

# Building Back Better: Strengthening post disaster agriculture inputs service delivery

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*October 2016*

## Synopsis

**Sector:** Crop Protection Inputs (CPI)

**Disaster hit district:** Kavre

**Partner:** Life Seeds Udhyog

**Partnership timeline:** 15 Jan 2016 – 31 Dec 2016

**Model:** Low Cost Demonstration (LCD)

**Benefits of the model:** Low investment, cost saving, improved productivity, health benefit

**Market System Change:** Market players have adapted to the model to suit the demand

**Beneficiaries reached:** 400

**Net annual income change of beneficiaries:** Rs. 8,148 (as per the recent farmers pocket survey – comprehensive survey is in the process)

**Cost benefit ratio:** 1 : 8



## 1. Introduction

Post disaster, deaths and injuries as well as damages to buildings and service delivery stations, greatly affected agriculture service delivery. As per the National Planning Commission report, the post disaster recovery needs for the period covering 2015-16 in agriculture inputs alone is estimated to be NRs 2,755 million.

This paper focuses on a business model that is demonstrating promising results in not only building back the disrupted delivery of **Crop Protection Inputs (CPIs)** in Kavre – a major seed and fresh vegetable producing district and one of the hardest earthquake hit districts of Nepal - but also on building back better as the model addresses issues of climate change adaptation and disaster risk reduction which had not been addressed prior to the earthquake

The model builds on the success of Samarth's field based **Low Cost Demonstration (LCD)** of CPIs in non- affected districts of Jhapa, Dhankuta and Taplejung. The goal was to target a promising sector that is relevant to the beneficiaries such as seeds and vegetables in case of Kavre, so that the livelihoods could return to normalcy as quickly as possible

## 2. Guiding Principles/Framework

Markets are important for providing income, employment, goods and services to people. Samarth-Nepal Market Development Programme (NMDP), a five-year UK funded program, works with the market players to foster well-functioning markets. Systemic changes are brought about through the introduction of innovations, capacity building and through cost sharing mechanisms, also known as co-investments in promising businesses, to ensure that the inventions are market led and also sustainable beyond the life of the project.

More importantly, instead of undermining markets through direct aid transfers, the program works with the private sector companies to introduce innovations in the delivery of agriculture inputs - in this case Crops Protection Inputs (CPI) - to ensure continuous service delivery to the vulnerable communities.

## 3. Rapid Market Analysis

Post disaster, Samarth-NMDP, initiated a **Rapid Market Analysis (RMA)** of three main sectors - vegetables, dairy and agri-inputs in the disaster-hit districts. The RMA conducted by Samarth-NMDP revealed that there was a need for early market recovery, particularly in the agriculture sector, led by the private market players, to revive the agriculture sector and support the rehabilitation of farmers affected by the earthquake.

Many farmers affected by the earthquake had only limited resources which could be reused for farming purpose. Since, Samarth had been successfully implementing the low cost demonstration model in Jhapa, Dhankuta and Taplejung, the programme decided to venture into Kavre district.

The programme partnered with **Life Seeds Udhyog**, an importer of CPIs that supplied vegetable seeds to farmers in Kavre through agro-vets and co-operatives. The core objective of the partnership was to support farmers in post-earthquake rehabilitation by replicating the LCD model so that farmers could not only have access to agricultural inputs supplies which had been disrupted in the earthquake but also increase their productivity at lower cost so that they could move to the path of recovery in a short time frame.

