

Kaitland Miller
The University of Guelph
Canadian Agrifood Export Project-AGR1110
Exporting Canadian pH and Macronutrient Soil Testers to Nepal.
Faculty Sponsor: Prof. Manish Raizada (raizada@uoguelph.ca)
Report Word Count: 3301

Part I: Canadian Export Product Introduction and Analyses.

The country of Canada has approximately 35 million inhabitants with 2% of the population employed in agriculture; the country of Nepal has a population density of 27 million people with over 75% employed in agriculture (Statistics Canada, 2011; Central Intelligence Agency, 2013). In this report the examination of Canadian agricultural exports to Nepal will be assessed for potential economic and agronomic benefits. The goal of this evaluation is to discover a Canadian agricultural opportunity or product that can be exported to Nepal, in hope to facilitate Nepalese farmers, while stimulating Canadian jobs.

A product export opportunity that can help Nepalese citizens is the exportation of inexpensive pH/macronutrient soil testers from Canada to Nepal. A pH soil tester is an agricultural tool that allows cultivators to assess acidity and alkalinity levels in the soil. A macronutrient soil tester allows cultivators to analyze their soil further as it measures nitrogen, phosphorus and potassium levels in the soil. Soil acidity and macronutrient content is of vital importance to agriculture, as it affects soil fertility, crop productivity and total yields. A simple and inexpensive soil tester that can measure both pH and macronutrient levels, that can be exported to Nepal is a product called *Rapitest Soil Test Kit 1601*. This product includes 40-test capsules/package, 10-test capsules for each of the following: pH, nitrogen, phosphorus and potassium. It includes detail instructions for adjusting pH and has color-coded acidity levels making it simple and comprehensible for the operator (Luster Leaf, 2014). The *Rapitest Soil Test Kit 1601* is considered a quick and inexpensive way to check soil pH, pre and post-harvest. Once this product is purchased there are no further costs, as it is electricity-free and can be used in rural areas.

Although this soil tester is manufactured from an American company called *Luster Leaf*, it is sold in various stores and regions of Canada. The *Rapitest Soil Test Kit 1601* can be found at Canadian retailers such as, *Urban Nature Store*, *The Home Depot*, and *WalMart* (Urban Nature Store, 2014; The Home Depot, 2014; Walmart, 2014). In the *Appendix*, Canadian retail locations along with Canadian and Nepalese prices are summarized in *Table 1* for this product. All tables and figures referenced in this report can be found in the *Appendix* succeeding this report. The Canadian retailer with the lowest cost available for the *Rapitest Soil Test Kit 1601* is *Walmart*, at a cost of \$12.30 CAD or 1074.24 NPR. *Walmart* bulk pricing for this product was contacted by mobile and email, but unfortunately bulk pricing information is unavailable at this time. This is considered an unknown for the cost analyses of this report, as bulk pricing of the *Rapitest Soil Test Kit 1601*, could bring further savings to Nepalese farmers. Since bulk pricing is not available all cost analyses will be done with the current figures in hand.

In all agricultural practices, the quality of the soil is the main component for crop success. If soil conditions are poor, it will be reflected in low crop yields and poor quality. For this reason there are many soil testers for pH, nitrogen, phosphorus and potassium currently on the market. Products that are similar to the *Rapitest Soil Test Kit 1601*, sold by Canadian retailers are *Rapitest Soil pH Meter*, *LaMotte Garden Soil Test Kit*, *Soil Fertility Test Kit-Model NPK-1* and *NPK Soil Test Kit*. Summarized in *Table 2* of the *Appendix*, are the Canadian retailers selling these alternative products, what each product can measure and a price comparison between products (Walmart, 2014; Cole-Parmer, 2014; HACH Canada, 2014; ZORO Canada, 2014). As exemplified in *Table 2*, there are a wide variety of tools on the market to help growers and farmers assess their

soil. Through product comparison the *Rapitest Soil Test Kit 1601* mentioned above, yields the lowest product cost and proves to be the most practical, by means it measures all values of pH, nitrogen, phosphorus and potassium. The *LaMotte Garden Soil Test Kit, Fertility Test Kit-Model NPK-1, NPK Soil Test Kit*, measure the same constituents as the *Rapitest Soil Test Kit 1601*, but are more than double the price. These alternative products on the market are simply too expensive for Nepalese farmers to afford and utilize. *Rapitest Soil pH Meter* is the only product with a similar price comparison to the *Rapitest Soil Test Kit 1601*, but is less practical as it only measures soil pH (*Table 2*). Through calculated analyses, the *Rapitest Soil Test Kit 1601* sold from Canadian *Walmart* retailers is the most economic and advantageous option for Nepalese farmers to evaluate their soil.

