Ana Paula Becerra
AGRI 1110
November 28, 2015

An analysis of the potential for export of packaging for ginger from Canada to Nepal

Introduction

Nepal is one of the third largest producer of ginger in the world, after India and China. Within Nepal, ginger contributes to 0.59 % of the total exports (USAID, 2011). It is a widely used crop and it is cultivated by over 66,000 farmers, predominantly in the mid-hill region of the country. Ginger is third out of the 19 crops listed in Nepal's Trade Integration Strategy (NTIS), a report created to analyze the export potential of various crops grown in Nepal (MoCS/GoN, 2010). The government is continuously trying to implement programs in order to increase the value of ginger in Nepal but they struggle with a lack of processing facilities. Nepalese ginger is usually seen as an inferior product on the market because it is high in fiber and it is not typically cleaned, graded or packaged (ITC, 2007). With all this in mind, it seems necessary for Nepal to invest in processing facilities and equipment which will increase the value of ginger and reduce barriers to international markets. A potential option to increase the product of ginger is packaging the ginger in Nepal before it is sold to other markets. Through extensive research, this paper will analyze the potential for NNZ Packaging, a company in Norwich Ontario, to export packaging materials for ginger to various districts in Nepal.

Product info

The potential product is ginger packaging from NNZ packaging solutions. The product is manufactured in Canada and it is sold in rolls as flowpack film packaging or individually, as plastic clamshell containers or mesh bags (D. Hill, personal communication, November 26, 2015). Typically, flowpack film is ordered by metre and clamshell containers or mesh bags are sold in quantities of 1000 or more. The product is shipped to farmers who often have processing machinery such as a flowpack film machine (D. Hill, personal communication, November 26, 2015). The other option of plastic clamshell containers or mesh bags do not need machinery and could be a good option for Nepalese farmers.

A small flowpack film machine can cost around $1000 to $5000 (Alibaba, n.d.). The flowpack film machine runs on 2.4KW which can be powered by a generator. 2.4 KW Generators typically range from $100 - $600 CDN, and there is an option to run them on gas or diesel. The price of the flowpack film varies on the amount that is needed and the type of film that is being used. The price range for other types of packaging from NNZ vary from $0.07 a piece for plastic clamshell containers, or $0.20 up to $0.30 a piece for mesh bags (D. Hill, personal communication, November 26, 2015). Mesh bags can have a customers' name on it or it can have a generic label to help market the products. Below is an outline of the different options that can be shipped from NNZ packaging. Shipping from Canada to Nepal through A1 Freight Forwarding would cost roughly $500 (A1freightforwarding, n.d.).

Flowpack film costs:

	Cost in CDN dollars
Flowpack film machine	$ 1000 - $ 5000
Generator	$ 100 - $600
Flow pack Film	Varies/ metre Estimate: $ 200
Shipping flowpack film	$500
Total:	$1800 - $5800

Clam shell or mesh bag costs:

	Cost in CDN Dollars	Shipping	Total (x 1000)
Clam Shell Containers	$ 0.07 a piece	$500	$570
Mesh bags	$0.20 - $0.30 a piece	$500	$700 - $800

Labour Required

For Canada, the labour required will be minimal because Canada is already producing packaging solutions and sending them out by truck. Any additional labour would be for logistical reasons such as contacting Nepalese producers, marketing the product to farmers, road-head traders and exporters and the labour required to ship the product to Nepal. The biggest cost for

Nepal will be the initial implementation of either a flowpack film machine or the price of shipping the clamshell containers or the mesh bags.

Market Opportunities in Nepal

The market opportunity for this product will include small and large scale commercial farmers. Nepal is already focusing on investing in processing equipment that will help with cleaning and grading of Nepalese ginger. An example if this is a community in Surhket, Nepal that is involved in a cooperative called Organic Mountain Flavour (Dolkher & Surkhet, 2013). Through this cooperative, they are building a processing plant to manufacture high quality dried ginger powder and candy for domestic and export markets (Dolkher & Surkhet, 2013). This example shows that processing facilities are only beginning to sprout in the Nepal ginger industry.

