

Improving Livestock Management in Nepal with BioTrack

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AGR1110

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A Brief Look at Nepal:



Figure 1. Map of Nepal

Retrieved from: Nepal Lecture with Raia Khanal

Nepal is a country located along the northern border of China and the south-east and –west borders of India (AgTrade Nepal Canada [ATNC], 2014). The country’s population is 27.83 million (Export Development Canada [EDC], 2014) with a growth rate of 1.35% (Government of Nepal Bureau of Statistics

[GNCBS], 2013). Of that population, 25.2% live in poverty (GNCBS, 2013). Developing agriculture in Nepal will help to provide food to everyone, increase gross domestic product and decrease poverty. The Himalayan mountain range runs through Nepal, resulting in a wide range of elevations and climates (ATNC, 2014). There are five main climate zones: the tropical and subtropical zone (located below 1200 m altitude), the temperate zone (located between 1200 m and 2400 m), the cold zone (ranging from 2400 m to 3600 m), the subarctic zone (3600 m to 4400 m) and the Arctic zone (located above 4400 m) (ATNC, 2014). The country is also divided up into three different geographical regions: the terai region, which is located on the southern border of the country and is also the flattest region, the midhill region, located in the middle of Nepal, and the mountainous region along the northern border (ATNC, 2014). The types of agriculture vary dependant on the climatic and geographic regions of Nepal (ATNC, 2014).

Many Nepalese are Hindu, therefore they do not eat beef (R. Khanal, personal communication, October 8, 2014). They use other livestock for meat, a common source being goats (R. Khanal personal communication, October 8, 2014). Goats are easy to care for and perform well in many different types of climatic and geographical regions (Devendra, 1999). In addition to producing meat, goats can also be used for milk, soap, cheese and many other

products. Because of the many uses goats have, they would be very valuable to raise. By using BioTrack, goat herds in Nepal will be able to be expanded and improved.

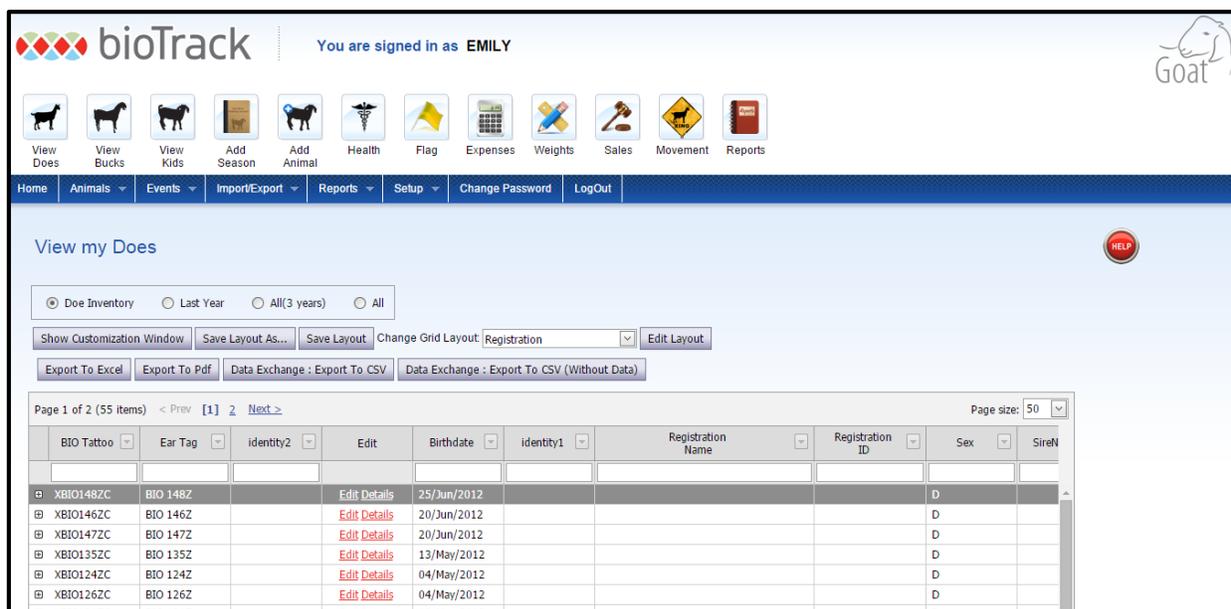
About BioTrack:

BioTrack is an online herd management program provided through the company BIO, or Bridging Intelligence, that can be used to keep track of everything that happens to a farmer's livestock (B. Livingston, personal communication, October 8, 2014). It is a very flexible program and producers can use it according to their farming operation and their goals (Bridging Intelligence, 2014). The program was developed in 1993 in Guelph, Ontario and the company is now located on 660 Speedvale West in Guelph (Bridging Intelligence, 2014). Originally the program was focused on herd management and genetic development for beef cattle (B. Livingston, personal communication, October 8, 2014). Since then it has expanded to provide versions of the program for dairy cattle, goats, sheep, turkeys, chickens and the production of eggs (Bridging Intelligence, 2014). Because BioTrack is an online system, it can be accessed and updated at anytime, anywhere as long as internet access is available (Bridging Intelligence, 2014). Also, it eliminates the risk of losing paper records. For a herd of 100 goat does, the cost is approximately \$35.88 CDN/month (B. Livingston, personal communication, October 8, 2014). However, costs vary depending on the number and type of livestock. Figure 2 shows an example of a BioTrack account for a goat farmer ("BioTrack Meat Goat", 2013).

The BioTrack program can be used to keep track of herd inventory and performance (such as birth dates, growth rates and offspring production) and can provide livestock traceability from farm to farm or to consumer, allowing the farmer to monitor for diseases and prevent them from spreading ("BioTrack Meat Goat", 2013). BioTrack can also be used to track livestock genetics, record livestock health (including records of vaccinations) and livestock value records

(i.e. net gain from each animal), allowing farmers to keep track of production easily and monitor their financial situation (“BioTrack Meat Goat”, 2013). The program is well maintained and consistently updated to provide farmers with the best experience (B. Livingston, personal communication, October 8, 2014). The BioTrack program has already been implemented in other countries besides Canada such as Trinidad, Kazakhstan, and Brazil and has been an aid in furthering the development of agriculture in these countries (B. Livingston, personal communication, October 8, 2014).

Figure 2: An example of a BioTrack account.



Retrieved from: <http://goat.BioTrack.ca/cattleManage/Does.aspx>

Herd Inventory and Performance:

By entering animal information for each individual animal in the herd, inventory is easier to keep track of (B. Livingston, personal communication, October 8, 2014). This is especially beneficial for larger commercial farms with hundreds of animals (“BioTrack Meat Goat”, 2014). BioTrack can also monitor herd performance by putting together reports with statistics showing the productivity of each animal (Bridging Intelligence, 2014). For example, it can show EPDs, or Expected Progeny Differences, for bucks in a goat herd by showing the buck’s birth weight,

percentage of calving ease and weight gain after weaning (Bridging Intelligence, 2014). This compares animals by taking into account the history of the specific animal as well as the history of its offspring (B. Livingston, personal communication, October 21, 2014). An example of a buck report is shown in Figure 3. Another example is that for does, it can show the average amount of kids produced for each gestation period. A farmer can use this information to determine which doe should be bred with which buck to produce the best offspring, as well as to determine which animals are under producing.

Figure 3: An example of a buck performance report on BioTrack.

Name Tattoo EID Number	ID Eartag	Last Kid	# Prog	# Buck Kids	# Doe Kids	# Kiddings	Avg # Born	# Weaned	PROGENY			
									MBWT	MA50d	MA100d	MADG
Breed 32BZ Inbreeding Coefficient	BIO 12N	03 May 2013	28	12	16	16	1.14	0	0	0	0	0.000
Birthdate 02 Feb 2003 Natural Sire	Age 12											
Buck Buck Breed Dam Dam Breed												

Retrieved from: <http://goat.BioTrack.ca/cattleManage/Bucks.aspx>

Traceability:

For traceability, each animal is assigned an RFID (Radio-Frequency Identification) number or a herd management number on an ear tag (J. Van Loo, personal communication, November 4, 2014). This number is recorded in the BioTrack system along with the animal's record. When the animal is moved to a different location or sold, the number helps to keep track of where the animal came from. If there is a disease outbreak on a farm, the identification number along with movement information recorded in BioTrack can be used to determine the origin of the disease so that the source can be identified. Appropriate steps can then be implemented. This is also useful to trace meat products back to the farm where they came from. Again, if there is a disease outbreak, it can be traced back to the farm of origin and the issue can be solved (J. Vanloo, personal communication, November 4, 2014). This can help prevent sickness from meat, improving health in the people of Nepal.