Exporting from Canadian *Walmart* retailers can help boost sales and stimulate jobs in various regions of Canada. *Walmart* has retail locations in every province of Canada, totaling 391 stores and currently employs approximately 91 477 Canadian citizens. Although *Walmart* originated in the United States, it opened its first Canadian store in 1994, and has spread province wide across the country (*Walmart-History Timeline, 2014*). This company has provided income and employment to many Canadian citizens through never-ending success and expansion. Exporting the *Rapitest Soil Test Kit 1601* from this company can help boost sales and further increase employment for Canadian citizens.

Although exporting the *Rapitest Soil Test Kit 1601* from Canada to Nepal may be ideal, there are a significant number of factors to consider. In order to export this product from Canada to Nepal, specific export and import procedures are required. Exporting commercial goods from Canada entails the company to have a business number (BN)

issued but the *Canada Revenue Agency* for an export account. An accurate description of the product is also needed in order to determine if further licensing or permits are requisite. For example, a general export permit is mandatory to export United States origin of goods with a value of \$2000 or more (Canadian Boarder Service Agency, 2014). In this scenario a permit may be required in order to export the *Rapitest Soil Test Kit 1601*, as it has United States product origin, but is sold by a Canadian retailer. Exact permits, permit costs and specific document requirements are considered an unknown in this report, as a formal export description and analyses would have to be approved by trade commissioners and the Government of Canada.

Another factor to consider when exporting this product is not only the competition from Canadian retailers but international retailers as well. Two online international companies that also sell the *Rapitest Soil Test Kit 1601* product is Amazon.com owned by the United States and Alibala.com owned by China. This product is not available from Tradeindia.com which is an international online company owned by India. The cost of this product from amazon.com is \$17.32 (1513.37 NPR), with shipping not included (Amazon, 2014). The cost of the *Rapitest Soil Test Kit 1601*, from Alibala.com is available for \$15.50 (1354.35 NPR) with shipping also not included (Alibala.com, 2014). As these international companies are online retailers, shipping expense increases the product's estimated total. Competition from these international companies is not a current threat as the price for the *Rapitest Soil Test Kit 1601*, is available from at a Canadian retailer for a lower cost; \$12.30 (1074.24NPR) at *Walmart* Canada. Exporting from *Walmart* Canada has the potential to boost sales and contribute to the Canadian economy. The *Rapitest Soil Test Kit 1601* would also help Nepal as it enables Nepalese farmers to

assess their soil conditions and increase crop productivity. As agriculture is the number one occupation in Nepal with over 90% of population dependent on this sector, any agricultural improvements would benefit all citizens of Nepal (Sharma, 1986).

Part II: Product Export Potential to Nepal and Benefits for Nepalese Farmers.

Nepal is located in in South Asia, landlocked between China and India and is among one of the poorest countries in the world. As previously mentioned, the country of Nepal is built on agriculture and the hard work of residents that sustain farming as their main occupation. Agricultural receipts accounts for approximately 3/5th of the country's GDP and 70% of the total export earnings. It is geographically diverse, in land and elevation with three main regions running east-west across the country: terai region, hill region and mountain region. These regions are extremely distinct by means of arable land available for agriculture and cultivation (Central Intelligence Agency, 2013). The leading crops in Nepal are paddy, maize, millet and wheat, but the vast majority of Nepalese citizens are subsistence farmers. Subsistence agriculture means that a farmer only grows enough food to feed the family. This is the most abundant practice of agriculture worldwide with 85% of the world being subsistence farmers, owning less than 2 hectares of land (Von Braun & Brown, 2003). In this consequence Nepalese families must grow a variety of crops on a small hectares of land, in order to feed their families and to meet dietary needs.

As agriculture is vital for Nepalese citizens improvements in tools and agricultural measures, can help Nepalese families increase their planted yields. The *Rapitest Soil Test Kit 1601* is capable of measuring pH, nitrogen, phosphorus and