These processing supplies would be geared to small commercial and large scale commercial producers because it can help them increase the value of their products going to the market (USAID, 2011). Processing, however, will benefit subsistence farmers less because they are not currently selling to large markets. Subsistence farmers tend to produce for their own households or sell products to the road-head traders and in local markets (USAID, 2011). Although they will benefit the least, they could still benefit from plastic clamshell packaging. In addition, adding labels on the packaging will increase the value of the product since they can have third-party certification labels or labels geared towards consumer interests such as "Himalayan Ginger" to increase the value (USAID, 2011).

Benefits to Canada

Canada will benefit from the creation of new partnerships in Nepal. Currently, the NNZ location in Canada only supplies to the US and all around Canada (D. Hill, personal communication, November 26, 2015). If Canada formed a trade partnership with Nepal through NNZ, this could create offices in Nepal and other employment opportunities within the Canadian chapter. In 2013, Canada decided to focus on improving trade and investments in Nepal instead of focusing on aid to Nepal (GoC, 2013). By creating partnerships, Canada and Nepal will continue to grow their trade relationships and it will contribute to Canada's Department of Foreign, Trade and Development (DFAIT). In addition, research is required to analyze which

type of packaging is most suitable for Nepal and this creates an opportunity for Canadian students to engage with organizations such as the International Development Research Centre (IDRC), the Consultative Group for International Agriculture Research (CGIAR) and the Canadian International Food Security Research Fund (CIFSRF).

Environmental Sustainability in manufacturing in Canada

Manufacturing this product in Canada is a reasonable option because NNZ packaging is already producing the products. By producing the product in Canada, NNZ can ensure that it meets quality standards and it can be durable for the needs of Nepalese farmers. NNZ has made a commitment to sustainability by increasing the shelf-life of food through the use of packaging. In addition, NNZ commits to making most of their products reusable and recyclable (D. Hill, personal communication, November 26, 2015). The cost to the environment can be seen in the shipping practices. Freight in general contributes largely to the increasing concern of global climate change and pollution. A study done by the Organization for Economic Co-operation and Development (OECD) in France shows that shipping, air transport and trucking all create a comparable amount of land, water and air pollution (1997). While shipping creates more water pollution due to discharge of polluted or oily water, air transport discharges NOx which can cause ozone depletion (OECD, 1997). Trucking increase the levels of CO2 and contributes to global air pollution (OECD, 1997). The environmental impact of freight is concerning but for this project, the report will focus on using air and truck transport because it is more convenient than shipping.

References

Alibaba (n.d.) China supplier plastic bag low price flowpack machine for cheese. Retrieved from http://www.alibaba.com/product-detail/China-Supplier-Plastic-Bag-Low-Price_60363074545.html?spm=a2700.7724838.30.163.czLc3k

Dolker, T., & Surkhet, G. (2013). The value of Nepalese Ginger Farming. *Nepali Times.* Retrieved from http://nepalitimes.com/article/nation/nation-ginger-surkhet-snv-nepal,826.

Government of Canada (GoC). (2013). Canada-Nepal Relations. Retrieved from http://www.canadainternational.gc.ca/india-inde/bilateral_relations_bilaterales/canada_nepal.aspx?lang=eng

International Trade Centre (ITC). (2007). Export Potential Assessment in Nepal, 77 – 85.

Ministry of Commerce and Supplies (MoCS)/Government of Nepal (GoN). (2010). *Nepal Trade Integration Strategy 2010: Executive Summary and Action Matrix.*

Organization for Economic Co-operation and Development (OECD). (1997). The environmental effects of freight. *OECD Report*, 34.

USAID (2011). *Value Chain/ Market Analysis of the Ginger Subsector in Nepal*. Nepal Economic Agriculture and Trade Activity.

