



CREATING TECHNOLOGY-ENABLED INCLUSIVE MARKETS

Electronic Trading Platform for
Small and Marginal Women Farmers
in Bihar, India



TECHNOSERVE
BUSINESS SOLUTIONS TO POVERTY



Creating Technology-Enabled Inclusive Markets

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1. THE JEEVIKA, BMGF, WORLD BANK AND TECHNO SERVE ALLIANCE

JEEVIKA¹, a World Bank supported program for poverty alleviation in rural Bihar, focuses on deepening agriculture and value chain-based livelihood interventions by leveraging the platform of community-based organizations like self-help groups (SHGs) and their federations and producer groups. The push towards deepening interventions is mandated under the additional financing being provided to the project from World Bank.

Bill and Melinda Gates Foundation (BMGF), as part of its effort towards creating scalable livelihood models in agriculture, was keen to leverage the substantive work on social mobilization and productivity enhancement being undertaken by livelihood projects, and to demonstrate agriculture value chain interventions in the states of Bihar and Uttar Pradesh. Towards this end, it was decided to fund a technical assistance project for JEEVIKA, which would build and strengthen such value chain interventions.

It is in this context that TechnoServe, a global non-profit organization with longstanding experience of developing value chain-based business solutions, was roped in after a tripartite dialogue involving the World Bank, and the senior management of BMGF and JEEVIKA.

Based on this dialogue, TechnoServe India launched a year-long technical assistance project in Bihar in December 2014. The objective of the project was to build the capacity of the JEEVIKA team on value chain development, provide technical assistance to producer groups and develop a multi-year roadmap to facilitate producer group formation and strengthen the broader producer group ecosystem in the state. To achieve these objectives, two main elements were identified:

- a. Generic support to value chain development at the state level
- b. Demonstration of a value chain model in a specific commodity and in a specific geography in Bihar

This note highlights the pilot undertaken as part of the second element.

¹ Bihar Rural Livelihoods Project or JEEVIKA (which means livelihood in Sanskrit) is implemented by Bihar Rural Livelihoods Promotion Society (BRLPS), an independent society of the Government of Bihar. The organization has been designated as the State Rural Livelihoods Mission (SRLM) to roll-out the National Rural Livelihoods Mission (NRLM) in Bihar. For more information, see www.brllp.in.

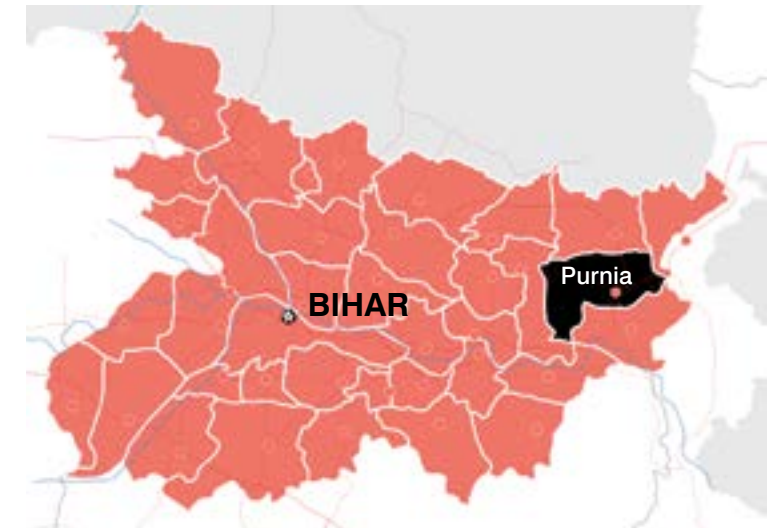
2. RATIONALE FOR THE INTERVENTION: WHY MAIZE, WHY PURNIA?

For the pilot, it was important to identify a commodity with a fairly evolved supply chain and larger marketable surplus at the household level. Maize, which is the third largest crop in Bihar after rice and wheat in terms of acreage, proved to be an ideal starting point. The selection of Purnia as the district where the pilot would be implemented was based on the fact that JEEVIKA has a ready institutional platform of producer groups there, as well as a higher federation in the form of a producer company which is licensed to do business on a commercial scale.

