

# Competitive Supply Chain framework of Insecticides India Limited Udhampur, Jammu

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## Abstract:

Supply Chain Management (SCM) has an indispensable role in the performance of the firm and has allured serious research awareness over the last fiscal years. This paper is entitled to understand the concept of competitiveness in the supply chain and to present a framework based on supply chain activities at IIL, including inputs, necessary for Supply Chain Competitiveness (SCC) and the benefits which are the outputs of SCC. India produces 214,000 metric tons of pesticides in a year (The Statistics Portal). Nearly 30% of potential crop in India losses to insects, weeds and rodent attacks. The Pesticides/Crop Protection/Agrochemicals industry plays a crucial role in protecting crops from damage by pests, weeds, fungus and insects, both before & after harvesting. Considering the vast size of the country, the SCM of the industry is critical for its competitiveness and is likely to significantly influence the end price of the product to the end users. This review employs perceptual performance measures. Future studies can expand this by examining data on performance metrics at Jammu level and global level to better quantify costs and benefits of SCM. This paper suggests that SCM practices are positively related to performance. The main objective of this paper to provide an insight over supply chain architecture & internal layout of insecticides firms with an attempt to understand the product flow at IIL & mark the various quality parameters used to improve the standards of production. The paper is organized as: after the literature review, a Competitive Supply Chain Framework of IIL. In the end, concluding remarks with some limitations are provided in the paper.

Keywords: Internal layout, Supply Chain Competitiveness, Supply Chain Management (SCM).

## I. Introduction: Company Overview

Insecticide India Limited (IIL) in Udhampur is established in the year 2010 but the production in Insecticide plant is started in the year 2011. IIL is in crop protection industry, IIL is one of the premier names. IIL manufactures insecticides, fungicides, & weedicides for all types of crops and household uses. IIL has more than 120 formulation products & 15 technical products. The major product famous among farmers is Lethal, Victor, Thimet, Monocil, Nuvan, xplode, Hijack etc. IIL has about 4800 distributors and 6000 dealers across the country. The company has manufacturing units, located at Chopanki (Rajasthan), Udhampur (J&K), Dahej (Gujrat), Samba (J&K). Source: ([www.insecticidesindia.com](http://www.insecticidesindia.com)). Insecticide Udhampur is a world class facility, manufacturing Granules, Liquid, and Dry Powder formulation.

The general information about the company is given in the following table:

Year of establishment	2010
Entrepreneur	Mr. Hari Chand Aggarwal
Location	Battal Balliyan, Udhampur, Jammu
Production start	2011
Capital investment	Rs. 169 lacs
Manufactures	Insecticide, Weedicides, fungicides, herbicides
Number of labour	118
Number of employees	38
Area	12K
Area covered	9K
No. of shifts	1
Time of shifts	9.00 am - 5.30 pm
Number of SKU'S	176
Per hour production	1700 litre/hr and 300 kg/hr
Number of suppliers	200

Table 1: General Information of IIL

Source: Based on the discussion with the management

## II. Literature Review

SCM techniques deals with the planning and control of total materials flow from suppliers through end-users [1]. IIL Udhampur has an extended supply chain that includes suppliers of the immediate supplier and customers of the immediate customer, all involved in the upstream and/or downstream flows of products, services, finances, and/or information [2]. Competitive priorities have forced organizations to change dramatically due to rising customer expectations, continually increasing competition on a world-wide scale, time and quality based competition [3]. With over 400 million acres under cultivation and more than 60% of the country's population dependent on agriculture, Indian economy is highly dependent on the agriculture produce and productivity. The approach for achieving competitiveness is through closer supplier-customer relationship by the "Advanced Supplier Partnership" concept introduced by [4].

## III. Objectives of the study

The overall objective of the study is to critically analyze the supply chain practices of Insecticide India Limited. The specific objectives of the study are

1. To critically analyze the supply chain architecture of Insecticides India Limited.
2. To view the Internal Layout of Insecticides India Limited.

- To critically analyze the Product Flow of Insecticides India Limited.
- To analyze Quality Management of Insecticides India Limited.

