

# **Export potential of a Canadian vegetable washer from Willsie Equipment Sales Inc. to Nepal**

Elizabeth Cyr

## **Introduction**

Students in the University of Guelph's AGR1110 course have been given the task of suggesting products that could be exported from Canada to benefit Nepalese farmers. The ideal export would also benefit Canada. This project exists because of a collaboration with SAKNepal. SAK stands for Sustainable Agriculture Kits, an initiative that aims to bring affordable technologies to poor farmers, in this case Nepalese farmers (Raizada, n.d.). This report will examine the export potential of a vegetable washer produced in Canada by the Canadian company Willsie Equipment Sales. The potential benefits and issues associated with this product will be critically analysed and discussed.

## **Product information**

### *Description*

The product is a vegetable washer made by Willsie Equipment Sales Inc. The washer includes a rotating drum that is 26" in diameter and 3 feet in length ("Veggie Processing Equipment For Smaller Producers", 2010). The rotation is powered by a ½-hp motor and helps loosen up the dirt on the vegetables so that it can be washed away by the flow of water ("Veggie Processing Equipment For Smaller Producers", 2010). The water aspect consists of a 55-gpm sump pump and a pvc pipe with small holes for the water to exit out of and gently spray the produce ("Veggie Processing Equipment For Smaller Producers", 2010). The system also includes a 160-gallon tank for the recirculation of water (*26" Drum Washer*, n.d.). The machine is ideal for washing root crops such as beets, carrots and potatoes, but is also suitable for most types of vegetables according to the company (*26" Drum Washer*, n.d.). Other features of this product include rust-resistant paint and the fact that it is low maintenance, according to Willsie Equipment Sales Inc. (*26" Drum Washer*, n.d.). In the

brochure for this vegetable washer, it is recommended for small growers and farmers' markets (*26" Drum Washer*, n.d.). The product typically sells for \$5,028.61 in Canadian dollars.

For assembling, there is an assembly instruction manual to be found on the company's website. This manual includes a list of tools required and a step-by-step guide including photos that explains how to assemble the product (*Assembly Manual for Drum Washer*, n.d.). The process of setting up the motor that powers the rotating drum is not covered in this manual. Instead, the manual instructs the reader to consult an electrician for this matter (*Assembly Manual for Drum Washer*, n.d.). The tools needed to assemble the washer are a 9/16 wrench and two 1/2 wrenches, and the nuts and bolts are provided (*Assembly Manual for Drum Washer*, n.d.). Since the instruction manual already contains a lot of images to illustrate the assembly process, it could potentially be transformed into a picture book to make instructions accessible for illiterate farmers in Nepal. However, if this is to be done, additional photos will be needed, as well as clear diagrams with arrows and such to make instructions clear, because the photos currently included in the manual do not clearly show how each step is accomplished.

### ***About the company***

Willsie Equipment Sales Inc is a Canadian manufacturer and distributor of horticultural equipment with its head office located in Thedford, Ontario. It was officially formed in 1991 but has existed under different names and as a smaller operation since the 1950's (Willsie, n.d.). The company began as a vegetable farm where the farmers were buying machinery parts for their own use (Willsie, n.d.). Since there were no dealers of vegetable equipment in South Western Ontario at the time, the farmers started selling equipment to their neighbours who were also vegetable farmers, and this grew to become

Willsie Sunnyview Farms Ltd. in 1973 (Willsie, n.d.). The business kept growing and is now known as Willsie Equipment Sales Inc., a company serving fruit and vegetable growers mainly in North America but also around the world with dealers all over North America as well as in Hawaii and South Africa, and customers in Canada, Italy, Mongolia, Panama and many other countries (Willsie, n.d.). It is important to note that although this company does not have a distributor located near Nepal, it has customers located in various areas of the world, meaning that it has experience with sending its merchandise overseas.

### ***Similar Canadian products***

Research to find other Canadian manufacturers and distributors of similar vegetable washers was mostly unsuccessful. The results found were mainly guides for farmers who wish to build their own barrel washers for washing root crops, and a few search results were farmers who offer their expertise or designs for others to use, but no Canadian manufacturers or distributors of vegetable washers were found other than Willsie Equipment Sales Inc. That is with the exception of McGill University, which had a small root crop washer designed by engineering students to be used by the McGill Student Ecological Garden (MSEG), a student-run 1 ½ acre farm on the MacDonald Campus of McGill University (*MSEG Root Crop Washer*, 2013). The washer was a prototype that cost approximately \$2000 to build and had potential for use by small farmers in Nepal since it was designed to be used on a small scale. After being in contact with someone from the current MSEG team, it was found that the prototype was no longer in use because it was said to be poorly designed and did not work well for those who used it in the past (MSEG Team, personal communication, November 2, 2015).

