World Bank

Case studies of successful pro-poor value chain models in India

National Rural Livelihood Project

Abhinav Kumar Gupta
abhinav.kr.gupta@gmail.com
9/26/2015
# Contents

1. **Introduction** .......................................................................................................................... 7
   1.1 Objective of the research ................................................................................................. 7
   1.2 Research methodology ................................................................................................. 7
   1.3 Research roadmap ........................................................................................................ 7

2. **Maize Aggregation and Marketing Value Chain Model in Purnia (Bihar)** ......................... 8
   2.1 Context ............................................................................................................................. 8
      2.1.1 Purnia district ........................................................................................................ 8
      2.1.2 Project: ................................................................................................................ 8
      2.1.3 Beneficiary: ......................................................................................................... 8
   2.2 Model .............................................................................................................................. 9
      2.2.1 Information about maize value chain before the intervention: ......................... 9
      2.2.2 Transformed Model and details about the intervention .................................. 10
      2.2.3 Impact on the beneficiary .................................................................................. 11
   2.3 Analysis ........................................................................................................................... 12
      2.3.1 Critical Factors of Success ................................................................................. 12
      2.3.2 Factors to keep in mind before replication ......................................................... 13

3. **Smallholder Cooperative Poultry Value Chain Model in Kesla (Madhya Pradesh)** ............ 14
   3.1 Context ............................................................................................................................. 14
      3.1.1 Kesla district ........................................................................................................ 14
      3.1.2 Project: ................................................................................................................ 14
      3.1.3 Beneficiary: ......................................................................................................... 14
   3.2 Model .............................................................................................................................. 14
      3.2.1 Information about traditional backyard value chain before the intervention: .... 14
      3.2.2 Transformed Model and details about the intervention .................................. 16
      3.2.3 Impact on the beneficiary .................................................................................. 18
   3.3 Analysis ........................................................................................................................... 20
      3.3.1 Critical Factors of Success ................................................................................. 20
      3.3.2 Factors to keep in mind before replication ......................................................... 20

4. **Agriculture Production Cluster Linked Value Chain Model in Gumla (Jharkhand)** .............. 22
   4.1 Context ............................................................................................................................. 22
      4.1.1 Gumla district ........................................................................................................ 22
      4.1.2 Project: ................................................................................................................ 22
      4.1.3 Beneficiary: ......................................................................................................... 22
4.2 Model .................................................................................................................. 22
4.2.1 Information about value chain before the intervention: .................................. 22
4.2.2 Transformed Model and details about the intervention ...................................... 24
4.2.3 Impact on the beneficiary ............................................................................... 26
4.3 Analysis ................................................................................................................ 27
4.3.1 Critical Factors of Success ............................................................................. 27
4.3.2 Factors to keep in mind before replication ....................................................... 28
5.0 End to End Tasar Silk Value Chain Model in Jharkhand ...................................... 29
5.1 Context ................................................................................................................. 29
5.1.1 Districts in Jharkhand .................................................................................... 29
5.1.2 Project: .......................................................................................................... 29
5.1.3 Beneficiary: ..................................................................................................... 29
5.1.4 Overview of a typical silk value chain: ............................................................ 29
5.2 Model .................................................................................................................... 30
5.2.1 Information about Tasar silk value chain before the intervention: ............... 30
5.2.2 Transformed Model and details about the intervention .................................. 33
5.2.3 Impact on the beneficiary .............................................................................. 37
5.3 Analysis ................................................................................................................ 38
5.3.1 Critical Factors of Success ........................................................................... 38
5.3.2 Factors to keep in mind before replication ....................................................... 39
6.0 NDDB Dairy Value Chain Model in Chittoor district (Andhra Pradesh) ............ 40
6.1 Context ................................................................................................................. 40
6.1.1 Chittoor district ............................................................................................. 40
6.1.2 Project: .......................................................................................................... 40
6.1.3 Beneficiary: ..................................................................................................... 40
6.2 Model .................................................................................................................... 40
6.2.1 Information about milk value chain before the intervention: ....................... 40
6.2.2 Transformed Model and details about the intervention .................................. 42
6.2.3 New Developments ....................................................................................... 44
6.2.4 Impact on the beneficiary .............................................................................. 45
6.3 Analysis ................................................................................................................ 45
6.3.1 Critical Factors of Success ........................................................................... 45
6.3.2 Factors to keep in mind before replication ....................................................... 46
7.0 Ajeevika Fresh Retail Stores linked Vegetable Cluster Value Chain Model in Madhya Pradesh .... 47
7.1 Context ........................................................................................................................................47
7.1.1 District .........................................................................................................................................47
7.1.2 Project: ........................................................................................................................................47
7.1.3 Beneficiary: ...................................................................................................................................47
7.2 Model ...............................................................................................................................................47
7.2.1 Information about value chains before the intervention: ..............................................................47
7.2.2 Transformed Model and details about the intervention ...............................................................48
7.2.3 Impact on the beneficiary ............................................................................................................49
7.3 Analysis ...........................................................................................................................................49
7.3.1 Critical Factors of Success .........................................................................................................49
7.3.2 Factors to keep in mind before replication ..................................................................................50
References and Sources .......................................................................................................................51
## List of Figures

<table>
<thead>
<tr>
<th>Figure no.</th>
<th>Description</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Graph showing the proportion of maize sold in the market and proportion of members producing maize</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Schematic diagram depicting the traditional value chain in Purnia</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Schematic diagram depicting the aggregation and marketing model in Purnia</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Graph showing the income increase of the members in Purnia</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>Schematic diagram depicting the traditional backyard poultry value chain in Kesla</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Cascade chart depicting margins of value chain actors in traditional poultry value chain</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>Schematic diagram showing the linkages between the smallholder and cooperatives in the smallholder cooperative value chain in Kesla</td>
<td>17</td>
</tr>
<tr>
<td>8</td>
<td>Schematic diagram depicting the smallholder cooperative poultry value chain in Kesla</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>Cascade chart depicting the margins of value chain actors in traditional backyard poultry value chain in Kesla</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>Schematic diagram showing traditional commodity value chain in Gumla</td>
<td>23</td>
</tr>
<tr>
<td>11</td>
<td>Schematic diagram showing transformed commodity value chain model in Gumla</td>
<td>26</td>
</tr>
<tr>
<td>12</td>
<td>Income increase of the farmers due to agriculture production cluster intervention</td>
<td>26</td>
</tr>
<tr>
<td>13</td>
<td>Overview of a typical silk value chain</td>
<td>30</td>
</tr>
<tr>
<td>14</td>
<td>Schematic diagram depicting the traditional Tasar silk value chain</td>
<td>31</td>
</tr>
<tr>
<td>15</td>
<td>Cascade chart depicting the margins of value chain actors in traditional backyard poultry value chain in Kesla</td>
<td>32</td>
</tr>
<tr>
<td>16</td>
<td>Schematic diagram depicting end to end Tasar silk value chain</td>
<td>34</td>
</tr>
<tr>
<td>17</td>
<td>Cascade chart depicting the margins of value chain actors in the end to end Tasar silk value chain</td>
<td>35</td>
</tr>
<tr>
<td>18</td>
<td>Schematic diagram of private dairy value chain</td>
<td>42</td>
</tr>
<tr>
<td>19</td>
<td>Schematic diagram of NDDB dairy value chain model</td>
<td>43</td>
</tr>
<tr>
<td>20</td>
<td>Schematic diagram of traditional value chain model in Madhya Pradesh</td>
<td>48</td>
</tr>
<tr>
<td>21</td>
<td>Schematic diagram depicting Ajeevika Fresh Retail Stores linked Vegetable Clusters Value Chain model</td>
<td>49</td>
</tr>
</tbody>
</table>
# List of Tables

<table>
<thead>
<tr>
<th>Table no.</th>
<th>Description</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Table showing comparison of economic benefits accrued to producers from three different value chains – industrial, backyard and cooperative</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>Table showing the value chain actors and their roles in the end to end Tasar value chain model</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>Table showing the economic benefits to the value chain actors of end to end Tasar silk value chain</td>
<td>37</td>
</tr>
</tbody>
</table>
1.0 Introduction

1.1 Objective of the research
The objective of the research is to illustrate the successful and diverse pro-poor value chain models operating in India through real case studies. The following criteria were used while selecting the case studies:

1) Cases should cover diverse commodities
2) Cases should cover successful and diverse pro-poor value chain models
3) Cases should cover diverse states in India

1.2 Research methodology
The identification and analysis of the cases were accomplished using the following three research methodologies:

1) Secondary research of variety of literature
2) Key informant interviews
3) Independent analysis

1.3 Research roadmap
In the four chapters that follow, Chapter 2 focuses on the aggregation and marketing value chain model in Purnia, Bihar which has been developed under the Jeevika project.

Chapter 3 describes the smallholder cooperative poultry value chain model in Kesla, Madhya Pradesh which has been successfully replicated in the other states of Odisha, Jharkhand and Chhattisgarh.

Chapter 4 elaborates on the agriculture production cluster linked value chain model in Gumla, Jharkhand which has been recently developed by Pradan.

Chapter 5 explains end to end Tasar silk value chain model in Jharkhand, which has been successfully replicated in Bihar, Chhattisgarh and Odisha.
2.0 Maize Aggregation and Marketing Value Chain Model in Purnia (Bihar)

2.1 Context

2.1.1 Purnia district
Agriculture is the main occupation of the Purnia district with many crops ranging from staple to cash crops being cultivated in the district. The two main staple crops are paddy and wheat which are largely self-consumed by the producers, while the two main cash crops are maize and jute. Mango and banana are two main horticulture crops of the district. There has been a growing trend of replacing area under cultivation of jute with maize considering the suitability of the land for maize production (Purnia boasts of highest maize productivity in the country) and growing maize demand. Purnia district produces two crops in a year as the area is irrigated by Kosi and Mahananda rivers.

2.1.2 Project:
As part of the Bihar Rural Livelihood Project or Jeevika, Bill and Melinda Gates Foundation financed TechnoServe India to launch a year-long technical assistance project in Bihar in December, 2014. The technical assistance project aimed at strengthening the state’s effort to support women farmers through the formation of producer groups by providing capacity building support and developing a multi-year roadmap to facilitate producer group formation and strengthen the broader producer group ecosystem in the state. It was consensually agreed to test a pilot at Purnia first which could be further replicated in the state.

2.1.3 Beneficiary:
The beneficiaries of the pilot projects are 10 women producer groups which were started under the Jeevika project. Maize was chosen as the main cash crop as most of the group members were producing it and most of the maize was sold in the market as shown in the graph below. The quantity of maize produced and closeness to the roads were chosen as the selection criteria for the producer groups to participate in the pilot.