**IV. Research Design**

Nature of Study	Exploratory, Qualitative Research Design
Nature of Data	Primary
Method of Data Collection	Unstructured Interviews Method, Observation Method
Case for the Study	Insecticide India Limited, Udhampur
Number of Visits Conducted to the Manufacturing Facility of the Firm	11
Average length of Interview Conducted	1 hour
Method of data analysis	Content Analysis, Descriptive Statistics, Graphical Method

Table 2: Research Design Parameters

**V. Findings of the study**

**Objective One: To critically analyze the supply chain architecture of Insecticides India Limited**

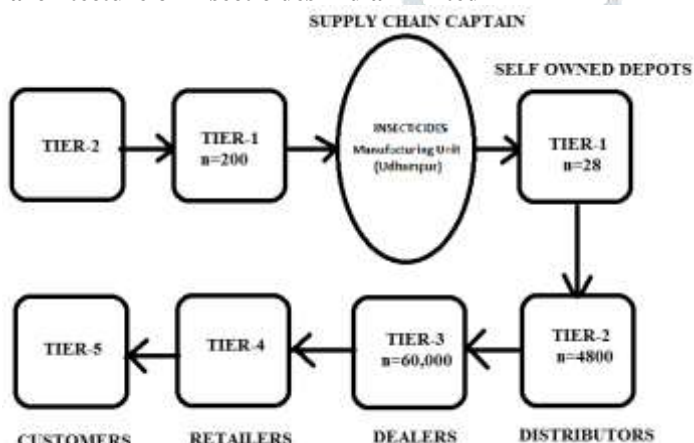


Fig1: Supply Chain Architecture

The analysis of the supply chain architecture suggests that

- The supply chain is integrated in the downstream, however is non-integrated in the upstream
- The manufacturer acts as a channel captain.
- The supply chain in the upstream is partner owned partner monitored (POPM), and the supply chain in the downstream is self owned self monitored (SOSM).
- The analysis of the external layout suggests that the company follow process oriented layout.

**Objective Second: To view the Internal Layout of Insecticides India Limited**

The plant is divided into three manufacturing sheds for different products. The internal layouts for the various products are shown in figure below:

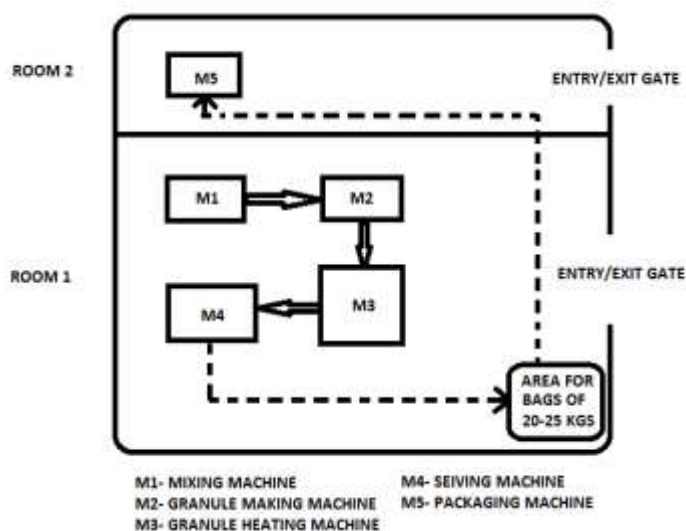


Fig 2: Internal Layout for Granule Insecticides

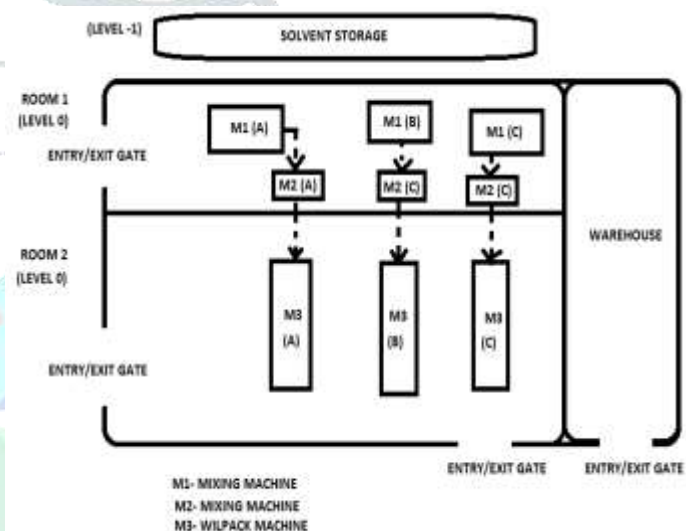


Fig 3: Internal Layout for Liquid Insecticides

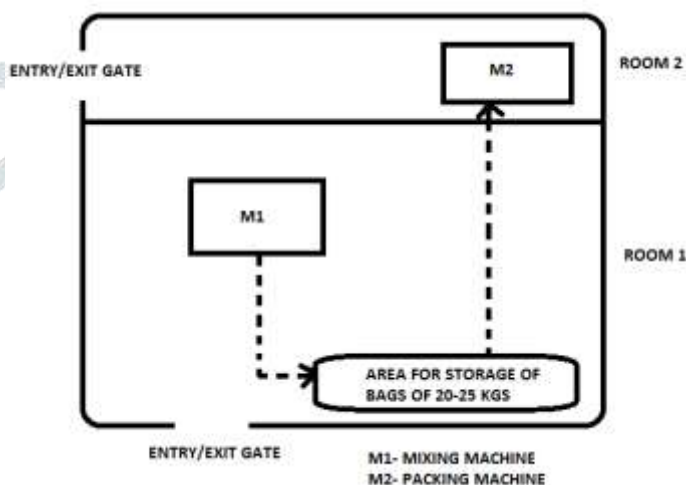


Fig 4: Internal Layout for Powder Insecticides

The company follows different production system for three different categories of products. Continuous production system is followed for a liquid category of products and batch production system is followed for granular and powder products. Further, Internal layout of machines is arranged as per the product oriented layout for liquid product and as per

the process oriented layout for granular and powder products. IIL manufactures almost 22 products with 176 SKU's insecticides. The machine categorization used is:

Products	Machines	Name of machines	Capacity of a machine	Capacity utilized
Liquid	M1	Mixing Machine	5KL	3.5KL
	M2	Storage Machine	5KL	3.5KL
	M3	Wilpack Machine (6 head)	1200-1320 litre/hr	720-840 litre/hr
	M3	Wilpack Machine (4 head)	900-1020 litre/hr	540-720 litre/hr
	M3	Wilpack Machine (2 head)	360-420 litre/hr	300-360 litre/hr
Granule	M1	Mixing Machine	2.5 ton/hr	745-845 kg/hr
	M2	Granule making Machine	2 ton/hr	725-830 kg/hr
	M3	Heating Machine	1400 kg/hr	1300 kg/hr
	M4	Seiving Machine	2.5 ton/hr	400- 500 kg/hr
	M5	Packaging Machine (1kg)	2100-2400 bags/hr	600-700 bags/hr
Powder	M1	Mixng Machine	2.5 ton/hr	1 ton/hr
	M2	Packaging Machine (1kg)	600-700 bags/hr	250 bags/hr

Table 3: Machine description along with capacity utilization

**Objective Third: To critically analyze the Product Flow of Insecticides India Limited**

The flows for various products in the Insecticide India Limited are shown below.