## 4. State of usage and awareness of CPI in Nepal

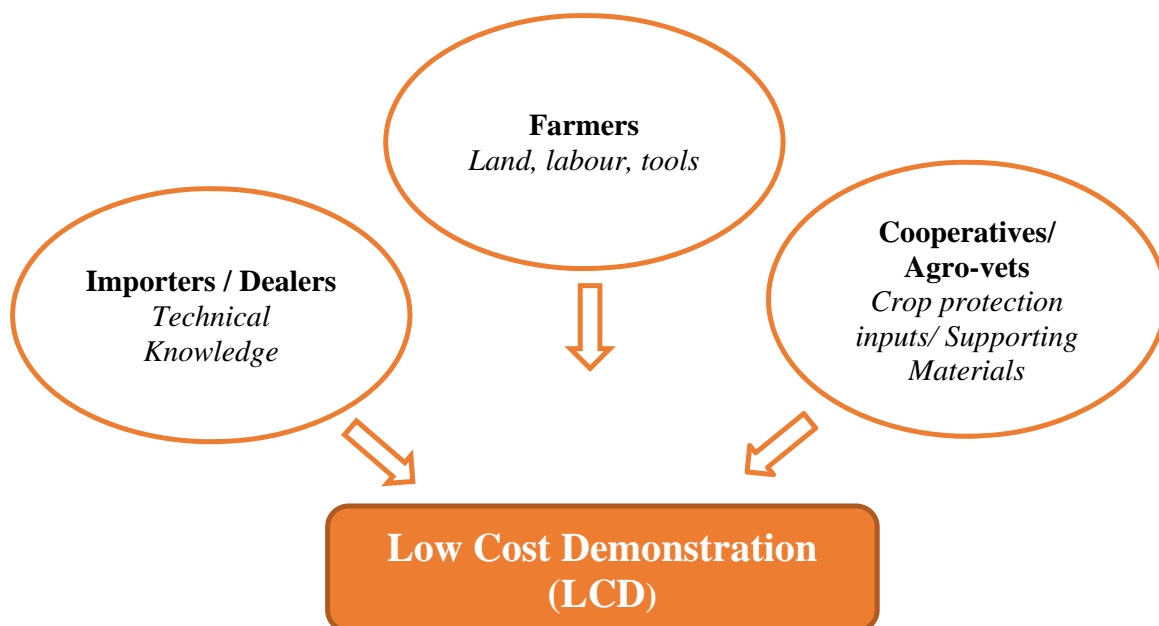
Crop Protection Input (CPI) is a well-used term consisting of chemical/bio-pesticides, micronutrients, vitamins, calcium, and fertilizer including plant protection products. Around 17% of farmers use CPI, especially in highly commercial areas (such as Kathmandu valley), and is overused by an average of four times the optimal level, costing around NRS. 1500 per year per farmer in wasted expenditure.<sup>1</sup>

According to the official Plant Protection Directorate (PPD) data, CPI use has increased fivefold over the past 15 years from 56,173 kg in 1997 to 345,032 kg in 2012<sup>2</sup>. The overall growth in supply however, belies the continued undersupply to large numbers of smallholder farmers in more remote areas. Smallholder farmers are not aware about the various kinds of crop protection inputs available in the market and their use; and often times they are found to be misguided by their source of information - the agro-vets - who in a mere drive to earn more profits have the tendency to sell extra inputs. This has led to degradation of farmers' health as well as poor soil health.

In such a market scenario, Samarth's partner – the importer of CPI – realised that the only way to create a sustainable demand for CPI among smallholder farmers is to show them the benefit of using the correct amount and method of CPI so that they are able to cut cost while increasing profit. These importers have started using the LCD model, introduced by Samarth, as a marketing tool to reach out to more farmers through agro-vets, so that farmers get a more hands on experience about how to apply different crop protection inputs in their own plots while utilizing available resources.

## 5. Significance of the LCD model

Field demonstration is not a new phenomenon in the agriculture sector. It is the low cost method introduced by Samarth that not only ensures ownership by the farmers due to their involvement in the process but is also affordable to the agro-vets/importers and as a result it's sustainable and scalable.



