

## OPTIMIZATION OF REVERSE LOGISTICS IN INDIAN SEED INDUSTRY.

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### **An Executive Summary of the Case:**

The case study discusses the challenges faced by Namdhari Seeds Pvt. Ltd., a leading seed company in India, in optimizing its reverse logistics operations. The company has witnessed a high rate of seed returns, ranging from 9% to 16.3% over the past few years, which has had a significant impact on the company's profitability and operations. The key issues identified include the bullwhip effect in the supply chain, financial implications of reverse logistics, data management and traceability challenges, product quality and viability concerns, and the impact of seasonality on timely processing of returns.

To address these challenges, the company is seeking strategies to improve the efficiency of its reverse logistics processes. Potential solutions include forecasting sales based on seasonality, mitigating the bullwhip effect, implementing robust data management systems, ensuring timely returns and proper storage conditions, and providing comprehensive customer support. By optimizing its reverse logistics operations, Namdhari Seeds Pvt. Ltd. aims to reduce the seed return rate, improve profitability, and enhance customer satisfaction.

**Introduction:** Mr. Shailesh Lanke, Head of Supply Chain Management has blocked the date on his calendar to discuss on the alarming rate of returns in the seeds business at the organisation. Mr. Shailesh Lanke conducted a brainstorming session to discuss the increased rate of returns of seeds with all the team members first to service the affected customers quickly through optimized operation of reverse logistics and secondly reverse such high trends in the returns regarding seeds business. Some key members of the team argued that many factors are contributing to the issue, such as seasonality, return delays from dealers, variation in the market demand, process delays etc. while others have favoured the argument that organization needs to re-look into its supply chain redesign, optimization of various operations in reverse logistics with likely adoption of new technology and data driven approaches for achieving the stated objectives. Mr. Shailesh Lanke read through the reports and documents provided by Mr. Sreeranganath M.L, Manager of Warehouse and Logistics.

There were many issues and complications that required close and detailed analysis. Optimization of reverse logistics processes for quick servicing of affected customers through corrective action measures is the major agenda on the card to be taken up on priority.

**Background of the Company:** Namdhari Seeds Pvt Ltd Bidadi, Karnataka was founded by Mr. Uday Singh in the year 1985. Under the able guidance and leadership of Mr. Uday Singh-Chairman and Managing Director, the company started its production of vegetable seeds and garnered both export and domestic business. Company export seeds to various countries in the Europe and to USA by adhering to the strict international quality standards.

Now the company is producing approximately 20 different crops, 500 hybrid and 20 open pollinated seed varieties. The company engages with contract farming of around 4000 hectares yearly for production of several variety of seeds. Namdhari Seeds Pvt Ltd has a high reputation for providing quality seeds, meeting the requirements of its customer around the world.

The company has witnessed a massive growth in the past few years due to its state-of-the-art world class infrastructure, intensive research & development activities, dynamic marketing, and network of their newly located production facilities. The company has expanded in Southeast Asia and Middle East. It has trailing stations at Bangladesh, Thailand, Indonesia, and Vietnam. In Middle East trailing stations are in Egypt, Jordan, and Turkey. The company has 800 distributors and 15000 dealer touch points. The Namdhari seeds Pvt Ltd has been recognized as India's largest Producer and Exporter of Quality Seeds.

**Seed Industry Background:** As per Federation of the Seed Industry of India (FSII), the Indian seed industry is estimated to be US \$ 3 Billion and growing and the annual global seed market is about US\$ 45 Billion. India has a potential to capture at least 10 percent of the global market by 2028 as per FSII estimate and currently the seed export from India is about US \$ 0.2 Billion per annum. The Indian seed industry holds immense potential driven by advancement in biotechnology, robust R&D, and more and more private sector companies entering this area of business. With a diverse agricultural-climatic landscape, India can develop and export a wide variety of seeds, meeting both domestic and international demand. The Indian seed industry's growth can be attributed to favourable government policies, public-private partnerships, and a strong focus on sustainability and climate-resilient agriculture. Innovations in digital agriculture and precision breeding techniques further enhance seed quality and productivity. By addressing challenges such as quality assurance and regulatory hurdles, the Indian seed industry can significantly contribute to global food security and sustainable agriculture practices of the whole world.