![Graph showing the proportion of maize sold in the market and proportion of members producing maize](image-url)

Figure 1: Graph showing the proportion of maize sold in the market and proportion of members producing maize
2.2 Model

2.2.1 Information about maize value chain before the intervention:
Before the intervention, the ten producer groups were involved in the traditional maize value chain which had many intermediaries due to which producer margins were getting to get squeezed. The following inefficiencies were observed in the value chain:

1) Cash payment to the farmers exposed them to risks of theft, fraud etc.

2) Month long delays observed in receiving the cash from the local aggregators

3) Weighing malpractices were rampant in the local aggregator level where manual weighing and grading resulted in an average loss of Rs 70/q quintal for the farmers at the local aggregator level.

4) The commissions were being charged at three levels of local aggregator, broker and mandi trader which substantially increased the transactional cost, and hence squeezed the farmer’s margin.

5) In addition to commission charged, the mandi trader used to pay for 1 Kg/ quintal less while procuring the whole lot citing quality concerns based on subjective criteria.

6) The institutional buyers bought the maize from the spot market which exposed them to supply risks, quality risks, price volatility risks etc.

The diagram below shows the actors involved and inefficiencies encountered in the traditional value chain.

![Diagram showing the traditional maize value chain](image_url)

**Figure 2:** Schematic diagram depicting the traditional value chain in Purnia

<table>
<thead>
<tr>
<th>Inefficiencies at farmer level</th>
<th>Inefficiencies at local aggregator level</th>
<th>Inefficiencies at broker level</th>
<th>Inefficiencies at mandi level</th>
<th>Inefficiencies at institutional buyer level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash payment increases risk</td>
<td>Manual weighing and grading</td>
<td>Commission charged</td>
<td>Commission charged</td>
<td>On-spot buying increases risk</td>
</tr>
<tr>
<td>Delay in payment</td>
<td></td>
<td>Commission charged</td>
<td>1 Kg/ quintal is deducted citing subjective quality concerns</td>
<td></td>
</tr>
</tbody>
</table>
2.2.2 Transformed Model and details about the intervention

Keeping these inefficiencies in mind, aggregation and marketing value chain model was adopted to eliminate many intermediaries in the value chain and gain better price realisation. The diagram below provides the overview of the model.

![Diagram of the aggregation and marketing model in Purnia]

<table>
<thead>
<tr>
<th>Efficiencies gained at Farmers level</th>
<th>Efficiencies gained at producer group level</th>
<th>Efficiencies gained at Producer Company level</th>
<th>Efficiencies gained at NeML and accredited warehouse level</th>
<th>Efficiencies gained at institutional buyer level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cashless payment</td>
<td>Electronic weighing and grading done by sophisticated measuring instruments</td>
<td>No deductions in weight citing quality concerns</td>
<td>NeML enables direct link to institutional buyers and offers forward contracting options</td>
<td>Forward contracts reduce risks</td>
</tr>
<tr>
<td>Payment made in 3-5 days after the sale</td>
<td>No Commission charged</td>
<td>No commission charged</td>
<td>Storage in accredited warehouse maintains produce quality</td>
<td></td>
</tr>
</tbody>
</table>

**Figure3: Schematic diagram depicting the aggregation and marketing model in Purnia**

The intervention to realise this model are listed below:

1) Business plans were prepared for each of the ten producer groups on the basis of which Rs 6 lakh of grant was arranged with Jeevika’s support. Out of this Rs 6 lakh grant, Rs 5 lakh was transferred to Producer Company to meet its working capital requirements.

2) Defunct Producer Company was revived to link the producer groups to institutional buyers. A separate business plan was prepared on the basis of which the organisation received a working capital loan of Rs 10 lakh from the Deepak Credit Level Federation at a nominal interest rate of 0.6%.

3) The Producer Company signed MOUs with NCDEX e Markets Limited (NeML) to be the electronic trading partner and LTC commercial Pvt. Ltd to be warehouse partner which provided an efficient platform for the company to connect with the institutional buyers. The company also coordinated and financed the packaging, transportation and labor cost in order to operationalize this arrangement.
4) Weekly meetings were organised to make the farmers aware about the pilot as well as train them on post harvest practices such as drying and cleaning. Individual bank accounts were also opened for farmer to enable cashless payment within 3-5 days of sale to Producer Company.

6) Sophisticated measuring instruments such as electronic weighing scales and digital moisture meters were procured by the producer groups to ensure transparency, quality and better price realisation during the procurement.

7) Attractive incentive structure was put in place for community skill extension workers and village resource persons for convincing the farmers 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.

8) Logistics management such as agreement with local transporters and labor requirement during the procurement process was addressed at 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.

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

2.2.3 Impact on the beneficiary

1) Income increase: The intervention was quite successful and a total of 1014 MT of maize was procured from the producer groups. The farmers were offered an assured price of Rs 1058 which was substantially higher than the price of Rs 957 offered to them by local collection aggregator. If the produce met all the quality parameters, the farmers were given an additional option of selling the produce after three months for which they were given a premium of Rs 50. The graph below shows that a farmer could potentially access 16% more price depending on his decision to sell.

![Figure 4: Graph showing the income increase of the members in Purnia](image)

The increase in the price serves as a good proxy for increase in farmer incomes.
2) **Dividends to the beneficiary participating in the procurement process**: The procured 1014 MT of maize was sold in two lots of 519 MT and 495 MT. Around 80% of the procured maize was high quality maize (A grade) and was sold through the NeML platform. This has enabled the Producer Company to realise a profit of Rs 11 lakh; 70% of this profit will be distributed in the form of dividends to the producer group members in accordance to the share of maize procured from them. This will further increase the incomes of the producer group members and will encourage them to supply more maize to the Producer Company in the future.

3) **Assured market**: The procurement of maize by Producer Company has enabled the farmers to get an assured market for their products. It is important to mention that the company sold approximately 20% of the maize which didn’t satisfy the quality standards for NeML in the local mandi. This has greatly improved the image and loyalty of the farmers towards the producer groups and Producer Company. In order to meet its working capital requirements for the next business cycle, the Producer Company plans to adopt the warehouse receipt model whereby the warehouse receipt of the stored commodity in the accredited warehouse would allow them to access loan of 70 to 80% worth of the stored commodity from the nationalised bank. This will greatly contribute towards sustainability of the operations.

2.3 Analysis

2.3.1 Critical Factors of Success

1) **NeML interface to link with institutional buyers**: The NCDEX platform of accredited warehouses and NeML enabled the project to get rid of many intermediaries in the chain. An important prerequisite to establish this link was reviving a defunct farmer Producer Company because a legally registered entity can only do business with the platform.

2) **Initial Working Capital Grant and Credit loan to Producer Group and Producer Company**: The initial working capital grant provided by Jeevika project to Producer Groups and working capital loan provided by Deepak Cluster Level Federation to Producer Company were essential to meet the working capital needs of the Company. This allowed the Company to pay the members in 3-5 days and make it attractive for the members to sell to the Company than to the local aggregation agents.

3) **Intervention strategy**: The intervention strategy was formulated after carefully mapping the inefficiencies in the traditional value chain. All the action items ranging from linkage to daily price discovery sheet to loan and grant provision for meeting working capital needs were important in making the model successful.

4) **Attractive incentive structure for the village resource persons and community extension agents**: Attractive incentive structure linked to the maize procured from the producer groups was used to reward the village resource persons and community extension agents mapped to these groups. This financial incentive served as a great motivation for the resource persons and extension agents to convince the producer group members to sell to the Producer Company, which led to members selling close to 80% of their product to the Producer Company in the first year of operation.

5) **Technical Assistance from TechnoServe**: The technical assistance provided by TechnoServe to producer groups and Producer Company in order for them to manage the activities leading to the success of the model was critical.
2.3.2 Factors to keep in mind before replication

1) State of the value chain: The aggregation and marketing model can lead to substantial gains in the value chain only when the value chain has many intermediaries which are increasing the transaction cost. Therefore, it is important to analyse whether the value chain is a typical traditional one with many intermediaries or has it overtime graduated to become one with less intermediaries. The more the value chain leans towards a typical traditional value chain, the more the rationale of replicating the model.

2) Selection of commodity: For the successful replication of model, the following factors have to be kept in mind before the selection of commodities:

   i. Commodity should be tradable on the NCDEX platforms
   ii. Majority of the producers, ideally more than 80%, should be engaged in the commodity production, in the given intervention area ensuring economies of scale for the operations
   iii. The commodity should be a cash crop with a market surplus, ideally of more than 90%

3) Selection of area of intervention: For the successful replication of model, the following factors have to be kept in mind before the selection of the intervention area:

   i. The area should ideally be a production cluster i.e. producing one crop with uniform features at a scale. This will allow the project to exploit the economies of scale
   ii. The area shouldn’t be very remote and should have access to asphalt roads which allows for transportation of heavy vehicles like trucks
   iii. The area should have telecommunication connectivity which would enable smooth linkages to NCDEX platform through internet
3.0 Smallholder Cooperative Poultry Value Chain Model in Kesla (Madhya Pradesh)

3.1 Context

3.1.1 Kesla district
Kesla is a tribal block in the Hoshangabad district of Madhya Pradesh. About 44% of the population of Kesla are tribal and 13% are scheduled castes. Typically, a tribal family in Kesla block earns about Rs 15,000–18,000 per year, one-third of which comes from rain-fed agriculture with low productivity, another third from the collection of minor forest produce, and the rest from wage earnings. Most of the budgets of the target households are in deficit; hence, they resort to coping mechanisms of reducing consumption, and forward selling their expected agricultural and forest products.

3.1.2 Project:
This case describes PRADAN’s intervention to enhance income from backyard poultry in Kesla block. Efforts initiated in 1992 have led to the establishment of a model for small holder broiler farming, which is being replicated in other states such as Jharkhand, Chhattisgarh and Orissa. PRADAN has been working with more than 5,306 women broiler-farmers, organized into 15 cooperatives, and one producers’ company, with a collective turnover of about Rs 400 million. This is the largest conglomeration of small- holder poultry farmers in India.

3.1.3 Beneficiary:
The beneficiaries of the Kesla intervention were predominantly poor smallholder tribal households. Traditional backyard poultry was chosen as the area of intervention because of its livelihood and social importance as described below:

1) The activity provides Rs 1,200–1,800 of income in a good year, mainly meeting requirements for emergency cash

2) The activity has social significance as the country fowl were mainly reared for festive occasions, ceremonial purposes and celebration because of its reputation of being regarded as a special delicacy

3.2 Model

3.2.1 Information about traditional backyard value chain before the intervention:
Before the intervention, the tribal household were involved in the traditional backyard poultry value chain which is characterised by low productivity. In this, the birds attain the weight of 800-900 gm in six to seven months and lay 30 to 50 eggs a year.