Part II

Transportation Logistics for NNZ packaging:

Norwich, ON to Kathmandu, Nepal

Transportation from NNZ packaging to Kathmandu Nepal will be as follows:

- Transportation will begin in Norwich, Ontario at the NNZ distribution centre.
- The product from the NNZ distribution centre will be brought to A1 Freight Forwarding warehouse in New Market, Toronto by truck using L.T.L trucking (D. Hill, personal communication, November 26, 2015)
- From the A1 Freight Forwarding warehouse, the products will be shipped by air to Kathmandu, Nepal (A1Freightforwarding, n.d.)
- Once arriving to Kathmandu, Nepal the product can be brought to a processing and distribution centre such as Dabur Nepal, Gorkha Ayuryed, Male International or Coffee Plantec (USAID, 2011)

Ginger Market Value Chain to India

Typically, the ginger market value chain in Nepal involves only a few actors before it gets exported to India. The supply of ginger generally comes from producers in Ilam, the major ginger producing area in Nepal (Dolkher & Surkhet, 2013). Farmers will bring their ginger directly to the local collectors and local markets such as the Delhi, Kolkata or Dhaka market (Anetragul & Thapa, 2003). Often, a road-head trader will collect the ginger and transport it by truck to Kathmandu, the major domestic market for ginger. In Kathmandu, the ginger is sold to retailers and distributed at the Kalimati Fruit and Vegetable Wholesale market (Maharajguni, 2012). When exporting goods, road-head traders will collect the ginger product and bring it directly to the exporters at the Nepal/India border. Throughout this whole chain, there is little processing involved except for minimal grading by removing the rotten ginger rhizomes. Exporters are the ones who will typically implement any form of processing by washing, cleaning and sorting through the ginger rhizomes in India (Maharajguni, 2012). All of the processing, including cleaning, grading and packaging, is typically done in Naxalburi, India which receives 2500 to 3000 truckloads of ginger per year (USAID, 2011).

In order for the packaging to get to the Nepalese farmers, there either needs to be the creation of a processing facility or a network of road-head traders who will distribute the packaging to the farmers. Information taken from the processing centre in Naxalburi, India shows that one single processing centre can provide employment for approximately 50 people (USAID, 2011). In addition, most people working in processing centres are women and other disadvantaged groups. Currently, there are plans to build a processing facility in Butwal region with Mr. Ram P Pokharel and a ginger cooperative, Palpa, in the far west and mid-west regions of Nepal (USAID, 2011). Other organizations such as the Jadibuti Associations of Nepal (JABAN) and the Nepal Economic and Agriculture Trade Activity (NEAT) have shown interest in creating a washing facility for Nepalese ginger (USAID, 2011). Ideally, all processing accessories and machinery would go in one facility with washing stations for ginger.

Creating a processing facility would change the production of ginger in Nepal significantly. The value chain would differ because it would not go straight from the producer, to the road-head trader to the exporter for processing in India. Instead, the product would go to a processor before arriving to India. The "value chain/market analysis of the ginger sub-sector in Nepal" done by USAID shows that a farmer will sell their produce at 25 NPR/kg and once processed, an exporter will sell it for 40 NPR/kg (2011). If it is the road-head trader collecting the packaging and bringing it to the producer, this can also increase the sale price of the ginger and the employment opportunities for Nepalese traders.

Cost analysis

The following table shows the value of processed products sold from 2008 – 2010 in the Kilimati market in Kathmandu, Nepal using figures from the Value chain/market analysis of the ginger sub-sector in Nepal (USAID, 2011).

Year	Amount produced (MT)	Value in NPR (25 NPR/kg)	Value in CDN ($0.31/kg)	Value in NPR (Processed) 40 NPR/kg	Value in CDN ($0.50/kg)
2009/2010	1807.87	451, 96700	$560, 400	723, 14800	$903, 900
2008/2009	1582.29	395, 57200	$490, 500	632, 91600	$791, 100

(USAID, 2011)

This table provides information on the additional income Nepal could be receiving from processing their ginger through washing, grading or packaging.