#### **Present Supply Chain Infrastructure Capabilities at Namdhari Seeds Pvt Ltd**

- **Planning teams:** Dedicated teams that ensure the supply chain is efficient and well-prepared.
- **Logistics:** An experienced team that ensures timely delivery of seeds from production to the market
- **Warehousing:** Advanced infrastructure to store seeds in favourable conditions to ensure quality
- **In-house laboratories:** A Seed Quality lab that uses in-house skills and internationally accepted protocols.
- **Protected cultivations:** High-tech greenhouses and precision agriculture to grow export-grade products.
- **Distribution points:** Presently company has its presence in 17 states on Indian subcontinent. In each district it has its own office with a dedicated staff and experts. The

district office will cater the needs of distributors and distribution points. The company has its processing, quality control, R&D facility, and central warehouse at Bidadi, Bangalore. All the products will be distributed across India by central warehouse situated at Bidadi, Bangalore. It has 15,000 distribution points within India, and a network of over 800 distributors globally.

**Reverse logistics:** It involves handling returned products due to defects, end-of-life recycling, or excess inventory. It aims to reduce operational costs by reclaiming value, enhance customer satisfaction through hassle-free returns and exchanges, optimize inventory management, integrate reverse logistics into supply chain management, and capitalize on returned goods for resale. However, challenges include complexity in handling returns, additional transportation costs, and the need for specialized processing facilities. Overall, optimizing reverse logistics can lead to a more streamlined and responsive supply chain.

**Core Issues and Challenges of Reverse Logistics in the Company:** With a main objective of optimization of reverse Logistics operation for efficient and quick servicing of returns, Mr. Shailesh Lanke with his team analysed the data and the following issues emerged.

- **Seeds Return Rate:** The company has recorded the seed return rate of 9 percent, 11 percent, and 16.3 percent for the year 2020-21, 2021-22 and 2022-23 respectively. The detailed data are shown in the Exhibit-1, Exhibit-2, and Exhibit-3 respectively.
- **Impact of Bullwhip:** He was sensing the effect of bullwhip in the supply chain but not very sure of its existence. It is a phenomenon where small changes in customer demand can cause large fluctuations in inventory and production levels throughout the supply chain. It is caused by information systems and decision-structures used by managers in the supply chain.
- **Financial Impact and Cost Management:** Issues related to transportation, handling, warehousing, and disposal of returned products, that has implications on the overall financial aspects of reverse logistics. Namdhari Seeds Pvt. Ltd. incur cost for transportation, inspection, processing, and potential disposal or refurbishment of returned seeds. Balancing these costs against potential revenue from refurbished or resold seeds require careful financial planning and reverse logistics management.
- **Data Management and Traceability:** The company was facing the issues in tracking returned seeds related to various orders all along the reverse logistics process which was essential for quality control, regulatory compliance, and customer service. The absence of robust data management system to track returns, inspection, and outcome to ensure transparency and accountability was another issue noticed.
- **Product Quality and Viability:** Seeds are perishable, and their viability is crucial for farmers. One of the primary challenges in reverse logistics for Namdhari Seeds Pvt. Ltd. is to ensure that returned seeds are assessed promptly for quality and viability. Handling and storing seeds improperly during the transportation or storage can significantly impact their germination rates and overall quality.
- **Seasonality and Timeliness:** Agriculture operates on seasonal timelines, and the return of seeds often needs to be processed quickly to ensure they can be redistributed or properly disposed of before the next planting season. Delays in reverse logistics was leading to inventory management issues and lost sales opportunities at Namdhari Seeds Pvt Ltd.

Having identified various issues, Mr. Shailesh Lanke is keen that Namdhari Seeds Pvt. Ltd. Bidadi Karnataka should look at ways and means of increasing their operational efficiency by optimising the reverse logistics process for streamlining the entire process of reverse logistics to reduce return of seeds, improve profitability, and reduce seed disposal rate. Mr. Shailesh Lanke posed the following questions to the team to discuss and suggest suitable solutions.

