



Master's degree thesis

LOG950 Logistics

Assessment of Capital Tied Up in Finished Inventory and its Impact on Profitability

(Case of Real Fruit Juice: A Product of Dabur Nepal Private Limited)

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Acknowledgement

This research paper is the result of our deep intent to study in Capital Tied Up in Finished Inventory and its impact on Profitability of Nepalese Manufacturing Enterprises. Dabur Nepal Private Limited (DNPL) has been taken as a representative manufacturing enterprise with one of its leading product “Real Fruit Juice” to examine the issues related to finished inventory and its impact on profitability. This study will be useful to provide the information about current practice of finished inventory planning of DNPL and to draw attention of DNPL management regarding what can be done for future planning to achieve better efficiency.

We wish to express our deepest appreciation to our thesis supervisor- Associate Professor- Arild Hoff (Molde University College) who has been a great source of constant inspiration and encouragement. His proper guidance, continues cooperation, critical comments and valuable suggestions inspired us to finish this research work in pre-stated timeframe. We would also like to express our deep gratitude to all teaching and administrative staffs of Molde University College who always provide suggestions and help directly or indirectly.

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At last but not least, we would like to express our gratitude to all of helping hands of Real Fruit Juice Section of DNPL without whose cooperation this thesis would not be possible to complete.

Finally, we do not want to declare that this study is perfectly satisfactory and complete. As there may be some limitations and shortcomings because of limited time and resources, we hereby want to take the responsibility of all those. We have a plan to improve this study further if concerned company helps us to do so.

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May 28, 2013

Executive Summary

This research is an attempt for the assessment of capital tied up in finished inventory and its impact on profitability of Dabur Nepal Private Limited with focus on Real Fruit Juice, a product of Dabur Nepal Private Limited. Major problem of most of Nepalese manufacturing enterprises is that they are operating with high level of finished goods inventory which results into excess amount of capital tied up in that inventory for longer period. Cost of funds in Nepal is significantly higher. In this way they seem to incur higher financial cost. For this reason, research in this area may help Nepalese industrialists, managers and academics to add up in their current knowledge to enhance overall performance of this sector.

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Chapter 1: Introduction

1.1 Introduction to Nepalese Economy and Industrialization

Nepal officially 'The Federal Democratic Republic of Nepal' is a landlocked country in south Asia between People's Republic of China in north and Republic of India in south, east and west. The total area of Nepal is 147,181 sq. km with a total population of around 27 million people made of different races and ethnics group living in different regions with diverse culture, languages and dialects. (History of Nepal, 2012) Nepal has more than hundred cast/ethnic groups and more than 90 spoken languages. The total area of the country covers 0.1% of the earth. The length of country is 885km east to west and its breadth varies from 145-241 km north to south. Ecologically, Nepal is divided into three regions called Himalayan region, Hill region and Terai Region. Himalayan region accounts 15% of the total land area and 7.3% of total population. It includes 8 of the 10 highest summits in the world which exceed the altitude 8000m. Mount Everest, the highest peak of the world lies in this region. The hill region captured by high peaks, hills, valley and lakes accounts for about 68% of the total land area and 44.3% of the total population. The low land Terai occupies about 17% of total land area and 48.4% of the total population of the country. (CIA, 2012)

Nepal is also one of the poorest and least developed countries in the world. One-fourth (25.2%) of the total population resides under the poverty line. Agriculture is the basis of the economy, income for the three-fourth of the total population and agriculture contributes one-third of total GDP of the country. The GDP is the composition of agriculture (34.9%), industry (15%) and services (50.1%). Nepal generally exports clothes, pulses, carpets, textiles, juice, pashmina, jute goods. The total export was \$896 million (2011 est.). The export partners for Nepal are India (29.2%), US (9.2%) and Germany (5.2%). Nepal imports petroleum products, machinery and equipment, gold, electrical goods, medicine, etc. from India (54.4%) and China (27.5%). (CIA, 2012)

In an agricultural country like Nepal effective mobilization of agricultural resources is very much essential. For the economic development of the country industrial sector must be developed. Rapid and sound economic development is neither possible only from the side of private sector nor public sector. Participation of both sectors is essential for the economic

development of the country. Different public and private manufacturing industries were established with the objective of balance regional development, public welfare, employment generation, import substitution and export promotion.

The table 1 shows the total number of industries (companies) on the basis of large, medium and small scale, the total project cost, total fixed cost and number of people employed in particular scale of industries. We can see that the number of small scale industry is high this is due to geographical and economic condition of the country.

Table 1: Number of Industries Registered by Scale (Up to F.Y. 2067/68) (i.e. 2010/2011)

Scale	No. of Industries	Total Project Cost (NRs Million)	Total Fixed Cost (NRs Million)	Total No. of Employment
Large	440	290453.24	255245.52	80564
Medium	1113	83886.38	56435.12	118483
Small	2999	40852.05	23811.82	213766
Total	4552	415191.67	335492.46	412813

* Small Scale Industries are only Foreign Investment

Source: Government of Nepal, Ministry of Industry (2010/2011)

Industrial Enterprises Act, 2049 (1992) has categorized different scale of industries as follows:

Small Scale: Industries with the fixed assets of up to Rs. 30 million.

Medium Scale: Industries with the fixed assets between Rs. 30 million and Rs. 100 million.

Large Scale: Industries with the fixed assets more than Rs. 100 million.

According to Industrial Enterprises Act, 2049 (1992), the fixed assets of an industry shall consist of the following movable and immovable assets:

- Land and land improvement (works such as land leveling, filling and fencing).
- Physical infrastructures (such as sewerage, internal road).
- Office, factory building, warehouse, electric distribution, water distribution system and residential buildings.

- Machinery, equipment and tools.
- Means of transportation.
- Electrical equipment and office equipment.
- Furniture, fixture, communication system and equipment.

Table 2 shows that total fixed cost accounts for 88% of total project cost for large scale industries, 67% for medium scale, 58% for small scale and 81% for all industries taken together. Large scale industries are operating with higher fixed cost whereas medium and small scale industries are operating comparatively with lower fixed cost. This shows that risk factor for large scale industry is higher compared to other mode of industries. It is also to be noted that with lower total project cost (around 10% of total project cost of all industries) small scale industries seems very good in terms of employment generation.

The industries in Nepal can be divided into Agro-based, Construction, Energy based, Manufacturing, Minerals, Service and Tourism. The table below shows total number of various types of industries up to the fiscal year 2067/2068 (i.e. 2010/2011). The figure shows no. of industries, the total cost for the project, total fixed cost and total number of people that are employed in the particular industry. We can also see that the Mineral industry is least in number whereas manufacturing industry is at the top. All the values are in Nepalese Currency. The current conversion rate is 0.00870240 EUR.

Table 2: Number of Industries Registered by Category (Up to F.Y. 2067/68) (i.e. 2010/2011)

Category	No. of Industries	Total Project Cost (NRs Million)	Total Fixed Cost (NRs Million)	Total No. of Employment
Agro-Based	205	11265.99	9536.58	26553
Construction	38	5729.03	5419.01	2542
Energy Based	81	128184.22	122849.14	12341
Manufacturing	2148	150681.55	106853.00	250406
Mineral	35	3579.76	3174.84	4017
Service	1251	78918.27	55039.82	84032
Tourism	794	36832.85	32620.07	32922
Total	4552	415191.67	335492.46	412813

Source: Government of Nepal, Ministry of Industry (2010/2011)

1.2 A Brief Note on Juice Factories in Nepal

Nepal is an agro-based developing country with a very low per capita income. There have been efforts in industrialization by developing private sectors as well as by encouraging foreign investment. Nepal has various private sector industries based on the nature and consumption of product. Industries in Nepal are in emerging trend.