	2008/2009	2009/2010
Value in CDN ($ 0.31/kg)	$560, 400	$490, 500
Value in CDN ($0.50/kg)	$903, 900	$791, 100
Potential increased income	$343, 500	$300,600

(USAID, 2011)

The tables above show that processing facilities would be very beneficial to Nepal because simple washing, grading and packaging ginger can increase the value of ginger by 62%. These numbers are not entirely representative of the current market of ginger in Nepal since over the years, the price of ginger has been increasing (USAID, 2011). With the growing interest in ginger production and large plots of cultivable land, it would be feasible and very beneficial for Nepal to invest in processing facilities that include washing, grading and packaging (ITC, 2007).

Needs and benefits to Nepal

Ginger is the most important spice commodity and it creates the main income for the farmers in the mid-hill region of Nepal. Although the production of ginger is continuously increasing, Nepalese farmers face various issues throughout the entire process of producing, post-harvest, trading and exporting ginger. A main issue with the production of ginger is rhizome rot diseases which decreases the productivity of the ginger significantly (Maharajguni, 2012). Quality rhizomes are not always available and because of its high fiber content, Nepalese ginger is considered a low quality product. Nepalese farmers will continue to grow ginger despite these setbacks because ginger contributes to a reduction of soil erosion and it can be intercropped with maize, coffee and vegetables (ITC, 2007). The value of ginger is also increasing and some farmers claim that one year of ginger production is equal to ten years of maize production (Dolkher & Surkhet, 2013). Although rhizome rot disease will continue to be a problem in the production of ginger, most farmers find that producing ginger has many benefits.

After the production process, farmers will often struggle with post-harvest facilities and storage of the ginger rhizomes. Ginger is a very perishable crop and if it is not stored properly it can easily perish within one month of storage (Chung & Moon, 2011). The lack of post-harvest facilities also affect farmers because they are unable to clean the ginger rhizomes and the ginger arrives to the exporter with intact soil on it (Anetragul & Thapa, 2003). The visual appearance of the dirty ginger rhizomes reduces the value of the crop (ITC, 2007). Farmers need solutions in order to increase the value of the product and ensure that the product stays fresh for longer.

As ginger is brought from the road-head traders to the exporter, about 8% of ginger is lost due to rotting and sprouting of the ginger rhizome (USAID, 2011). Indian importers have strict regulations on ginger from Nepal because the ginger has to meet India's phytosanitary and sanitation procedures. India also restricts trade from Nepal because all ginger has to be scanned for pesticides which typically takes about 3 days (ITC, 2007). In addition, trucks from Nepal are not allowed to go into India which creates a barrier to trade by increasing the price for the Nepalese traders (ITC, 2007).

Post-harvest facilities would help increase the value of the product and packaging the product would also help increase the shelf life. Studies have shown that packaging can increase the shelf life of ginger from one month to three months (Chung & Moon, 2011). Packaging a product helps to reduce rhizome rotting and it prevents the sprouting of the ginger root. If proper packaging is used, the rotting can be subdued for up to 5 months of storage (Chung & Moon, 2011). In order to increase the shelf life of ginger, it is important to study different types of packaging and see what their effects on ginger are. A note-worthy study was done with modified atmosphere packaging for ginger and the results showed that packaging with 2 to 12 perforations increased the shelf life of ginger form 3 months to 5 months (Chung & Moon, 2011).