3. EXISTING VALUE CHAIN AND MAJOR ISSUES

Purnia district falls under the maize belt of Bihar, and is known to have the highest productivity of *rabi* (winter crop) maize in the nation.² As a result, maize is the primary cash crop for farmers in the district. While the marketable surplus of these farmers is nearly 90%, they have limited access to mandis³ where they can directly sell their produce as most of them are small and marginal farmers (with an average land holding of 1.39 acre). In the absence of an alternate solution, they have to depend on multiple intermediaries for the sale of their produce.

The intermediary chain is extremely long with a wide-range of players, from collection agents at the village level to brokers at each mandi to large traders who eventually sell the produce to institutional buyers across the country. Each intermediary charges a commission, thereby reducing the final price the farmer receives. In addition to this, collection agents in villages follow manual grading processes and are notorious for weighing malpractices that lead to significant losses (approximately ₹60-₹80 on each quintal of produce procured from farmers). The repealing of the Agricultural Produce Marketing Committee (APMC) Act⁴ has also worsened the market infrastructure and trading regulations. Prices are now decided by a few big traders and grain quality is judged by its look and feel, without the use of moisture meters. This combination of an unorganized trade network consisting of multiple market intermediaries with weighing and grading malpractices significantly reduces the final price received by farmers for their produce.



Most women producer groups in the state, including the ones promoted by JEEVIKA, largely represent small and marginal farmers with little capacity to directly market their produce, or hold back the produce to gain lean season premium. The management of these producer groups suffers due to a lack of understanding of various marketing tools and inadequate skills to negotiate with buyers, leading to higher risks and losses. As a result, so far the members have been unable to realize the potential of collective aggregation and marketing. This indicates a clear need to revive existing producer groups in Bihar through collective aggregation and marketing so that farmers can realize additional returns.

² 4 metric ton per acre, as compared to the national average of 2.5 metric ton per acre

³ Large markets where farm produce is sold

⁴ Under the APMC acts, states are geographically divided into markets which are headed by market committees (or *mandis*) and any production in that area has to be brought to a market committee for sale. This is applicable to 'notified agricultural products' which differ from state to state and generally include most of the important cereals, vegetables and other horticulture products. Notified products are meant to be brought to the market committee and auctioned in the presence of the farmer.

4. PROPOSED VALUE CHAIN AND OBJECTIVES: BRINGING TRANSPARENCY IN THE MAIZE VALUE CHAIN

Given the background detailed above, the pilot was initiated with two objectives:

- To demonstrate higher price realization to farmers through collective aggregation and marketing of produce, reducing information asymmetry and reaching out to national buyers through commodity exchange platforms
- Ensuring a long-term, sustainable scale-up of the intervention by building capacities of the community institutions, community cadre and JEEViKA staff

The key elements of the proposed pilot that will contribute to the increased price realization are summarized below:

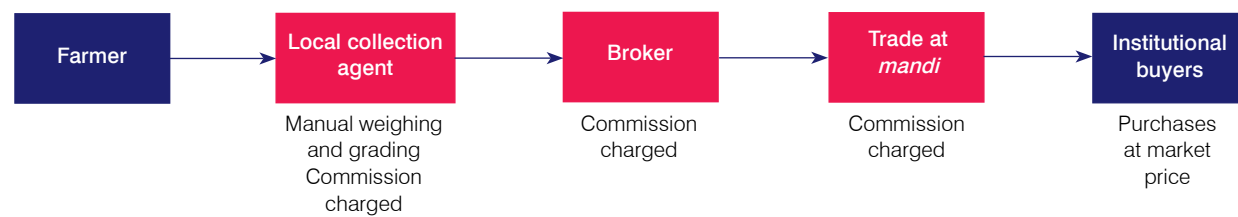
- Collective aggregation and marketing of produce
- Transparent weighing and grading practices
- Direct electronic access to institutional buyers
- Option of off-season sale