potassium (NPK) levels in the soil. This kit is extremely useful as the primary macronutrients of all plants are nitrogen, phosphorus and potassium, meaning that the plant requires these nutrients in the largest quantities. Nitrogen is a part of all plant proteins and is a major element for photosynthesis and plant growth. Phosphorus is also vital for plant growth and energy transportation; if levels are low plant growth can be stunted significantly. Potassium contributes to a variety of factors in plant growth such as water absorption and root health to name a few. Increasing these macronutrients in the soil can potentially lead to increased photosynthetic activity and improved growing conditions (Piouceau, Panfili, Bois, Anastase, Dufossé, & Arfi, 2014). As these nutrients are vital to plant health they can become depleted in the soil, if continuous homogenous planting occurs in the same location uninterrupted. This scenario can be found in Nepal, as many residents are subsistence farmers owning small hectares of land to exploit. The land is often continually cultivated year round with similar crops in order for the family to have a food source. This can ultimately lead to a nutrient deficient soil, progressing to long-term low crop yields. The *Rapitest Soil Test Kit 1601* can give Nepalese farmers the ability to measure these vital macronutrients and the acidity level of their soil, in order to assess their crops and growing conditions. This product also contains color-coded test results and a comparison chart, making it easy to use and comprehensible for different languages to assess soil nutrient levels (Walmart, (2014).

As previously indicated The *Rapitest Soil Test Kit 1601* also measures soil pH. Measuring soil acidity is another important aspect of agriculture and soil health as it affects nutrient availability in the soil. In *Appendix Figure 1*, is a visual representation of plant nutrient availability at various pH levels (Little & McCutcheon, 1996). As

illustrated, the optimum pH range where most nutrients are available in the soil averages between 6.5pH-7.5pH. Primary macronutrients as well as many micronutrients are sensitive to soil acidity levels that fall below 6.0pH and above 8.0pH. Macronutrients, nitrogen and potassium appear less sensitive to soil pH variations than many other nutrients, but still are to various degrees. The primary macronutrient phosphorus is most affected to pH variations and becomes quickly unavailable when soils become either too acidic or too alkali (Jensen, 2010). Changes in soil acidity can occur for numerous reasons, severely affecting soil fertility and crop productivity. In particular heavy rainfalls, which occur in many tropical regions contributes to increased soil acidity. This occurrence is apparent in Nepal, as heavy rains, especially monsoon rains leads to elevated soil acidity. Nepal has a typical monsoon season that runs from June-September; this is a period of intense and frequent rainfall (Central Intelligence Agency, 2013). Monsoon rains can significantly devastate soil fertility, as not only is soil acidity increased, rapid nutrient leaching can also occur. These events occur in Nepal and in many countries of similar climates with large precipitation levels. For a comparison central Africa (Savanna Rainforest) has a similar climate to Nepal, entailing large amounts of rainfall. Illustrated in *Appendix, Figure 2*, are the affects of extensive precipitation in Africa on the average annual nitrogen, phosphors and potassium depletion in the soil (Henao & Baanante, 1999). It is apparent that regions with large amounts of rainfall such as central Africa (Savanna Rainforest) and regions of Nepal, can have significant nutrient leaching and decreased soil fertility. These conditions are devastating to agricultural success, leaving many farmers in under developed countries in jeopardy of low crop yields and food insecurity. Summarized in *Appendix, Figure 3*, is a

flow chart of the effect of poverty, limited resources and knowledge in under developed countries, and how in combination these elements can be desolating to rural farmers (Tan, Lal & Wiebe, 2005). Agricultural measures that can help farmers assess their soil fertility in under developed countries can be one step in a direction for change. With tools such as the *Rapitest Soil Test Kit 1601*, farmers can begin to record annual NPK depletion and soil acidity. This kit also includes information for adjusting soil conditions, macronutrient levels and soil fertilization (Walmart, 2014). If the practice of soil-data recording catches on, farmers in rural areas can analyze soil degradation rates and begin to attain soil fertility data. Although many subsistence farmers cannot afford expensive NPK fertilizers or liming practices to decrease soil acidity, with annual recorded soil fertility data farmers can plea for government subsidization or peak the interest of agricultural organizations to help rural farmers with unfertile soil.

The next step to attaining this goal is to get products such as the *Rapitest Soil Test Kit 1601* into the hands of Nepalese farmers. This product can be exported from Canada to Nepal by an international courier company called *A1 Freight Forwarding*. This company is a global cargo service provider with headquarters in Toronto Canada, and offers airfreight, ocean freight and land transportation. *A1 Freight Forwarding* ships to over 200 countries worldwide including Nepal (A1 Freight Forwarding, 2014). As the market demand for this product in Nepal is undetermined it is considered an unknown in this report. In order to test the benefits of *Rapitest Soil Test Kit 1601* product in Nepal it can be exported to various regions of Nepal and annually assessed. To gain an estimate of the utility of this product, arbitrarily 1000 *Rapitest Soil Test Kit 1601* can be sent to each of the 14 administrative zones in Nepal. In *Appendix Figure 4*, is a visual reference of the