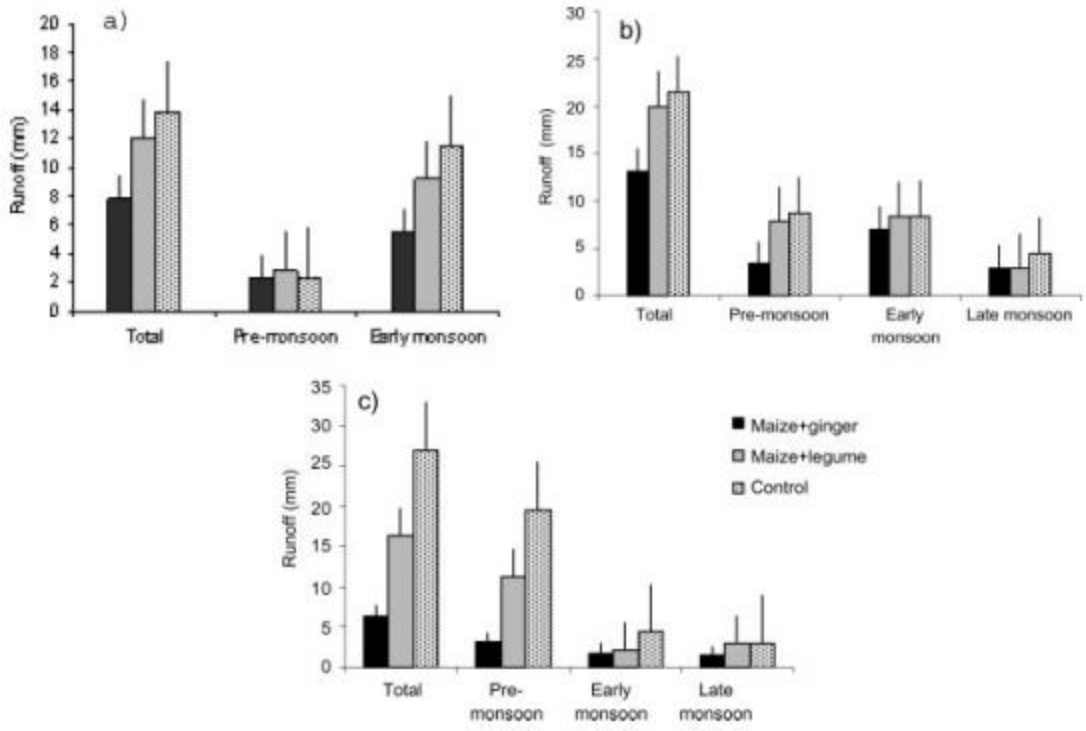
Improvements in the Nepal ginger industry need to be made at every level of production. At the production level, there needs to be research done on the management of rhizome rot disease and quality seeds. At the post-harvest level, there needs to be processing facilities where ginger can be washed, graded and packaged. A processing facility will also increase the marketability of ginger products from Nepal because they can be labelled. When exporting ginger, Nepal can ensure that their ginger is meeting India's regulations within its own country prior to exporting it to India. In addition, Nepal will be able to expand to other markets such as

Bangladesh, Japan, Netherlands and Pakistan (Maharajguni, 2012). This is capable of increasing employment opportunities for women and disadvantaged groups who are typically found working in processing facilities in India (USAID, 2011). There is a lot of potential in increasing the ginger sector in Nepal by simply having a processing facility or a packaging facility.

Environmental Benefits to Nepal

The environmental benefits to Nepal will be minimal since the packaging will mostly work towards reducing the post-harvest losses of ginger. This creates many socio-economic benefits to Nepal but it does not directly benefit Nepal environmentally. The packaging for ginger may, however, increase the awareness of ginger rhizome rot disease and researchers may become more interested in evaluating different methods to prevent ginger rhizome rotting through improved seeds or the use of tissue culture for propagation (USAID, 2011). Some farmers fear to enter the ginger market because there is little market assurance due to trade policies and regulations from India and other importers (ITC, 2007). If processing facilities exist, Nepal farmers could be more interested in producing ginger.

Indirectly, increasing the productions of ginger would benefit Nepal because the of the benefits that ginger can provide to farmers and soils. Ginger is a valuable crop because it can be intercropped with maize which provides extra income to farmers. Additionally, studies on intercropping maize with rows of ginger show that ginger helps to reduce sediment loss and soil erosion in the mid-hill areas of Nepal (Acharya, Tripathi, Gardner, Mawdesley & McDonald, 2008). This study compared strip cropping with maize and mulched ginger to strip cropping with maize and legumes such as cowpea and to only cultivating maize (control plot). It found that the runoff and soil loss was significantly lower in the maize with ginger plots than it was in any of the other plots (Acharya et al., 2008). The figures below are taken directly from the study and demonstrate the amount of runoff experienced each year in the different types of plots.