The drum washer from Willsie Equipment Sales Inc. was the only product found that is produced by a Canadian company and can be purchased as product that is ready to assemble with all parts included.

### ***Potential benefits to Canada***

Exporting this vegetable washer could be quite beneficial for Canada. It would support a Canadian company located in Ontario, not far from the University of Guelph and it would serve as a way of encouraging trade between Canada and Nepal. In recent years, Canada has started to change its relationship with Nepal to focus on trade and investment rather than aid (Government of Canada, 2013). However, Canadian exports to Nepal from 2012 to 2013 formed a total of only \$7.1 million. Exporting a new product to Nepal could help reinforce trade between Canada and Nepal.

Since Willsie Equipment Sales Inc. is based out of Ontario, it offers jobs to Canadians here in Ontario and also at its many distributors across Canada and North America. Successful exporting to Nepal means more money for this Canadian company, offering an opportunity to expand and hire more Canadian workers.

### **Nepal: the potential importing nation**

#### ***Introduction to Nepal***

Nepal is a small country located in southern Asia between China and India, with China to the north and India to the south. It has a population of 31,551,305 people and its capital is Kathmandu (World Fact Book, 2015). It has a total area of 147,181 square kilometres including land and water, with 143,351 square kilometres of land (World Fact Book, 2015). The country is landlocked and is composed of three geographical regions: the terai region in the south, the hill region in the center, and the mountain region, home to the

Himalayan mountain range in the north (T. Chapagain, guest lecture notes, AGR1110 Intro to Agri-Food Systems, September 18, 2015) (Figure 1). Climate varies greatly between those regions. The mountain region in the north has an alpine climate and a short growing season (T. Chapagain, guest lecture notes, AGR1110 Intro to Agri-Food Systems, September 18, 2015), with cool summers and severe winters (World Fact Book, 2015). The hills region has a warmer, subtropical climate and terrace farming is a common agricultural practice in this region (T. Chapagain, guest lecture notes, AGR1110 Intro to Agri-Food Systems, September 18, 2015). The terai region in the south has a warmer climate, with subtropical summers and mild winters (World Fact Book, 2015), making it the better suited region for growing vegetables and tropical fruits (T. Chapagain, guest lecture notes, AGR1110 Intro to Agri-Food Systems, September 18, 2015).

Agriculture is extremely important in Nepal, with 75% of its population employed in the agriculture sector and 28.8% of its land used for agriculture, according to the World Fact Book (2015). This sector accounts for 30.7% of the Nepal's GDP, with the main crops being pulses (such as lentils and beans), rice, corn, wheat, and root crops (World Fact Book, 2015). Sugarcane, jute, milk, and water buffalo meat are also products of Nepalese agriculture (World Fact Book, 2015). Nearly one quarter of Nepal's population lives under the poverty line, making it one of the poorest countries in the world, and only 63.9% of the population is literate (The World Factbook, 2015). This is important to consider when thinking about exporting a new technology to Nepal, and it means that the export product must be affordable for poor farmers and that any instructions concerning the product must be accessible to illiterate farmers.



*Figure 1: Map of Nepal showing its 3 main ecological regions.* Retrieved from [http://3.bp.blogspot.com/-Y9FyNfHu-s4/VWtsr9EoiXI/AAAAAAAAABZ0/-G\\_UHRV9ymc/s1600/20150531-nepal-2.jpg](http://3.bp.blogspot.com/-Y9FyNfHu-s4/VWtsr9EoiXI/AAAAAAAAABZ0/-G_UHRV9ymc/s1600/20150531-nepal-2.jpg)

### ***Potential benefits of exporting to Nepal***

There are many potential benefits of exporting a vegetable washer to Nepal. It would help to make food more clean and therefore safer, reduce labor, and it could be an important first step in improving post-harvest processing on small farms. Nepal has a high degree of risk for major infectious diseases, which include foodborne diseases (World Fact Book, 2015). Foodborne and waterborne diseases present in Nepal include hepatitis A and E, bacterial diarrhea, and typhoid fever (The World Factbook, 2015). According to the World Health Organization, more than 200 diseases are caused by unsafe food (WHO, 2015). Unsafe food is food that contains parasites, viruses, harmful bacteria, or chemical substances (WHO, 2015). Every year millions of people are affected by foodborne diseases (WHO, 2015).