5. PROCESS FOLLOWED

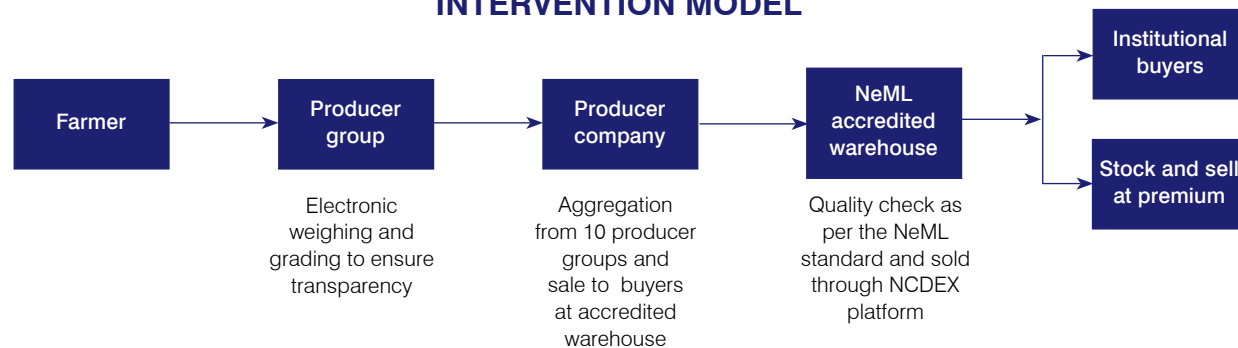
Based on an initial assessment of the producer groups in Purnia, along with their crop profiles and existing post-harvest challenges faced, TechnoServe India recommended that the Aranyak Agri Producer Company Limited (AAPCL) (federation of the producer groups) adopt an aggregation and market linkage business model which eliminates multiple layers of intermediaries and thus ensures better price realization and also allows farmers to benefit from off-season price increases. The project further recommended that the producer company sell its produce on an electronic trading platform to minimize risk.