The following constraints and inefficiencies were observed in the value chain:

1) The tribal households made no efforts to improve the quality of the breed or the flock. Stockbreeding was left to chance and no selective breeding was being practised

2) No specialised feed was prepared for the birds and they were left to scavenge on the household wastes which resulted in low productivity
3) Veterinary advice was not available. Therefore, the survival rates across the ages were very low. Especially during summer, due to disease outbreaks, the death rate was very high; it was not uncommon for the entire flocks to be completely wiped out if a disease broke out.

4) Less than 5% of the households had built dedicated pens for their flock and usually the flock was found to be sharing the owner’s home.

The diagram below shows the actors involved and inefficiencies encountered in a typical traditional backyard poultry value chain.

![Diagram of the traditional backyard poultry value chain](image)

<table>
<thead>
<tr>
<th>Inefficiencies at farmer level</th>
<th>Inefficiencies at local village trader level</th>
<th>Inefficiencies at primary market trader level</th>
<th>Inefficiencies at terminal market buyer</th>
</tr>
</thead>
<tbody>
<tr>
<td>No breed improvement activity</td>
<td>Commission charged</td>
<td>Commission charged</td>
<td></td>
</tr>
<tr>
<td>No veterinary services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absence of quality poultry infrastructure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No specialised feed prepared</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5: Schematic diagram depicting the traditional backyard poultry value chain in Kesla**

A distinctive feature of the traditional backyard value chain is scarcity of supply in a small, niche market. Therefore, the return per bird to the farmer is high, and the farmer’s share in the value chain is highest at 63%. However, the annual return for a family maintaining only 10-15 birds is Rs 1,200–1,800, representing only about 10-12% of the annual income. The cascade chart illustrates the margins/bird earned by various stakeholders in the value chain:
3.2.2 Transformed Model and details about the intervention

Keeping these inefficiencies in mind, home based broiler intervention was planned to evolve the traditional backyard value chain to a smallholder cooperative value chain to address the inefficiencies of backyard chain and increase the poultry production scale of smallholders. The linkages between the smallholder and cooperative in the smallholder cooperative poultry value chain are depicted below:

![Cascade chart depicting margins of value chain actors in traditional poultry value chain](image)

**Figure 6: Cascade chart depicting margins of value chain actors in traditional poultry value chain**

**Figure 7: Schematic diagram showing the linkages between the smallholder and cooperatives in the smallholder cooperative value chain in Kesla**
The diagram below provides the overview of the model.

![Diagram](image)

**Figure 8: Schematic diagram depicting the smallholder cooperative poultry value chain in Kesla**

<table>
<thead>
<tr>
<th>Efficiencies at farmer level</th>
<th>Efficiencies at cooperative</th>
<th>Efficiencies at wholesaling trader</th>
<th>Efficiencies at terminal market buyer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breed improved</td>
<td>No commission charged</td>
<td>Volume made it viable to trade with smallholder cooperatives</td>
<td>Volume made it viable to trade with smallholder cooperatives</td>
</tr>
<tr>
<td>Economies of scale exploited by linkages to cooperatives</td>
<td>Delinked the market risks by offering fixed price to smallholders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poultry infrastructure improved to house 300-400 hens</td>
<td>Veterinary service provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialised feed prepared at the cooperative level</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The interventions to realise this model are listed below:

1) Decentralized production infrastructure with 300-400 birds in the homestead backyard, which fits into the daily life of the tribal women was introduced

2) Rigorous training of producers, intensive production support and on-call referral veterinary services of high quality was organised

3) The cooperative model as depicted above was used to cost effectively conduct collective procurement of inputs and sale of birds to achieve economies of scale and backward-forward integration

4) System to address the volatile nature of the market by de-linking production efficiency from enterprise efficiency, and collectivization of operations when dealing with markets was created

5) Customized financial and MIS software was introduced for decentralized operations
6) Para veterinary services was organised chargeable on production parameters

7) Market for chicken meat was developed in the nearby areas like Sami Pathakheda to decrease the dependence on the far away Bhopal market

The proportion of a farmer's margin with respect to the total margin in the chain at the production end is about 44%, lower than that of the traditional backyard poultry value chain which is 63%. However, the critical point is the absolute income in the hands of the farmer is much higher at about Rs 15,000–18,000 than Rs 1500 -2000 for traditional backyard value chain because the low-carrying capacity of the backyard value chain results in low absolute returns for smallholders. The cascade chart illustrates the margins/bird earned by various stakeholders in the transformed smallholder cooperative value chain:

![Cascade chart depicting the margins of value chain actors in traditional backyard poultry value chain in Kesla](image)

**Figure 9: Cascade chart depicting the margins of value chain actors in traditional backyard poultry value chain in Kesla**

### 3.2.3 Impact on the beneficiary

1) **Income increase:** The home based broiler intervention was quite successful and has contributed significantly to increase income levels of the farmers in absolute terms from Rs 1500 -2000 to Rs 15000 – 20000 which is evident from the above discussion. The table in the next page details other economic benefits to the smallholders participating in smallholder cooperative value chain in comparison to the traditional backyard poultry value chain and industrial broiler value chain.
<table>
<thead>
<tr>
<th>Particulars</th>
<th>Country fowl supply chain</th>
<th>Industrial broiler value chain</th>
<th>Cooperative value chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-production features</td>
<td>- Chick is obtained from in-situ hatch of eggs in the household - Birds scavenge</td>
<td>- Chicks are supplied from hatcheries - Feed is bought from private company (compound livestock feed) or prepared in-house</td>
<td>- Chicks are supplied from hatcheries or are of own production - Feed is produced in cooperative's own unit</td>
</tr>
<tr>
<td>Production features</td>
<td>- No significant labour deployment required in the family - No access to veterinary/technical services</td>
<td>- Outside labour is employed - Veterinary/technical services from market</td>
<td>- Deployment of family labour - Round the clock veterinary/technical services at the doorstep</td>
</tr>
<tr>
<td>Production cycle (in a year)</td>
<td>1.5</td>
<td>5-6</td>
<td>5-6</td>
</tr>
<tr>
<td>Feed conversion ratio (kg of feed/kg body weight of bird)</td>
<td>5</td>
<td>1.8</td>
<td>1.65</td>
</tr>
<tr>
<td>Mortality rate (%)</td>
<td>30 %</td>
<td>5 %</td>
<td>5 %</td>
</tr>
<tr>
<td>Average flock weight (kg)</td>
<td>0.9</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Efficiency index</td>
<td>60</td>
<td>220</td>
<td>246</td>
</tr>
<tr>
<td>Marketing features</td>
<td>Directly picked from farms by procurers or sold in local haats</td>
<td>Involves elaborate chain of wholesalers and distributors for supply to retailers</td>
<td>Direct to retailers, wholesalers, and cooperative-owned retail outlets</td>
</tr>
<tr>
<td>Total value chain margin (Rs/kg)</td>
<td>63</td>
<td>7.5</td>
<td>9</td>
</tr>
<tr>
<td>Average flock size (birds)</td>
<td>10</td>
<td>5,000</td>
<td>350</td>
</tr>
<tr>
<td>Average investment (Rs in '000)</td>
<td>Minimal</td>
<td>1,000</td>
<td>50</td>
</tr>
<tr>
<td>Average annual margin (Rs)</td>
<td>1,500</td>
<td>2,000,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Primary producer’s share in terminal price</td>
<td>60 %</td>
<td>76 %</td>
<td>76 %</td>
</tr>
<tr>
<td>Primary producers’ share of overall margin</td>
<td>63 %</td>
<td>33 %</td>
<td>44 %</td>
</tr>
<tr>
<td>Price assurance mechanism</td>
<td>Price discovery not in the hands of farmers</td>
<td>No mechanism</td>
<td>Pooled across farmers and time. Delinked production and market.</td>
</tr>
</tbody>
</table>

Table 1: Table showing comparison of economic benefits accrued to producers from three different value chains – industrial, backyard and cooperative
2) **Nutrition**: Due to increased poultry production, the eggs and meat have gradually become part of the diet of the locals which has considerably improved their nutrition levels.

3) **Assured market**: The cooperative model has enabled the smallholder to have an assured market for themselves. Further, the cooperative has evolved a system of fixed prices, in consultation with producers, which has made it possible to de-link the risks of producers from those of the enterprise. This has greatly contributed to the sustainability of the overall operations of the value chain.

### 3.3 Analysis

#### 3.3.1 Critical Factors of Success

The critical factors of success for the model are:

1) **Leveraging cooperatives for economies of scale**: The cooperatives have been used as an effective mechanism to collectively bargain and procure inputs as well as collectively market outputs of the smallholder members. This has enabled the smallholder cooperative value chain model to exploit the economies of scale.

2) **Developing an effective network of service providers**: The organisation of collective institutions and service providers trained by Pradan to serve as effective service providers to support smallholder’s poultry production has been critical to the success of model.

3) **Technical Assistance of Pradan**: The intensive technical assistance offered by Pradan in not only developing an innovative model, but also in making it sustainable through various interventions in the different value chain stages has been responsible for the demonstrated success of model.

4) **Market Development**: The efforts taken to develop the chicken meat market in the nearby areas and reducing the dependency on the Bhopal market has contributed greatly to the success of model.

5) **Delinking the risk of farmers from enterprise risks**: The setting up of fixed price system for the smallholders has enabled the enterprise risks to be decoupled from the production risks which has greatly contributed to the sustainability of operations and reduction of risks at the smallholders level.

#### 3.3.2 Factors to keep in mind before replication

1) **State of the value chain**: The home-based broiler intervention can lead to substantial gains in the value chain only when the value chain has many intermediaries which are increasing the transaction cost, and the producers are not doing poultry production at a viable scale. Therefore, it is important to analyse whether the value chain is typical traditional backyard poultry with many intermediaries or has it overtime graduated to be one with less intermediaries. The more the value chain leans towards a typical traditional backyard poultry value chain, the more the rationale of replicating the model.

2) **Beneficiary profile**: The ideal beneficiary to undertake this intensive operation are women, but it has to be tested whether these women or men in the potential area of intervention have enough time to devote to the successful running of business. For example, if the women beneficiary is
already involved in a complex and intense activity of dairy business, it might be challenging for her to balance the poultry operations with dairy operations.
4.0 Agriculture Production Cluster Linked Value Chain Model in Gumla (Jharkhand)

4.1 Context

4.1.1 Gumla district
Gumla is located 600 to 700 meters above the sea level in Chota Nagpur plateau region with moderate climatic conditions and healthy rainfall of 1200-1500 mm annually. The district is classified as Schedule Area because it has a dominant population of Munda and Oraon tribes. The average landholding is 2.5 acre to 5 acre. Agriculture is the main occupation with more than 70% of the people participating in the activity as main workers (employment for more than 183 days).