Soft Drink Industry is one of the prosperous industries in Nepal. The profitability of juice factories largely depend on the production, operation, technique and various promotional strategy in marketing and distribution for sale of Juice. The name of leading soft drink factories in Nepal are as follows:

Table 3: Name of Juice factories, their Products and Location in Nepal

S.N.	Name of The Factory	Name of the Product	Location
1	Dabur Nepal Pvt. Ltd.	Real Juice	Narayani
2	Dugar Beverage Pvt. Ltd.	Mango Fruity	Narayani and Bagmati
3	Chaudhary Group of Nepal	Rio	Narayani and Bagmati
4	Bottlers Nepal Pvt. Ltd.	Slice	Narayani and Bagmati
5	Himalayan Beverage Pvt. Ltd.	Rite	Narayani

Among all the above mentioned factories, Dabur Nepal Pvt. Ltd., Dugar Beverage Pvt. Ltd., Bottlers Nepal Pvt. Ltd., Chaudhary Group of Nepal are the leading and successful companies in production of Soft Drink in the form of Juice . In Nepal, consumption of juice is very high due to its hot and humid climate.

1.3 Introduction to Dabur Nepal Private Limited (DNPL)

Nature is full of valuable resources which help people to sustain their life. Nature provides various valuable things to people which are useful for human beings in every aspect of their life. According to information placed on the official website of Dabur, Dabur is a multinational company which was established in the year 1884 A.D. in Calcutta, India. Dabur Nepal Private Limited was established as an independent Group company in 1992 in Nepal by the group of Nepalese investor and Dabur India Private Limited with the concrete intention of serving Nepalese society with homemade herbal health and hygiene product and to provide remarkable economic development of the country. Moreover, the aims were also to utilize world's most rare herbs found here and to give continuity in their production and mobilization. DNPL started its commercial production from 1992. The products of DNPL are the mixture of traditional

knowledge which is known as “Ayurveda” and high technology, which are as per the demand of today’s herbal based products market. The company promises to give the products having the same quality of any other popular products of international product brand. DNPL manufactures Real Fruit Juice, Vatika Hair Care products, Dabur Hajmola, Dabur Honey, Glucose, Dant shakti, Dhsudhavardhak Churna, Vatika shampoo, honey processing, etc. for national and international markets. In a decade DNPL has more than 20,000 outlets throughout Nepal. In 10 years DNPL capital assets increases by 10.5 times. The exports crossed Rs. 250 crores and it contributes over Rs. 200 millions to the Nepalese exchequer. The net profit crossed to Rs. 100 millions and the turnover increased by 19%.

1.3.1 Core Values of DNPL

Every organization has its own values and visions for the smooth operation and long term prosperity of the organization. DNPL has a vision “**Dedicated to the health and well-being of every household**”. DNPL has following principles for the overall socio-economic development of the nations.

- **Ownership:**

This is our company. We accept personal responsibility, and accountability to meet business needs.

- **Passion for Winning:**

We all are leaders in our area of responsibility, with a deep commitment to deliver results. We are determined to be the best at doing what matters most.

- **People Development:**

People are our most important assets. We add value through result driven training, and we encourage & reward excellence.

- **Consumer Focus:**

We have a superior understanding of consumer needs and develop products to fulfill them better.

- **Team Work:**

We work together on the principle of mutual trust & transparency in a boundary-less organization. We are intellectually honest in advocating proposals, including recognizing risks

- **Innovation:**

Continuous innovation in products and processes is the basis for our success.

- **Integrity:**

We are committed to the achievement of business success with integrity. We are honest with consumers, with business partners and with each other. (Source: DNPL)

1.3.2 Strategic Intent of DNPL

DNPL intend to significantly **accelerate profitable growth**. To do this, DNPL will:

- Focus on growing our core brands across categories, reaching out to new geographies, within and outside India, and improve operational efficiencies by leveraging technology
- Be the preferred company to meet the health and personal grooming needs of our target consumers with safe, efficacious, natural solutions by synthesizing our deep knowledge of ayurveda and herbs with modern science
- Provide our consumers with innovative products within easy reach
- Build a platform to enable Dabur to become a global ayurvedic leader
- Be a professionally managed employer of choice, attracting, developing and retaining quality personnel
- Be responsible citizens with a commitment to environmental protection
- Provide superior returns, relative to our peer group, to our shareholders (Source: DNPL)

1.3.3 Location Facilities and its benefits to DNPL:

DNPL is located in Rampur Tokani, in Bara district of Nepal which is connected with the Mahendra Highway and is benefited by many location facilities. The major location facilities are as follows:

- Favorable Labor Climate
- Proximity to Market
- High Profile and Quality of Life
- Proximity to Suppliers
- Proximity to Resources
- Proximity to Customers
- Proximity to Parent Company's Facilities
- Easy Utilities, Taxes, and Real State Costs
- Transportation Facilities
- Maintained Law & Order.

1.3.4 Organization Structure of DNPL

Following organizational structure is found in DNPL to incorporate the various activities of company.