Runoff (mm) from experimental plots in Nayatola, Nepal during a) 2000 b) 2001 and c) 2002 (Acharya et al., 2008).

Increasing the market demand and market assurance of ginger can indirectly have benefits for the environment in Nepal. As farmers discover the benefits of increasing ginger production in Nepal, they will be reducing helping to reduce soil erosion and maintain high yields.

Real world Names and contact info of Canadian companies & Nepalese companies

NNZ packaging solutions in Canada:

- Contact info for Adrian de Jonge:
  - adejonge@nnz.ca
  - (519) 863 5782
- Contact info for Doug Hill
  - dhill@nnc.ca
  - (519) 863 5782

Companies/private sector involvement in Nepal

- Contact info for Male International (Exporter)

    - Rameshwor Panta:
    - 985 104 3387
- Contact info for Processing Cooperative in Palpa (Processor)
    - Tula Bahadur Adhikari
    - 974 700 5329
- Jadibuti Assoication of Nepal (JABAN)
    - Shanta Gyawali
    - 984 804 5535
- Nepal Ginger Producers and Traders Association (NGPTA)
    - Narendra Kumar Khadka
    - 985 106 9351
- Nepal Economic and Agricultural Trade (NEAT)
    - Menu Kumar Shrestha
    - 985 111 5196

Creative, real world sales/marketing strategy

In order to market the use of packaging, I think it will be important to find if there are any third party certifications that Nepalese farmers could market with. These labels can be added on to the packaging and create a niche market for Nepalese ginger. If the value of their products increase after labeling, then more farmers might be interested in investing in packaging equipment. It is also important to create a participatory market analysis approach that involves Nepalese farmers in the market research process. Nepalese farmers should be directly involved in research regarding packaging in order for them to see the benefits packaging can have. A good way would be to work with small cooperatives such as the cooperative in Surkhet, Nepal focusing on marketing their ginger as “Organic Mountain Flavour” (Dolkher & Surkhet, 2013). This group is already trying to increase the processing of their ginger to dried ginger and packaging could help further increase the value of their ginger.

Imports/Export Documentations required

Export documents from Canada include the Export and Import Permit Act (EIPA). This document can be found at this link: http://www.international.gc.ca/controls-controles/about-a_propos/EIPA_No_LLEI.aspx?lang=eng

If the amount of product exceeds $2500, then it will have to be declared using the Export Declaration form which can be found at this link: http://www.cbsa-asfc.gc.ca/publications/forms-formulaires/b13a.pdf

Any good being exported also needs to be reported using the Canadian Automated Export Declaration (CAED) and information on how to install and register for this software can be found at this link: http://www.statcan.gc.ca/eng/exp/registrationinfo.

For entry into Nepal, the following documents are required in order to import cargo by air freight:

1. Import declaration form
2. Airway bill
3. Invoice
4. Package list and weight list
5. Certificate of origin
6. Insurance policy
7. Letter of credit
8. Import License
9. Firm registration certificate
10. Income tax registration certificate
11. Value added tax certificate
12. Authorization letter to act as custom agents (SMEToolkitNepal, n.d.).

Since packaging is not a prohibited or quantitatively restricted item, no license is required for importing it.

Canadian government or international loan/grants programs

It is possible that organizations such as the International Development Research Centre could provide funding through participatory research initiatives with Nepalese farmers. The

Consultative Group for International Agricultural Research (CGIAR) could also be involved in order to increase the capacity and innovative frameworks of Nepalese ginger farmers though their research and development programs. In addition, this project is already being considered by the Canadian International Food Security Research Fund (CIFSRF) through IDRC.