4.1.2 Project
Gumla intervention was jointly financed by Swarnajayanti Gram Swarozgar Yojna (SGSY), Special Central Assistance (SCA) and Integrated Action Plan (IAP) funds. Rs 12 Crore SGSY funds were channelled through Jharkhand State Livelihood Promotion Society (JSLPS) between 2009 and 2013 towards the rural infrastructure development with the objective of impacting 1000 SHGs. The SCA and IAP funds were administered by the Tribal Welfare Commission Office (TWCO). The objective of the technical assistance was to develop Gumla into an agriculture production cluster for addressing abject poverty in the district. This was planned to be done by taking advantage of the suitable agro-climatic conditions, plentiful labour, natural resource endowment, access to available credit and relevant government schemes. The intervention was started as a pilot in 2007/08 and was successfully replicated in the district in view of the positive results observed on the field.

4.1.3 Beneficiary
The main beneficiaries of the project are 20000 women, majority of which belong to the marginalised tribal communities of Oraon and Munda. These 20000 women have been organised into 3000 Self Help Groups (SHGs) which serve as unit of intervention for the project. It is important to note that the project used the medium of these women to strengthen the household economy by following the strategy of intensification and diversification of crop production.

4.2 Model

4.2.1 Information about value chain before the intervention:
Before the intervention, the Gumla farmers were following subsistence agriculture for most part of the year and very little produce (5%) was being sold in local haats in rainy season only. The description and inefficiencies observed in the production and marketing systems are described below. There is additional section on nutrition to describe the nutritional status of the district before the intervention.

**Production Systems**: The landscape in Gumla can be classified into lowlands, medium lowlands, medium uplands and uplands. The lowlands and medium lowlands comprised 70% total land, while medium upland and upland comprised 30% of total land. Prior to the intervention, subsistence agriculture was predominantly being practiced in Gumla. The different landscape had different rain-fed cropping system as described below:
1) Lowlands: The lowlands are considered the best agricultural land in Gumla. 10% of these lands are valley lands which have high nutrient and moisture retention. Wealthiest farmers owned lands here and successfully followed paddy mono-cropping system even with a fickle monsoon.

2) Medium lowlands: The medium lowlands are characterised by good soil with medium water and nutrition retention. Relatively better off farmers owned land here and had a stable paddy mono-cropping system depending on a more than average performance of monsoon.

4) Uplands: The uplands were depleted and poorly husbanded lands where the moisture holding capacity of the soil was very low. The most vulnerable, marginalised and poor farmers owned land here and produced millet and pulses which gave a very poor yield.

3) Medium uplands: The medium uplands were degraded lands, but better than the uplands in terms of nutrient and moisture retention. The poor and marginalised farmers owned land here and practiced paddy mono-cropping system which was highly vulnerable to water stress. Medium uplands were also the region where most of the households had their dwellings. In the backyards of these dwelling, every household was practicing vegetable production which was being predominantly self consumed. Once in a while, whatever little excess was being produced was sold in the local haats. It is important to note that this production was taking place in the rainy season between the months of August and October.

This predominantly subsistence paddy mono-cropping system had compelled people to take up small ruminant rearing and backyard poultry as a means for livelihood. These livestock assets were being used by the households as emergency cash reserves as well as to pay for their annual expenses such as education of children.

Marketing systems: Prior to the intervention, markets in Gumla and its proximity were grossly deficit as the local farmers were not able to sufficiently supply agricultural produce to them. This was mainly because they were following subsistence paddy mono-cropping system which left little for the market. As a consequence, most of the products used to come to these markets from either Bengal, Bihar or Pithoria agriculture cluster in Ranchi. The diagram below depicts a typical commodity value chain which existed in Gumla before the intervention:

![Diagram](image)

Figure 10: Schematic diagram showing traditional commodity value chain in Gumla
Nutrition: The low purchasing power in combination with subsistence mono-cropping of paddy had led to households consuming very less nutritious food. The vegetable consumption was very low for most of the year with potato, onion and chilli comprising main vegetables that were consumed.

4.2.2 Transformed Model and details about the intervention
Keeping these inefficiencies in mind, agriculture production cluster was planned in Gumla to address the food insecurity and abject poverty persisting in the region. The following interventions were undertaken to realise this:

1) First intervention was to organise the women into SHGs and federate them under Village Organisations (VOs). There was on average one VO for every 700 to 800 families residing in six to seven villages. These VOs became a platform for channelling grants and entitlements as well as delivering support to the SHGs. The livelihood subcommittee of the VO was responsible and accountable for providing livelihood related services. A Community Service Provider (CSP) was appointed by the subcommittee for actively engaging with SHGs in a VO to access working capital credit from the banks and facilitating preparation of SHG livelihood and micro-credit plans.

2) The SGSY, SCA and IAP financing was used to construct robust irrigation infrastructure such as lift irrigation schemes, seepage tanks, lowland wells, water harvest tanks etc. with the technical assistance of Pradan. This resulted in significant irrigation access to 9000 families. This has overtime led to farmers not only becoming self sufficient, but also producing market surplus by having a double or even a third crop.

3) After the irrigation access had been achieved, crop diversification and intensification strategies were pursued in order to maximise the benefits to farmers. Therefore, the following two strategies were followed:

   i. The food security of the households was prioritised and hence advanced practices such as Systematic Rice Intensification (SRI) and modern inputs such as improved paddy seed varieties were introduced for increasing paddy productivity of the farmers so that they can become self sufficient
   
   ii. After achieving paddy self sufficiency, the following two different crop systems were encouraged for adoption for uplands and lowlands with technical assistance of Pradan:
      
      - For the uplands, fruit orchards were planted with vegetables grown between the fruit trees to provide regular and consistent income stream
      - For the lowlands, alternate cropping of vegetable and pulses or oilseeds and pulses were followed.

In addition to these, modern farm implements such as power tillers and wheel hoe were acquired at 40 to 50% subsidy from Agricultural Technological Management Agency (ATMA) for intensifying the agriculture production.

3) The Water Users Associations (WUAs) were organised to coordinate the irrigation operations and resolve any disputes arising from the sharing of water. This includes, but not limited to, planning of the type of crop to be grown and in what area depending on the availability of irrigated water, coordinating turns among the beneficiaries for equitable access to irrigation, resolving issues pertaining to acquisition of land for irrigation infrastructure development etc.
4) The structure of SHGs was effectively leveraged to deliver trainings to the women beneficiaries on planning their crop calendar and improving their agronomic practices for diversification and intensification of agriculture. Pradan delivered the initial set of agronomic trainings to the SHG members which was followed by refresher trainings and handholding support provided by the CSPs. The adoption of improved agronomic practices has led to substantial yield gains. With respect to crop calendar planning, vegetables were preferred keeping in mind their nutritional benefits as well as high demand and prices. The following vegetables were chosen for intervention:

i. **Tomato** had 10-13 days of shelf life which enabled it to be transported over long distances.
ii. **Cauliflower and Cabbage** harvest could be timed in early rabi to access high prices
iii. **Garden Pea** could be cultivated at a large scale and harvested before mid-January to realise high prices
iv. **Chilli and Ginger** had long shelf lives, stable demand and commanded high prices all around the year.

These diverse horticulture crops and extended production cycle (8-9 months) has been successful in attracting market actors even from the distant markets. This is because Gumla gives these distant buyers an opportunity to buy assortment of vegetables in bulk from the same area, thus significantly reducing their transaction and logistics costs.

5) In order to do aggregation operations, Aggregation Centres were established for every 800 to 900 families serving one to two agriculture clusters. These agriculture clusters were equipped with crates and weighing machines to improve transparency and decrease post harvest losses respectively. These Centres were piloted with Bill and Melinda Gates Foundation funding and consequently replicated with IAP funds. The crates were bought at ATMA at a subsidy. In these centres, the CSPs were actively involved in aggregation, transportation and price negotiation on behalf of the farmers on a commission basis. These CSPs have been exposed to various markets and trained on accessing relevant market information for making selling decisions which allowed them to perform these selling tasks quite professionally.

6) Good service delivery mechanism was organised with CSPs serving as the main service delivery channels for the farmers. CSPs were coached to prepare livelihood plans, help SHGs access credit, procure inputs in bulk, build capacities of farmers through agronomic trainings, aggregate the produce, market the produce, provide market information to the farmers and facilitate the purchase of produce in the aggregation centres. They provided refresher trainings and on-field technical assistance to the farmers. On farm technical assistance included, but not limited to, diagnosis of plant diseases, timing of sowing, Integrated Pest Management (IPM), staggering the production of the farmers to access premium market prices, etc.

These CSPs were initially being paid by Pradan, but overtime they have been successfully in getting farmers to pay for their services. They typically serve on average 100 households and charge a household Rs 50 to 100/crop for their services with a separate commission charged for output marketing. This allows them to earn a good average income of Rs 3500/month, which is in addition to the income that they get from managing their own farm. Additionally, they have a high social status in the district. The diagram below shows the transformed commodity value chain model in Gumla after the agriculture production cluster intervention.
As can be seen above, most of the farmers were utilising the professional services of CSPs for selling their products.

4.2.3 Impact on the beneficiary

1) Income increase: The crop diversification and intensification strategy has substantially increased the income levels of the farmers as can be seen from the diagram below:

![Income Increase Diagram]

**Figure 12: Income increase of the farmers due to agriculture production cluster intervention**

2) Investment in assets: After becoming aware of the importance of technologies in crop intensification, the farmers are increasing their investment in technologies such as irrigation pump sets, farm implements etc. In particular, the farmers, especially in lowland areas, have already started investing in lowland wells by dividing the investment of one well among five to six households who would be the potential beneficiaries of the water access gained through the well. This has led to further expansion of irrigation command areas benefitting additional farmers.
3) **Improved nutrition status**: The self-sufficiency gained in paddy and diverse production of vegetables all round the year has considerably improved the nutritious status in Gumla with people introducing more vegetables in their daily diet.

4) **Women empowerment**: One of the most important benefits of the Gumla SHG model has been that the women have assumed the decision making role in the household, which has considerably improved their status. Consequently, this has increased their mobility in the district and they have been found to pursue both economic activities relating to farming operations and governance activities relating to panchayats more actively. As a consequence of this empowerment, the enrolment of children, especially of girls, in schools has increased and women have started taking up important roles of CSPs that has further brought about a transformation in the society.

2) **Innovation**: The farmers are increasingly taking up high value horticultural crops such as broccoli and adopting new technologies. This shows that the economic empowerment and access to irrigation has considerably increased their risk-taking appetite for adoption of higher value crops and new technologies.