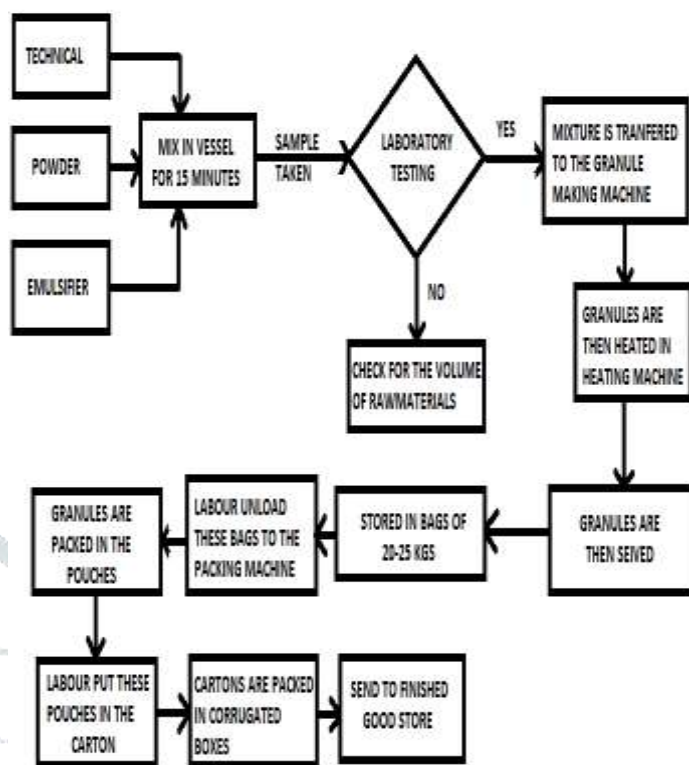


Fig 5: Product flow for Granule

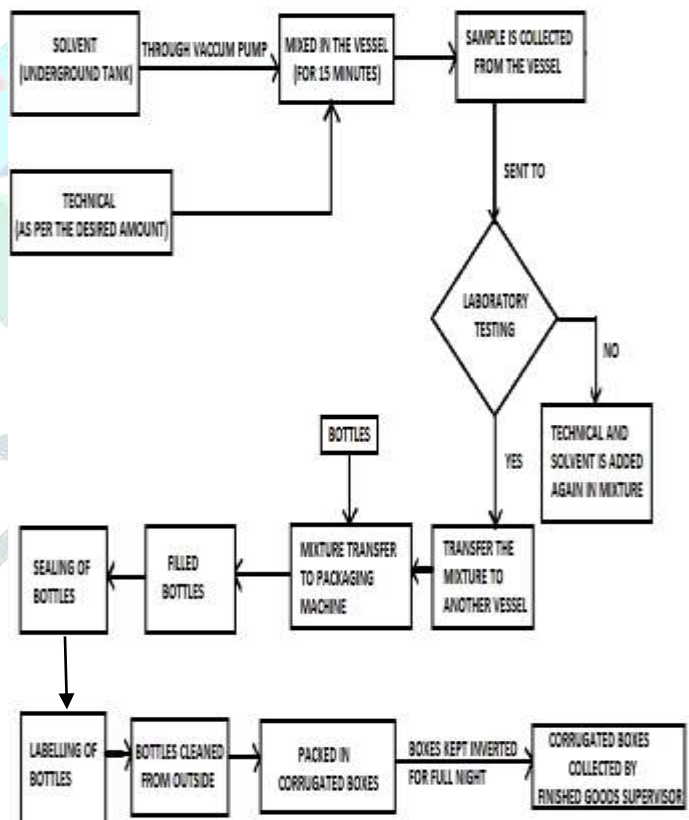


Fig 6: Product flow for Liquid

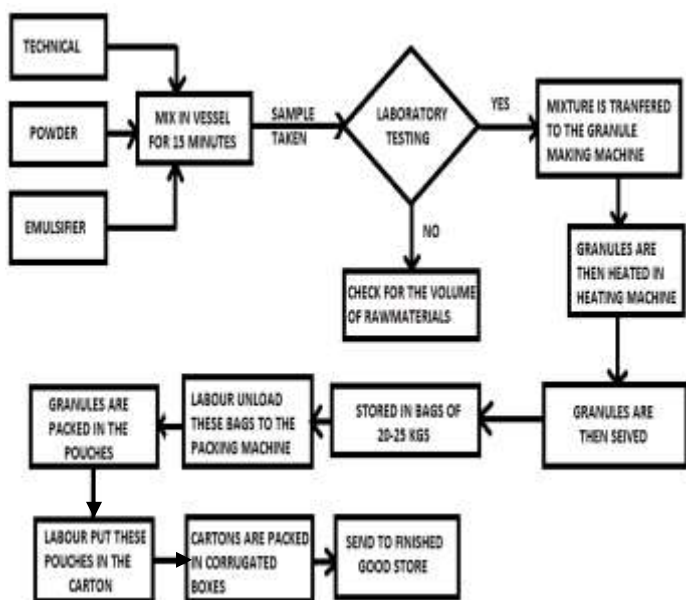


Fig 7: Product flow for Powder

For making of insecticide, the raw material (solvent) passes from the underground tank to the vessel upward. Then it is mixed with the other raw material (technical). Technical is added in a specified volume to the solvent to prepare the insecticide needed. This mixture is mixed in a vessel with the help of rotating shaft. Now, a sample of the mixture is sent to the laboratory for checking the amount of technical present in the sample. If, the specifications meet, then this mixture is transferred to another vessel from where filling of bottles is done. Then bottles are label and packed into the cartons and shipped to the depots. The process oriented layout is followed by this Insecticide plant and follows a batch production system to produce a lot of insecticides at a particular time.

**Objective Fourth: To critically analyze Quality Management of Insecticides India Limited**

At IIL Udhampur quality is checked at quality control lab and quality assurance lab. Quality is checked for the amount of technical present and for others specifications as well. The various parameters, certifications and tools used for quality at IIL Udhampur is given below:

Parameters	Leadership Commitment, Knowledge and Process Management, Training, Supplier Quality Management, Customer Focus, Strategy Quality Planning.
Certifications	ISO 9001:2008 (quality), ISO 14001:2004 (environment), OHSAS 18001-2007
Quality tools	Laboratory Equipments, Pie-Charts, bar graph, Pareto Chart, Flow-Charts, Relations Diagram

Table 4: Quality Indicators

In quality management of Insecticides India limited quality is checked at in process inspection i.e. liquid is sent to the lab for checking of the amount of technical is added or not. The quality is checked at finished good point where the corrugate boxes are titled to check for the leaks. If leaks take place then it is rejected.

**VI. Conclusions of the study**

- The supply chain is integrated in the downstream, however is non-integrated in the upstream
- The manufacturer acts as a channel captain.
- The supply chain in the upstream is partner owned partner monitored (POPM), and the supply chain in the downstream is self owned self monitored (SOSM).
- The analysis of the external layout suggests that the company follow process oriented layout.
