28.8% is used for agricultural purposes, 25.4% is forest areas and 45.8% are used for other purposes (CIA, 2015). The 28.8% of agricultural land in Nepal is divided into three small categories: 15.1% is arable land, 1.2% is used for permanent crops and 12.5% is permanent pasturelands (CIA, 2015).

With Nepal only having a small percentage of its land suitable for agricultural production, it is important that land is used in its most effective way possible. Over 80% of Nepal's people live in rural areas and largely depend on subsistence farming for their livelihoods (IFAD, 2013). Poor rural people in Nepal generally have large families, very small landholdings or none at all (IFAD, 2013). In addition, the country's population density varies according to altitude; in the low Terai region there is an average of 1,000

persons per square kilometer, about 300 persons per square kilometer in the hilly regions and a low average of about 30 persons per square kilometer in the mountainous areas. With this being said, there is a major need to increase food production to be able to properly feed the citizens of Nepal, which is becoming increasingly populated (IFAD, 2013).

With poor growth in Nepal's agricultural sector (IFAD, 2013), there is a major need to recover and to improve this sector, to better the lives of Nepalese citizens.

iii.) Benefits from the Seed Sieve to Nepal's Agricultural Sector

An effective way to increase crop production in Nepal is to introduce the seed sieve. The function of a seed sieve can bring large benefits to subsistence farmers in Nepal. The sieve's primary function is to remove dead waste, soil particles, weeds and smaller and discoloured seeds from a "batch" of seeds in which a farmer would like to keep to reuse in the next crop production. By eliminating these wastes and collecting only the large seeds will bring substantial benefits to farmers and their crop productions in Nepal. By removing these substances and only planting sizeable and "healthy" seeds in the next planting, the crop's yields will be maximized and thus will increase food production.

Removing the described matters from the seed composition will reflect great results. Sorting out weeds and dead waste from the desired seed will reduce the amount of weeds and unwanted plants from growing and from negatively affecting the crop. If fewer weeds grow amongst a crop, the farmer will not have to undertake the large and manual task of attempting to remove all the weeds from a field. This will save the farmer time and reduce difficult labour that can be utilized elsewhere.

Moreover, removing small seeds and keeping the large ones for planting will increase germination. Sorting seeds has been found to increase germination by 80-100% (Ter Heerdt, Verweij, Bekker & Bakker, 1996). Furthermore removing seeds that are discouloured will increase germination effectively. Planting non-discoloured seeds early in the planting season increases germination by 82% (Dube, Sibiya & Fanadzo, 2014). Since pathogens are often found in discoloured seeds, farmers can remove these seeds to eliminate crop-threatening pathogens (Dube, Sibiya & Fanadzo, 2014). Non-discoloured seeds that were planted early were seen to have low levels of infection (Dube, Sibiya & Fanadzo, 2014).

Therefore, when farmers sort their seeds and use the largest and best-coloured seeds available, they will have an increase in yields because the most profitable seed will be used in planting. An increase in yields will have great implications for subsistence farmers in Nepal and ensure long-term food security (Baiphethi & Jacobs, 2009). This will allow them to better provide for their families.

Subsistence farmers produce most of their own food, however, there has recently been an increase in dependency on rural farmers in both rural and urban areas (Baiphethi & Jacobs, 2009). About 90% of people in developing countries rely on subsistence farmers for their daily food supply (Baiphethi & Jacobs, 2009). This increase in productivity will lessen pressure on marginal lands, as the intensification of cultivated land will reduce pressure to crop fragile marginal lands (Baiphethi & Jacobs, 2009). Rural farmers will also save money because they will be less dependent on buying foods that are high in price (Baiphethi & Jacobs, 2009).

iv.) Cost Analysis to Achieve Profitability

There are five major crops grown in Nepal, they include: rice, maize, wheat, millet and barley (Prasai, 2010). With their major crops categorized as corn and cereals, it is appropriate to export only the corn and cereal sets, which will best accommodate the needs of these crops. Therefore, the corn and cereal sieve sets will be exported to Nepal. These sets retail for 139.00 Canadian dollars, which translates to 11094.38 Nepalese rupees. Over 30% of Nepalese people live on less than 14 US dollars (1117.72 Nepalese rupees) per month and the overall poverty rate is 46% (IFAD, 2013). These statistics show that it may be difficult for a Nepalese farmer to purchase a seed sieve, as the price is high when compared to their overall income per month.

