

Canada-Nepal trade Project
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Background on Nepal

Nepal is a small country located between India and China with a population of approximately twenty seven million people it is the world's 93rd largest country (Joshi, 2012). Nepal is a country with a rich geographical diversity consisting of the Hill region, the Mountain region and the plain region these three areas cause a massive difference in elevation and climate within the country which causes a rich biological diversity between the three main regions (Brown, 1997). Only twenty percent of Nepal's land base is cultivable this is due to the massive difference in geography between the different regions (Agriculture, N.D.). In Nepal close to 88% of the population lives in rural areas with 78% of the population engaged in agriculture (Joshi, 2012), the need for improved agricultural practices is greatly spread across the population. To help increase and diversify agriculture in Nepal the government focused on introducing modern farming practices like irrigation, fertilization and insecticides which helped to increase the yield of the crops grown on the land available (Agriculture, N.D.). The most commonly grown crops in Nepal are rice, millet and barley, which are traditionally consumed by humans (Joshi, 2012), which leaves livestock farmers to graze their animals in the plain and hill regions. Malnutrition is a major health concern for most people in Nepal over forty percent of children under the age of five are stunted because of an improper diet (Joshi, 2012), which could be improved by the addition of more animal protein from sources like milk and eggs. Nepal's government is set up to be a republic-based system with multiple parties that can be elected; Nepal has both a president (head of state) and a prime minister (head of government) (The World Factbook, N.D.).

The position of president is currently occupied by Dr. Ram Baran Yadav and the position of prime minister is occupied by Sushil Koirala executive power is invested in the president and his cabinet who have the power to make major decisions regarding Nepal (The World Factbook, N.D.). The Nepalese economy is dominated by the agricultural industry, which is the main source for food, income and employment for the majority of the people in Nepal. Nepal has two main season the wet season, which is the prime agricultural season and the dry season where less agricultural activity takes place (Joshi, 2012). The drastic difference in weather patterns can make it difficult for livestock farmers to feed their animals proper forage all year long resulting in a loss of income.

Part 1 Product info

Product Description

The Ag-Bag unit is designed to help farmers and livestock owners store the



necessary feed for their animals from the prime-growing season for use in the less productive season (Ag-Bag, N.D.). This product takes forage harvested from the producer's field and compacts it into a plastic bag where the feed is fermented by the

bacteria present in the forage (Ag-Bag, N.D.). The feed is taken to the machine and placed in the hopper where it is then conveyed into the rotor which tightly packs the forage inside of the plastic creating an optimal environment for feed fermentation in the presence of sunlight (see figure 1)(Ag- Bag, N.D.). This process of fermenting the

feed not only allows the farmers to store the forage for later use but also increases the nutritional value of the feed for the animals (Ag-Bag, N.D.), which will make the animals more productive increasing the farmer's revenue.

Forage Production

The Nepalese farmers who traditionally produce forages like Napier grass and have recently started growing sorghum (see figure 2)

(Pariyar, N.D.) grass will grow the forage. These forages would be harvested and taken directly from the field to the bagging unit and compacted tightly for fermentation (Ag-Bag, N.D.). This process will benefit



the farmers because most Nepalese dairy farmers spend most of their income on concentrate feed for the diet of lactating animals (Joshi, N.D.), feeding more fermented feed could reduce this cost saving farmers money.

Machinery and required cost

To run the Ag-Bagger the unit requires external power from a source like a small tractor or external motor, which produces the power to compact and bag the forage



(see figure 3)(Ag-Bag, N.D.). The unit does require some initial cost from the producers in Nepal but this cost could be split between a community of farmers and the unit could be

shared amongst the community reducing the cost for the independent farmer. This will allow the farmers to benefit from the increased nutritional value of the forage without taking on the cost of the machinery alone.

Labour Required

To produce the fermented feed from the Ag-Bagger the forages must first be harvested from the field by Nepalese farmers and brought to the Ag-Bagger where they can be loaded into the machine and compacted into the plastic wrap (Ag-Bag, N.D.). The Ag-Bagger must then be monitored while in use to ensure all forage is being stored properly to prevent spoilage while fermentation is occurring (Ag-Bag, N.D.). This practice will typically take place at the end of the wet season when the forages have matured and are ready to be harvested for storage over the dry season. Overall the use of this machine is intended to help reduce the labour of farmers moving their animals around the local area for grazing. By storing all of the feed in one place farmers can keep their animals close and bring the feed to the livestock.

Inputs Required

The Ag-Bagger unit requires power from an external source like a small tractor, which would require fuel to run the machine this can be available in Nepal but does create an additional cost of the fuel, which can be in short supply this will raise the cost of producing the forage. (Fuel Shortage Threatens Food Security, 2008) The Ag-Bagger also requires the input of the plastic used to produce the bag in which the feed is compacted and sealed (Ag-Bag, N.D.). The plastic can be shipped to Nepal where it will be used in the machine to wrap the feed for fermentation. The only other input required by the farmer is the forage itself, which is already produced in Nepal and has to be harvested for storage by the farmer before it can be stored. (Pariyar, N.D.).