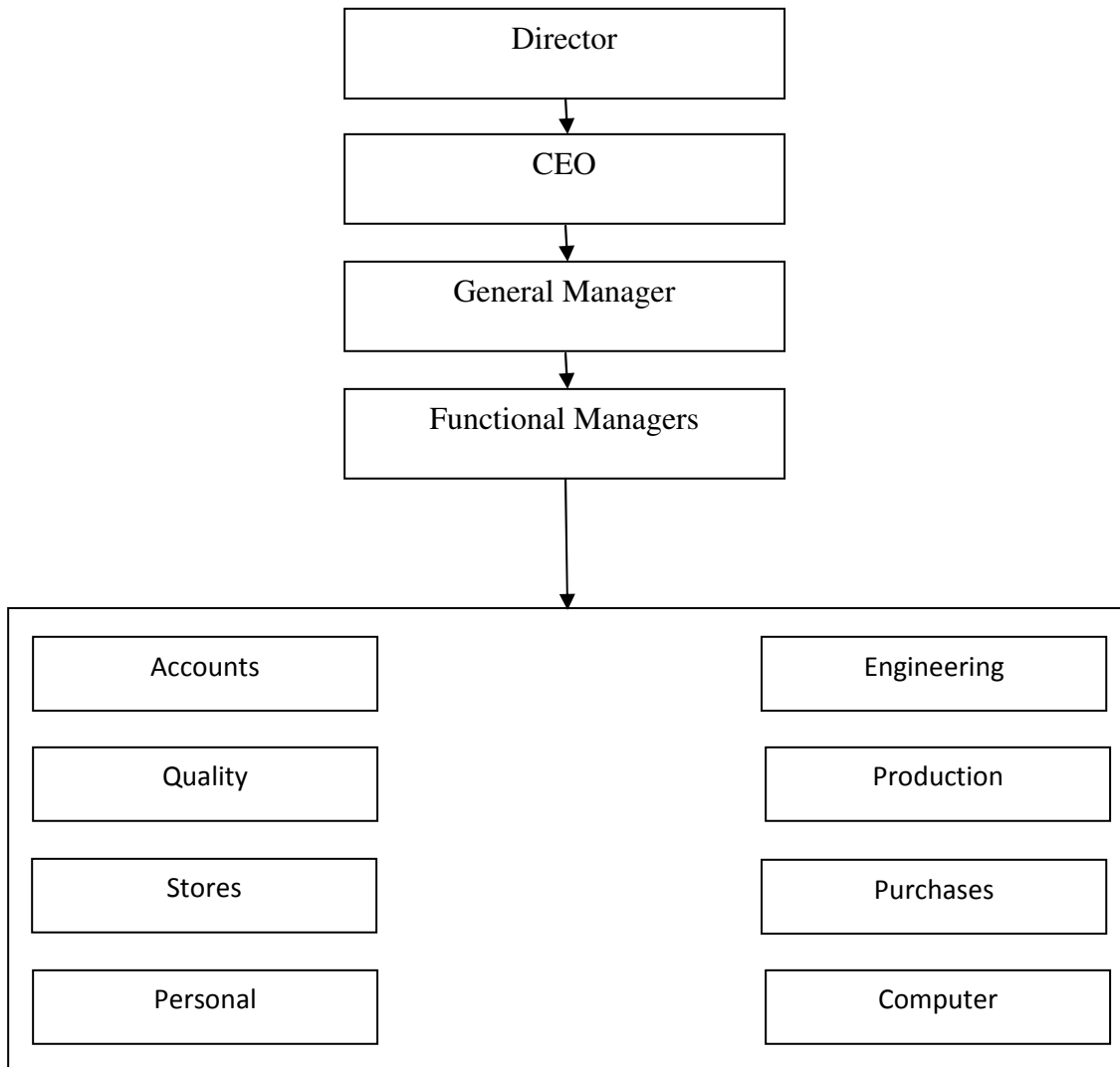


Figure 1: Organizational structure of DNPL

1.3.5 Various Products Produced By DNPL

In Nepal, there are two types of industries. First, industries which are single product production based. And another which produces a large range of products to fulfill the needs of customers. DNPL is one of the second types of industry. It has a very large product range.

DNPL is a leader in manufacturing and marketing nature-based products, marked with quality and trust gained through decades of experience. Today DNPL products are available for people in more than 50 countries across the world helping them move towards a healthy, natural and holistic lifestyle. DNPL products are available in the markets of the Middle East, South-East Asia, Africa, the European Union and America.

Table 4: Various Products Produced by DNPL

Product Section	Products
Ayurvedic Pharmaceuticals	Dabur Chyawanprash, Pudina Hara, Lal Dant Manjan, Hajmola Tablets, Hajmola Candy, Honitus, Gripe Water, Lal Tail
Cosmetics	Dabur Amla Hair Oil, Dabur Special Hair Oil, Dabur Amla Lite, Vatika Hair Oil, Sarson Amla Hair Oil, Dabur Baby Olive Oil, Vatika Heena Conditioning Shampoo, Anti Dandruff Shampoo, Vatika Nourishing Cream Shampoo, Anmol Black Silky Shine Shampoo, Anmol Natural Shine Shampoo, Vatika Cleaning Shampoo, Vatika Body And Bounce Shampoo, Dabur Gulabari
Food Products	Real Fruit Juice, Dabur Glucose C, Dabur Glucose D, Dabur Honey
Drug Intermediaries	Dant Mukta, Pachan Churna, Dcp Mishran
Plastic Products	Containers, Pet Bottles, Plug, Caps

1.3.5 Various types of Juice product Produced by Real Juice Department of DNPL

Real Fruit Juice department of DNPL produces real fruit juice in varieties of flavors (nectars) which have been shown in table 5.

Table 5: Types of Real Juice

S.N.	Types
1	Real Orange Juice
2	Real Mango Nectar
3	Real mixed fruit Juice
4	Real Pineapple Juice
5	Real Grape Juice
6	Real Tomato Juice
7	Real Guava Nectar
8	Real Litchi Nectar
9	Real Cranberry Nectar
10	Real Pomegranate Nectar
11	Real Peach Nectar
12	Real Apple Nectar

1.3.6 Major raw materials for manufacturing Real Juice at DNPL

DNPL has a separate raw material department which surveys and finds out the market trends, availability, pricing, scarcity, time taken by placing order and receipt of materials. Similarly raw materials and its management are among one of the crucial point of DNPL. Raw materials are the basic need of an industry. The factory should be located such that it can reach to the raw materials very easily and efficiently. This will increase the productivity as well as the efficiency of the organization The Company should easily reach to its raw materials source. For this the factory should be in touch with the new knowledge about the management of raw materials and its sources. The managers of the raw materials department of DNPL should be cautious enough

to grab the opportunities and handle the threats in the raw materials market. The major raw materials of Real Juice are stated below in table 6. These raw materials are imported from Latin America, Europe, South Africa, Middle East, South Asia and Eastern Asia.

Table 6: Major Raw materials for Real Juice Production

S.N.	Raw materials
1	Sugar
2	Frozen Fruit Concentrate
3	Aseptic fruit Concentrate
4	Fruit Cells
5	Sodium Alginate
6	Citric Acid
7	Ascorbic Acid
8	Flavors
9	P.P Strips
10	Stream Caps
11	Laminate
12	Xanthenes Gums

1.3.7 The Production (Manufacturing) Process of Real Juice in DNPL

Production Process of any company is the use of organization's resources as well as external resources to produce something of value. No product can be made and no service can be provided without a process, and no process can exist without a product or service. According to

the production department of Real Juice at DNPL, the step wise production process is stated below:

Step 1: Sugar Syrup Preparation

Sugar Syrup preparation is the starting step in the production of real juice. Sugar is dissolved as per the weight sheet issued by the Production Department and Quality Assurance Department in demineralised (DM) water. Then the solution is heated at 70°C to 80°C in Steam Jacketed Vessels in order to achieve 650 Brix sugar syrup. Then the sugar syrup is sent to the Plate filter machine for further process. Brix represents the sugar content of an aqueous solution.

Step 2: Filtration of 650 Brix Sugar Syrup

The sugar syrup prepared at 650 Brix is then passed through filtration by two machines simultaneously as follows:

- Plate Filter machine
- Frame Filter Machine

Filtration of the syrup is one of the most important functions in production of real juice.

Step 3: Inspection of the Concentrate Pulp

Before mixing, each drum of Fruit Concentrate is inspected and examined, then only the concentrate pulp are transferred by the Spiral Pump to the Mixing Tank i.e. Juice Dump Tank

Step 4: Cooling of Sugar Syrup

The sugar syrup is cooled by the help of Plate Heat Exchange and the temperature of sugar syrup is maintained to 25°C to 30°C for the quality maintenance.

Step 5: Storage of Sugar Syrup

Then the sugar syrup of 650 Brix is stored in the sugar syrup tank at the temperature of 25°C to 30°C.

