

# **Potential for Exporting Fertigation Equipment to Nepal for Agricultural Use.**

**John Thompson**

## Part 1: Product Information

### Description

Fertigation is the process of applying fertilizer to your crops directly through an irrigation system (Mann, n.d.). In general, fertigation systems are used to apply nitrogen directly to the root systems of the plants to decrease the amount of nutrient and water loss (Mann, n.d.). Using a fertigation system is beneficial for farmers because there is more control and flexibility with the quantity of fertilizer used (Plant, Via, In, & Watermelon, n.d.). Typically, fertilizer is spread on a field using a broadcast method where a farmer will use a machine to spread the fertilizer evenly on the soil or they will spread the fertilizer by hand. This method is inefficient because fertilizer that lands in a furrow between the rows of crops is likely to not be absorbed by the plant (Šimůnek, Bristow, Helalia, & Siyal, 2016).

### Parts of a Fertigation System

The fertigation system that is best suited to be exported to Nepal is called a dripper line system. The dripper line system would be the best for Nepalese farmers to use on their crops because it is a simple design with minimal mechanical components (Mann, n.d.). With a dripper line system farmers place lengths of tubing through their fields, this tubing has holes in it that are spaced out along the sides of the tubing for the water and nutrient mix to access the plants root systems (Šimůnek et al., 2016). Another component of a fertigation system is the water pump, for a farmer in Nepal a small water pump is required to move water from their water source to the crops in the field (Mann, n.d.). In order to add the fertilizer to the water the farmers of Nepal

will need a storage container for their fertilizer, using a five gallon bucket farmers can safely store their fertilizers while they are being mixed with the water (Mann, n.d.). The way in which

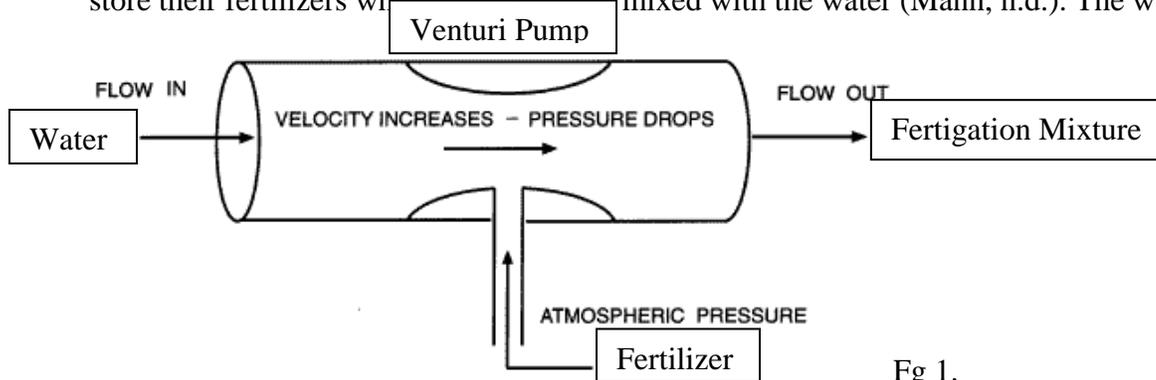


Fig 1.

<http://www.mcallyinstitute.com/08-html/8-12.html>

the fertilizer will be mixed with the water is by using a venturi pump; a venturi pump uses vacuum pressure to draw the fertilizer out of its storage and into the stream of the water on the way to the field this is an example of a passive injector because it doesn't use any outside energy to operate (Plant et al., n.d.). After the fertilizer is mixed, the solution needs to be filtered because the dripper line cannot have any stones inside it because they may create large holes. Once the solution is filtered it can be pumped to the field for the plants, if the field is far away from the water source the farmer may want to have pipes connecting the system at the water source to the dripper lines in the field (Production, n.d.). Dripper lines need to be spaced apart so they can be effective, the spacing of the lines depends mostly on what the composition the soil is (Bhuyan, Ferdousi, & Iqbal, 2014). Dripper lines are typically spaced from eight to sixteen inches apart, with a soil composition that is mainly sand a narrower spacing is required (Production, n.d.).

### Inputs Required

Because this is a very simple system the only inputs required for the farmers to purchase are; fertilizer and fuel for the water pump.

## Canadian Business

A Canadian business that produces fertigation equipment in Canada is Vanden Bussche Irrigation. This is a small company that operates out of Delhi Ontario with other facilities in Concord ON, Milton ON, Ottawa ON, and Scarborough ON. They employ fifty to seventy-five Canadians between these facilities. If Vanden Bussche is able to export their fertigation systems to Nepal the benefit to Canada is the creation of jobs in the manufacturing sector.