A study conducted in Shahrekord, Iran investigated the presence of intestinal parasites in vegetables before washing, after washing traditionally and after washing using a standard washing procedure (Fallah, Pirali-Kheirabadi, Shirvani & Saei-Dehkordi, 2011). The study found that 32.6% of the unwashed vegetable samples were contaminated with intestinal parasites, and that this percentage went down when vegetables were washed (Fallah et al.). The traditional washing procedure involved soaking vegetables in a sink and rinsing them under running water, and with this method the percentage of vegetables in which intestinal parasites were detected went down to 1.3% (Fallah et al.). No parasites were found after the vegetables were washed using a standard washing procedure involving the disinfecting of vegetables by soaking them in an active calcium hypochlorite solution and then putting them through an automatic washer (Fallah et al.). The study concluded that transmission of parasites from food to humans can be prevented by proper washing procedures (Fallah et al.). Based on this information, washing vegetables with the drum washer could help prevent the transmission of intestinal parasites that are making people sick. Although the addition of a chemical disinfecting solution such as the one used in the study by Fallah et al. would further decrease the amount of parasites in vegetables, washing with an automated washer such as the Willsie drum washer could be a good starting point and would still make a significant difference.

In addition to health concerns, there are other reasons why washing vegetables would be beneficial for Nepalese farmers. One reason is that it could make their produce more appealing, especially for the urban population at farmer's markets. People tend to like vegetables and fruits that look nice, and washing the crops before taking them to market has the potential to make them more appealing to people. Another reason is that post-harvest processing adds value to a crop (M. N. Raizada, lecture notes, AGR1110 Intro to Agri-Food Systems, November 30, 2015), and washing is one of the first steps in post-harvest

processing. For example, root vegetables can be trimmed after being washed and potentially sell for a higher price than root vegetables that have not been processed at all. One last aspect to consider is that since the washer is quite expensive, forming a cooperative between small Nepalese farms would be a good way to make the product more affordable, and the creation of a co-op could have other beneficial impacts on rural communities. This idea will be further discussed in other subsections of this report.

One more very important benefit of bringing this vegetable washing technology to Nepal is reducing labour required from farmers to manually clean vegetable crops. This factor will especially affect women, who actually make up the majority of agricultural labour in Nepal, with 72.8% of women and girls over the age of 10 involved in agricultural work of some form, compared to 60.2% for men (Food and Agriculture Organization of the United Nations, 2010). The literacy rate of women in Nepal is significantly less than that of Nepalese men (FAO, 2010), and maybe agricultural labour is a factor in this, because girls who need to stay home and help on the farm are likely not going to school. An automated vegetable washer would reduce time and labour involved in post-harvest processing, and therefore would be beneficial to the women farmers in Nepal.

### ***Market opportunity in Nepal***

The target consumers for the vegetable washer are Nepalese farmers, in particular those with small farms since the product is designed to be used on a small scale. The washer is extremely expensive considering that about 25.2% of the population of Nepal lives below the poverty line (The World Factbook, 2015) and that like most of the world's poor farmers, poor Nepalese farmers probably earn \$1-\$2 per day (Raizada, n.d.). With this in mind, the only way to possibly make the product affordable for Nepalese farmers would be to have a group of farmers who agree to collectively buy one washer so that the cost is split between

them. The more farmers that contribute, the more affordable it becomes. Setting up a cooperative in a rural community is the ideal solution, since it can then serve other purposes and bring different resources to farmers. The co-op could serve as a central location to install the vegetable washer so that many farmers could have access to it. It could also be developed into a place to properly store seeds, grain, and tools such as educational picture books, as well as tools for labour involved in planting, harvesting and processing. A cooperative can empower farmers and in return stimulate economic growth and agricultural sustainability (Poudel, 2007) An organization that could help set this up is Canada Foundation for Nepal (CFFN). CFFN is a not-for-profit organization based out of Ottawa whose goal is to encourage cooperation and exchanges of ideas between Nepal and Canada to help with sustainable development in Nepal (CFFN, n.d.). According to an article published on the CFFN's website, cooperatives between farmers have existed in Nepal for many years and for various purposes (Poudel, 2007). Because of the cost of the product and the process associated with making it affordable, it would be best to export only one washer to Nepal initially, as a trial, and set it up in a cooperative or similar arrangement. If the idea is successful, more washers can be sent to Nepal and bought by rural communities in who wish to purchase them.