Step 6: Mixing of Juice Pulp and other Materials in Mixing Tank

The next and most important step in the production of sugar syrup is mixing of sugar syrup from syrup storage tank, DM water, Juice Concentrate and other raw materials like Ascorbic Acid, Citric Acid, Flavors and Essence are mixed in it.

Step 7: Balancing the Mixture

Then the juice from the Mixing Dump Tank is transferred to the balance tank for the balance of speed and flow rate of juice.

Step 8: Sterilization Process

In this section, the juice is sent to Tabular Heat Exchanger and the juice is pasteurized at 95°C to 98°C for 45 seconds. In this process the micro-organism are nearly finished. This is one of the, major area of quality maintenance.

Step 9: Cooling Through Deaerator

After the pasteurization process, the juice passes through the Spiral Flow Process which cools the juice and again maintains the moderate temperature of the juice.

Step 10: Homogenizer Juice Treatments

Then the juice is transferred to homogenizer to properly mix the solution in order to make it homogeneous by pumping to and from at a speed of 2000 - 2500 Psi.

Step 11: Brix Checking of the final mixture

In this section, the brix of the juice is checked whether it is up to standard or not. This is the final stage of juice treatment prior to filling.

Step12: Filling of Juice

Then, the juice is transferred to the filling machine namely:

- Filling Machine 1 (TBA 19)
- Filling Machine 2 (TBA 8)

- Filling Machine 3 (A3 Flex)

These machines fill the juice in the Laminate by Aseptic Filling Technology

Step 13: Straw application & Cap Application

After filling by the filling machines, the juice packets are then passed through the Straw Applicator and Cap Applicators for their finalization.

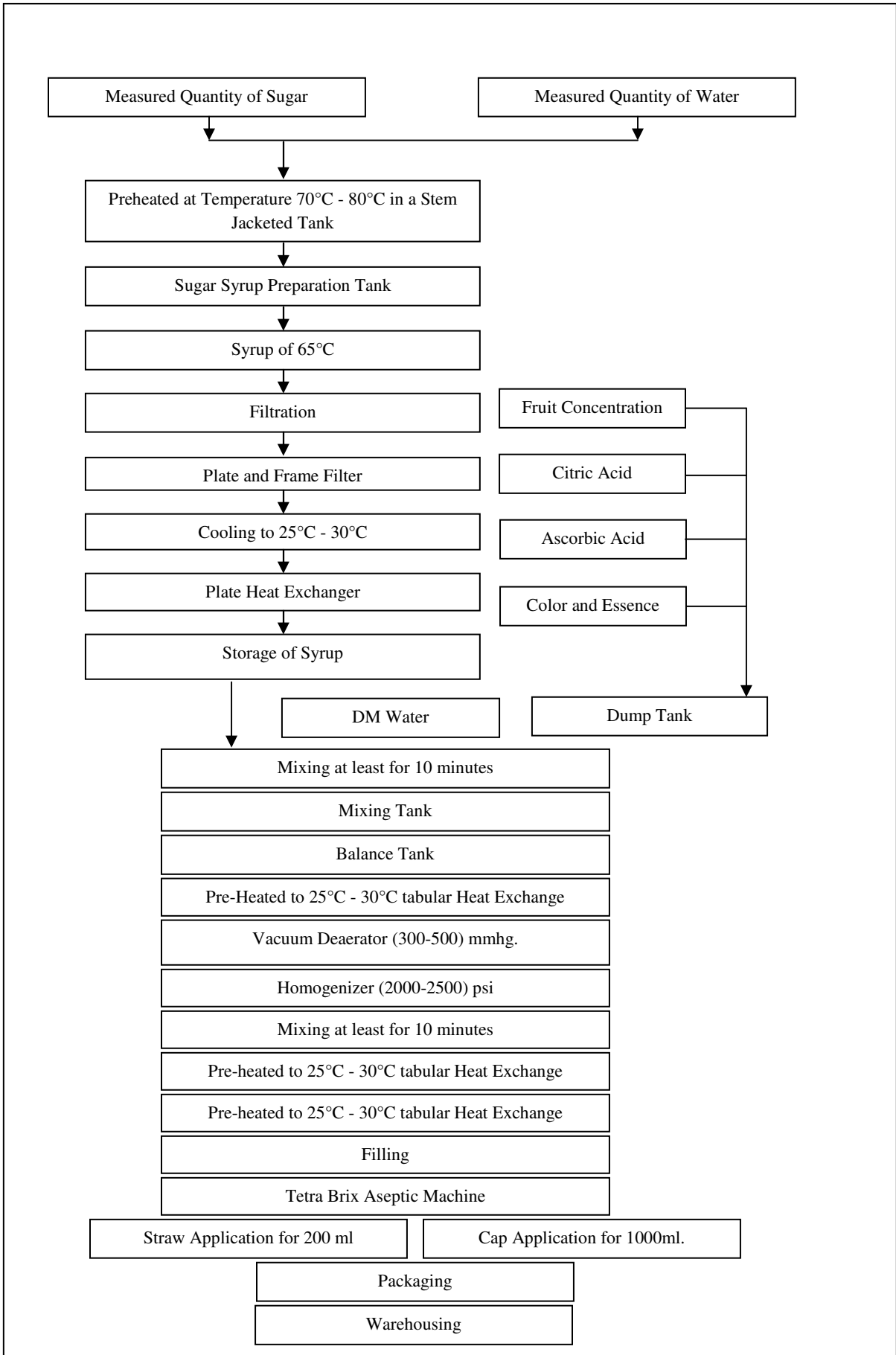
Step 14: Packaging

The individual packets are then sent to the Crate, Packager machine to pack the Pieces of juices in Crates of 36 Pieces of 200 ml and 12 Pieces of 1000ml. These crates are sealed by Tape and finally they are laminated by the Laminating Machine.

Step 15: Warehousing

The next step is warehousing the final products. The goods are sent to the store from the production floor. Then the goods are distributed in the market as per the demand of the goods.

Figure 2: Flow Chart of Real Fruit Juice Preparation (as per Production Department of Real Juice)



1.3.8 Consumption of Raw materials in Real Juice Department at DNPL:

Raw materials are the basic need of and industry. The production and operation should be efficient enough to produce the products in the set standard of quality. According to production department of Real Juice, the consumption pattern of the raw materials in the production of Real Juice stated in the table 7.

Table 7: Consumption of Raw Materials

S.N.	Ingredients	Unit	Std. Qty For 6489 Liters	Std. Qty for 3244 Liters
1	Frozen Juice Concentrate	Kg.	1430	715
2	Aseptic Juice Pulp	Kg.	197	98.50
3	Ascorbic Acid	Kg.	1.299	0.65
4	Citric Acid	Kg.	6.140	3.07
5	Sodium Alginate	Kg.	3.248	1.62
6	Beta Carotene	Kg.	6.276	3.14
7	Dabur Juice Flavor	ML.	171.50	85.75
8	Sugar Syrup	Kg.	1164	582
9	DM Water	Kg.	3687	1843.50

1.3.9 Various Test or Examinations of Raw Materials of Real Juice

Real Juice consumes various raw materials. The raw materials are examined at various stages for examining the superiority of their quality and also assuring the better quality of the Real Juice. The raw materials encompasses through the various examinations performed by different departments of DNPL at Real Juice department. The lists of examination performed are shown in table 8.