### 4.3 Analysis

#### 4.3.1 Critical Factors of Success

1) **Agriculture Cluster Production concept**: Crop intensification and diversification strategy was followed to realise agriculture cluster in Gumla which has significantly increased its scale of operation. This increased scale has not only attracted the distant buyers to the market, but also made it viable for service providers and banks to deliver their services. CSPs are at the centre of the service delivery model and have been a critical factor of success for the agriculture production cluster to come up in Gumla.

2) **Women Self Help Groups**: The SHG platform has served as an ideal medium to develop the model. Services ranging from livelihood plan development to collective marketing of agriculture produce are provided to SHGs making it viable for the service providers to engage with them. In particular, the success of high repayment of the microcredit loans to the bank can be attributed to the SHGs style of working where the loan is accessed collectively.

3) **Access to working capital**: The access to working capital by taking microcredit loans from the bank has been important to finance the initial investment required to transition from paddy monocropping system to high value horticulture crop production system. The loan application is made collectively by the members of the SHG based on their livelihood plans, which allows them to have a strong business rationale when asking for a credit, thus increasing the probability of loan being accepted.

4) **Irrigation**: Initial irrigation investment has been critical for farmers to access water which has enabled them to take up high value horticulture production. The organisation of WUAs around these irrigation schemes for coordination and maintenance has further increased the sustainability of these schemes.

5) **Techno–managerial assistance from Pradan**: The techno-managerial assistance provided by Pradan has been of prime importance in not only developing agriculture production cluster in Gumla, but also in developing strong service delivery services to sustain cluster’s operation.
4.3.2 Factors to keep in mind before replication

1) **Strong culture of community collectives**: As seen from the Gumla case, the whole agriculture production cluster has been developed by using SHGs as the unit of intervention. Therefore, it has to be checked whether the potential area of intervention has a culture of formal and informal community collectives on which the SHG kind of model can be planned.

2) **Land conducive for irrigation infrastructure development**: It has to be seen whether the potential area of intervention has the right water table and topography for the development of irrigation infrastructure as was the case in Gumla.

3) **Natural resources endowment**: It has to be checked whether the potential area of intervention has the right agro-climatic conditions and natural resources endowment such as temperature, humidity, soil etc. for the development of a horticulture production cluster.

4) **Deficit markets in a radius of 200 km**: The deficit markets in the radius of 200 km are great enablers for agriculture production cluster development because they act as immediate demand centres for the agriculture produce of the cluster. In Gumla’s case, the markets in Gumla and its neighbourhood were grossly deficit and incentivised the producers to supply their diverse and surplus crops to it.

5) **Funds to invest in rural infrastructure**: Initial funds from the donors or government for technical assistance and productive rural infrastructure development such as irrigation facilities, aggregation centres etc are good enablers for the agriculture production clusters development. This also demonstrates the importance of making productive investments to the farmers which could be replicated by them in the future. For example, the Gumla farmers have already successfully replicated lowland wells in the district.
5.0 End to End Tasar Silk Value Chain Model in Jharkhand

5.1 Context

5.1.1 Districts in Jharkhand
The intervention was initiated in Tasar silk production cluster of Godda, Dumka and Pakur districts of Jharkhand. It was then further replicated in another Tasar silk cluster of West Singhbhum, East Singhbhum and Seraikela districts of Jharkhand. These districts are predominantly hilly protected forested areas with undulating topography, which makes it unsuitable for agriculture production. As the main occupation of the inhabitants is agriculture, subsistence paddy mono-cropping is followed in the area. However, the yields are very low which feeds them only for six to seven months. Therefore, they depend on Tasar cocoon production as an alternative means of livelihood. The Tasar cocoon production has been happening in these clusters from time memorial with one generation bequeathing the patch of forested land to another generation over the years. Even though these are protected forests, Jharkhand has recognised the Tasar cocoon production as a forest activity and locals are allowed to access the forest to pursue it.

5.1.2 Project:
A collaboration between the Union Ministry of Rural Development (MoRD), Central Silk Board (CSB), and PRADAN led to the direction of large-scale public finances to remote villages, with the objective of enabling over 10,000 families below the poverty line to gain robust livelihoods in Tasar sericulture. This collaboration has taken place through two special Swarnjayanti Gram Swarozgar Yojana (SGSY) projects, one each for Bihar and Jharkhand. In this collaboration, the MoRD provided the finances, CSB provided both funds and technology, and PRADAN implemented the projects. A total of Rs 187.0 million has been invested in the SGSY projects, which include Rs 89.3 million from MoRD, Rs 16.1 million from CSB, Rs 36.8 million as credit from banks and SHGs, and Rs 44.8 million from people’s contribution.

5.1.3 Beneficiary:
There are 12000 families being served in the two production clusters with Santhal tribe dominant in the Godda, Dumka and Pakur district, while Ho tribe dominant in the West Singhbhum, East Singhbhum and Seraikela districts of Jharkhand. Tasar silk was selected for the intervention because of the two reasons:

1) Tasar cocoon production is a very important livelihood source for the locals living in these areas

2) The cocoon production mainly happens between the transplantation and harvesting of paddy when there is slack labour to undertake the activity.

5.1.4 Overview of a typical silk value chain:
Production of Tasar silk involves rearing silkworms to produce the cocoons, and processing the cocoons to make yarn and fabric. Tasar silkworms eat leaves of Asan (Terminalia tomentosa) and Arjuna (Terminalia arjuna) trees during the larval phase of their life cycle in forests or plantations. The larval phase ends with the spinning of silk cocoons. Silk is extracted from the cocoons to make yarn that is woven into fabric as show in figure on the next page.
5.2 Model

5.2.1 Information about Tasar silk value chain before the intervention:
Before the intervention, the rearers and weavers were involved in the traditional Tasar silk value chain which had many intermediaries due to which rearers’ and weavers’ margins were getting squeezed. The following inefficiencies were observed in the value chain:

1) There was shortage of Disease Free Layings (DFLs) of the Tasar moth at the village level
2) The crop cycle was too long with the crop being realised only once in four years
3) Traditional silk rearing practices were being practiced leading to low productivity
4) Weavers used to face shortage of cocoons regularly and pay higher prices because of hoarding operations of cocoon hoarder
5) Non-value added hoarding operations of cocoon hoarder had not only built additional cost in the value chain, but also distorted the market
6) Yarn making was done by hands and thighs, generally by weaver’s wife, which involved drudgery and resulted in poor productivity
7) The commissions were being charged at three levels of petty cocoon traders, fabric agents and fabric wholesaler which substantially increased the transactional cost, and hence squeezed the primary beneficiaries’ (rearers and weavers) margin.
8) Primary beneficiaries (rearers and weavers) were able to capture only 30% of the total price of the final product

The diagram on the next two pages shows the following:

1) actors involved and inefficiencies encountered in the traditional value chain
2) cascade chart showing primary beneficiaries’ share in the traditional Tasar silk value chain as 30%
### Inefficiencies at various levels

<table>
<thead>
<tr>
<th>Inefficiencies at rearer level</th>
<th>Inefficiencies at petty trader level</th>
<th>Inefficiencies at cocoon hoarder level</th>
<th>Inefficiencies at weaver level</th>
<th>Inefficiencies at agent level</th>
<th>Inefficiencies at fabric wholesaler level</th>
<th>Inefficiencies at retailer level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortage of DFLs</td>
<td>Commission charged</td>
<td>Distorting the market by hoarding</td>
<td>Shortage of cocoons due to hoarding</td>
<td>Commission charged</td>
<td>Commission charged</td>
<td></td>
</tr>
<tr>
<td>Traditional rearing practices followed</td>
<td></td>
<td>Non value added operation built costs in the value chain</td>
<td>Traditional reeling operations involved drudgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop was being realised once in four years</td>
<td></td>
<td>Percentage of price capture is low</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of price capture was low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 14:** Schematic diagram depicting the traditional Tasar silk value chain
Figure 15: Cascade chart depicting the margins of value chain actors in traditional backyard poultry value chain in Kesla
5.2.2 Transformed Model and details about the intervention

Keeping these inefficiencies in mind, an end to end model was adopted to eliminate many intermediaries in the value chain and bring value added activities closer to the primary beneficiaries in order for them to gain better price realisation. The diagram and table on the next two pages provides the overview of the model and the role of each value chain actor.

The intervention to realise this new end to end model were as follows:

1) Hamlet-level groups of rearers called Tasar Vikas Samitis (TVS) were promoted to ensure participation of rearers at every stage

2) Scientific rearing practices were promoted to reduce diseases and mortality among silkworms

3) Plantations of Tasar host trees was raised on privately owned wastelands

4) Village-based, Tasar egg-production centres called grainages, were promoted to ensure a supply of DFLs

5) Special measures were taken to deal with the risk in production, including prophylactic measures, rearing early stage worms to ensure protection against predators, and insurance for the crop, the rearer, spouse and one dependent, especially a girl child

6) Tasar yarn production was promoted among women in poor and marginalized communities, and creating common facility centres in villages for the same

7) Producers’ company of women yarn producers was promoted to aggregate all the yarn produced by various groups and sell it at Bhagalpur market, rest of the country, and export market

8) Motivational trainings were conducted to enable cocoon and yarn producers to set higher goals.

9) Specialized marketing organization was established to market hand-woven, off-the-loom made-ups such as stoles, scarves, shawls, and sarees into which the fabric can be converted.