Traceability is also useful for identifying and tracking genetics (B. Livingston, personal communication, October 8, 2014). For example, if a doe has a high kid production rate, a farmer may keep this doe for additional breeding while a doe that has aborted multiple times may be sent for slaughter. A doe may also be culled if the growth rate of her kids is slow. This may make her undesirable for the production of future offspring. The information inputted into BioTrack can help a farmer easily identify these animals. This will also enable a farmer to expand herd sizes quicker by identifying goats with high production rates and breeding them to increase the herd size. BioTrack puts together reports with herd statistics based on the information that has been recorded in the program. Once the data is analyzed, a farmer can determine which animals are better producers statistically (J. Vanloo, personal communication, November 4, 2014).

Expenses:

This feature on BioTrack can be used by a farmer to keep track of operation expenses and livestock values (B. Livingston, personal communication, October 8, 2014). It can also be used to identify animals that are costing the farmer without bringing in a significant profit. The farmer can select for animals that are bringing in an income and determine which animals should be sold because they are a financial burden. The farmer can use this feature to make better financial decisions such as determining whether there is a budget for purchasing more animals.

Health Records:

Keeping track of the health of animals is important to ensure that disease and sickness does not spread through a herd, wiping it out and leaving the farmer with nothing. A farmer can keep track of vaccinations, veterinary visits, antibiotics and other medications used and the types of procedures performed on the farm. Health records help prevent the spread of disease from

farm to farm and increases food safety (B. Livingston, personal communication, October 8, 2014).

Using BioTrack:

To begin using BioTrack, a farmer would need to contact BIO and the employees would figure out what they are looking for, setting up their account accordingly (B. Livingston, personal communication, October 8, 2014). From there, it is up to the individual farmer to decide which management tools in the program are most useful for them. The program is set up in such a way that it is simple to use. However, webinars are provided by the company to help teach farmers how to use BioTrack (“BioTrack Meat Goat, 2014).

In North America, BioTrack is based off of a license fee and an additional cost per animal (B. Livingston, personal communication, October 8, 2014). It can be paid monthly or yearly and must be renewed yearly. When implementing the program in a new country, the pricing model is more flexible to meet the payment requirements in the country (B. Livingston, personal communication, October 8, 2014).

Development & Research:

The BioTrack software was developed by Angus GeoSolutions Inc., or AGSI (B. Livingston, personal communication, October 8, 2014). All of BioTrack’s IT development is contracted to AGSI (B. Livingston, personal communication, October 8, 2014). Almost the entire program is built on research and development funding. BIO is a not-for-profit organization eligible to apply for government funding. The funding provided goes towards program development. BIO does a great deal of genetic research in livestock as well, so funding also assists with this. BioTrack is constantly being updated through research. New features are

added as the needs of farmers change. For example, genomic results can now be integrated with performance results of a herd (B. Livingston, personal communication, October 8, 2014).

Benefits to Canada:

In Canada, BioTrack is helping farmers to improve their operations and make better business decisions based on the production calculations the program provides for farmers based on the information entered in the program. If BioTrack were to be implemented in Nepal, the company's revenue in Canada would increase. With the increase in income, there would be more opportunity for research and development in the field of livestock management and genetics. Canadian farmers would benefit greatly from this because they would be able to use the new ideas, systems and products developed as a result of the research. Moreover, the additional money would be put back into the Canadian economy, helping to increase the gross domestic product, or GDP. In addition, jobs would be created because more people would be required to manage the program. Also, interpreters would need to be contracted to translate the program into Nepali, which is the official language in Nepal (EDC, 2014). Furthermore, people would be needed to go to Nepal and set up an organization to manage the BioTrack program from Nepal and teach the Nepalese how to use the program.