Table 8: Examinations of Raw Materials of Real Juice

S.N.	Raw Materials	Examinations
1	Fruit Concentrate	Brix, Acidity, and Microbiological Test
2	Sugar & Syrup	Compound Test and Brix Test
3	Sodium Alginate	Microbiological Test, Impurities and Arsenic
4	Xanthenes Gum	Microbiological Test, Impurities and Arsenic
5	Citric Acid	Assay and Impurities
6	Ascorbic Acid	HPLC, Assay and Impurities
7	Flavors	Refractive Index and Gas Chromatography
8	DM Water	Impurities and Arsenic

1.3.10 Production Capacity, its Utilization and Impact on Real Juice:

Juice is a daily consumable item in the Nepalese households and DNPL is one of the leading producers of juice in Nepal. DNPL is located nearby the Mahendra Highway. The main reason for establishing company at this place is to have the benefits for the production, delivery and transportation of raw materials and finished products. DNPL has wide coverage in the market and has been successful in earning a good reputation among the consumers despite of so many fierce competitors. The factory plays a dominant role in Nepal amongst the available juice factories. Real juice has the production capacity of 23424 cases per day which has been shown in detail in table 9.

Table 9: Production Capacity of Juice in DNPL

Name of Machine	Production Capacity Pieces per min	Production Capacity pieces per hour	Production capacity Cases per Day
TBA 8	92	5520	11040.
TBA 19	125	7500	6000
A3 Flex	133	7980	6384
Total			23424

(Source: Production Department of Real Fruit Juice)

DNPL can utilize its production capacity as per the demand of its product in market. Thus, planned production = planned sales does not allow the full utilization of the production capacity of any organizations. If the demand occurs less than the production capacity, the production of the goods may not occupy the full production capacity. Similarly, if the demand occurs more than the production capacity, then the organization will be unable to fulfill the demand of the market in the specified period even utilizing full capacity. Thus, it can be viewed that whether underutilization or over demand can create a problem for the organization.

It is exercised that production capacity has a very critical impact on the organization's policy and strategy. In every organization the fixed cost remains constant. If DNPL utilizes the full production capacity, the fixed cost will be distributed among each pieces of the real juice and finally per piece production cost will be minimized. Similarly, when there will be partial utilization of production capacity, per piece cost of production of real juice will be increased to some extent. Concluding the production capacity utilization in real juice department, DNPL should try to increase the demand in market to utilize its production capacity at its peak.

1.3.11 System of Requisition, Acquisition, Recording and Regulation of Inventories in Real Juice Department at DNPL

Every organization has its own system for requisition, acquisition, recording and regulation of inventories. DNPL, being a multinational company has its own system of administrating their

inventory with the help of software named BAAN. There a large provision for the maintaining the records of inventories of raw materials as well as the finished products inventory. The real juice department is highly automatic and computerized All departments are provided with a large numbers of computers.

BAAN has a provision of the following given points for the system of requisition, acquisition, recording and regulation of inventories;

1. Material Issue Note (MIN)

It is the list of raw materials required for the production of certain batch. It is sent with Batch Production Record (BPR) by Quality Assurance Department to the store and then it is forwarded to the production department before the production of a batch along with the issued materials.

2. Material Return Note (MRN)

After the production if any extra materials are left, it is sent back to the store through raising the MRN.

3. Material Arrival Note (MAN)

It is the system of recording all the purchased materials. It is prepared by the main gate security officer when the purchased materials is received by the concerning authority.

4. Batch Production Record (BPR)

It is the systematic process to keep the record as per Good Manufacturing Practice (GMP) norms so that error can be eliminated. BPR for each production is issued by QA department and sent to the store along with MIN and again it is forwarded to the production department. BPR defines each and every operation to be followed along with processing as well as packaging parameters. As soon as the manufacturing of batch is completed it is to be analyzed and approved by QA personnel to process for packing, every record of the bulk analysis should be included in it. BPR also provides instructions for in-process check, packing line check, finished product check including other procedures involved from store to dispatch warehouse.

These are the system of requisition, acquisition, recording and regulation of inventories of real juice at DNPL.

1.3.12 Global Quality Certifications Achieved By Real Juice at DNPL

DNPL has obtained three global quality certifications by the production and sales of Real Juice. The various Global Quality Certifications are as follows:

1. Good Manufacturing Practice (GMP)

GMP is the world standard manufacturing procedure which has laid down certain process and provisions for the production of Real Juice. If the organization produces according to the procedures laid down by GMP, the product is said to be produced at its best quality. It was introduced in DNPL since 1995.

2. Hazard Analysis and Critical Control Point (HACCP)

HACCP is an organization which is directly devoted towards the hazards analysis which can be seen in the juice factories. The various areas of their inspection are as follows

- Wearing a Cap before entering the floor
- Wearing Apron within the production floor
- Wearing gloves in the production floor
- Hands should be washed properly
- The production floor should be kept clean and tidy

All the production floors along with the surrounding areas are kept clean. A very hygienic environment is given to the production plant along with the equipments that are used in the production process. The area is kept free from unwanted materials as well as materials from last batch.

3. ISO 9002

ISO 9002 is a set of standard governing documentation of quality program. Companies become certified by proving a qualified external examination that they have complied with all the requirements. Once they are certified companies, they are listed in the directory so that potential

customers can see which companies have been certified by ISO which will help the company to earn valuable customers' trust towards the company.

1.3.13 Cleaning in Process and Plant Sanitation in Real Juice Department at DNPL

All the production floors along with the surrounding area are kept clean for assuring hygienic products. Also the CIP program is followed to clean every tubes, pipes, tanks and equipments after manufacturing of variants changed or after every 12 hours. The CIP follows the following steps with flow rate of 8000 liter per hour as shown in table 10.

Table 10: Steps of CIP System

S.N.	Process	Temperature	Duration
1	Hot Water Flushing	50-60°C	5 Minutes
2	1-2 % NaOH Flushing	70-75°C	15 Minutes
3	Hot Water Flushing	50-60°C	10 Minutes
4	Litmus Paper test		
5	Nitric Acid Flushing	60-70°C	15 Minutes
6	Hot Water Flushing	50-60°C	15 Minutes
7	Litmus Paper Test		
8	Sterilization Of Machines	70-75°C	45 Minutes

1.3.14 Storage System and Use of FIFO as the Stock Rotation Technique in DNPL

Storage is one of the crucial points of an organization which is closely related with better management of raw materials as well as finished goods. Storage is mainly the responsibilities of Stores Department. A separate store for raw materials, packing materials and finished goods are

present in DNPL for their proper maintenance. All these materials are kept in racks. All the racks are properly marked with their identification tags. First in First out (FIFO) is followed for the rotation of stock. Some packing materials and raw materials are stored in the cold store for maintaining the temperature and atmosphere. Fruit Juice Concentrate brought in the factory are of two types:

1. Aseptic Fruit Juice Concentrate:

Aseptically packed fruit juice can be kept even in ambient temperature. They are mainly stored in the RM Stores.

2. Frozen Fruit Juice Concentrate

Frozen fruit juice concentrate are stored in the cold store at the temperature of -18°C for achieving the best features of the raw materials.