14 administrative zones that divides the country of Nepal. This estimate would entail that 14 000 *Rapitest Soil Test Kit 1601* would be exported from Canada to Nepal, 1000 sent to each administrative zones for market demand test trials. Summarized in *Appendix, Table 3* is the calculated cost of *Rapitest Soil Test Kit 1601* at the quantity specified. It should be noted that although at a quantity of 14 000 units the product cost is approximately \$172, 200 CDN at retail cost; potentially discount bulk pricing is currently ignored. This product also includes 10-test capsules/ package for each measurement of pH, nitrogen, phosphorus and potassium, indicating that the product can be shared among 10-farmers/ package. Due to this reason the product utility at a quantity 14 000 rises to 140 000, illustrating that 14 000 *Rapitest Soil Test Kit 1601* can be hypothetically used by 140, 000 farmers. Continuing with this estimated quantity, transportation and shipping cost must also be considered. Due to the nature of this product, by means that it is compactable and lightweight, the most convenient shipping method is by airfreight directly from Canada into Kathmandu, Nepal. Utilizing *A1 Freight Forwarding* online shipment quoting system, for 14 000 *Rapitest Soil Test Kit 1601* units to be shipped from Toronto Canada directly to Kathmandu, Nepal is approximately \$22,832.38 Canadian, 2013628.64 NPR. In *Appendix Figure 5* is the detailed *A1 Freight Forwarding* quote estimate for this quantity and product by airfreight (*A1 Freight Forwarding-Airfreight Quote, 2014*). If it is found that there is a larger market demand for this product in Nepal, larger quantities can be shipped by ocean freight, as it is considerable cheaper. Utilizing *A1 Freight Forwarding* online shipment quoting system for ocean-freight of 14, 000 *Rapitest Soil Test Kit 1601* units, the cost is considerably cheaper at \$10,254.57 Canadian, 904368.97 NPR. In *Appendix Figure 6* is the original *A1 Freight Forwarding*

quote estimate for this product by ocean-freight. Although ocean-freight is approximately half the price of airfreight, there are a number of factors to consider that increase the shipment cost. Nepal is a landlocked country, indicating that ocean-freight cargo sent from Canada to India, still needs to be transported to Nepal. This expense is considered an unknown for this report, but it should be noted that ocean-freight to Nepal would have added travel costs due to its location.

In order for the *Rapitest Soil Test Kit 1601* to travel into the hands of Nepalese citizens and help local farmers, a buyer of this product must be evident in Nepal. One potential buyer in Nepal is an importing company called *Ranjan Enterprises Pvt. Ltd*, located in Birgurj, Nepal. This company carries out business in the agriculture sector by importing and distributing goods throughout the country, while catering to remote areas of Nepal (Ranjan Enterprises Pvt. Ltd, 2003). If airfreight transportation were conducted, the estimated product cost including transportation would be approximately \$2,185,828 Canadian (~192772101.38 NPR). It should also be noted that air-cargo would have to travel from Kathmandu to Birgurj, which is only ~138km, but still contributes to transportation costs. The financial capability of *Ranjan Enterprises Pvt. Ltd* is considered an unknown in this report; government or organizational funding may need to be considered in order to make this export product feasible. This product must also be affordable to local consumers and farmers in Nepal. The *Rapitest Soil Test Kit 1601* costs \$12.30 Canadian/ package but includes 10-test capsules/ package. This indicates the cost burden can be shared among 10 farmers for approximately \$1.23 CAD or 108.48 NPR/ family/year. Financial capability of Nepalese farmers is also considered an unknown for this report as well as consumer and market demand.

Part III: Summary and Recommendations

Through critical and quantitative analyses exporting the *Rapitest Soil Test Kit 1601*, from Canada to Nepal has demonstrated to be advantageous for both countries. Exporting this product from Canada can increase retail sales and employment for Canadian citizens, while expanding Canada's international trade with Nepal. This product has also proven to be particularly useful for Nepalese farmers as it is an inexpensive and low-input product. With the *Rapitest Soil Test Kit 1601* Nepalese citizens would be able to assess the pH and vital macronutrients in their soil that contribute to increased soil fertility, crop productivity and food security. The *Rapitest Soil Test Kit 1601* product is also applicable to many developing countries, as it gives rural farmers access to soil fertility measures and information. One recommendation that would help this product reach rural farmers in need is government or private organization endorsement. Financial subsidization would help rural and isolated farmers in developing countries access agricultural tools to increase their food security and ultimately quality of life. Although there are several financial and informational aspects unknown for this export idea, with further research and economic subsidization products such as the *Rapitest Soil Test Kit 1601* can make a difference in developing countries to increase agricultural output food security worldwide.