## Market Opportunity

There is a large opportunity for Vanden Bussche to export fertigation systems to Nepal because irrigation is not very widely used by farmers in Nepal. In Nepal there are 1.766 million ha of land that can be irrigated out of the 2.641 million ha of arable land available in Nepal (“Effort and Achievement of Irrigation Development,” n.d.). Out of all the possible land area that can be irrigated in Nepal 76% lies in the Tarai region (Fg 2. Green area) (“Effort and

## Physiographic Regions of Nepal

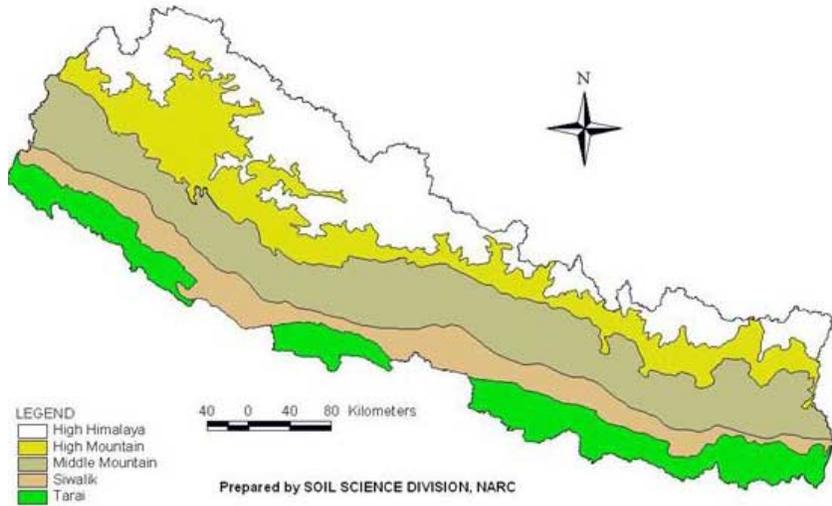


Fig 2.

<http://www.fao.org/ag/agp/agpc/doc/Counprof/Nepal/nepal.htm>

Achievement of Irrigation Development,” n.d.). The best opportunity for Vandenberg is the farmers in Nepal that already irrigate their crops because they don’t have to buy any pumps, they would still need dripper line, the venturi pump, and the filters to set up the fertigation system.

## **Part 2: Export Potential**

### Environmental Benefits

The major benefit of using a fertigation system in place of a standard irrigation system is that there is very little erosion because the water is being introduced under ground and is being immediately absorbed (Kumar et al., 2015). Another environmental benefit that Nepal will have is there will be less unabsorbed Nitrogen that just stays in the soil (Liang et al., 2014). This is very useful because the farmers do not waste expensive fertilizer, the use of fertigation was found to increase the yield of cucumbers by 6.2% and 8.3% while applying less nitrogen to the plants than if they were watered and fertilized by a broadcast system (Liang et al., 2014).

### Regional Competition

In addition to Vanden Bussche Irrigation, there is another Canadian company that produces fertigation equipment. This company is called Irrigation Direct and it is based out of Burlington ON. The reason that Vanden Bussche is a better company to export fertigation equipment to Nepal is because they are a larger company with products that are more geared to an agriculture application.

### Global Competition

A global competitor that would be able to affect the Vanden Bussche sales is a company called Sashanka. Sashanka is an agriculture technology company that is based in India. This company makes very comparable products that will cost a lot less to ship to Nepal because India is just south of Nepal. Sashanka would be able to handle the same production capacity as Vanden Bussche as they are very similar size companies.

### Contact Information

Vanden Bussche

Marc Vanden Bussche: Vice President/ General Manager

Phone: 1-800-387-RAIN(7246)

Irrigation Direct

Phone: 905-465-9950

Sashanka

Mr. Aniruddha Sinha

Phone : +917210113796

## **References**

- Bhuyan, M. H. M., Ferdousi, M. R., & Iqbal, M. T. (2014). Increasing yield and agronomic efficiency of boro rice (*Oryza sativa*) by fertigation with bed planting compared with conventional planting. *International Journal of Agricultural and Biological Engineering*, 7(5), 34–47. <https://doi.org/10.3965/j.ijabe.20140705.004>
- Effort and Achievement of Irrigation Development. (n.d.). Retrieved October 17, 2016, from <http://doi.gov.np/about-us/>
- Kumar, D., Kumar, A., Sarkar, S., Mohodi, D., Thakuria, P., & Das, J. (2015). Optimal design of flow rate in drip irrigation system to enhance the tomato cultivation. *Agriculture, Environment and Biotechnology*, 8(March), 11–19. Retrieved from [spotidoc.com/.../optimal-design-of-flow-rate-in-drip-irrigation-sy](http://spotidoc.com/.../optimal-design-of-flow-rate-in-drip-irrigation-sy)
- Liang, X., Gao, Y., Zhang, X., Tian, Y., Zhang, Z., & Gao, L. (2014). Effect of optimal daily fertigation on migration of water and salt in soil, root growth and fruit yield of cucumber (*Cucumis sativus* L.) in solar-greenhouse. *PLoS ONE*, 9(1). <https://doi.org/10.1371/journal.pone.0086975>
- Mann, T. (n.d.). \*South Carolina PE Registration only.
- Plant, S., Via, N., In, E., & Watermelon, T. (n.d.). What is Fertigation ? SUPPLYING PLANT NUTRIENTS VIA FERTIGATION : PRINCIPLES AND Benefits of Fertigation Benefits of Fertigation Fertigation Concerns Increased management required Fertigation Concerns Fertilizer Injection Fertilizer Injection Fertilizer I, 1–6.
- Production, V. (n.d.). AGRICULTURAL Drip Irrigation for.
- Šimůnek, J., Bristow, K. L., Helalia, S. A., & Siyal, A. A. (2016). The effect of different fertigation strategies and furrow surface treatments on plant water and nitrogen use. *Irrigation Science*, 34(1), 53–69. <https://doi.org/10.1007/s00271-015-0487-z>