Regional and Global competition

Regional competition for packaging supplies is minimal because currently the only processing centres are processing fresh ginger to dried ginger. These processing centres focus on traditional methods of processing which can be labour intensive and tedious (Maharajguni, 2012). According to past reports, processing facilities to peel and dry ginger were being developed but the results were not positive (Maharajguni, 2012). Currently, the most common processing technique is slicing and solar drying (Maharajguni, 2012). This is the extent of the processing and packaging market in Nepal.

Globally, Nepal will face competition from India and China since they both have highly developed processing facilities. China is very competitive since they package, clean, and wax their ginger which increases the value of their product significantly (USAID, 2011). India already imports 75% of Nepal's fresh ginger and does all the cleaning, grading and packaging for Nepal (USAID, 2011). Although the competition is pretty strong, Nepal will benefit from packaging ginger because it can increase its market to other importers such as Bangladesh, Pakistan and Japan.

Future studies

Future studies will be needed in order to assess if Nepalese farmers are interested in processing facilities. If farmers show interest and see the benefits of cleaning, grading and packaging their products, then research will be necessary to find out which type of packaging is best suited for Nepalese farmers. An in depth cost analysis will be required to assess which type of machinery should be purchased and what capacity Nepalese farmers have to keep a machine running in terms of electricity or fuel. It is also necessary to study the sustainability of packaging and if packaging is the best option to increase the value of Nepalese ginger. All future studies should be participatory in order to ensure the adoption of these practices by Nepalese farmers. NNZ can also work closely with the communities to find the best product for their needs.

Conclusion

The ginger sector in Nepal is growing as farmers are realizing the benefits that ginger can provide in terms of increased income and reduced soil loss. There is evidence to show that it will be possible to cultivate more land under ginger production in the future which will provide greater opportunities to farmers in Nepal. In order for Nepal to continue receiving a good return on their ginger, they will need to shift away from exporting fresh ginger and focus on processing ginger. If Nepal decides to continue to export fresh ginger, washing, grading and packaging will be important in order to make Nepalese ginger competitive in global markets. NNZ packaging is one option that Nepalese farmers have to provide packaging for ginger. One limitation, however, will be washing the ginger before it gets packaged. It will therefore be necessary to create processing facilities that will be able to supply washing stations, grading equipment and packaging machines and supplies. Much more research will be needed but some literature shows that processing facilities are already being created or in the process of being created. Nepalese ginger has a lot of potential in the global market and there is a significant amount of work that needs to be done in order for Nepal ginger to reach its full market potential.

References

A1freightforwarding (n.d.) Canada & Worldwide Cargo Express. Retrieved from http://www.a1freightforwarding.com/quote/booking.php?quoteID=154207&CargoType=Commercial%20cargo.

Acharya, G.P., Tripathi, B.P., Gardner, R.M., Mawdesley, K.J., McDonald, M.A. (2008). Sustainability of Sloping Land Cultivation Systems in the Mid-hills of Nepal. *Land Degradation & Development, 19,* 530 – 541.

Auetragul, A., & Thapa, P. K. (2003). Feasibility Study of Agricultural Products' Export production villages in selected rural districts in Nepal.

Chung, H.S., & Moon, K.D. (2011). Sprouting and quality control of fresh ginger rhizomes by modified atmosphere packaging with film perforation. *Food Science and Biotechnology*.

Dolker, T., & Surkhet, G. (2013). The value of Nepalese Ginger Farming. *Nepali Times.* Retrieved from http://nepalitimes.com/article/nation/nation-ginger-surkhet-snv-nepal,826.

International Trade Centre (ITC). (2007). Export Potential Assessment in Nepal, 77 – 85.

Maharajgunj, S. (2012). Project for Agriculture Commercialization and Trade: A Value Chain status of Ginger in Mid-Western Development Region. *Government of Nepal Ministry of Agriculture Development.*

SMEtoolkit. (n.d.) Customs Clearance for Imports. Retrieved from http://nepal.smetoolkit.org/nepal/en/content/en/1638/Customs-Clearance-for-Imports

USAID (2011). *Value Chain/ Market Analysis of the Ginger Subsector in Nepal*. Nepal Economic Agriculture and Trade Activity.