Nutritional Information

Fermenting feed inside of the plastic bags will increase the nutritional value of the forages when compared to feeding them directly (Ag-Bag, N.D.). By investing in this product Nepalese farmers will be able to improve the feed quality for their animals by decreasing the PH of the feed by better fermenting the forage, This will increase the nutritional value of the feed and keep it cooler which will entice cows to eat more (Hollenbeck, 1998). By increasing the nutritional value of the already existing forages farmers will be able to reduce the amount of concentrated feed in their lactating animals diet, which will help reduce the input costs for farmers (Joshi, N.D.).

Patent / Intellectual concerns

This product is patented by the company Ag-Bag, which owns the rights to manufacture the machine (Ag-Bag, N.D.). The machine itself can be purchased by anyone interested in producing higher quality feed for their animals. Once the machine is purchased there are no patent/ intellectual concerns associated with the use of this product.

Market Opportunity

This product does require a fairly large input cost of roughly 30,000\$ to purchase the unit new (Ag-Baggers For Sale, N.D.), which could be too great for individual farmers to afford. This machine could be purchased by a community of farmers which would decrease the cost for the individual farmer, That is why this product would be marketed to smaller communities of producers who are interested in

improving the feed quality of their forages and reducing the overall input cost for their feed (Hollenbeck, 1998). Nepalese farmers need a better way to store and produce feed and the Ag-Bagger is a good solution to this problem and will help farmers in Nepal increase the nutritional value of their feed. If farmers are interested in advancing their livestock feeding practices there will be a market for this product to be sold in Nepal.

Benefits to Canada

This product would not have a direct benefit on Canadian farmers but would create jobs in manufacturing and retail at the supplying companies and could increase other Canadian trade deals to Nepal (Farm Credit Canada, 2013-2014), which could include agricultural products produced by Canadian farmers. This product would therefore increase the economic activity in the Canadian agricultural product manufacturing industry by creating jobs and increasing revenue. This trade deal will also improve relations between the Canadian and Nepalese agricultural industries and could increase trade between the two countries (Farm Credit Canada, 2013-2014).

Environmental Impact in Canada

Manufacturing this product in Canada would not have a big impact on the Canadian environment; the machine is produced using new materials and would not harm the natural environment (Ag- Bag, N.D.). The plastic produced for the storage of the feed could have a negative impact on the environment if not recycled properly but this could be reused a second or even third time for feed storage (Ag- Bag, N.D.) before it would



have to be returned to Canada for proper recycling where the facilities exist. The used plastic wrap will be brought back to Canada to be cleaned and recycled into plastic lumber and fence boards (Government of Ontario, 1995). (see figure 4) (Think Plastics, N.D.)

Part 2 Export Potential to Nepal

Transportation

This product could easily be shipped from the Ag-Bag dealer Dominion Ag- Bags LTD located in Red Deer Alberta (Ag-Bag, N.D.) to Nepal. From the dealer the Ag-Bagger can be loaded onto trucks and sent to the Global Terminal port in New Jersey where it can be loaded onto a freighter and sent to the Haldia shipping port in India (Global Terminal, N.D.). From here it could loaded onto a truck and sent to Nepal for distribution to local communities that are interested in the product.

Storage

This machine does not require any storage itself but the intended purpose of it is to



store feed (Ag- Bag, N.D.) grown in the rainy season for use in the dry season to feed to livestock. This machine will create the storage for the feed by tightly compacting and sealing the feed in a plastic tube where the forage can be fermented by the bacteria

present in the feed (see figure 5) (Ag- Bag, N.D.).

Cost Analysis

This machine does have a fairly high price point for small farmers in Nepal, while it does offer many benefits it would be too expensive for an individual farmer to purchase. To help decrease the cost of the machine a community of farmers could purchase the machine together and share it throughout the harvest season. This will help reduce the rather high initial cost of almost 30,000\$ (Fast Line, N.D.) of the machine and still allows farmers to benefit from storing and fermenting feed. The Ag-Bagger will also improve the quality of the feed, which will allow farmers to purchase less concentrated feed for their animals, which will save farmers money and increase their production levels (Hollenbeck, 1998).