These interventions greatly improved the price share of the primary beneficiaries with the members of the MATSUTA’s company having as much as 75% price share as depicted in the figure. It is important to note that the MATSUTA’s share in Eco Tasar company had been 90%, and therefore the price share for primary beneficiaries amounts to 7.47% (90% of total price share of 8.3%). While for the Eco Tasar Retail outlet, the primary beneficiaries’ share is 0.73%which depends on the proportion of sales that was retailed in 2011. The cascade chart depicting this is shown in page 32.
Figure 16: Schematic diagram depicting end to end Tasar silk value chain
<table>
<thead>
<tr>
<th>No.</th>
<th>Nodal Point in Value Chain</th>
<th>Institution/Functionary</th>
<th>Broad Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic seed production</td>
<td>Grainage entrepreneurs</td>
<td>To produce own supply of basic seed DFLs for the production of DFLs</td>
</tr>
<tr>
<td>2</td>
<td>Grainages or DFLs production</td>
<td>Grainage entrepreneurs</td>
<td>To provide quality DFLs to cocoon rearers</td>
</tr>
<tr>
<td>3</td>
<td>Cocoon production</td>
<td>Individual rearers drawn from SHGs; guided by local service providers, and belonging to cluster-level samits</td>
<td>To produce cocoons, and supply to the next level in the value chain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tasar Vikas Samiti at the cluster level with 300-350 rearers</td>
<td>To aggregate the production of tasar cocoons for selling in the open market as well as to the producers’ company</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MASUTA, producer company, at multi-state level</td>
<td>To procure cocoons, sort and store these, and supply to reeling units</td>
</tr>
<tr>
<td>4</td>
<td>Yarn production</td>
<td>MBTs at the village/cluster level with about 30 women reellers</td>
<td>To manage the reeling centres</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MASUTA, producer company, with a membership of over 60 MBTs, at multi-state level – majority being in Jharkhand</td>
<td>To supply quality cocoons in adequate quantity to the reeling units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tasar Cocoon Development Company, joint venture of Jharcraft (federation of weavers promoted by state government), and MASUTA</td>
<td>To procure cocoon requirements for the entire year during the season in December, and to stock it and supply to reeling units of both MASUTA and Jharcraft.</td>
</tr>
<tr>
<td>5</td>
<td>Fabric production</td>
<td>MASUTA producer company</td>
<td>To market or facilitate marketing of yarn to weavers after grading and quality control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eco-Tasar Silk Pvt. Ltd., a private company at the national level, promoted by MASUTA (majority share capital) along with a marketing professional</td>
<td>To get fabric made as per market requirements by outsourcing to weavers, dyers, finishers, and to get inputs from designers</td>
</tr>
<tr>
<td>6</td>
<td>Marketing</td>
<td>Eco-Tasar Silk Pvt. Ltd., a private company</td>
<td>To cater to the export, and domestic market for yarn and fabric</td>
</tr>
</tbody>
</table>

Table 2: Table showing the value chain actors and their roles in the end to end Tasar value chain model
## Figure 17: Cascade chart depicting the margins of value chain actors in the end to end Tasar silk value chain

<table>
<thead>
<tr>
<th>Value Chain Actor</th>
<th>Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grainage Entrepreneur</td>
<td>6,050</td>
<td>6,750</td>
</tr>
<tr>
<td>Reaper</td>
<td>6,500</td>
<td>9,263</td>
</tr>
<tr>
<td>Reeler</td>
<td>2,513</td>
<td>9,976</td>
</tr>
<tr>
<td>MASUTA Producers Company</td>
<td>713</td>
<td>2,025</td>
</tr>
<tr>
<td>Weaver</td>
<td>12,001</td>
<td>13,501</td>
</tr>
<tr>
<td>Eco Tasar Private Limited</td>
<td>1,500</td>
<td>18,001</td>
</tr>
<tr>
<td>Retailer</td>
<td>4,500</td>
<td></td>
</tr>
</tbody>
</table>

*Note: The chart illustrates the margins at each stage of the Tasar silk value chain, from the grainage entrepreneur to the retailer.*
5.2.3 Impact on the beneficiary

1) Economic benefits to primary producers: The table below summarises the economic benefits accrued to the primary producers in the region due to the intervention:

<table>
<thead>
<tr>
<th>No.</th>
<th>Nature of Benefit</th>
<th>Grainage Entrepreneur</th>
<th>Cocoon Producer</th>
<th>Yarn Producer</th>
<th>Fabric Producer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Annual Employment (person-days)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Without intervention</td>
<td>-</td>
<td>75</td>
<td>-</td>
<td>135</td>
<td>210</td>
</tr>
<tr>
<td>2</td>
<td>With intervention</td>
<td>30</td>
<td>75</td>
<td>230</td>
<td>160</td>
<td>495</td>
</tr>
<tr>
<td>3</td>
<td>Increase in employment</td>
<td>30</td>
<td>0</td>
<td>230</td>
<td>25</td>
<td>285</td>
</tr>
<tr>
<td>4</td>
<td>% Increase</td>
<td>100</td>
<td>0</td>
<td>100</td>
<td>18.51</td>
<td>135.7</td>
</tr>
<tr>
<td></td>
<td><strong>Average annual income/ family (Rs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Without intervention</td>
<td>-</td>
<td>3,500</td>
<td>-</td>
<td>10,125</td>
<td>13,625</td>
</tr>
<tr>
<td>5</td>
<td>With intervention</td>
<td>10,500</td>
<td>12,000</td>
<td>14,250</td>
<td>16,000</td>
<td>52,750</td>
</tr>
<tr>
<td>6</td>
<td>Increase in income</td>
<td>10,500</td>
<td>8,500</td>
<td>14,250</td>
<td>5,875</td>
<td>39,125</td>
</tr>
<tr>
<td>7</td>
<td>% Increase</td>
<td>100</td>
<td>242.85</td>
<td>100</td>
<td>58.02</td>
<td>287.15</td>
</tr>
<tr>
<td></td>
<td><strong>Active producers (no.)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Without intervention</td>
<td>-</td>
<td>27,500</td>
<td>-</td>
<td>8,250</td>
<td>35,750</td>
</tr>
<tr>
<td>8</td>
<td>With intervention</td>
<td>1,600</td>
<td>42,500</td>
<td>12,500</td>
<td>8,250</td>
<td>64,850</td>
</tr>
<tr>
<td>9</td>
<td>Increase in producers</td>
<td>1,600</td>
<td>15,000</td>
<td>12,500</td>
<td>0</td>
<td>29,100</td>
</tr>
<tr>
<td>10</td>
<td>% Increase</td>
<td>100</td>
<td>54.54</td>
<td>100</td>
<td>0</td>
<td>81.4</td>
</tr>
<tr>
<td>11</td>
<td><strong>Regional increase in annual employment (million person-days)</strong></td>
<td>0.048</td>
<td>1.125</td>
<td>2.875</td>
<td>0.206</td>
<td>4.254</td>
</tr>
<tr>
<td>12</td>
<td><strong>Regional increase in family Income (Rs in million)</strong></td>
<td>0.315</td>
<td>127.500</td>
<td>178.125</td>
<td>48.469</td>
<td>354.409</td>
</tr>
</tbody>
</table>

Table 3: Table showing the economic benefits to the value chain actors of end to end Tasar silk value chain

The following conclusions can be drawn about the benefits to primary producers from the table:

i. Introduction of new technology resulted in the creation of two additional livelihood options along the value chain, and increases in annual employment, ranging from 30 to 230 person-days per family
ii. Average annual income for all four categories of producers increased substantially, ranging from 58% to 242%
iii. After the intervention, all producers are earning at least Rs 10,000 annum, with the weavers earning the maximum income at Rs 16000
iv. The number of active silkworm rearers increased by 15,000 due to intervention whereas there was no increase in the number of weavers
v. The total number of people employed in the value chain at the primary level increased by 29,100 taking the total to 64,850, representing an increase of 81.4%
vi. The total annual increase in employment for the region is estimated at 4.25 million person-days, and the total increase in family income for the region is estimated at about Rs 354 million

2) Empowerment: The project has led to empowerment across the value chain, especially due to:
   i. Access to credit and new livelihood options
   ii. Access to employment during the off-season thereby increasing the staying power in the village (as opposed to stress migration of the past)
   iii. Freedom of women from the drudgery of traditional methods of reeling
   iv. Demystification of technology, and development of scientific attitude and temper
   v. New technological and managerial skills
   vi. Ability to negotiate in the market
   vii. Overall improvement in economic status

3) Gender Equity: Earlier there was a taboo against women taking up this activity, on the basis of cleanliness. Now, this is changing and women also go to the forest to collect worms. Weaving was traditionally done by weavers’ wives through a crude method, using hand and thighs. The drudgery involved in such a method has been eliminated with the introduction of modern machines. With the elimination of this drudgery and increased income from the reeling and spinning activities, the status of women in the family and society has gone up.

5.3 Analysis

5.3.1 Critical Factors of Success

1) Masuta Producers Company: MASUTA producer’s company, promoted by 60 Mutual Benefit Trusts (MBTs) of women reebers, has enabled the primary beneficiaries to gain more margins by reducing the intermediaries in the value chain. To promote year round supply of cocoons, it has also collaborated with the state government-promoted Jharcraft to promote a special joint venture to look after procurement and storage of cocoons because the production of cocoons is seasonal.

2) Grainage Entrepreneurs: The supply of quality DFLs from the grainage entrepreneurs has significantly addressed the constraint of shortage of quality DFLs. This has led not only to increased productivity, but also to more marketable and better quality cocoon production.

3) Eco Tasar Silk Private Limited: The Company has successfully started manufacture and sale of value-added products from part of the yarn produced by MASUTA, leaving the rest to be marketed by its parent company. This has transformed the silk value chain to become end to end allowing
value added activities of marketing and retailing to come closer to the primary beneficiaries, thus increasing their margins.

4) **Introduction of modern technologies**: The introduction of modern practices and technologies for performing sericulture activities such as reeling and rearing has improved the productivity and made the products more marketable. This has also contributed greatly to reducing the drudgery of the reeling activity which was generally being performed by women.

5) **Technical assistance from Pradan and Central Silk Board**: The technical assistance offered by Pradan and CSB has been critical in revolutionising the silk value chain. They have been instrumental in building capacities of the primary beneficiaries as well as introducing modern practices and improved technologies.

5.3.2 **Factors to keep in mind before replication**

1) **Agro-climatic conditions**: The activity should be taken up in the areas that have suitable agro-climatic conditions to support sericulture. The optimum temperature and humidity for maximum productivity growth ranges from 23°C to 28°C and 75% to 80% respectively. The land should also be appropriate for the growth of Asan and Arjun tree which are the host trees for breeding of Tasar silkworm.

2) **Time availability for beneficiaries**: For the successful replication of model, it is important to check whether the potential beneficiaries have sufficient time available to pursue this operation. This will ensure that the project avoids the scenario where the beneficiary takes little interest in engaging in the proposed silk business because of the other activities such as irrigated agriculture.

3) **Access to finance to fund productive investments for transforming the value chain**: In this case, the funds from MoRD and CSB enabled the project to finance technologies as well as capacity building efforts led to the transformation of Tasar silk value chain. Therefore, there should be a provision to access funds (government or private) for making the productive investments to transform the value chain.

4) **State of the value chain**: This model can lead to substantial gains in the value chain only when the value chain has many intermediaries which are increasing the transaction cost. Therefore, it is important to analyse whether the value chain is a typical traditional one with many intermediaries or has it overtime graduated to be one with less intermediaries. The more the value chain leans towards a typical traditional value chain, the more the rationale of replicating the model.
6.0 NDDB Dairy Value Chain Model in Chittoor district (Andhra Pradesh)

6.1 Context

6.1.1 Chittoor district
Agriculture is the main occupation of the Chittoor district of Andhra Pradesh. Around 70% of the lands in Chittoor are dry lands and rain fed crops are grown in them. The district is the second largest producer of milk in India with dairy industry being the largest in the state. Therefore, milk is an important livelihood option for the district. Groundnut and sugarcane are the major commercial crops with mango being the major horticulture crop. It is important to note that the district is classified as one of the most backward district in India and is one of the thirteen districts in Andhra Pradesh receiving funds through Backward Region Grant Fund Programme. Thus, there is a lot of scope for poverty alleviation in the district.