The Goat Industry: A Comparison of Nepal & Canada

In Canada, Ontario has the largest goat population, with 52% of the goats, as shown in Figure 4 (Kennedy, 2014). Since 2001, the number of goats have been increasing steadily (Kennedy, 2014). The number of goats has doubled since 2001, however the number of goat farms has

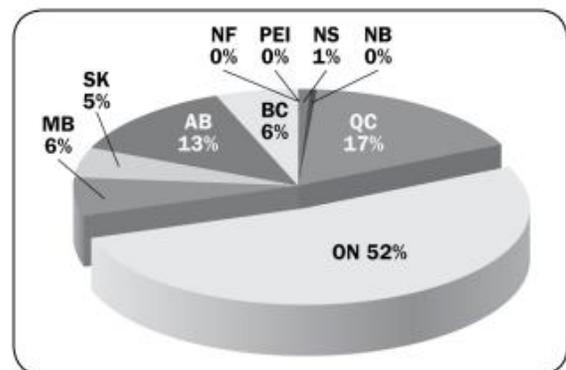


Figure 4. Goat Population in Canada by Province
Retrieved from: <http://www.omafra.gov.on.ca/english/livestock/goat/facts/14-019.pdf>

decreased by approximately 15.5% (Kennedy, 2014). There are 225 licensed goat milk farms and approximately 147 licensed meat goat farms in Ontario (Kennedy, 2014). Live goat imports are small compared to live goat exports, however only a small number of live goats are imported and exported (Kennedy, 2014). Goat meat imports are increasing and between 2012 and 2013, goat meat imports increased by 3.4% (Kennedy, 2014). The majority of goat meat exported from Canada goes to Trinidad and Tobago, with some also going to Barbados and France (Kennedy, 2014).

In Nepal, goats are one of the most commonly farmed animals. If farmers are raising goats with the intention of subsistence, they may have anywhere from 1-6 goats (R. Khanal, personal communication, October 8, 2014). However, a commercial goat farm may have 250-300 goats (R. Khanal, personal communication, October 8, 2014). The goat industry has many opportunities for expansion because the geography of Nepal suits an environment conducive to raising goats. Other livestock may not be as suited to grow in this topography. Approximately 154 200 goats are farmed in the mountainous region, 865 200 in the midhill region and 666 900 in the Tarai region (Government of Nepal Central Bureau of Statistics [GNCBS], 2014). Goats make up approximately 50% of the total livestock population in Nepal (GNCBS, 2014). The orange section of the pie graphs in Figure 5 show the goat and sheep population in different areas of Nepal.