Appendix:*Table 1: Canadian retail locations selling the Rapitest Soil Test kit 1601 model, with Canadian and Nepalese price conversions.*

Canadian Retailer	Store Locations (Canada)	Canadian Price	Nepalese Price
Urban Nature Store	Ontario (Toronto, Mississauga, Woodbridge, Pickering, Oshawa)	\$18.95 CAD	1655.02 NPR
The Home Depot (Canada)	Ontario, Québec, British Columbia, Alberta, Nova Scotia, Saskatchewan, PEI, Manitoba, New Brunswick, Newfoundland and Labrador	\$16.98 CAD	1482.97 NPR
Walmart (Canada)	Ontario, Québec, British Columbia, Alberta, Nova Scotia, Saskatchewan, PEI, Manitoba, New Brunswick, Newfoundland and Labrador	\$12.30 CAD	1074.24 NPR

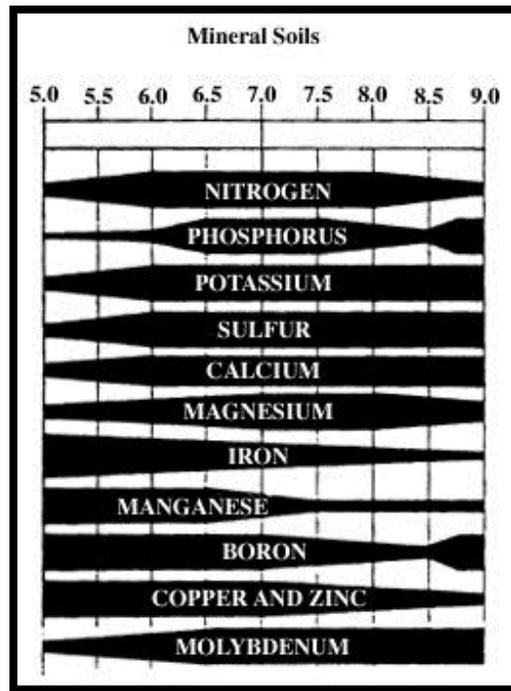
Table 2: Canadian retailers selling comparative soil acidity and fertility testers, with Canadian and Nepalese price conversions.

Soil Testing Product	Canadian Retailer	Product Test Measures	Canadian Price	Nepalese Price
Rapitest Soil pH Meter	Walmart (Canada)	pH	\$14.98	1308.91 NPR
LaMotte Garden Soil Test Kit	Cole-Parmer Canada	pH, NPK	\$71.51	6248.35 NPR
Fertility Test Kit- Model NPK-1	HACH Canada	pH, NPK	\$865.00	76285.91 NPR
NPK Soil Test Kit	ZORO Canada	pH, NPK	\$31.94	2790.83 NPR
The Rapitest Soil Test Kit 1601	Walmart (Canada)	pH, NPK	\$12.30	1074.24 NPR

*NPK- Stands for Nitrogen, Phosphorus, and Potassium.

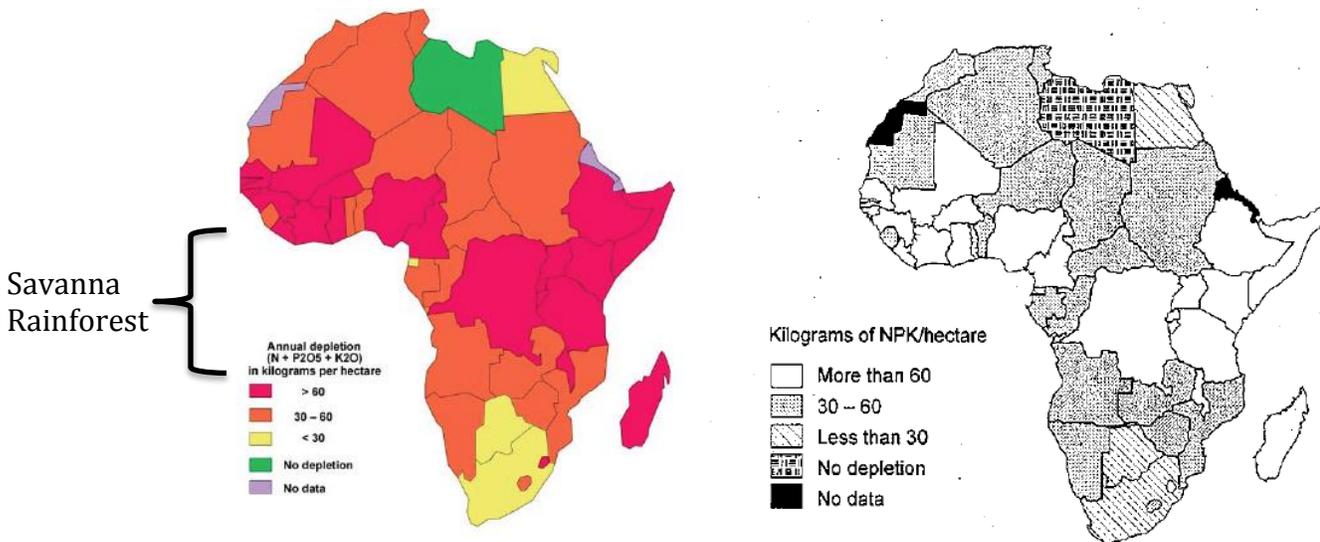
*pH –Stands for Potential Hydrogen (Measure of Acidity)