### Case Questions

1. How Reverse Logistics impacted on the profitability of the organisation and to suggest measures to reduce the cost of reverse logistics operation.
2. Analyse the major issues for its causes and identify issues having maximum impact and take such issues on priority for optimising the reverse logistics operation.
3. If you were in the place of Mr. Shailesh Lanke, what strategies you would recommend for overcoming the challenges faced by him.

### Teaching Note

**Synopsis of the case:** Seed industry is one of the prominent sectors which is significantly contributing to the Indian agriculture sector. Mr. Shailesh Lanke, Head of supply chain division-Namdhari Seeds Pvt. Ltd. Bidadi Bangalore wanted to optimize the reverse logistics operations in his division. He observed some issues like seeds returned rate, reverse logistics cost, traceability and data management, seasonality, product quality & viability. He has adopted certain strategies to over come the issues encountered by him such as proper sales forecasting, timely returns, good storage conditions for returned seeds. These strategies were win-win situation for both company and its dealers.

**The Target Learning Group:** This case can be thought in MBA/ Business Schools offering Post Graduate Diploma in Management through their curriculum. The case is equally useful for the Training and Placement Agencies who are working in this sector.

**Teaching Learning Objectives:** The following are the teaching objectives of the case:

- To understand the concept of reverse logistics and its Impact on organizations.
- To evaluate multiple strategies while optimizing the reverse logistics process.
- To study the major issues, one should take into consideration while optimising the reverse logistics process.

**The Case Teaching Strategy:** The learner must be aware of the concept such as reverse logistics and other relevant concepts of supply chain management; The case should be given to the students at least 2-3 days advance. Advise the learner to do prior reading and analysis of the case before coming to the class. The case may be distributed to the small group of 3-4 students. Every group will present the case analysis with power point presentation. Each group may interpret and give strategies to resolve the issues and challenges involved in the case.

- A. Individual Assessments:** The learners may apply the various situations like Issues and challenges of reverse logistics, SWOT analysis of reverse logistics, Implementation Strategy, Profitability and Cost reduction in reverse logistics. The learner should be able to explore multiple options and understand the pros and cons of the decisions which he has chosen to apply.
- B. Group Assessments:** The learner may be asked to adopt the role play of various key positions such as Supply Chain Management Head, Marketing Head, Operations Head and Dealer of Namdhari Seeds Pvt. Ltd. The Power Point Presentation can be made by SCM Head, Dealer and Operations Head to discuss the strategies to address the problems given in the case study.

### Teaching Plan:

S.No.	Details	Timeline
1.	Introduction of the case study and profile of Namdhari Seeds Pvt.	10 Min

2.	Reverse Logistics, Bullwhip effect, Sales Forecasting, Robust Data Base Management System, Product Quality & Viability, Timely Returns, Storage Condition (Inventory), and Interpretation.	30 Min
3.	Issues and Challenges involved in the Case Study and its Mitigation Strategies	10 Min
4.	Summary	10 Min

### Questions for Discussion

#### 1. Does optimization of reverse logistics process help in seed industries?

Yes. Optimizing the reverse logistics process will indeed be extremely beneficial for the seed industry. Reverse logistics involves the management of seeds moving backward through the supply chain, such as returns, reutilizing, and disposal. Optimization of reverse logistics process will be beneficial in the following aspects.

- **Cost reduction:** optimised and consolidated shipments can reduce the significant transportation expenses.
- **Traceability:** Optimized reverse logistics processes ensure traceability and documentation of returned seeds. This helps in compliance with agricultural regulations and quality standards.
- **Feedback Loop:** Seeds returns will give a valuable information about seed performance and customer issues. This will improve quality control and product improvement efforts.
- **Real-time Data:** Optimised reverse logistics process will provide real-time data on seeds returns, assisting in better forecasting and inventory management.
- **Improved Return Process:** A efficient return process will improve customer satisfaction, leading to better relationships with dealers, distributors, and farmers.
- **Minimise the inventory holding cost:** Proper handling and processing of seeds returned can minimize the time they occupy in storage, reducing holding costs.