To make this purchase possible for local farmers, alternative-purchasing methods can be explored. For example, one farmer could purchase a sieve and could allow others to use it as well, perhaps charging an affordable price for each use. This way, several farmers in a community can experience the benefits of this product. Another option that could be explored upon export is a grant from the Government of Canada to assist in funding this project. This grant could help supply each accessible farm cooperative throughout Nepalese communities with a sieve for farmers to use whenever necessary. A grant, which is funded by the Canadian government, by the name of AgriCompetitiveness, finances projects similar agricultural projects with $114.5 million dollars over five years (Agriculture and Agri-Food Canada, 2014). These are two functional options, which can make this project possible, allowing seed sieves to be exported and used effectively in the farming communities of Nepal.

v.) Transportation Logistics from Canada to Nepal

The most effective way to send large quantities of sieves from Winnipeg, Manitoba to Kathmandu, Nepal is by plane. A cost analysis was formulated to estimate the exporting cost of this product. Table 3 shows the cost to ship 20 pounds of seed sieves, which is about 7 sieves (3 pounds each) to Nepal by three popular Canadian shipping companies (Diehl, personal communication, Nov 30, 2015).

Table 3: Shipping Cost Analysis

Company	**Cost**	**End Location**
FedEx	577.26 CAD	Kathmandu, Nepal
UPS	707.58 CAD	Kathmandu, Nepal
Purolator	767.40 CAD	Kathmandu, Nepal

(FedEx, 2015) (UPS, 2015) (Purolator, 2015)

Other transportation costs will also have to be discussed including the costs of trucking from the Kathmandu airport to local farm cooperatives. Coordinators of this project can use these estimated cost analyses to view the overall costs of undertaking this project when exporting seed sieves to Nepal. The shipping prices are quite costly and will have to be considered with the original price of the product as well.

vi.) Potential Global Competitors

A hand held seed sieve is a product that is made by many agricultural equipment companies worldwide. Therefore, there is global competition against the Canadian product. However, a competitor from China sells stainless steel mesh sieves for a price of 460.00-500.00 CAD (Made in China, 2015). To compare, this product is more expensive than Labtronics' corn or cereal sieve set priced at 139.00 CAD. The Labtronics set is the

most convenient for Nepalese farmers, because all sieve levels come together rather than having to buy them separately. The convenient nature of the Canadian manufactured seed sieve makes it most desirable, however with high export costs in place, it may be more reasonable for the product to be exported to a closer nation, such as China, India or Europe.

vii.) Conclusion and Future Steps

In conclusion, the export potential for the Canadian manufactured seed sieve by the company Dimo's Labtronics has huge potential to bring very large benefits to the citizens of Nepal. Through analyzing the product and its price, the market opportunity for the product in Nepal, the profitability and the current situation of Nepal's agriculture sector, it can be noted that the benefits brought by the product will be substantial. The benefits include: a decrease in weeds and waste present amongst a crop, an effective increase in the overall plant yield by increasing germination and a decrease the level of pathogens amongst the seeds. The only issue with this export opportunity is transportation. A major issue involving transportation is the large shipping costs from Winnipeg, Manitoba to Kathmandu, Nepal. As well, potential complications with ground transportation may arise when transporting the product to farm cooperatives in rural Nepalese communities.

Further research should be conducted to analyze other global competitors to evaluate which company offers the most cost effective package including the product's price and transportation costs to offer the farmers in Nepal. However, regardless of where the product is produced, the implications of a seed sieve will bring great benefits to the agriculture sector Nepal and will therefore better the lives of several Nepalese people.

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