Figure 1: Relative availability of elements essential to plant growth at various pH levels for mineral soils.



(Little, & McCutcheon, 1996).

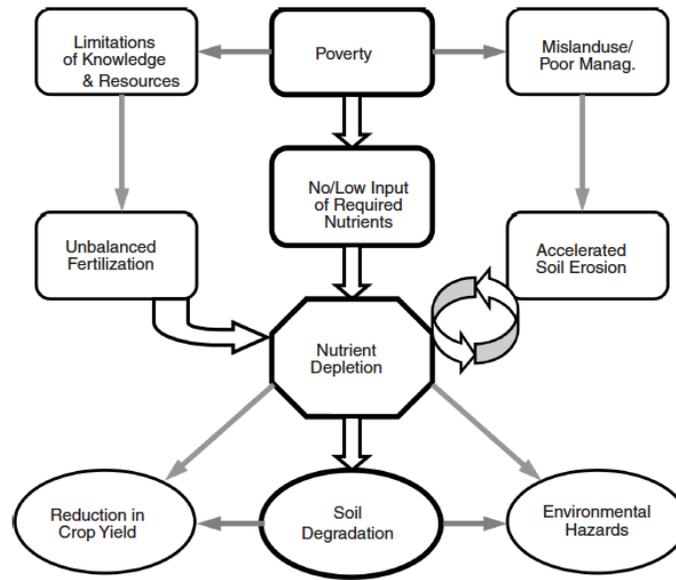
Figure 2: Average annual nutrient depletion of nitrogen, phosphorus and potassium (NPK) in Africa from 1993-95, illustrated in color on the left and the original on the right.



Source: J. Henao and C. Baanante, "Nutrient Depletion in the Agricultural Soils of Africa." 2020 Vision Brief 62 (Washington, D.C.: International Food Policy Research Institute, 1999).

(Henao & Baanante, 1999).

Figure 3: Summarized flowchart of poverty, knowledge/resource limitations and nutrient depletion and its impacts on soil quality, crop yields and the environment in under developed regions.



(Tan, Lal & Wiebe, 2005)

Figure 4: The country of Nepal’s 14 administrative zone divisions: Mahakali, Seti, Bheri, Karnali, Rapti, Lumbini, Dhawalagiri, Gandaki, Narayani, Bagmati, Janakpur, Sagarmatha, Koshi, Mechi



<http://www.sherpatrek.com/images/nepal-map1.png>

Table 3: Summarized Rapitest Soil Test Kit 1601 calculated cost at the quantity specified, exclusively.

Canadian Retail Cost (Walmart-Canada)	Annual Export Quantity	Quantity + Product Cost Isolated.
\$12.30 CAD 1074.24 NPR	14 000	\$172 200 CAN 15186627.61 NPR

Figure 5: Estimated *A1 Freight Forwarding* airfreight quote for 14 000 *Rapitest Soil Test Kit 1601* from Toronto, Canada to Kathmandu, Nepal.