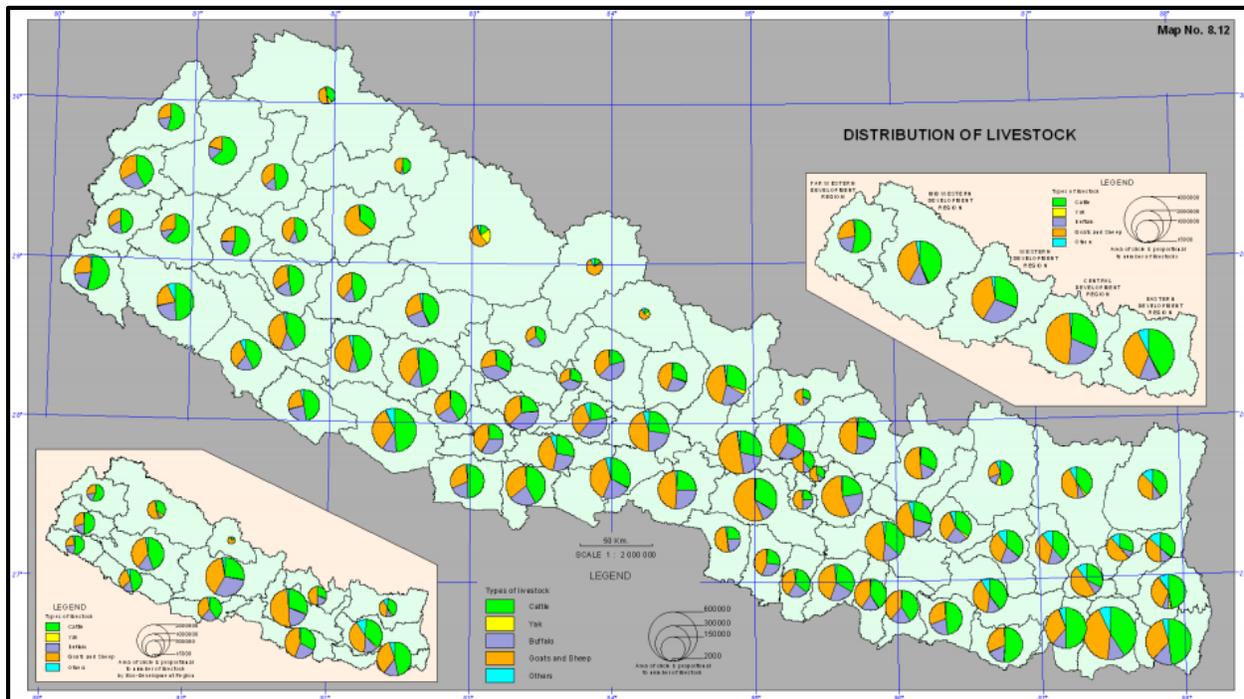


Figure 5. Goat Population in Nepal by Region

Retrieved from: http://cbs.gov.np/wp-content/uploads/2012/Gis_Maps/Agriculture/Distribution%20of%20Livestock.gif

Market Strategies:

BioTrack is marketed to Ontario and North America on an individual farm basis (B. Livingston, personal communication, October 8, 2014). There is a fee structure based on either a whole farm cost or individual animal cost. BIO's marketing campaign for other countries and continents also includes the opportunity for national agricultural ministries and associations to pay a set fee to BIO and make the service available to all of their producers on behalf of the entire industry (J. Leutenegger, personal communication, October 21, 2014).

Some different approaches may be taken to market BioTrack to farmers in Nepal. One way is to have people from BioTrack go from farm to farm in Nepal and explain the program to the Nepalese farmers. A data collection center could be set up in Nepal for farmers to send in paper records. The center could either negotiate to do the data analyses themselves by entering the information into the BioTrack system themselves or send the records to Canada where the data would be entered and analyzed. This method is used by Breedplan, an initiative created by

the Australian Genetics Corporation to register beef cattle (Breedplan, 2014). The corporation works with beef associations all around the world, including the Canadian Angus Association, or the CAA (Sundstrom, 1997). The CAA sends information to Australia for analyzing (Sundstrom, 1997). This method could be used with BioTrack in Nepal, however program costs would be still be an issue.

In order to decrease costs for Nepalese farmers, it would make more sense to provide BioTrack to the country as a whole instead of to individual farmers. Employees from BioTrack in Canada could be sent to Nepal to set up an organization to maintain the country's BioTrack account as well as to provide training for farmers on how to use the program. These employees could train other Nepalese on how to use the program and how to interact with the program users in Nepal. Farmers would be able to either enter their own information online if internet access is available or send in paper records to the organization for them to input online. The organization could receive funding from various Canadian associations and the Nepal government, and the organization would use this money to pay the program fees as well as to keep the organization running. In turn, having an organization to manage the BioTrack program in Nepal would create jobs for other Nepalese people in the management of the organization and the program. Due to government corruption in many third world countries (R. Khanal, personal communication, October 8, 2014), it would be more beneficial to run the organization as an independent body instead of as a government initiative and apply for government funding. This is a second and more advisable approach that could be used to implement BioTrack in Nepal.

Funding:



Figure 6. Exporting from Ontario
Retrieved from: <http://www.ontarioexporters.ca/home/>

Many agencies and programs in Canada have funding available to assist with initiatives in developing countries. One example of an agency is CIDA, the Canadian International Development Agency. It is an initiative run by Foreign Affairs, Trade and Development Canada through the Government of Canada (Foreign Affairs, Trade and Development Canada [FATDC], 2013). A program provided by OMAFRA and the Ontario Chamber of Commerce called Export Market Access: A Global Expansion Program, or EMA can provide funding for the translation and adjustment of the BioTrack program to better suit Nepalese farmers (Export Market Access [EMA], 2014). This will reduce some of the major initial costs that are associated with implementing BioTrack in a new country. A second program that is available for funding is the Ontario Exporters Fund, which is a component of the Global Growth Fund (Ontario Exporters Fund [OEF], 2014). It is administered by the Ontario Chamber of Commerce, or the OCC (OEF, 2014). Yet another Canadian program is the AgriMarketing program provided by Agriculture and Agri-Food Canada (Agriculture and Agri-Food Canada [AAC], 2014). This program helps improve market opportunities abroad and has \$341 million available for funding until 2018 (ACC, 2014). The market development stream of this program assists not-for-profit organization develop a better long-term market plan (ACC, 2014). Funding from programs such as these can be used to lower the cost of using BioTrack for Nepalese farmers as well as assist with maintaining the organization maintaining BioTrack in Nepal. OMAFRA also has experts to assist with making contacts in Nepal and clearing up any regulatory issues (Ontario Ministry of Agriculture, Food and Rural Affairs [OMAFRA], 2014).