The raw materials are stored in the atmosphere free from temperature variation and moisture migration. No living pests and weevils can survive at that temperature. The packing materials which are not affected by temperature variation are stored in corrugated cartons for e.g. stream caps, straw and tubes. Materials are protected from ground moisture by preventing direct contact between materials and cemented grounds by the use of trays at the base. In this way DNPL manages its storage system efficiently.

1.3.15 Marketing Channel & Policy of Real Fruit Juice

DNPL follow the rule of channel marketing using various distributors, wholesalers and retailers for the marketing of the product in order to approach to its end customers effectively and efficiently. These channels include the structure as shown in figure 3.

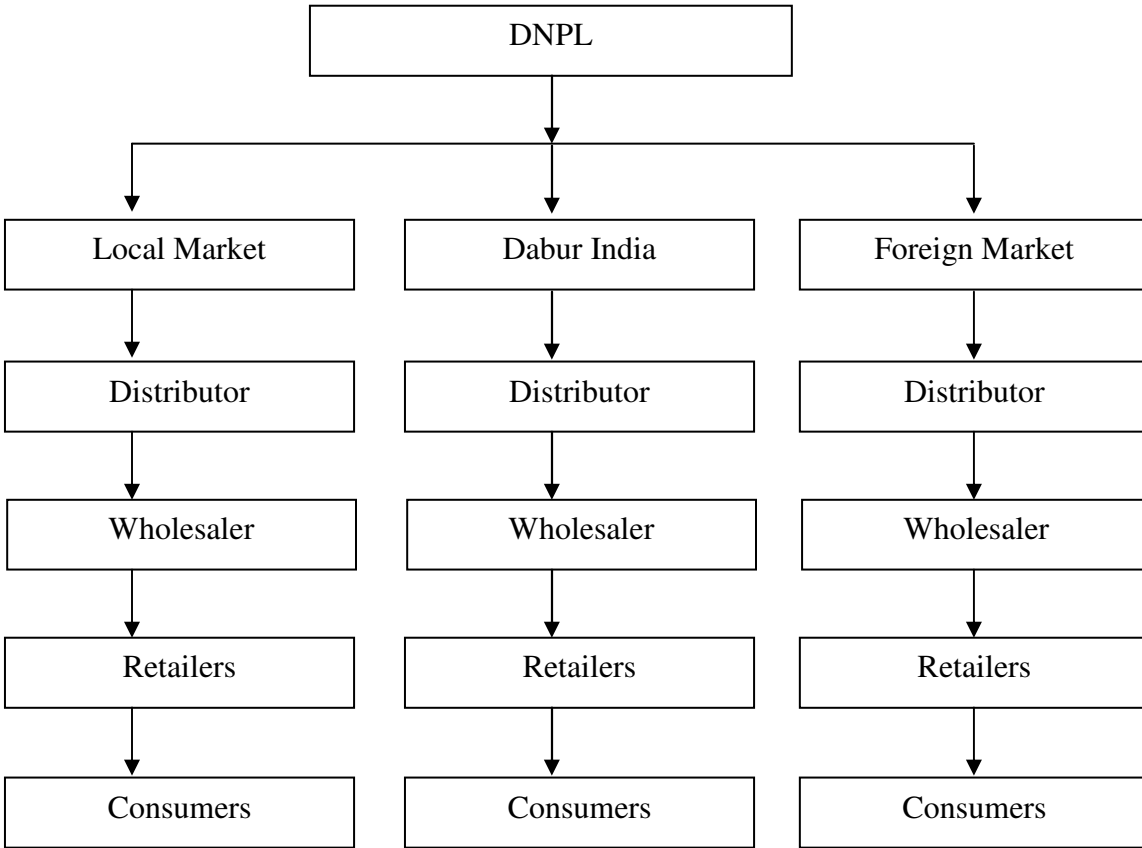


Figure 3: Marketing Channel of Real Fruit Juice

Figure 3 shows the marketing channel of DNPL with context to Real Fruit Juice Distribution and Sales.

1.4 Statement of Problem

Manufacturing enterprises are playing a dominant role in the Nepalese economy. It contributes around 15 percent in nation's GDP (CIA, 2012). Nepal's manufacturing sector is small but steadily growing. It consists mainly of small scale industries. Intermediate and capital goods industries are few but emerging. Industrial sector of Nepal is dominated by food and beverage manufacturing industries. The major problems faced by manufacturing industries can be summarized as:

- Ineffective resource utilization
- Lack of adequate infrastructure
- Lack of skilled manpower and technical expertise
- Political instability and interference

- Limitation of market
- High competition with imported goods
- Unsatisfactory financial performance

The present study highlights the problems in relation to manufacturing industries in Nepal with references to DNPL taking one of its major products “Real Fruit Juice”. Being a manufacturing industry the problems of DNPL is also more or less same to the problem of other manufacturing industries of Nepal.

Besides these several problems, the present study is concentrated mainly towards the inventory issues. Inventory is a broad term and comprises raw materials, work in process and finished products. Huge amount of capital is associated with these inventories. Cost of capital in Nepalese context is quite higher. Carrying high level of inventories results in high level of financial costs in terms of interest which ultimately affects the profitability. So it has been the subject of great challenge to manage and control the level of inventory so as to operate the enterprise with low financial costs. Though capital are also tied up with raw materials and semi-finished goods, but present study will examine the capital tied up with finished products and its impact on profitability of the enterprise. In the light of this explanation, the present study tries to answer the following questions:

- To what extent is the planning for finished goods inventory is being followed in DNPL?
- To what extent is capital tied up in finished inventory affecting the profitability?
- What is the situation of sales and production activities?
- What steps should be taken to improve the level of finished inventory so as to achieve better profitability?

1.5 Significance of the study

Profit is the lifeblood of every business unit. It is essential for every business units to earn sufficient profit in order to survive in long run. Actually profit is the excess of revenues over its costs. Profits can be increased either by increasing revenue or by decreasing costs. Revenues are generated by selling firms’ products or services which are managed and controlled by the factor of competition. So we cannot do much with revenue. But we can play with costs. Company operating with cost advantage incurs lower costs which ultimately improves the profitability.

There are so many aspects related to costs like materials costs, labor costs, overheads, financial costs, etc.

It is essential for the enterprise to keep sufficient quantity of finished products in its stock. Demand pattern of the products are uncertain. This leads the company to operate with high level of inventories of finished goods. As cost of materials, labor and overheads are included in finished products, so large amount of capital seems blocked if operated with high level of inventory. There might be several factors responsible for operating with such a high level of finished inventory. This study will also try to identify and analyze those factors.

This study will try to show the linkage between cost of capital associated with finished inventory and its profitability. This will help business managers to think more on these aspects and operate the company with broader horizon.

1.6 Objectives of the study

This study is an attempt to draw a vital conclusion about DNPL regarding its operating efficiency and the financial position through inventory policies and its application. DNPL has played a vital role in the economic development by providing opportunities of employment and promoting herb farming and utilizing wild herd resources in the best ways. The primary objectives of this study are to examine and highlight the degree of application of finished products inventory management in terms of capital association and its impact on profitability.

Following are the specific objectives of the study:

- To examine the variance between target and actual sales and production
- To analyze the trends of finished inventory periodically
- To analyze the financial performance with some financial ratios
- To provide recommendation and suggestions for improving the finished inventory management with regards to cost of capital tied up.