TRADITIONAL PROCESS



INTERVENTION MODEL



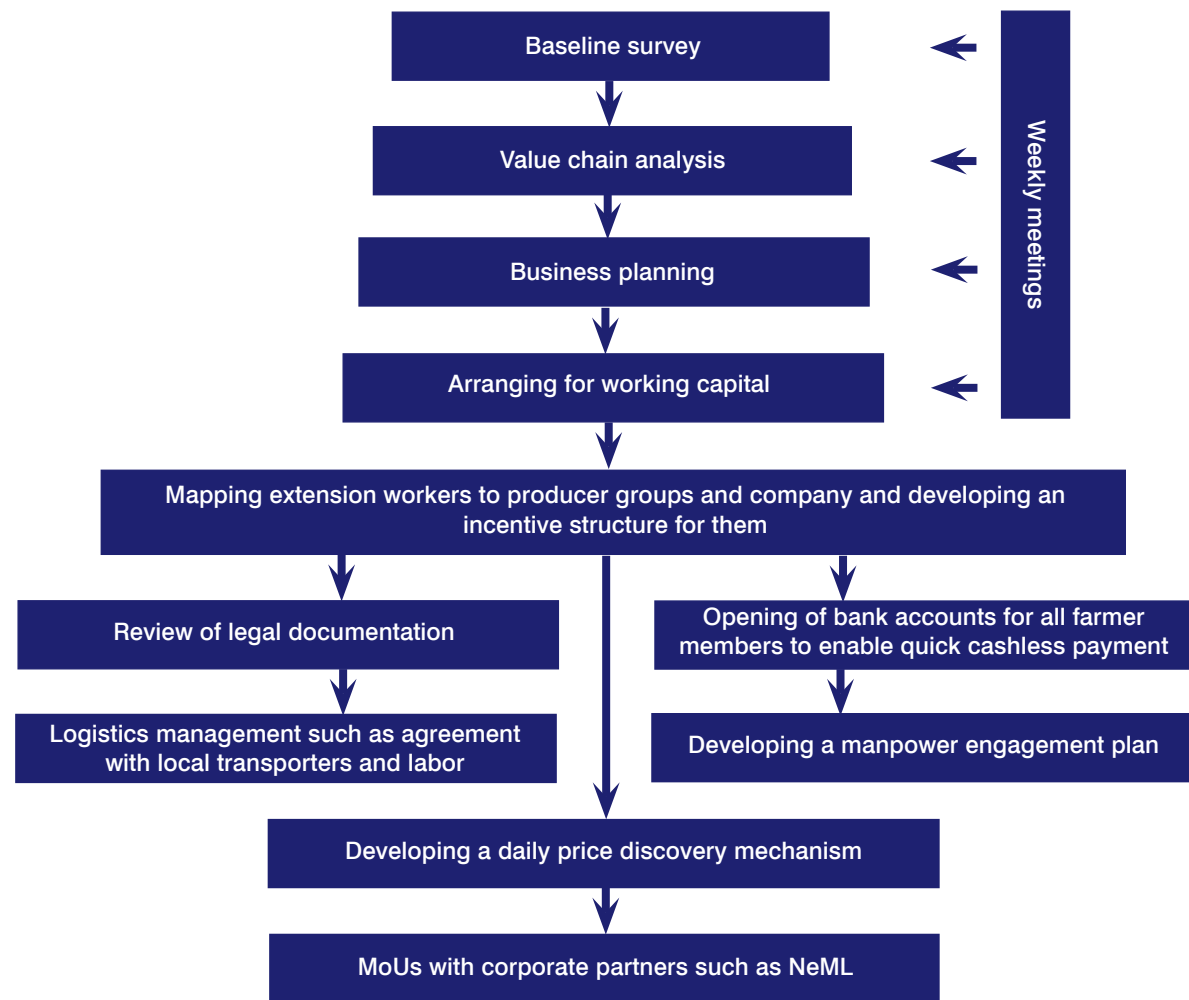
The project followed a structured and efficient process to implement the pilot. To begin with, a baseline survey was conducted for 20 producer groups with a total membership of 1,861 households in Dhamdaha block of district Purnia. Based on the results of this survey, the pilot began with 947 maize growers of 10 producer groups. Following this, a value chain analysis of maize was conducted, which helped the team identify gaps and accordingly develop an aggregation and market linkage business plan for both the producer groups as well as the producer company.

On the basis of these business plans, working capital was arranged on loan from local community institutions in a unique and innovative arrangement, with support from JEEViKA.

Simultaneously, weekly meetings were held with members of the producer group and community extension workers, regularly for two months, to build awareness about the pilot. Farmers were also trained on key post-harvest management practices such as drying and cleaning. Village resource persons were mapped to the producer groups and skilled extension workers were mapped to the producer company. These community extension workers were responsible for convincing the farmer members to sell their produce to the producer groups, conduct quality checks, aggregate the produce, package it, and then finally transport the produce or send it for storage in warehouses. Given the wide range of their involvement in the process, attractive incentive structures were developed for them in order to motivate them to work hard.

In addition to this, the project team also reviewed the legal documentation of the producer groups and the producer company to ensure compliance. Individual bank accounts were opened for all farmer members to ensure cashless payment within three to five days of sale. Fixed assets, such as electronic weighing scales and digital moisture meters, were procured for the producer groups to ensure transparency, quality and better prices.

Logistics management, such as the agreement with local transporters and labor requirement during the procurement process, was addressed at the village level by the producer groups. A manpower engagement plan was developed with the producer groups, which specified a detailed operating model with clear assignment of roles for each of the members.



A daily price discovery sheet was developed based on the daily Management Information System (MIS) of the mandi as well as the price offered by the village trader. This daily price was shared with all the key stakeholders through SMS.

After an extensive analysis of the market, corporate partners were finalized by the team and MoUs were signed with them. This included NCDEX e Markets Limited (NeML) as the electronic trading partner and LTC Commercial Pvt. Ltd as the warehouse partner.