Figure 7 lists contact information for the various programs and agencies with funding available for assisting with the implementation of BioTrack in Nepal.

Figure 7: Contact Information for Funding Programs

Program	Provider	Email	Telephone
AgriMarketing Program	Agriculture and Agri-Food Canada	<i>Market Development Stream:</i> md-dm@agr.gc.ca	1-877-246-4682
Ontario Exporters Fund	Global Growth Fund	<i>Program Director:</i> louiedipalma@occ.on.ca <i>International Trade Consultant:</i> lesleycole@occ.on.ca	<i>Program Director:</i> 416-482-5222 ext. 2270 <i>International Trade Consultant:</i> 416-482-5222 ext. 2390
Export Market Access: A Global Expansion Program	Ontario Ministry of Agriculture, Food and Rural Affairs Ontario Chamber of Commerce	<i>Program Director:</i> louiedipalma@occ.on.ca <i>International Trade Consultant:</i> lesleycole@occ.on.ca	<i>Program Director:</i> 416-482-5222 ext. 2270 <i>International Trade Consultant:</i> 416-482-5222 ext. 2390
Canadian International Development Agency	Foreign Affairs, Trade and Development in Canada	enqserv@international.gc.ca	<i>Toll-Free in Canada:</i> 1-888-306-9991 <i>In the National Capital Region and Outside Canada:</i> 613-944-9991

Information retrieved from:
<http://www.ontarioexporters.ca/home/>
<http://exportaccess.ca/en/contact-us>
<http://www.agr.gc.ca/eng/?id=1357941192614>
<http://www.tradecommissioner.gc.ca/eng/contact-us.jsp>

Cost Analysis:

In Nepal, the goat population is nearing 1.7 million (GNCBS, 2014). Currently, the Nepalese goat market could probably sustain an estimate of 50 cents per animal record, providing approximately \$500 000 gross revenue per year for the BioTrack company based on estimated costs and the goat population. However, it is not anticipated that the whole goat market would be gained in one year. It would be more plausible to suggest that in the first year, 100 000 goats could be gained, with an increase of 20% of the market over a period of five years.

An illustration of approximate costs over the first five years after implementing the BioTrack program has been put together and is shown in Figures 8 and 9. These costs are based on an estimate and are for illustration purposes. These assumptions are based on projections similar to marketing campaigns in other countries that hopefully would be achieved. Revenue costs are estimated by comparing BioTrack fees with the Nepalese goat population and increasing the revenue by 20% each year. Training and management costs are estimated at about \$200 000 for employees and \$200 000 for translation, marketing and training of the BioTrack program. This cost would decrease after the first year because initial translation and program adjustments would be completed (B. Livingston, personal communication, October 8, 2014). BIO could sell the BioTrack services for data analyses as a revenue stream to Nepal farmers or to the Nepalese government and sell training and management to the Nepal government or industry funded. A comparison between Canadian currency costs and Nepalese currency costs has been included in Figure 8 as well. One Canadian dollar is equivalent to 88.54 Nepalese rupees (Bank of Canada, 2014). These estimates show why funding would be necessary in order for the BioTrack program to be accessible for Nepalese farmers.