6.1.2 Project:
In erstwhile Andhra Pradesh, Chittoor Milk Union was one of the district cooperative milk unions which received substantial financial assistance under Operation Flood Programme including setting up of Balaji dairy - a milk processing unit in Tirupati. The Union was unable to efficiently manage the operations and cope with competition from the private dairies in the district, which led to it becoming defunct late 1990s. The Union was also unable to repay the loan amounts and interests there on to National Dairy Development Board (NDDB). Therefore, the Union handed over the management of Balaji Dairy to NDDB in May 2000 following which NDDB undertook different interventions to develop a sustainable and viable business model for profitable dairy operations.

6.1.3 Beneficiary:
The beneficiaries of the NDDB’s intervention were smallholder milk producers, which were part of the private dairy value chain. Prior to the intervention, the limited dairy market actors in the private dairy value chain had made the private dairies to have high bargaining power and offer less than average market prices to the smallholder milk producers.

6.2 Model

6.2.1 Information about milk value chain before the intervention:
Chittoor Milk Union which was providing market and related services to the rural milk producers through its network of village dairy cooperatives spread over the district, had received substantial financial assistance from NDDB under the Operation Flood Programme (OF).

Specifically, during the third phase of OF, considering the growing milk procurement and capacity constraint faced by the milk union (at its dairy plant located in Chittoor), NDDB had extended financial assistance for setting up a dairy plant near Tirupati. It was envisaged that this new dairy plant named as Balaji dairy when ready, would be able to handle milk procured from the eastern part of the district, process/ condense the milk and enable Union’s linking with the northern and eastern markets of the country through long distance train transportation.
Unfortunately, by late 90s, with increasing competition from private dairies in the district coupled with inadequacies in governance and other constraints, the Union failed to effect timely payment to milk producers (delays by several weeks for the milk received) leading to loss of faith of its members, dwindling of milk collection/handling and the organisation becoming defunct. The Union also defaulted in repayment of loan and interest there on to the NDDB in respect of finances received under OF.

As the Union had become non functional, it was also unable to have the Balaji dairy works completed and commissioned. Faced with this complex situation, the Union’s management decided to hand over Balaji dairy pending construction work and installation of machinery/ equipment to the NDDB with a request to complete the works, commission the plant and also initiate milk procurement in the area.

After taking over the Balaji dairy by NDDB, it took a little more than 2 years to complete the works and commission the plant. During this period of crisis, taking advantage of the Milk Union’s defunct status, private dairies operating in the area resorted to exploitative practices including formation of a cartel to have the purchase price for milk as low as possible. This led to a situation of milk production becoming an uneconomical proposition getting to the extent of disposal of milch animals by the farmers in several villages.

The following inefficiencies were observed in the private value chain:

1) Limited and uncertain milk collection: Milk collection from the private dairies was limited and uncertain. There were no alternative market outlets for the smallholder producer but private dairies. Therefore, the bargaining power of the smallholder was quite low.

2) Lack of production incentives: The private diaries were not offering competitive prices to the smallholder milk producers. In addition, the private dairies did not incentivise the producers for the better quality milk by conducting quality tests, resulting in little incentive for milk production.

3) Low price offered: The monopolistic tendencies of the private dairy led to low prices being offered to the smallholder milk producers.

4) Frauds and delays in payment: The high bargaining power of the private dairies resulted in payment delays. In addition, there were high incidences of fraudulent dairies emerging which were regularly duping farmers of money by collecting money in advance and never paying them.

The diagram on the next page shows the actor involved and inefficiencies encountered in the private value chain.
Consequently, with a view to revive producer centric operations in the district, after taking over the Balaji dairy and completion of pending works related to construction, installation and commissioning of the plant, NDDB decided to initiate milk procurement operations. This initiative called New Generation Cooperative Initiative (NGC) was undertaken with a clear vision to create a strong Milk Producers’ Organisation that would become a strong counter veiling force providing better returns to the milk producers of the area. For this purpose, a team of officers was deployed (in the year 2002) by NDDB and Mother Dairy (NDDB’s wholly owned subsidiary) to manage dairy plant operations of Balaji dairy as well as organising milk procurement by setting up milk collection and testing facilities in the villages. Till February 2005, Balaji Dairy had confined its milk procurement operations to about 50 km radius from the dairy plant at Tirupati.

Considering the positive feedback from the milk producers who were supplying milk to the Balaji Dairy, the district administration requested Balaji Dairy to extend its area of operation in order to benefit a larger number of milk producers. Since Chittoor district is spread over a vast area, it was not possible to procure milk from farther places without having intermediate chilling facilities. Taking note of this constraint, in order to enable NDDB/Mother Dairy to expand its operations/cover larger number of milk producers, the District Collector who also happened to be the Chairman, DRDA, offered assistance for setting up Bulk Milk Chilling Units (BMCU) and have them managed by the Mandal Mahila Samakhyas. With this initiative and help from the District authorities, from Feb 2005 onwards till date, 52 BMCUs were established and in respect of these, Balaji dairy undertook:

1) Organising Milk Pooling Points (MPP) with milk collection/testing facilities in the cluster of villages surrounding each BMCU,

2) Training of a person in each of these villages with MPP for managing the functions at the MPP (She is called ‘Palamitra’)

3) Training the staff of Mandal Mahila Samakhyas (MMS) in all aspects of managing BMCU operations (reception of milk, testing, chilling and maintenance of BMCU)
4) Arranging for transport of milk from villages (MPPs) to BMCUs (from cluster of villages linked with BMCUs) and transport of milk from BMCUs to the dairy plant in Tirupati

5) Regular and timely payment to the producers towards supply of milk at MPPs

6) Payment of service charges to MMS (towards BMCU operations) and Palamitras in the villages (for milk collection and related tasks in villages)

7) Providing required technical support to MMS in operation and maintenance of BMCU. For installation of BMCU, the DRDA either arranged to have a suitable building constructed based on a design / plan and guidance provided by Balaji dairy or arranged an appropriate hired premises.

8) The entire quantity of milk procured by Balaji Dairy was being processed, condensed and transported to Delhi in bulk by Rail tankers

---

### Figure 19: Schematic diagram depicting NDDB dairy value chain

<table>
<thead>
<tr>
<th>Efficiencies gained at farmers level</th>
<th>Efficiencies gained at MPP level</th>
<th>Efficiencies gained at Bulk Milking Cooling Units level</th>
<th>Efficiencies gained at Balaji dairy level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assured milk collection at regular intervals</td>
<td>No commission charged</td>
<td>Economies of scale realised in the cooling operations through intricate network of MPPs</td>
<td>Assured supply of milk reduces risk thus increasing investment</td>
</tr>
<tr>
<td>Competitive price offered</td>
<td>Fat tests done so as to reward for quality of milk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payment made in 15 days</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Case Studies of Successful Pro-poor models in India,
Abhinav Kumar Gupta, The World Bank, September 2015
6.2.3 New Developments

Shreeja Mahila Milk Producer Company (Shreeja MMPC): With the NGC operations centred around Balaji dairy having attained the expected scale and size for the business to become viable and sustainable, NDBD Dairy Services recently took the initiative of forming Shreeja Mahila Milk Producer Company Limited (Shreeja MMPC). Shreeja MMPC, an all women milk producer company, was registered on 03rd July 2014, with its Head Office in Tirupati, started its business operations from 15th September 2014. Entire milk procurement and related operations of Balaji dairy (NGC) has since been transferred to Shreeja MMPC which is a business enterprise 100% owned by its women members who are the share holders as well as suppliers of milk to the Company.

The main objective of Shreeja MMPC is to carry on the business of pooling; purchasing, processing of milk and marketing of milk to create maximum value for its members, at the same time provide good quality milk and milk products to the customers. Currently it operates in Andhra Pradesh covering two districts namely, Chittoor and Anantapur.

Milk Collection: The Company collects milk from the milk producer members through village level Milk Pooling Points (MPPs) established for this purpose. In order to ensure transparency of operations, for milk collection and testing of each member’s sample of milk a Data Processor based Milk Collection Unit i.e. DPMCU has been installed at about 760 MPPs and at the remaining MPPs, testing is done by using an Electronic Milko Tester (EMT) at the MPP or nearest BMC/MPP, where DPMCU is installed. The Company has plans to install DPMCUs at each of its MPP.

Milk Chilling: Currently, there are 107 BMCUs (52 provided by DRDA/SERP to Mandal Mahila Smakhyas and 55 owned by the Company) and one hired chilling centre in the area of operation. As far as the BMCUs provided to Mandal Mahila Smakhyas, Shreeja MMPC has continued with the same arrangement that existed before it’s taking over of operations.

Processing and Marketing: The company supplies the entire quantity of milk procured to Mother Dairy, Delhi in bulk (Mother dairy arranging to process, condense and transport by Rail tankers to Delhi). The five year business plan of the Company includes retail marketing of packed milk in different variants as well as products such as curd and butter milk etc.

Productivity Enhancement related services: Presently Shreeja MMPC is providing balanced compound cattle feed and mineral mixture to its producer members under animal productivity enhancement services. Currently, about 400 MT per month cattle feed is being sold per month. The Company plans to provide milk producers integrated doorstep delivery of animal productivity enhancement services. The Company would soon initiate project activities (Artificial Insemination (AI), Ration Balancing Program (RBP), fodder development, milk collection and bulking) under the National Dairy Plan (NDP-1), enabling convergence of milk pooling, improved animal nutrition, higher conception rates and genetically improved animals in the same area to derive maximum benefits from the project.

As on 31st March 2015, Shreeja operations were spread over in two districts of Andhra Pradesh covering about 900 villages with a membership of about 41000 through 2400 MPPs with a procurement of about 2.40 LKgPD. The Company plans to grow its current membership base to 0.78
lakhs during the project period. The company expects to procure around 4.32 LLPD of milk in the terminal year of the plan. The Company’s turnover is projected to grow from approximately Rs. 163 cr. in 2014-15 to around Rs. 476 cr. in 2017-18.

Shreeja MMPC has been formed with an objective of maximising returns to its members through professional management and by harnessing capital, markets and technology thus ensuring business growth without undermining the basic cooperative character of democratic governance and autonomy.