Under the LCD model, the market player (importers/agro-vets/cooperatives) conduct small-scale demonstration at the farmer level to market their CPI products and provide information about how

<sup>1</sup> SANDEE, 2008, Pesticide Exposure – a growth problem for Nepal's Farmers

<sup>2</sup> PPD, 2013, List of registered pesticides

to use those products in a cost-effective manner, using locally available resources, to increase agriculture yield and productivity. When conducting the demonstration, smallholder farmers provide land, labor, tools and other existing resources while the technical knowledge about the correct use and application of CPI products is provided by the importers. In many cases, the importers of CPIs mobilize their existing network of agro-vets/co-operatives to collaborate with smallholder farmers to conduct field level CPI demonstrations.



During the demonstration, farmers are oriented on seed treatment, soil treatment, compost preparation, right application of CPI to increase productivity with less use of harmful chemical pesticides and fertilisers. Considering that the farmers invest considerable amount of resources in the demonstration, the model is cost-effective for the market player and consequently sustainable. This practice also instills ownership among the farmers which ensure implementation of the process taught in the demonstration.

In addition, farmers are given a choice to either sell their produce in the open market or enjoy buy back guarantee of the vegetable seeds produced with assured income; the latter is mostly preferred by those farmers who do not have easy market access.

Before venturing to the earthquake affected district of Kavre, Samarth had partnered with Samrat traders – an importer of CPI – who conducted LCD in Jhapa, Dhankuta and Taplejung. Each demonstration had about 25 to 30 participants and in total reached about 900 farmers.

## CASE 1

A rough cost calculation of bitter gourd production in Mr. Netra Prasad Bhattarai's 2 Ropani of land in Taplejung, revealed that the production of 15 quintal of bitter gourd based on LCD conducted by Samrat Traders was Rs. 2,600 lower than the traditional method of farming.

COST COMPARISON	
Conventional method	LCD method
Seed cost = NRs 500	Seed cost = NRs 500
Insecticides = NRs 2500	Trichoderma = NRs 100
Fertilizer = NRs 500	Fertilizer = NRs 300
<b>Total = NRs 3500</b>	<b>Total = NRs 900</b>

In addition to cost saving from the adoption of low cost farming method, the farmers are now able to breathe freely in their fields without the fear of side effects from strong chemical pesticides. By following the eco-friendly and climate-smart agriculture practices, some of the farmers are also getting higher value for their produce at high-end shops where consumers prefer vegetables with low/safe level of pesticides. Overall, the farmers were able to increase their profits due to increased volume of productivity through judicious and right use of bio-pesticides and other CPI products that helped them to gradually recover from the losses incurred due to the earthquake.

## 6. Evolution of LCD in Kavre

Samarth-NMDP, having observed success in the use of Trichoderma (bio-fungicide) in other districts, decided to introduce and promote Trichoderma through LCD in Kavre. Since recovery in the seed market was important for early recovery of the earthquake ravaged district of Kavre, a district identified as one of the major vegetable production pockets, Samarth worked with one of the key players in the seed market – Life Seeds Udhyog – that was already supplying seeds to Kavre prior to the earthquake.

During the earthquake, Life Seeds Udhyog faced major disruptions in the seed supply chain which disrupted the linkage with cooperatives - with which it had more than 80% percent of its businesses, farmer groups and individual farmers. Post-earthquake, Life Seeds Udhyog would have resumed the supply of seeds in a matter of time in a similar manner and the supply could have been delayed. However, the partnership with Samarth not only accelerated the supply of seeds to Kavre but also allowed them to add a new line of services to its portfolio. In addition to the seeds businesses, Life Seeds also started stocking bio-pesticides called Trichoderma and introduced LCD model as a market tool through embedded services to smallholder seed and fresh vegetable farmers.

LIFE SEEDS UDHYOG	
<b>Before Earthquake</b> <ul style="list-style-type: none"><li>➤ Supplied seeds</li></ul>	<b>After Earthquake</b> <ul style="list-style-type: none"><li>➤ Restored the supply of seeds</li><li>➤ Added crop protection inputs (bio-fungicide) that replaced expensive and harmful chemical pesticides</li><li>➤ Added Low cost demonstration which taught the correct method of application of CPI</li></ul>

Life Seeds Udhyog conducted LCD in two districts through Jorsalla Vegetables and Vegetable Seed Production and Marketing Cooperatives in Methinkot; and Fulbari Vegetable and Vegetable Seed Production and Marketing Cooperatives in Sarsyun Kharke, Amaltari VDC. Approximately, 400 farmers attended the demonstrations.