Figure 8: Illustration of Raw Cost Analysis (Funding Not Included)

Year	Revenue		Training & Management Costs (CDN \$)	
	(CDN \$)	Nepalese Rupees (in millions)	(CDN \$)	Nepalese Rupees (in millions)
1	100 000	8.854	400 000	35.42
2	120 000	10.63	300 000	26.56
3	144 000	12.75	300 000	26.56
4	172 800	15.3	300 000	26.56
5	207 360	18.36	300 000	26.56
TOTAL	744160	65.89	1600000	141.67

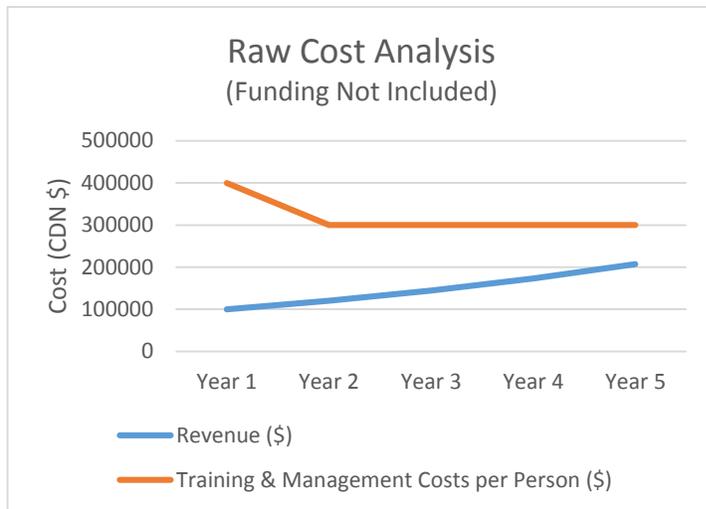


Figure 9. Raw Cost Analysis (Funding Not Included)
 Information based on an estimate to illustrate costs.

Because the Nepal government would want to improve their goat industry, they could provide funding for revenue costs while funding from the Canadian organizations mentioned above could be provided for training and management costs. What this means is that the Nepalese government

could cover costs for the actual BioTrack program while Canada covers the training and management costs that are associated with the Nepalese BioTrack organization described earlier. One example of how funding applications could be distributed is to apply to CIDA for 50% funding, to the Export Market Access and Ontario Exporters Fund for 15% funding and to the AgriMarketing program for 15% funding. Funding applications can be divided in many different ways however. The goal is to give Nepalese farmers time to develop their operations and generate an income before having to pay the program fees. Eventually the farmers would be able to pay the fees themselves once their operations are generating more income.

Benefits to Nepal:

Nepalese farmers can benefit from the use of BioTrack in many ways. To begin, the use of BioTrack in Nepal would improve the country’s herd management system in general, helping them to be more organized. Because there is better organization, opportunities for expansion would open up. Farmers would be able to care for more livestock, meaning that they would have enough to feed their families as well as additional livestock to take to market which would increase profits (FATDC, 2013). Figure 10 uses estimates to illustrate the revenue increase for

farmers in Nepal over the first five years after implementing the BioTrack program in Nepal. These estimates are based on similar projections from other countries who have implemented BioTrack to manage beef herds. This is an example of the financial benefits for farmers using BioTrack.

Figure 10: Revenue increase for Nepalese farmers.

Year	Initial Revenue (CDN \$)	Increase with BioTrack (CDN \$)	Final Revenue (CDN \$)	Addition Income
1	0	-	-	-
2	10000	\$10 extra value	\$1 million	-
3	120000	\$10 extra value	\$1.2 million	-
4	100000 + 150000	10\$ extra value	\$1.5 million	Export sales of superior goat genetics
5	500000 + 200000	\$10 extra value	\$2.5 million	Export sales of superior goat genetics and traceable meat

In addition to the initial revenue farmers would receive, they could increase revenue or decrease costs by 10 CDN \$/goat. If farmers selected for better immunity and production, health costs could be decreased. If the farmer took more goats to market, revenue could be increased. In years 4 and 5, farmers would be able to start exporting their goat genetics and products. Again, these assumptions are based on projections similar to other marketing plans in other countries.

Using the program would also allow farmers to improve their herd performance by using selection tools and genetic evaluations incorporated with the BioTrack program (OMAFRA, 2014). The traceability aspect would allow them to prevent the spread of disease by monitoring animal movement and picking out sick animals before they infect the rest of the herd (OMAFRA, 2014). Superior goat genetics could be identified using the program, which could be used to increase herd immunity to disease and improve herd performance (B. Livingston,

personal communication, October 8, 2014). This would improve food safety, which would in turn improve health and the quality of life for people living in Nepal (Atteberry, 2012).