6.2.4 Impact on the beneficiary
1) Income increase: The intervention was quite successful and the smallholders were able to access a better price than what they had been receiving from private dairies. The increase in the price serves as a good proxy for increase in the income of a smallholder milk producer. In addition, the smallholder milk producers were eligible to receive share dividends and patronage bonuses from the producer company depending on their share of milk supplied to the producer company.

2) Assured market: The procurement of milk by Producer Company has enabled the farmers to get an assured market for their products. It is important to mention that the producer company was able to do so much procurement because of the presence of large buyer in the form of Balaji dairy at the end of value chain. The assured market at the end of chain has incentivised the farmers to invest in the dairy business wherever possible by increasing the milk productivity or production capacity.

6.3 Analysis
6.3.1 Critical Factors of Success
1) Promoting active participation of members: Active participation of farmer Producer Company and Mahila Samakhya Mandal members have been encouraged in both business and governance by formulation of the following policies:
   i. Patronage based member classes and representation of these member classes in board to ensure inclusiveness in governance
   ii. Producer company will do business strictly with the members with members’ equity built into the operations in proportion to their patronage

2) Leveraging information technology and data management to ensure transparency: The information technology services were leveraged for computerising the operation which enhanced the transparency. Due to this, all the members of the producer organisation started getting payment in a 15 day cycle based on the quality parameters of milk that they had supplied.

3) Appropriate mechanism of communication and redressal: A dedicated unit has been set up to look into members’ issues and take relevant steps for their redressal. Where relevant, the information from the database is used to transparently and quickly address any issues concerning payments and quality of milk supplied. Regular meetings are also conducted to disseminate important information to the members in relation to milk procurement as well as financial information, especially pertaining to dividend and bonus payment.
4) **Professionally managed business operations**: Frequent trainings offered to members have considerably improved their technical and business skills in relation to running a successful milk procurement business. The technical assistance of NDDB has been critical in this respect.

6.3.2 **Factors to keep in mind before replication**

1) **Beneficiary income through the milk as a proportion of total income**: For the successful replication of model, it is important to check whether milk constitutes sizeable percentage to the potential beneficiaries’ income and whether they have sufficient time available to pursue this intense operation. Ideally, this percentage should be more than 30%. This will ensure that the project avoids the scenario where the beneficiary uses produced milk for self consumption because of the other sizeable income sources or alternatively, takes little interest in developing the milk business because of its low importance in his livelihood share.

2) **Access to market for milk**: The model is only fit to be replicated in the areas where market access is a major constraint. This is because if the milk producer is able to access market easily and gain higher price by retailing directly to consumers as is the case with peri-urban areas, there would be little rationale for him to join a farmer producer organisation for exploiting economies of scale and reducing his risk. Therefore, it would be ideal to do a market mapping exercise and get a clear evidence of constraints observed in market access.

3) **Assured Market**: In order to replicate the strengthened farmer producer group model with intricate network of MPPs, there should be an assured and more attractive market in terms of price, especially in the initial 3-5 years, for the beneficiaries to join the farmer producer group and for farmer producer group to earn enough revenues to invest in the productive capacities of beneficiaries.
7.0 Ajeevika Fresh Retail Stores linked Vegetable Cluster Value Chain Model in Madhya Pradesh

7.1 Context

7.1.1 District
Ajeevika Fresh retail stores linked vegetable clusters have emerged in 14 project districts of Madhya Pradesh. Most of these districts have predominantly tribal population with agriculture as their main activity. Most of the farmers in the district were growing paddy, millets, cluster beans and soya beans before the project interventions.

7.1.2 Project:
These interventions have been financed by the second phase of Madhya Pradesh District Poverty Initiative Project (MPDPIP II). The broad objective of the project is to empower the rural poor in Madhya Pradesh by improving their capacities and opportunities for achieving sustainable livelihoods.

7.1.3 Beneficiary:
The beneficiaries of the project are rural poor in the 14 project districts, who were involved in traditional agriculture. This intervention sought to help transform their livelihoods depended on traditional crops such as millets to cash crops of vegetables. Vegetables were chosen because of the high price and potential of multiple harvests in the year.

7.2 Model

7.2.1 Information about value chains before the intervention:
Before the intervention, the beneficiaries were involved in the traditional value chains of soyabean, cluster bean, paddy and millet which had many intermediaries due to which producer margins used to get squeezed. The following inefficiencies were observed in the value chain:

1) There were delays observed in receiving cash from the local aggregators

2) There was little incentive for quality production at the farmer’s side as they were not exposed to grading standards

3) The farmers used to take loans at high interest rates from the money lender, sometimes keeping their land as collateral which used to drastically increase their risks

4) The lack of irrigation facilities compelled the farmers to grow traditional rain-fed crops

5) Weighing malpractices were rampant in the local aggregator level where manual weighing and grading was being done

6) The commissions were being charged at three levels of local aggregator, mandi trader and wholesaler which substantially increased the transactional cost, and hence squeezed the farmer’s margin.
7.2.2 Transformed Model and details about the intervention

Keeping these inefficiencies in mind, Ajeevika Fresh Retail Stores linked Vegetable Clusters model was adopted to eliminate many intermediaries in the value chain and gain better price realisation for the farmers. The following interventions were taken to realise the model:

1) The farmers were provided access to irrigation through irrigation infrastructure including drip irrigation which enabled them to transition to irrigated horticulture production

2) The farmers were provided access to seeds at a nominal prices and fertilisers in a timely manner

3) The farmers were given trainings on modern farm technologies and irrigated agriculture production such as drip irrigation system, poly mulch, poly nursery and vermicomposting. The technical assistance support of Community Resource Persons (CRPs) was critical in adoption of these production practices by the farmers.

4) Sixty three Ajeevika Fresh retail stores were opened in all the fourteen districts which provided direct market linkages to the project beneficiaries and brought value add closer to the farmer. This direct linkage incentivised the farmers to undertake market driven and high quality production
5) Farmers were provided working capital loans at 0.5% interest rate through the project which helped them escape the debt trap of the money lender and in the process considerably decreased their risk.

The diagram below provides the overview of the model.

![Diagram](image)

<table>
<thead>
<tr>
<th>Efficiencies gained at Farmers level</th>
<th>Efficiencies gained at retailer level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash deposited in the bank in a timely manner</td>
<td>Consistent supply of good quality products</td>
</tr>
<tr>
<td>Irrigation facilities set up</td>
<td></td>
</tr>
<tr>
<td>Loans provided at nominal rates from project</td>
<td></td>
</tr>
<tr>
<td>Incentives for quality production</td>
<td></td>
</tr>
<tr>
<td>Direct link with Ajeevika Fresh retailers</td>
<td></td>
</tr>
<tr>
<td>decreases margin charged</td>
<td></td>
</tr>
<tr>
<td>Incentives for quality production due to exposure to grading standards</td>
<td></td>
</tr>
</tbody>
</table>

Figure 21: Schematic diagram depicting Ajeevika Fresh Retail Stores linked Vegetable Cluster Value Chain Model

7.2.3 Impact on the beneficiary

1) Increase in the income: The incomes of the farmers increased substantially from the uptake of irrigated agriculture as well as direct market linkage to Ajeevika Fresh Stores. For example, the income per acre of chilli production was 14 times than that of conventional rice and soybean production which was widely practised before the intervention.

2) Increase in the job opportunities: Additional employment opportunities were created not only because of the high value horticulture production, but also because of the opening of the Ajeevika stores.

3) Reduction in risk through regular incomes: Unlike the traditional crops which have six months cycle, the vegetables have 3 months cycle which allowed the farmers to have three harvests. This regular stream of incomes as well as access to irrigation substantially reduced the risks of farmers.

7.3 Analysis

7.3.1 Critical Factors of Success

1) Irrigation: The access to irrigation was an important factor that enabled the farmers to undertake horticultural production. This allowed them to transition from long cycles of traditional crops to short cycles of vegetables, thus considerably reducing their risks.
2) **Market Linkage to Ajeevika retail stores**: The direct market linkage ensured that the farmers had access to assured market which brought the value closer to them as well as exposed them to the quality demanded by customer. The latter has resulted in them planning their next production in a market driven way.

3) **Access to working capital**: The working capital loan at a nominal rate of 0.5% helped the farmers to break away from the debt traps of money lenders as well as build their risk appetite to uptake high value added horticultural production.

4) **Timely access to quality seeds and fertilisers**: The timely access to seeds and fertilisers has been critical in increasing the productivity.

5) **Technology and sustainable agriculture practices**: The farmers were given regular trainings by CRPs on modern farm technologies and irrigated agriculture production practices such as drip irrigation system, poly mulch, poly nursery and vermicomposting which have enabled them to adopt these practices with ease, thereby considerably improving their productivity and incomes.

### 7.3.2 Factors to keep in mind before replication

1) **Land conducive for irrigation infrastructure development**: It has to be seen whether the potential area of intervention has the right water table and topography for the development of irrigation infrastructure as was the case in 14 districts in this case.

2) **Agro – climatic conditions and natural resources endowment**: It has to be checked whether the potential area of intervention has the right agro-climatic conditions and natural resources endowment such as temperature, humidity, soil etc. for the development of a horticulture production cluster in the region.

3) **Road connectivity to market**: As the farmers were directly supplying the produce to Ajeevika retail stores, the proximity or connectivity to road was important for them. Therefore, it has to be checked whether the potential area of intervention is close to the roads or not.

4) **Financing to set up the eco-system of innovation**: MPDPIP2 project financing allowed setting up and coordination of service providers and value chain actors which contributed for the project to develop necessary eco-system of innovation which resulted in positive results on ground. Similarly, it has to be checked whether there will be enough resources in the potential area of intervention to have a similar robust service delivery and coordination model in place.
References and Sources

The following reference and sources were used to write the cases:

1) Maize Aggregation and Marketing model in Purnia (Bihar)
   i. Key Informant Interview of TechnoServe team
   ii. Internal documents and powerpoints of TechnoServe

2) Smallholder Cooperative Poultry Value Chain model in Kesla (Madhya Pradesh)
   ii. Key informant Interview of Pradan team

3) Agriculture Production Cluster Linked Value Chain Model in Gumla (Jharkhand)
   i. Key informant Interview of Pradan team

4) End to end Tasar Silk Value Chain Model in Jharkhand
   ii. Key informant Interview of Pradan team

5) NDDB Dairy Value Chain Model in Chittoor District (Andhra Pradesh)
   i. Key informant Interview of NDDB team

6) Aajeevika Fresh Retail Stores linked Vegetable Cluster Value Chain Model in Madhya Pradesh
   i. ‘Aajeevika Fresh – MPSRLM’ video retrieved from YouTube
   ii. Key informant Interview of World Bank Task Team