#### 2. Describe the challenges faced by the Namdhari Seeds Pvt. Ltd in its Supply Chain?

There were couple of challenges faced by the company in its supply chain division. Some of them are listed below.

- Seeds return rate was more than the normal.
- Some issues were also noticed in the areas of transportation, handling the return seeds, warehousing, and disposal of the return products.
- The reverse logistics was costly due to transportation, inspection, processing, and potential disposal in its supply chain division.
- Seasonality was one of the challenges because, the returned seeds need to be processed quickly to ensure they can be reintubated or properly disposed before next planting season.
- Return seeds needs a specific and critical storage conditions to avoid contamination, moisture damage and exposers to pests that could compromise their quality.

#### 3. Which Strategy should be adopted for reducing the seed returns and optimize the reverse logistics operations.

An integrated strategy that incorporates the entire supply chain is essential to optimize the reverse logistics. Here are several key strategies that can be adopted. After identifications of the issues and the challenges faced in the reverse logistics area of operation, Mr. Shailesh Lanke, Head of SCM, Namdhari Seeds Pvt. Ltd., and his team discussed on the probable strategies that the company should weigh down for implementation to overcome the issues on hand.

- **Forecasting of Sales Based on Seasonality:** This will ensure seeds are dispatched to the market during optimal seasonal periods that minimize the potential for returns and maximize the profitability. Monitoring the trends and adopting the appropriate Forecast model that takes into consideration the seasonal demands can enhance the accuracy of forecast.
- **Mitigate the Bullwhip effect:** Strategies to mitigate the bullwhip effect include speculation by intermediaries, providing more information to upstream members, constrained information flows, fuzzy inventory control, collaboration, replenishment policy, and hybrid prediction models. In the seed industry, strategies include improving information sharing, implementing collaborative decision-making, and using advanced forecasting and inventory control techniques.
- **Robust Data Management Systems:** Team felt that data tracking and analysis of various data is required for tracking of returned seeds and monitoring the status throughout the reverse logistics process which is essential for quality control, regulatory compliance, and timely customer service.
- **Timely Returns and Storage Conditions:** This strategy in the market ensures that unsold products can be efficiently managed and preserved in cold storage for future seasons. With this company can effectively mitigate potential losses associated with unsold inventory while safeguarding seed quality and viability. A sufficient infrastructure and technology assistance is required for storing the returned seeds to maintain its quality and viability and to prevent contamination, moisture damage, or exposure to pests that could compromise its quality.
- **Customer Support:** Provide customers with detailed information on seed varieties, planting instructions, and care tips to reduce returns due to misunderstandings or misuse. Offer robust customer support to address issues proactively to prevent seeds returns.

#### Experience in Using the Case:

- The learners will understand the importance and factors which are affecting the reverse logistics in supply chain management.
- Bullwhip effect and its impact in supply chain at various levels.
- Learner will understand the how to optimize the cost in reverse logistics there by contributing to the profitability of the company.
- Learner will also understand leveraging the technological option to optimize the reverse logistics process.
- Learner will be able to understand that how to evaluate multiple strategies while optimizing the reverse logistics process.

**Exhibit 1: The Seeds Return Rate Form Various States for the Year 2020-21.**

<b>FY2022-2023</b>	<b>Percentage of Seeds Returned</b>				
<b>BRANCHES</b>	<b>OKRA</b>	<b>CHILLI</b>	<b>TOMOTO</b>	<b>WATERMELON</b>	<b>AVERAGE RETURNS</b>
ANDHRA PRADESH	6.32	12.40	9.85	9.57	9.54
BIHAR	11.25	7.98	27.37	24.13	17.69
CHATTISGARH	0.28	1.03	0.00	0	0.33
SGUJARAT	3.00	9.52	2.76	13.37	7.16
JHARKHAND	7.33	7.04	9.89	18.52	10.70
KARNATAKA	1.80	21.44	3.86	1.41	7.13