- The company follows different production system for three different categories of products. Continuous production system is followed for liquid category of products and batch production system is followed for granular and powder products. Further, Internal layout of machines is arranged as per the product oriented layout for liquid product and as per the process oriented layout for granular and powder products.
- Generally the products in Insecticides industry are divided on the basis of their state and on the basis of their compound. Insecticides India Ltd. manufactures almost 22 products with 176 SKU's insecticides.
- For making of insecticide, the raw material (solvent) passes from the underground tank to the vessel upward. Then it is mixed with the other raw material (technical). Technical is added in a specified volume to the solvent to prepare the insecticide needed. This mixture is mixed in a vessel with the help of rotating shaft. Now, a sample of the mixture is sent to the laboratory for checking the amount of technical present in the sample. If, the specifications meet, then this mixture is transferred to another vessel from where filling of bottles is done. Then bottles are label and packed into the cartons and shipped to the depots.
- The process oriented layout is followed by this Insecticide plant and follows a batch production system to produce a lot of insecticide at a particular time.
- In quality management of Insecticides India limited quality is checked at in process inspection i.e. liquid is sent to the lab for checking of the amount of technical is added or not .The quality is checked at finished good point where the corrugate boxes are titled to check for the leaks. If leaks take place then it is rejected.

**VII. Limitations of the Study**

- The research tool was interview and observation based so here chances of human errors may happen although proper care is being taken.
- No previous data about the company was available either online or offline, it's the first time project study on this company is being done.
- Limitation of the time was there as the employees and workers don't have much time to describe everything in detail.
- The number of industrial visits was limited only as company didn't allowed much visits.
- Every Company always try that they do not reveal every information about the company.
- Researcher was not allowed to take real time data to analyze the efficiency or other critical parameters related to the supply chain performance.

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