According to Life Seeds Udhyog, the promotion of Trichoderma through LCD in Kavre has resulted in about 20% increase in the yield of fresh vegetables. Additionally, the use of Trichoderma in seed treatment before plantation is protecting the seedlings from soil borne and seed borne diseases. A pocket survey conducted by Samarth revealed that the farmers who used CPI in a judicious manner increased their net annual income by Rs. 8,148. For one lakh Rupees spent on the demonstrations in Kavre, a profit of Rs. 8 lakhs had been gained.

*“After we started importing and supplying Trichoderma we are very satisfied to see that the health of farmers and consumers are secure as Trichoderma is a bio-fungicide. Furthermore, correct use of CPI through LCDs has led to lowered cost of production for farmers and increased profits for them. We are also enjoying good profit because the agro-vets who were not willing to stock Trichoderma earlier due to short shelf life, are now demanding it themselves because farmers involved in Low cost demonstration (LCD) want to use Trichoderma to increase productivity and profit.”*

**Keshab Panday, Marketing Manager  
Life Seeds Udhyog**

Although a comprehensive survey is still in the process, a rough calculation of the impact of LCD model in Kavre reinforces the results that were observed in other districts.

## CASE 2

Gagan Bahadur Bhandari, a lead farmer in Amaltari VDC, Kavre has successfully increased production of his vegetables and seeds through adoption of CPI products and practices learned in the LCD. His tomato production more than doubled from 570kgs last year to 1,100kgs this year after he used the low cost farming method and more importantly decreased the cost of production by more than NRs 3500 (refer to table below). He also noticed exponential growth in the production of cucumber which increased from 350 kg to 1230kgs and the productivity of beans increased from 100 kg to 500kgs respectively.

COST COMPARISON	
Conventional method	LCD method
Seed cost = Rs 500	Seed cost = Rs 500
Compost = Rs 2000	Compost= Rs 2000
	Trichoderma = Rs 500
Fertilizer = Rs 2000	Fertilizer = Rs 300
Pesticide= Rs 3500	Bio-pesticide: Jeevatu (compost prep)= Rs 250
Vitamin= Rs 500	Cow milk used to control virus= Rs 100
	Drum to make compost = Rs 700
	Safe pesticide= Rs 500

Total	Rs 8500	Total	Rs 4850
Cost Saving: 8500-4850= Rs3650			

A small pocket survey conducted by Samarth-NMDP revealed that women are more receptive to new concepts than men as they seem to be seriously concerned about their family's health and safety; and are in dire need of new sources of income for early recovery.

**CASE 3**



Sushmita Chumoriya, a twenty-year-old student and an enthusiastic farmer, who has been farming since the age of 16, had been a participant of a demonstration on judicious use of CPI organized by the local cooperative in Mehtinkot.

When she came to know that the yield increased almost twofold and the produce was of higher quality, Sushmita also wanted to try her hand in the new methodology. She sought guidance from the local cooperative, Jorsalla Cooperative, where she was provided with the bio-fungicide and the knowhow on its use and application.

With the use of Trichoderma, she was immediately able to observe the difference in her produce as the plants treated with the fungicide looked healthier and produced higher quality vegetables. Her tomato seed production increased from 50kgs to 70kgs and she was able to make a profit of Rs.3,00,000

Apart from the income increase, the fungicide has been proven to be much safer than the previous chemical sprays she used to apply. The enclosed green rooms for tomato farming were very hazardous to health due to the chemical sprays leading to headaches, eye irritation, nausea and constant nose block. Now she doesn't have to worry about such adverse health effects through the use of Trichoderma. It has exponentially reduced health hazard as well as the chemical residue in fresh vegetables.