A1 FREIGHT FORWARDING
 A1 Freight Forwarding Inc.
 171 Main Street South, Unit 6D, Newmarket, ON L3Y 3Y9, Canada
 Tel.: (800) 280-0277 info@a1freightforwarding.com
 Fax: (905) 581-0180 www.a1freightforwarding.com

QUOTE #86556

AIR FREIGHT
 FROM: Toronto (Our warehouse)
 TO: Kathmandu - Nepal (Airport)
 SHIPMENT TYPE: Commercial cargo

EMAIL ME THIS PRICE
 Enter your email address
 Send

Type	Qty	Dimensions	Weight
Other	14000	10 x 2 x 9 in	1 lb

AIR FREIGHT RATE	3.10 \$ CAD / KG ALL IN
ACTUAL WEIGHT	6342.00 KG
VOLUME WEIGHT	6882.54 KG
CHARGEABLE WEIGHT	6882.54 KG

AIR FREIGHT	21335.87
TERMINAL & SCREENING FEE	1421.51
PROCESSING FEE	75.00
EXPORT DECLARATION	0.00
SURCHARGES	0.00
TOTAL:	22832.38 \$ CAD

The final invoice will be based on the actual weight and dimensions from the cargo receiving terminal.
 To proceed to booking, please fill in the form below and click 'SUBMIT'.

Figure 6: Estimated *A1 Freight Forwarding* ocean freight quote for 14 000 *Rapitest Soil Test Kit 1601* from Toronto, Canada to Bangalore, India

A1 FREIGHT FORWARDING
 A1 Freight Forwarding Inc.
 171 Main Street South, Unit 6D, Newmarket, ON L3Y 3Y9, Canada
 Tel.: (800) 280-0277 info@a1freightforwarding.com
 Fax: (905) 581-0180 www.a1freightforwarding.com

QUOTE #86571

OCEAN FREIGHT LCL (LESS THAN CONTAINER LOAD)
 INTERNATIONAL SHIPPING BOXES, CRATES AND PALLETS
 FROM: Toronto CFS
 TO: Bangalore - India CFS
 SHIPMENT TYPE: Commercial cargo

EMAIL ME THIS PRICE
 Enter your email address
 Send

Type	Qty	Dimensions	Weight
Box	14000	10 x 2 x 9 in	1 lb

RATE:	7 \$ USD PER CUBIC FOOT / MAX WEIGHT 1000 KG PER 1 CBM
Total volume	1458.34 CUBIC FEET
Minimum charges	35.32 CUBIC FEET

OCEAN FREIGHT (1458.34 CUBIC FEET)	10208.39
OVERWEIGHT CHARGES	0.00
PROCESSING FEE	45.00
PRE-CARRIAGE FROM CFS TO PORT OF LOADING	0.00
EXPORT DECLARATION	0.00
SURCHARGES	0.00
TOTAL:	10254.57 \$ USD

The final invoice will be based on the actual weight and dimensions from the cargo receiving terminal.
 To proceed to booking, please fill in the form below and click 'SUBMIT'.

*All *Rapitest Soil Test Kit 1601* measurements and weights were taken from (Walmart, 2014) (A1 Freight Forwarding- Airfreight Quote, 2014). (A1 Freight Forwarding-Ocean freight Quote, 2014).

References:

A1 Freight Forwarding. (2014). *About A1 Freight Forwarding: Shipping, Warehousing, Logistics & More*. Accessed November 22/14. Retrieved from <http://www.a1freightforwarding.com/about-us/>

A1 Freight Forwarding-Airfreight Quote (2014). A1 Freight Forwarding, Quote #86556. November 22/14.

A1 Freight Forwarding-Ocean freight Quote (2014). A1 Freight Forwarding, Quote #86571. November 22/14.

Alibaba.com. (2014). *Rapitest Soil Test Kit-Luster Leaf*. (Accessed November 18/14) Retrieved from http://www.alibaba.com/product-detail/Rapitest-Soil-Test-Kit_256837023.html

Amazon. (2014). *Rapitest Soil Test Kit-Luster Leaf*. (Accessed November 18/14) Retrieved from <http://www.amazon.com/Rapitest-1601-RapiTest-Soil-Test/dp/B007MRPZA4>

Canadian Boarder Service Agency. (2014). *Step-by-Step Guide to Exporting Commercial Goods from Canada*. Retrieved from <http://www.cbsa-asfc.gc.ca/export/guide-eng.html>

Central Intelligence Agency. (2013). *The World Factbook: Nepal*. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/np.html>

Cole-Parmer Canada. (2014). LaMotte Garden Soil Test Kit. (Accessed November 19/14) Retrieved from http://www.coleparmer.ca/Product/LaMotte_Garden_Soil_test_kit_N_P_K_pH_15_pk/UZ-99030-10?referred_id=8608&mkwid=H8ePDc1l&pccid=50781320662&gclid=CMHb-b3JhMICFYhzmGodySAA8Q

HACH Canada. (2014). *Fertility Test Kit-Model NPK-1*. (Accessed November 19/14) Retrieved from <http://www.hachco.ca/soil-fertility-test-kit-model-npk-1/product?id=14533981674&callback=qs>