1.7 Limitation of the study

This study is limited to a single product name Real Fruit Juice of DNPL. The data used for this study will be historical and it will cover the period of recent five years. The concentration of the study will be on statistical, accounting and financial perspectives. The truth of the proposed

research will be based upon the available data from the company in the form of annual reports, brochures and information received through personal interview with the related personnel of the company.

1.8 Design of the study

This study has been organized into five chapters. The title of each of these chapters is as follows:

Chapter 1: Introduction

Chapter 2: Review of Literature

Chapter 3: Research Methodology

Chapter 4: Presentation and Analysis of Data

Chapter 5: Conclusion

1. Introduction

This chapter includes brief introduction of Nepalese economy and industrialization, general information about DNPL focusing on all related information about Real Fruit Juice, statement of problem, significance, objectives and limitations of the study.

2. Review of Literature

This chapter contains review of literature related to this study. This chapter mainly includes the concept and components related to the topic of this study basically concentrating in the area of sales, production, inventory, cost analysis, planning, forecasting, profitability, etc.

3. Research Methodology

This chapter includes introduction, research design, nature and sources of data, period cover, research variables, data gathering procedure, data analysis tools, etc.

4. Presentation and Analysis of Data

In this chapter, data collected through various sources have been presented in a number of tables, figures, graphs, charts as required by the research questions. This data have been analyzed and interpreted with the help of various analytical tools and techniques.

5. Conclusion

This is the last chapter of the study. In this chapter conclusion related to this study has been presented with suggestions.

Chapter 2: Review of Literature

In order to address the topic of this study several literatures have been referred and collected in this section. We have divided this section in two parts. In first part general background of literature review has been included which will address the overall idea of the study and in next part literature review related to several research variables like cost, profit, inventory, forecasting, financial and accounting analysis tools etc. have been elaborated specifically.

2.1 General Background

Inventory management is more crucial and challenging subject for the business enterprises especially for manufacturing concerns. “Inventory management is the control of inventory in a manner that best achieves the business objectives of your organization” (Piasecki, 2009). It is essential for all kinds of organizations to keep some stocks of items. For example: retail shops buy goods from wholesaler and hold them in order to sell them to customers, a factory keeps stock of raw materials for the production of finished products, financial institutions like banks keep sufficient cash for day to day transactions. So we see that every organization is holding some kind of items in its stock in order to fulfill the future use. “It takes money to make money, of course. But exactly how much money does it take to grow how much?” (Churchill and Mullins, 2001)

Tied-up capital from logistics perspective- “the capital involved in the flow of materials, that is, materials that are held in raw material and component stocks, in production (WIP), in finished stocks or distribution stocks and in transport.” (Kiani (2012) quoting Jonsson (2008))

According to Chartered Institute of Management Accountants, “Working Capital reflects the amount of cash tied up in the business’ trading assets. It is usually calculated as: stock (including finished goods, work in progress and raw materials) + trade debtors - trade creditors.” It is made up of three components-

1. **Days sales outstanding (DSO)** = $365 \times \text{accounts receivable balance} / \text{annual sales}$
2. **Days payable outstanding (DPO)** = $365 \times \text{accounts payable balance} / \text{annual cost of goods sold}$
3. **Days of inventory (DI)** = $365 \times \text{inventory balance} / \text{annual sales}$

Inventory is a broad term. So, it would be relevant to describe about what are included in stock or inventory. Waters (2003) has classified inventory as:

- Raw materials (received from suppliers and are kept until needed for operations)
- Work in process (units under processing)
- Finished goods (final products in the store that is to be delivered to the customers)
- Spare parts (for machinery, equipment)
- Consumable (oil, papers, cleaners, etc.)

It should be noted that retailers and wholesalers have stock of finished goods only but manufacturing concerns have all of the above types.

“Stocks are expensive, because of the costs of tied up capital, warehousing, protection, deterioration, loss, insurance, packaging, administration, and so on” (Waters, 2003). There might be several reasons for keeping stocks and vary from one firm to another. For example Nahmias (2009) advocates motivation for holding inventories as for economics of scale, to avoid uncertainties, speculation in price fluctuations, transportation, changes in demand patterns, logistics and control costs.

Another important issue is the relation of inventory with total assets, operating profit and inventory turnover. Silver, et al. (1998) argues that other things being the same; a decrease in inventory decreases the assets relative to liabilities because funds released through reduction in inventory can be used to have other types of assets or to reduce liabilities. This leads to affect the current ratio which is most commonly used measure of liquidity. This is supported by the following two relations:

$$\text{Operating profit} = \text{Revenue} - \text{Operating Expenses} \quad (1)$$

$$\text{Inventory turnover} = \frac{\text{Annual sales or usage (at cost)}}{\text{Average inventory (in \$)}} \quad (2)$$

Changes in inventory can influence both revenue and operating expenses in equation (1). Allocation of inventories among different items in improved way leads to increase the sales revenue. While on the other side, being a significant component of operating expenses, inventory carrying charges can be reduced with decrease in inventory levels. Similarly equation (2)

represents about the inventory turnover ratio which is very useful tool to measure the relation of inventory with sales. Higher inventory turnover is appreciated. It can be seen that turnover will increase by increasing sales by keeping inventory constant and again turnover increases by decreasing inventory keeping sales constant. So efforts made on increasing sales revenue but decreasing the level of inventories will help the firm to attain better use of inventory to increase the sales.

Cost minimization and profit maximization are the two vital issues that to be addressed in several inventory problems. Both objectives are interrelated. One can achieve higher profit by having cost advantage. There are several costs associated in inventory costs like holding costs, order cost, or penalty costs. But we limit our study concentrating only on holding cost. Nahmias (2009) describes holding cost as the sum of all costs which are proportional to the amount of inventory on hand at any time and divides the composition of holding costs as

- Costs related to storing the items
- Taxes and insurance
- Breakage, spoilage, deterioration, etc.
- Opportunity cost of alternative investment

It is important to note that inventory is somewhat cash in the sense that it requires the conversion from its state. When capital is invested in producing inventory, the level of capital is tied up. Similarly when we decrease the level of inventory, it results in increasing capital. So it is important to accelerate this conversion cycle to mobilize the flow of capital and inventory smoothly.

2.2 Literature Review in Detail Related to Various Aspects of Research

2.2.1 Brief overview of Production and Operation Management

Industrialization plays the vital role for the socio-economic development of any country. It is essential to manage the industrial sector in order to achieve long term and sustainable economic growth and prosperity. Through better management of industrialization, expansion of employment and generation of income could be achieved for the overall development of the society and nation as a whole. Industrialization not only provides opportunity for employment