6. MAIZE PROCUREMENT: A BIG SUCCESS!

The producer company has been able to procure 1,014 MT of maize from 299 farmer members belonging to 10 producer groups. This is much more than the estimated procurement volume of 800 MT. After the completion of the procurement operation, the TechnoServe India and JEEViKA teams shifted their focus to the updation of books of records of the producer group and producer company. The team also confirmed from producer group meetings that there was no outstanding payment due to any of the members. Payments of all the vendors had been settled. Incentives were distributed amongst the community extension workers based on the quantity or volume procured.

KEY BUSINESS FIGURES FOR AAPCL FOR MAIZE, 2015-16	
Total procurement of maize	1014 MT
Sale details: A grade	
NCDEX spot	200 MT
NCDEX forward	580 MT
Open market	118 MT
Sale details: B&C grade	
Open market	116 MT
Payment made to farmers	₹1.01 crore
Producer company revenue	₹1.28 crore
Net profit before tax	₹0.093 crore (7.3%)

After closing the books, 70% of the net profit of AAPCL was distributed amongst the members of the producer groups as a patronage bonus. This amount came to ₹50 per quintal per member.

Apart from the patronage bonus, the project also gave farmers an option to store their produce for sale at a higher price in the off-season. The farmers were to receive a benefit of ₹50 per quintal if they were to avail this feature. In Year I, none of the farmers exercised this option.



Technological innovation: Selling maize through an electronic trading platform

Most of the farmer producer organizations (FPOs) formed in India face major challenges to start and scale-up agri commodity businesses because of lack of understanding of market operations and appropriate skills. Many FPOs have incurred heavy losses because of the exploitative and unethical practices adopted by medium to large sized trading/agro processing businesses. A solution to these issues presented itself when the TechnoServe India team finalized NeML as a partner for selling maize electronically.



PC-CEO using NeML platform for selling maize

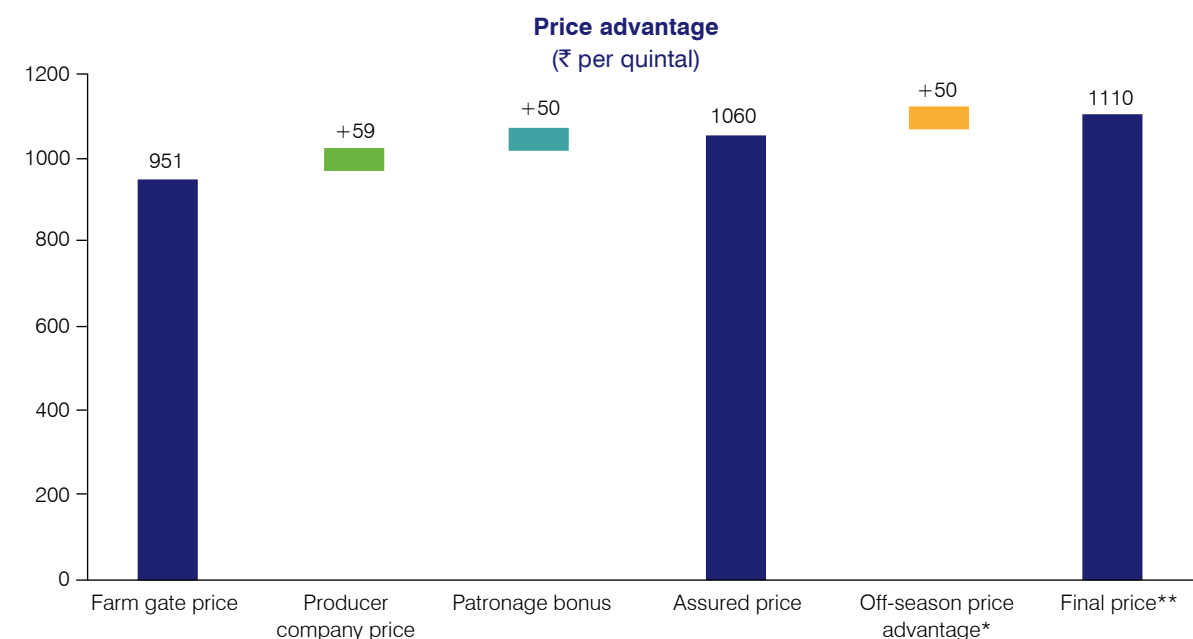
As the CEO of AAPCL, Mr. Prem Prakash Bharti says,