### ***Cost analysis***

As previously discussed, the cost of a 26" drum washer from Willsie Equipment Sales Inc. is \$5,028.61, in Canadian dollars. Other costs to consider are transportation costs, cost of tools and expertise needed to assemble the product, and potential maintenance costs. The currency in Nepal is the Nepalese Rupee (NPR) and 1 Canadian dollar is the equivalent of 87.25 Nepalese Rupee (Government of Canada, 2013). Therefore, the cost of the product

alone is around 438, 746 NPR. As indicated in the Assembly Manual for Drum Washer (n.d.), the tools needed to assemble the washer are a 9/16 wrench and two ½ wrenches. At a Canadian hardware retail store, wrenches typically sell for around \$5-\$10 per wrench (The Home Depot, n.d.). The setting up of the motor requires an electrician, and if an electrician has to be hired, the cost of that would be approximately 211 NPR per hour, which is the average hourly wage for electricians in Nepal (*Hourly Wage Survey in Nepal in Electrical and Electronics Trades*, n.d.). Therefore, if it takes two hours to set up the motor, for example, the electrician would be paid 422 NPR. Another potential added cost is maintenance cost. Although the product is described as low maintenance (*Assembly Manual for Drum Washer*, n.d.), there is always the potential for unforeseen problems such as the malfunctioning of the motor, which would likely require the assistance of a professional electrician once again.

The final but most major cost is the cost of transporting the product from Canada to Nepal and then from a city in Nepal to the rural community that purchased the product. Although rates vary depending on the shipping company, shipping fees would definitely add a significant amount to the already high cost of the product.

### ***Potential barriers***

The cost of the product itself and transporting to Nepal is a major barrier. Poor Nepalese farmers simply do not have the money necessary to invest in expensive equipment like the Willsie vegetable washer. Setting up a farm cooperative or another type of collective project would help alleviate the cost for farmers involved, but even then the price remain too high. In addition, farmers are not likely to want to invest in such costly technology, especially if the technology comes with complicated aspects such as assembly (Sharma, n.d.) A cheaper

and perhaps less sophisticated product from another country is likely better suited for the target consumer in this case.

Another potential barrier is the process of setting up a farm cooperative or a similar type of arrangement. It is entirely possible that Nepalese farmers have no interest in setting up this kind of organization, or that they will not accept help from a Canadian organization such as CFFN. It is also possible that geography will make the setup of a cooperative or the sharing of equipment between farmers very difficult and even impossible if farms are too far apart and farmers have no reliable methods of transportation to get to the location of the vegetable washer. Lack of access to proper transportation equipment for certain crops could also make this very difficult.

Lack of expertise is also a major issue when it comes to assembling the vegetable washer. The instructions from Willsie Equipment Sales Inc.'s assembly manual (n.d.) states that an electrician should be consulted to install the motor that powers the rotating mechanism. The World Factbook (2015) mentions a serious lack of skilled labor in Nepal. Because of this problem, it is unlikely that skilled electricians can be found in most rural communities. An electrician would need to travel from one area of Nepal to another, or possibly from another country where skilled trade workers are more common.

The vegetable washer requires clean water to spray and clean vegetables by removing dirt. The water is recirculated within the system, but nonetheless an input of water is required. This is a potential issue in rural areas where there is no running clean water. The setup of a well or other water system may be required and would add to the overall cost of the washer.

### **Competitive products from other nations**

One issue with washers for root crops and other vegetable crops is that the type and models vary greatly, from simple designs available for individual orders, such as the barrel

washers made at Grindstone Farm in the USA (*Root Crop Washers, n.d.*), which are actually cheaper to buy than the drum vegetable washer from Willsie. Prices for similar products from India and China were not readily available, but considering that these two countries have much cheaper labour costs than Canada does and that they are much closer to Nepal geographically, it is safe to estimate that products from those countries would be cheaper than a Canadian product.

### **Future studies required**

Despite the research that was done for this report, some questions remain unanswered, due to inability to find relevant information on those topics and inability to establish communication with Willsie Equipment Sales Inc. These questions would need to be considered and investigated should this export idea move forward. A good thing to look into would be the actual water usage of the Willsie vegetable washer, and how it compares to the amount of water used in other methods of washing, like soaking vegetables in a sink or bucket filled with water, for example. It may be easier to convince Nepalese farmers to invest in this technology if they are told that it will use less water and as a result save them money overtime. A thorough comparison of similar washers from China, India, or other countries would also be a good idea because although the Canadian product is too expensive for Nepalese farmers, a more affordable product from another country could greatly benefit Nepalese farmers by providing them with a similar vegetable washing technology. Further research concerning the total cost of transportation to Nepal is also necessary.