Benefits to Nepal

If farmers in Nepal decide to purchase this machine they will benefit by increasing the quantity and quality of forage they can feed to their livestock (Ag-Bag, N.D.). By addressing the issue of year- round storage farmers will be able to feed fresh forage to their animals consistently which will increase the production from the animals resulting in a larger gain (Hollenbeck, 1998) for the farmers and their families. By storing the feed in a plastic bag the fermentation process will take place increasing the nutritional value of the feed which will allow farmers to feed less concentrated feed to their animals which will save them money, this will also increase the production from the animals (Hollenbeck, 1998). These two benefits alone will increase the animals overall production, which will increase the farmers income this will allow them to invest and spend their money on other things like their family.

Environmental Benefits

This product does not have a direct impact on the environment in Nepal but does allow farmers to manage the forage crops they are growing instead of allowing animals to freely graze. This would allow farmers to fertilize and improve the yield of forages grown for the purpose of storage, which would help farmer's better manage the environment in which the forage is grown (Hollenbeck, 1998). The plastic used for wrapping can have a negative impact on the environment if not disposed of properly (Government of Ontario, 1995) which is why it is ideal for farmers to use the same plastic two or three times before it is recycled at the proper facilities.

Marketing the Product

To market this product in Nepal representatives of the Ag-Bagger should travel to Nepal and demonstrate how the machine works and explain the benefits associated with fermenting forage for livestock, which include increased nutritional value and decreased labour (Ag- Bag, N.D.). These demonstrations could be done to a community of farmers who are interested in advancing their livestock production system. This product is a very interesting concept, which offers many benefits to farmers a quick demonstration of how the machine compacts and seals the forage into the plastic bag will show the Nepalese farmers how storing forage will help

them by increasing the nutritional value of their feed throughout the year (Ag- Bag, N.D.).

Loans and Grants

There are loans available from the government of

**5-year trade
Canada - Nepal**

Year	Exports	Imports
2009	\$4,169,711	\$13,281,529
2010	\$5,496,537	\$15,376,553
2011	\$6,338,701	\$15,737,207
2012	\$6,557,819	\$12,292,706
2013	\$10,296,214	\$12,195,995

Canada for exporting to foreign countries. The government offers a market expansion-financing loan of up to two hundred and fifty thousand dollars for companies that are looking to expand their market to other countries (Government of Canada, N.D.). Canada currently exports \$12,195,995 dollars worth of products to Nepal (see figure 6) (Government of Canada, 2014) this value has steadily been increasing over the last five years as exports to Nepal increase making this a viable financial opportunity. The government also offer financing solution for Canadian companies to help pay for the up front costs of associated with filling an international order or to help businesses expand into new markets (Government of Canada, N.D.). These loans and grants could help pay for some of the up-front shipping costs associated with sending the Ag-Bagger to Nepal, which could help make this a more economically suitable endeavor.

Regional and Global Competition

There are other companies in North America that make similar products to the Ag-Bagger but none of the are exporting machine to Nepal. This product would be one of the first forage fermenting machines to be sent to Nepal and would help make drastic improvements to the nutritional value of the forage fed (Ag- Bad, N.D.) in Nepal. This product has been introduced to other countries and has been a very popular alternative to traditional forage storage in the United Kingdom (Ag- Bag Frequently Asked Questions, N.D.). Even though this product has not yet been exported to Nepal it could still offer many benefits in forage production and storage (Ag- Bag, N.D.) to Nepalese farmers.

Future Studies

To evaluate the impact exporting the Ag- Bagger has on the forage production of small Nepalese farms it would be beneficial to conduct research studies after the first crop has been harvested and stored. This will allow farmers; government and the companies involved see if the use of this machine has had any dramatic impacts on the storage and nutritional value of the forage before it is fed to animals. These studies could be conducted by measuring the levels of fat, protein and energy available in the feed (Hollenbeck, 1998) and also by looking at the production of the animals that are consuming the fermented feed. If the Ag- Bagger has made a difference in Nepal the feed should be of higher quality and the animals should be producing more milk and meat than they were before (Hollenbeck, 1998).

What This Means For The Future

If the Ag- Bag is successful it will help Nepalese farmers increase the production and income they receive from their animals, which will allow them the opportunity to invest in more Canadian agricultural tools to further advance their agricultural industry. This could help Canada increase trade to the small nation, which would help create Canadian jobs and increase revenue for the companies involved (Government of Canada, N.D.).

Recommendations- Conclusions

After thoroughly researching the Ag- Bagger and the benefits it could offer the farmers in Nepal it is safe to say that this trade deal offers many opportunities to Nepalese farmers. The introduction of the Ag- Bagger will allow farmers to store feed during the dry season and improve the nutritional value of the feed (Ag, Bag, N.D.). While this would be very beneficial to farmers the cost of this machine is too

great for individual producer to purchase on their own, if small communities can work together to purchase and operate the machine this becomes a more viable feed producing option for the Nepalese people. In conclusion this machine could help drastically improve the production of forage (Ag, Bag, N.D.) in Nepal but is a very expensive alternative to current livestock feed practices.

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