With farmers expanding their herds, there would be more available goat meat. Because there is more supply to meet the demand of consumers, meat prices would decrease, making meat a more affordable food for poorer people in Nepal (FATDC, 2013). Although meat prices could decrease, demand would stay high because Nepalese people do not eat beef and therefore resort to different meat sources (R. Khanal, personal communication, October 8, 2014). Furthermore, with the increased herd sizes, opportunities for exporting goats and goat products outside of Nepal would be created. This would increase revenue for farmers because there would be more market opportunities both in Nepal and around the world.

BioTrack is a great program because it does not have a minimum herd size. Farmers could start using BioTrack with a very small herd and expand from there. The program is flexible so that it is usable for both small and large herds, and as herd sizes increase, farmers could use more and more of the features on BioTrack (B. Livingston, personal communication, October 8, 2014). BioTrack allows a farmer to set goals for herd improvement and makes it easier to see when these goals have been reached.

Larger herd sizes mean more manure. This could be used as fertilizer for a farmer's crops. If there is an abundance of manure, some could be sold to other farmers for their crops as well. This is another way that income would be generated.

Women in Nepal would benefit from BioTrack because it would allow them to easily manage their own commercial operations and generate income. They would be able to use the management system to keep track of larger livestock herds, which would increase income because there would be more livestock available for market. This will help to empower Nepalese

women and give them an opportunity to improve the lives of themselves and their families (Atteberry, 2012).

There is opportunity for BIO to export goat semen to Nepal by using BioTrack to identify superior goat genetics in Canadian herds (B. Livingston, personal communication, October 8, 2014). Once BioTrack has been implemented in Nepal, Nepalese farmers could collect data and analyze it using the program to determine which goats in their herds have superior genetics. They could use these goats to improve their national goat industry as well as to improve exports to other countries by shipping their goat semen. This would benefit both countries by improving GDPs.

As the goat industry in Nepal improves, other livestock sectors could see how beneficial the use of BioTrack is to a farming operation. BioTrack is available for other livestock as well, so eventually the program could be marketed in Nepal for other livestock industries (Bridging Intelligence).

Stage 2: BioLinks

BioLinks is another online program provided by BIO that is used to track products once they leave the farm and go to market (Leutenegger, 2014). The program can be used with a special barcode scanner to scan barcodes on products (Bridging Intelligence, 2014). The information in the barcode on the product connects with the animal information stored in BioTrack, which allows for complete traceability from farm to consumer (Bridging Intelligence, 2014). BioLinks can be used by a farmer to identify product values, reduce recall impact and kept track of product inventory (Bridging Intelligence, 2014). This is the



Figure 11. bioLinks.

Retrieved from:
<http://www.bridgingintelligence.com/biolinks.aspx>

next step to improving food safety and developing a value chain export for the goat industry. BioLinks introduces a culture of continuous improvement because it focuses on record keeping, examining why farmers do what they do and demonstrating changes made and the effects they had (Leutenegger, 2014). Together, BioTrack and BioLinks encourage long-term continuous development in the agriculture industry.

Company Competition:

Although there are other global companies around the world such as Breedplan in Australia (Breedplan, 2014) and Hectus Livestock Manager in Brazil (DB1 Global Software, 2014), none have the same potential as BioTrack. This is because they do not have access to the same funding opportunities as BioTrack because BioTrack is a not-for-profit organization and therefore would be very expensive for the Nepalese farmers. BioTrack is also a multi-species program, and there are no other major herd management programs that are multi-species (Bridging Intelligence, 2014). This would make BioTrack a more attractive program to the Nepalese government because it can be used for other livestock industries as well.

Recommendations and Competition:

In conclusion, with the assistance of funding from various Canadian programs and the Nepal government as well as the development of a program managing organization, BioTrack would greatly benefit the farmers of Nepal if it were to be implemented there. For more information about BioTrack, contact information has been listed in Figure 12.

Figure 12: Contact information for BioTrack.

Name	Phone Number	Email
Brittney Livingston	(855) 246-2333 ext. 305	blivingston@bridgingintelligence.com
Jessie Van Loo	(855) 246-2333 ext. 308	jvanloo@bridgingintelligence.com
Jeannine Leutenegger	(855) 246-2333 ext. 303	jleutenegger@bridgingintelligence.com

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