“Like many others, I also had the wrong notion of commodity exchange being a gambling tool used by traders to earn money. However, with proper hands-on training and support from NeML, we realized that an electronic trading platform mitigates risk and allows better price discovery for producer organizations like us. After registering with NeML, our business risk was minimized as buyers make upfront payments to the producer company’s bank account before delivery of goods. NeML also brings transparency and better price discovery as it reaches out to buyers across the country.”

7. BENEFITS AND IMPACT

As many as 299 members belonging to 10 producer groups (32% of the total maize growers) participated in the pilot by selling their maize produce to the producer groups. On an average, these members sold about 78.5% of their produce to the producer groups, while the rest was sold to local collection agents. While there is still a long way to go, the pilot has created significant impact in the short duration in which it was operational. Its key achievements are as follows:

- **Higher price realization:** Project data shows that price realization per quintal of maize rose from ₹951 to ₹1,060, an increase of 11.46%. This can be attributed to direct electronic access to institutional buyers, elimination of multiple layers of intermediaries, transparent weighing and grading practices, and the patronage bonus. If farmers avail of the off-season price advantage, the increase in price per quintal of maize could be up to 16.72%.
- **Capacity-building at multiple levels:** The intervention has resulted in enhanced capacity at three different levels, which will contribute significantly towards the scaling up of the initiative.
 - » Community institutions (specific sub-committee members, board of directors of the producer company, producer group members): The pilot has trained members of the various community institutions to undertake collective crop planning, which includes the purchase of better quality inputs, adoption of improved agriculture practices, orientation towards quality control and collective marketing through higher level federations.



* No farmers opted for this in Year I

** If farmers opt for the off-season price advantage option



Various price points		Price advantage	Total price received by the farmer (₹ per quintal)	Percentage increase in price
Farm gate price	Farm gate price is usually offered by the village collection agents who use fraudulent practices in price discovery		951	
Producer company offer price	Weighing transparency + commissions	+ 59	1,010	6.2
Patronage bonus	70% of the producer company’s profit is distributed amongst members	+ 50	1,060	11.46
Off-season price advantage*	The project gives farmers an option to store their produce for sale at a higher price during off-season months. Farmers get a benefit of ₹50 per quintal if they choose to avail of this feature. In Year I, none of the farmers exercised this option.	+ 50	1,110	16.72*

* By availing of the off-season price advantage, farmers can earn up to 16.72% more on the price received per quintal of maize.

- » Community cadre: The pilot has trained village resource persons (VRPs) and skilled extension workers (SEWs) in facilitating producer group level aggregation, quality control using moisture meters and other checks, and facilitating payments by maintaining a receipt database.

- » JEEViKA staff in blocks and districts: The pilot has enhanced the capacity of the JEEViKA staff both in blocks and districts to facilitate the activities of higher federations (such as financing of the producer company through the cluster level federation), business planning and execution, and generating market intelligence for better returns at lower risk.

- *Increased bargaining power:* Due to the intervention, members are now aware of the merits of transparency in business and how to achieve it, and have thus started asking for better prices from the local collection agents. They are also building pressure on agents to replace their uncalibrated manual weighing scales and hand-based grading practices with industry standard equipment and practices.

- *Risk-free business:* The use of an electronic trading platform has helped the producer company connect with nationwide buyers while preventing the risk of delay in payment and any breach of contract by the buyers.

- *Timely repayment of loans:* With the members receiving the payment for their produce within three to five days of sale, they have been able to ensure timely repayment of crop-related or other loans.



“I will always sell my produce to the producer company from now on!”