Henao, J. & Baanante, C. (1999). Nutrient Depletion In The Agricultural Soils of Africa. *A 2020 Vision for Food, Agriculture, and the Environment*. Retrieved from <http://www.ifpri.org/sites/default/files/publications/vb62.pdf>

Jensen, T. (2010). Soil pH and The Availability of Plant Nutrients. *International Plant Nutrition Institute (IPNI)*. Retrieved from [http://www.ipni.net/ipniweb/pnt.nsf/5a4b8be72a35cd46852568d9001a18da/97c1b6659f3405a28525777b0046bcb9/\\$FILE/Plant%20Nutrition%20Today%20Fall%202010%202.pdf](http://www.ipni.net/ipniweb/pnt.nsf/5a4b8be72a35cd46852568d9001a18da/97c1b6659f3405a28525777b0046bcb9/$FILE/Plant%20Nutrition%20Today%20Fall%202010%202.pdf)

- Little, C. McCutcheon, J. (1996). Fertility Management of Meadows. *Ohio State University Extension Fact Sheet*. Retrieved from <http://ohioline.osu.edu/anr-fact/0005.html>
- Luster Leaf. (2014). *Product Rapitest Soil Test Kit 1601*. (Accessed November 18/14) Retrieved from http://www.lusterleaf.com/nav/soil_test.html
- Piouceau, J. Panfili, F. Bois, G. Anastase, M. Dufossé, L & Arfi, V. (2014) Effects of High Nutrient Supply on the Growth of Seven Bamboo Species. *International Journal of Phytoremediation*, 16(10), 15-22. Retrieved from <http://www.tandfonline.com/doi/full/10.1080/15226514.2013.810583#tabModule>
- Ranjan Enterprises Pvt. Ltd. (2003). Owner Shashi Ranjan. Accessed Nov 16/14. Information retrieved from <http://www.hellotrade.com/ranjan-trade-concern/profile.html> <http://www.businessportals.com/supplier/ranjan-enterprises-pvt-ltd.html>
- Sharma, S. (1986). Nepal's Economy Growth and Development. *Asian Survey*, 26(8), 897-900. Retrieved from <http://www.jstor.org.subzero.lib.uoguelph.ca/stable/2644139?seq=1>
- Statistics Canada. (2011). *2011 Census of Agriculture*. Retrieved from <http://www.statcan.gc.ca/daily-quotidien/120510/dq120510a-eng.htm>
- Tan, Z.X, Lal, R & Wiebe, K.D. (2005) Global Soil Nutrient Depletion and Yield Reduction. *Journal of Sustainable Agriculture*, 26(1), 123-146, Retrieved from http://www.tandfonline.com.subzero.lib.uoguelph.ca/doi/pdf/10.1300/J064v26n01_10 DOI: 10.1300/J064v26n01_10
- The Home Depot. (2014). *Rapitest Soil Test Kit 1601*. Retrieved from (Accessed November 17/14) <http://www.homedepot.com/p/Unbranded-Rapitest-Soil-Test-Kit-100061284/203903210>
- Urban Nature Store. (2014). *Rapitest Soil Test Kit 1601*. (Accessed November 16/14) Retrieved from <http://www.urbannaturestore.ca/shop/pc/viewPrd.asp?idproduct=593&idcategory=0#details>
- Von Braun, J., & Brown, M. A. (2003). Ethical Questions of Equitable Worldwide Food Production Systems. *Plant Physiology*, 133(3), 1040–1045. Retrieved from <http://www.ncbi.nlm.nih.gov.subzero.lib.uoguelph.ca/pmc/articles/PMC523879/> doi:10.1104/pp.103.024695
- Walmart-History Timeline. (2014). *Experience Walmart's History*. (Accessed November 17/14) Retrieved from <http://corporate.walmart.com/our-story/history/history-timeline>

Walmart. (2014). *Rapitest Soil pH Meter*. (Accessed November 16/14) Retrieved from <http://www.walmart.com/ip/Lusterleaf-1840-Rapitest-Soil-pH-Meter/21903380>

Walmart. (2014). *Rapitest Soil Test Kit 1601*. (Accessed November 16/14) Retrieved from <http://www.walmart.com/ip/Lusterleaf-1601-Rapitest-Soil-Test-Kit/21903415>

ZORO Canada. (2014). *NPK Soil Test Kit*. (Accessed November 19/14) Retrieved from <http://www.zorocanada.com/g/NPK%20Soil%20Test%20Kit/00123402/?category=8005>