MADHYA PRADESH	1.16	1.45	2.07	12.15	4.21
MAHARASHTRA	7.00	29.92	26.18	71.25	33.59
ODISHA	1.16	6.01	5.81	23.36	9.09
PUNJAB	4.79	0.00	5.48	8.56	4.71
RAJASTHAN	9.45	0.00	6.05	0.64	4.04
TAMILNADU	0.44	2.08	11.48	0.94	3.73
UP EAST	17.36	7.13	3.48	5.04	8.25
UP WEST	7.92	0.45	14.40	22.08	11.21
WB KOLKATA	1.79	9.85	6.08	5.55	5.82
WB SILIGURI	0.25	9.49	0.18	11.13	5.26
		<b>Total Percentage of Seeds Return</b>			<b>8.90 Percent</b>

**Exhibit 2: The seeds return rate form Various States for the Year 2021-22.**

<b>FY2021-2022</b>	<b>Percentage of Seeds Returned</b>				
<b>BRANCHES</b>	<b>OKRA</b>	<b>CHILLI</b>	<b>TOMOTO</b>	<b>WATERMELON</b>	<b>AVERAGE RETURNS</b>
ANDHRA PRADESH	10.63	28.89	11.43	7.02	14.49
BIHAR	9.77	8.90	5.33	12.40	9.10
CHATTISGARH	1.03	0.33	1.26	12.01	3.66
GUJARAT	3.55	2.88	9.92	1.20	4.39
JHARKHAND	2.88	17.36	11.61	35.32	16.79
KARNATAKA	12.13	3.00	2.90	1.26	4.82
MADHYA PRADESH	3.54	1.11	1.17	7.46	3.32
MAHARASHTRA	28.59	18.24	26.62	22.64	24.02
ODISHA	4.11	10.91	6.17	15.30	9.12
PUNJAB	19.08	8.27	26.71	14.13	17.05
RAJASTHAN	51.11	33.57	7.28	2.74	23.68
TAMILNADU	3.17	0.43	7.78	3.72	3.78
UP EAST	8.18	2.58	4.95	7.93	5.91
UP WEST	5.63	41.46	10.48	24.85	20.61
WB KOLKATA	7.78	27.10	14.43	13.93	15.81
WB SILIGURI	1.14	0.39	1.97	0.73	1.06
			<b>Total Percentage of Seeds Return</b>		<b>11.10 Percent</b>

**Exhibit 3: The seeds return rate form Various States for the Year 2022-23.**

<b>FY2022-2023</b>	<b>Percentage of Seeds Returned</b>				
<b>BRANCHES</b>	<b>OKRA</b>	<b>CHILLI</b>	<b>TOMOTO</b>	<b>WATERMELON</b>	<b>AVERAGE RETURNS</b>
ANDHRA PRADESH	2.30	32.47	2.24	6.98	11.00
BIHAR	14.95	12.96	20.32	44.00	23.06
CHATTISGARH	1.42	1.20	3.28	33.49	9.85

GUJARAT	6.03	13.04	7.89	5.65	8.15
JHARKHAND	26.82	6.24	7.60	41.99	20.66
KARNATAKA	6.16	12.31	6.37	1.99	6.71
MADHYA PRADESH	4.98	2.48	6.40	54.63	17.12
MAHARASHTRA	10.27	27.96	18.98	41.61	24.70
ODISHA	3.52	16.18	3.78	10.62	8.52
PUNJAB	50.55	18.76	9.34	51.74	32.60
RAJASTHAN	40.90	31.72	32.18	33.77	34.64
TAMILNADU	1.62	0.10	2.75	6.40	2.72
UP EAST	3.34	2.93	7.17	44.00	14.36
UP WEST	25.42	19.30	11.65	64.09	30.11
WB KOLKATA	21.51	0.40	8.10	32.26	15.57
WB SILIGURI	1.03	2.93	1.64	1.08	1.67
<b>Total Percentage of Seed Return</b>					<b>16.34 Percent</b>

### Background reading

#### Books:

1. Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service by Christopher, Martin. 2<sup>nd</sup> Edition. Published by Pearson Education.
2. Guide to Supply Chain Management by Jacoby, David. 1<sup>st</sup> Edition published by London Profile books Ltd.
3. Toyotas Supply Chain Management by Iyer, Ananth V, Seshadri, Sridhar. Published by Tata McGraw Hill Education Private Limited.

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