Shakila Khatun is a native resident of Kukrun East village in Purnia district. She is 40 years old and stays in a joint family of 11 members. With 8 acres of land, the family’s major income comes from agriculture. Maize is grown on 95% of the land, while wheat is grown for self-consumption. Rice is grown during kharif season, 50% of which is sold in the local market. Even after the cyclonic wind in the month of May, her production of maize was 27.7 MT this year. Till last year, she used to sell her maize produce to Mr. Mustaq, a village-level-aggregator-cum-trader who picked the maize from her doorstep and offered a price based on hand-grading practices. The produce was weighed using a handmade wooden weighing machine on which the adhatiyas (intermediaries) always took 7–8 kg per quintal in the case of higher produce, citing moisture loss as the reason. Like many others, Shakila did not have a say and was unable to negotiate with Mr. Mustaq, as she had also taken a loan during the period of crop sowing.

During the first week of March 2015, Shakila participated in the Annapurna producer group meeting, of which she is a member, and came to know that the producer groups would procure maize and sell to AAPCL that season. She participated in all the meetings organized by the JEEViKA and TechnoServe team, understood the procedure, and spread the information to all the members of the groups.

She took extra care in the post-harvest practices of maize, as suggested by the project team, and as a result 100% of her maize was sold as Grade-A produce to the producer group. She personally used the moisture meter to measure the moisture content of her grain. The accurate weight of the produce was measured using an electronic weighing scale and payment was credited directly to her bank account within three days of procurement. The level of transparency convinced her to sell 100% of her produce to the producer group. She earned an average price of ₹1,003 per quintal, 6% higher than her earnings from selling to Mr. Mustaq. Being a shareholder of the producer company, she will also receive patronage bonus if the company makes enough profit at the end of the financial year, taking her increased price realization to 11.3%.

“This is the first time in my life that I’ve seen someone procure maize from a farmer’s door step with such transparent procedure. Not only me, but all didis (producer group members) will sell maize to the producer company from now on.”

– Shakila Khatun, Member, Annapurna Producer Group, April 24, 2015



- *Brand building of the producer company:* The producer company sold maize under the brand name ‘JEEViKA Maize’ and earned a lot of traction from the buyers because of the higher quality of produce. This is because the members see an added advantage in selling Grade A material (locally known as Shalimar Calcutta Pass), which not only fetches a higher price but also comes with an option for future sale. The availability of moisture meters with every producer group helped the members to dry and clean the maize before sale, thus turning it into Grade A maize. Till last year, in the absence of moisture meters, the produce of the members often fell into Grade B as it did not meet the requisite quality standards, which also made it possible for local collection agents to cheat the farmers and give them a lower price for their produce.

- *Changes in business ecosystem at the micro level:* Interviews with a few collection agents revealed that most of them incurred losses in their business (to the extent of 40%) compared to last year because of the pilot. This prompted them to increase the offer price for farmers and also adhere to transparent business practices. A few of them have started using electronic weighing scales as farmers are reluctant to sell produce using traditional weighing scales. Many local collection agents have also started selling to producer groups to take advantage of the transparent processes and faster payments.

- *Building ownership:* All the members have acknowledged the power of negotiation through collective marketing. The success of the pilot has built a sense of ownership amongst the women farmers towards the producer group and producer company. They are now proud members of the producer group and have already started recommending it to fellow farmers.

REPLICABILITY AND WAY FORWARD

For 2016, JEEViKA plans to expand operations to 4,000 farmers with the support of TechnoServe across two districts in Bihar: Purnia and Muzaffarpur. While in Purnia the focus will be on deepening the maize intervention through inclusion of more farmers, in Muzaffarpur, the intervention will focus on vegetables and pulses. In both districts, TechnoServe will build capacities and improve efficiency across the value chain, with emphasis on both backward as well as forward integration.

This intervention acts as a live example to help revive many producer groups in the state and encourage them to adopt these best practices. Such an intervention, made through a social development agency, is the first of its kind in the state of Bihar and possibly across India, with a forward linkage driven agenda through a transparent trade facilitation and logistics management system. This pilot has the potential to transform the nature of community institutions from being mostly driven by a social development agenda to achieving higher level business and thus achieving long term sustainability goals.

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