## **7. Market players adapt to the model introduced by Samarth**

Based on the success of the use of Trichoderma in Kavre, Life Seeds Udhyog developed a new business of selling Trichoderma treated improved seeds in small affordable packets targeting the smallholder farmers. In addition, Life Seeds Udhyog is also offering buy back guarantees to the farmers on the seeds produced. This business practice is assisting affected markets to recover and return to normality as quickly as possible.

Moreover, the growing demand of bio-pesticides at the farmer level has provided incentive to agro-vets and cooperatives to start selling bio-pesticides and fungicides on a regular basis. The growing demand for quality inputs by the farmers is serving as a sales guaranty for agro-vets and the importers; this has led to greater interest and investments in the sector by the importers and the agro-vets and also helped to foster innovations such as right sized packaging and buy back guarantees. Similarly, at the farmer level, they are welcoming the new LCD model because it has not only helped them to recover faster through cost saving and improvement in productivity but has also protected their health from harmful chemicals.

## **8. Conclusion**

As per the reports of the National Planning Commission, the post disaster recovery needs for the period covering 2015-16 in the agriculture inputs alone is estimated to be NPR 2755 million. This is quite a large amount that is required to address even the basic agriculture input supply issues without considerable donor support. However, the LCD business model, which is led by the market player, is a cost efficient and replicable business model that is useful in reestablishing the broken supply chains at significantly low investment. The case presented above is a demonstrative example of Samarth's intervention in Kavre. The private sector led business model on Low Cost Demonstration (LCD) proved to be an effective service delivery mechanism in early market recovery due to its affordability and replicability. Adaptation of the model from other successful districts such as Jhapa, Dhankuta and Taplejung to disaster hit districts like Kavre proved useful in accelerating agriculture service delivery for early recovery. The importer as well as the farmers benefitted through cost savings and improvement in productivity. With short production cycle and assured market for quality vegetables, farmers were able to quickly increase income and recover from the losses of the earthquake.

In general, the market centered approaches to recovery; choice of right private sector partners (e.g. importers, distributors or the agro-vets) is the key to successfully facilitating and supporting linkages among private enterprise, government offices, NGOs and cooperatives operating in disaster hit areas. The goal is to foster innovations to address both the demand and the supply constraints so that companies like Life Seeds Udhyog as well as local co-operatives, agro-vets and farmers under its network are able to not only recover quickly but also build back better through introduction of community based climate change adaptation models.

## **9. Lessons Learnt**

- Recovery process can be accelerated both at the market player level and at the beneficiary level by transferring proven business practices / models from one region to another.
- Field Level Demonstration on CPI is easy way to transfer Crop Protection Inputs (CPI) knowledge to smallholder farmers and to keep farmers updated on the new products and practices that help to improve crop yield and productivity.



- In order for the demonstrations to be successful, it also needs to be affordable and easy to apply. Moreover, it should not be vastly different from the age old farming practices to ensure its regular application and sustainability.
- Using media in the marketing and promotion of agriculture inputs accelerated its demand and use. Exposing market players to new models broadens their horizon and motivates them to try creative additions to their existing business practice. Eg. Samarth introduced a new low cost model and crop protection inputs to Life Seeds Udhyog who in turn adapted the model and came up with Trichoderma treated seeds in small affordable packages as well as buy back guarantee.
- Women were found to be more receptive to new concepts than men, as they seemed to be seriously concerned about their family's health and safety; and were in dire need of new sources of income for early recovery. Therefore, it is very important to include as many women as possible in such demonstrations.
- Lack of sufficient knowledge and capacity among Plant Protection Officers and agro-vets is a long-standing constraint and a policy issue in the production and marketing of appropriate CPI products in Nepal. Under this backdrop, the project strategies and support services should encompass issues from the grassroots to the policy level.