### **Recommendations for the future**

In conclusion, exporting a Willsie vegetable washer to Nepal is not a realistic idea. It is not affordable for Nepalese farmers and it requires access to expertise and a source of clean

running water, both of which might be difficult or impossible to access in certain areas of Nepal. However, exporting a cheaper alternative to this product would be a great idea, because having an efficient method of washing vegetable crops could have a lot of potential for decreasing the risk of foodborne illness and increasing the market value of vegetable crops, as was discussed in this report. The idea of exporting an automated vegetable washer to Nepal should be kept in mind because it has potential benefits, but a different supplier and more research are needed to make this idea possible.

## References

*Canada Foundation for Nepal* (n.d.). Retrieved from <http://cffn.ca/>

Fallah, A. A., Pirali-Kheirabadi, K., Shirvani, F., & Saei-Dehkordi, S. S. (2011). Prevalence of parasitic contamination in vegetables used for raw consumption in shahrekord, iran: Influence of season and washing procedure. *Food Control*, 25(2), 617-620. doi:10.1016/j.foodcont.2011.12.004

Food and Agriculture Organization of the United Nations (2010, June). *Integration of Gender in Agriculture: An Analysis of Situation*. Retrieved from [ftp://ftp.fao.org/TC/CPF/Country%20NMTPF/Nepal/thematic%20studies/Gender%20Final%20Report%20\\_TC\\_.pdf](ftp://ftp.fao.org/TC/CPF/Country%20NMTPF/Nepal/thematic%20studies/Gender%20Final%20Report%20_TC_.pdf)

Government of Canada (2013, August). *Canada-Nepal Relations*. Retrieved from [http://www.canadainternational.gc.ca/india-inde/bilateral\\_relations\\_bilaterales/canada\\_nepal.aspx?lang=eng&menu\\_id=10](http://www.canadainternational.gc.ca/india-inde/bilateral_relations_bilaterales/canada_nepal.aspx?lang=eng&menu_id=10)

Government of Canada (2015, November). *Nepal*. Retrieved from [http://www.canadainternational.gc.ca/ci-ci/assets/pdfs/fact\\_sheet-fiche\\_documentair\\_Nepal-FS-en.pdf](http://www.canadainternational.gc.ca/ci-ci/assets/pdfs/fact_sheet-fiche_documentair_Nepal-FS-en.pdf)

*Hourly Wage Survey in Nepal in Electrical and Electronics Trades*, (n.d.). Retrieved from

<http://www.salaryexplorer.com/hourly-wage.php?loc=151&loctype=1&job=21&jobtpe=1>

MSEG Root Crop Washer (SP0118). (2013, October). Retrieved from McGill University website: <https://www.mcgill.ca/sustainability/mseg-root-crop-washer-sp0118>

Poudel, D.D. (2007, October 7). *Farmer Cooperatives for Food Self-sufficiency, Agricultural Commercialization, and the Socio-economic Development of Nepal*. Retrieved from <http://cffn.ca/2007/10/farmer-cooperatives-for-food-self-sufficiency-agricultural-commercialization-and-the-socio-economic-development-of-nepal/>

Raizada, M. N. (n.d.). *The SAK Approach*. Retrieved from <http://saknepal.org/the-sak-approach/>

Sharma, K.C. (n.d.). *Crop Diversification In Nepal*. Retrieved from <http://www.fao.org/docrep/003/x6906e/x6906e09.htm#TopOfPage>

The Home Depot (n.d.). Retrieved from <http://www.homedepot.com/l/Guelph/ON/Guelph/NIH-1G8/7142>

Veggie Processing Equipment For Smaller Producers (2010). *Farm Show*, 34 (2), 4. Retrieved from [https://www.farmshow.com/a\\_article.php?aid=22799](https://www.farmshow.com/a_article.php?aid=22799)

World Health Organization (2015, November). *Food Safety*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs399/en/>

Willsie Equipment Sales Inc. *Assembly Manual for Drum Washer* (n.d.). Retrieved from <http://willsie.com/brochures/Drum%20Washer%20Assembly.pdf>

Willsie Equipment Sales Inc. *26" Drum Washer* (n.d.). Retrieved from <http://willsie.com/brochures/Drum%20Washer%20web.pdf>

Willsie G. A. (n.d.). *Introduction and Mission*. Retrieved from

[http://willsie.com/index.php?main\\_page=page\\_history](http://willsie.com/index.php?main_page=page_history)

The World Factbook (2015, November 19). *South Asia: Nepal*. Retrieved from

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