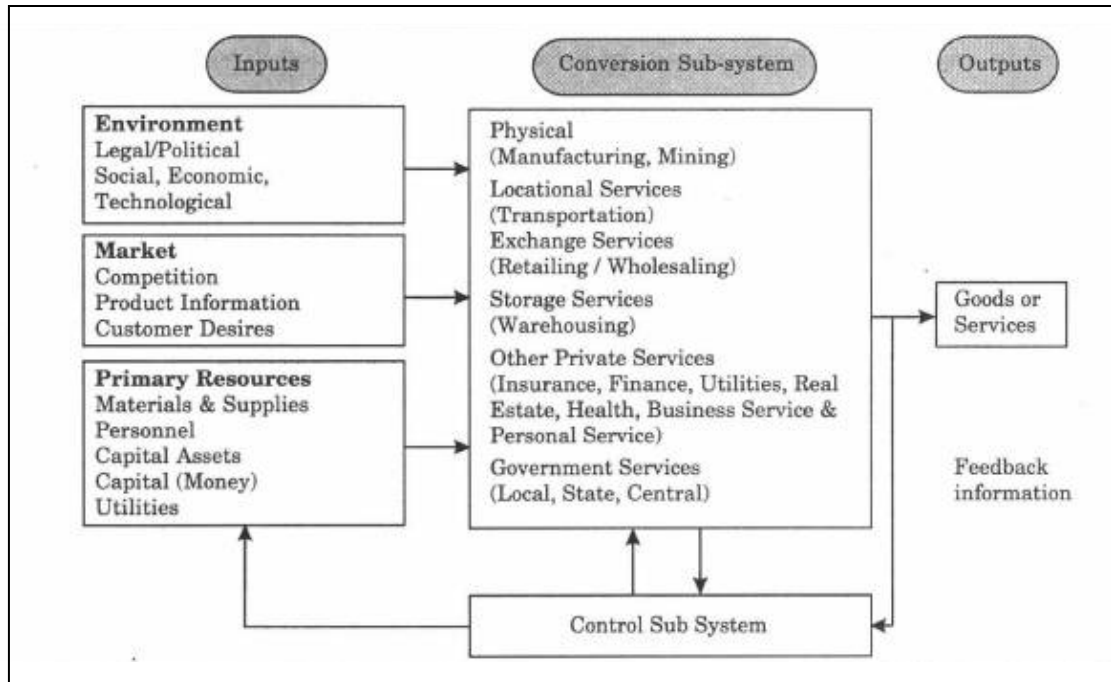
and produces other amenities of life but it also helps in accelerating the development of other sector of the economy. It is the industrialization which can help in raising the economy by eliminating circle of backwardness and poverty. Production is the foundation of whole organization. In the absence of production activities, there is no meaning of marketing, finance and other activities. Organizations produce both tangible and intangible products. Organization that produces tangible product is manufacturing organization whereas organization producing intangible product is service organization. “Manufacturing is understood to refer to the process of producing only tangible goods, whereas production includes creation of both tangible goods as well as intangible services”. (Aswathappa & Shridharabhat, 2009)

Operations management is about the management of the processes that produce or deliver goods and services. Operations management has made a significant contribution to society by playing a role in areas such as increasing productivity, providing better quality goods and services and improving working conditions. (Bhadur, 2008)

An operation also refers to the production of goods and services, the set of value-added activities that convert inputs into many outputs. Operations management is an area of industry that is concerned with the production of good quality goods and services, and involves the answerability of ensuring that business operations are well-organized and resourceful. (Srivastava & Bisen, 2009)

Aswathappa & Shridharabhat (2009) describes production as a system incorporating Production system, Conversion sub-system and Control sub-system. Materials, personnel, capital, utilities and information are obtained by production system as inputs and are converted into desired product by conversion sub-system. Finally control sub-system comes in action to confirm whether the output produced by conversion sub-system is acceptable in terms of quantity, cost and quality. Control sub-system maintains the corrective measures to be taken by the responsible managers through the flow of feedback information. This is demonstrated by the following figure:

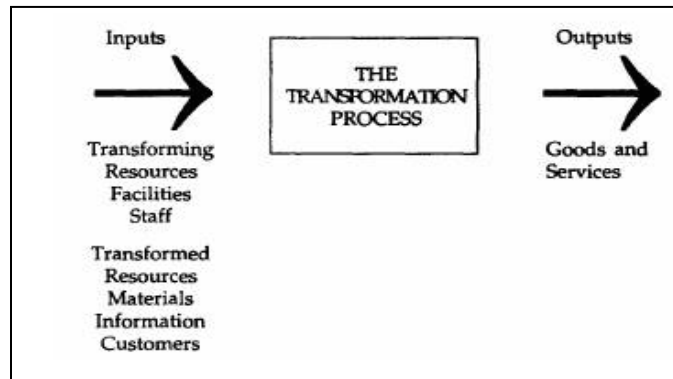
Figure 4: A Production System Model



Source: (Aswathappa & Shridharabhat, 2009)

Bhadur (2008) argues about the role of operations management is to handle transformation of an organization's inputs into finished goods and services. He emphasized on the fact that input activity involves two categories of resources i.e. transforming resources and transformation process which is supported by the following diagram:

Figure 5: The role of operations management



Source: (Bhadur, 2008)

Thus, in manufacturing organizations, inputs like raw materials, parts and components, labor, capital, information and technology are converted into desired output with the help of machine and equipment. So, it is of vital importance for a manufacturing organization to select an appropriate process technology i.e. machines and equipment to manufacture quality products in desired quantity.

2.2.2 Forecasting

Forecasting has the vital role in success of any company. Sales are the main source of revenue generation for an enterprise. Future is uncertain. Business activities are being performed in uncertain environment. For example we cannot predict accurately about the demand/sales in particular period. All other business activities like purchase of raw materials, production, labor requirement, capital expenditure decisions, etc. heavily depend upon the sales. This means demand/sales direct all other business functions. Accuracy in demand forecast will lead to manage and control all other functional areas and significance amount of efforts, time and costs can be saved. So it is essential for an enterprise to invest time, effort and money in developing reliable and appropriate forecasting technique for the overall soundness of the organization.

Forecasting is the first step in planning. It is defined as estimating the future demand for products and services and the resources necessary to produce these outputs. Estimates of the future demand for products or services are commonly referred to as sales forecasts. The sales forecasts or demand forecasts are the starting point for the entire planning in production and operations management. For example, material planning, capacity planning, manpower planning, financial planning and production scheduling, all depend on sales forecasting. (Aswathappa & Shridharabhat, 2009)

Srivastava & Bisen (2009) advocate forecasting as the primary activity in the planning involving study of past data & present data and the main purpose of forecasting is to estimate the occurrence timing and magnitude of future activity. By applying good projection of future demands, the management of the company can be benefited regarding inventory, production and operation, manpower planning, etc. They further point out the benefits of forecasting as:

- Effective handling of happening
- Better employee's interpersonal relations

- Minimizing the fluctuations of production
- Balance work load distribution
- Better material management and better utilization of production resources
- Better customer services and optimum utilization of capital and resources
- Better plant layout and better location distribution of production system

There might be several factors influencing the sales forecast. Hornhren, Foster, & Datar (1994) summarize the factors influencing the sales forecast as follows:

- Past sales volume
- General economic and industry conditions
- Relationship of sales to economic indicators such as gross domestic product, personal income, employment, prices, and industrial profitability
- Market research studies
- Pricing policies
- Advertising and other promotion
- Quality of sales force
- Competition
- Seasonal variations
- Production capacity
- Long-term sales trends for various products
- Regulatory policies and restrictions

Thus it can be concluded that forecasting is the future decision for future happenings tracing out at present through the analysis of relevant factors of past and present. Its main aim is to reduce uncertainty and risk involved in future and to achieve desired objectives as possible. So, forecasting is an important tool for business management helping in preparation of budgets and assisting in decision making process.

2.2.3 Cost Concept with Classification and Behavior

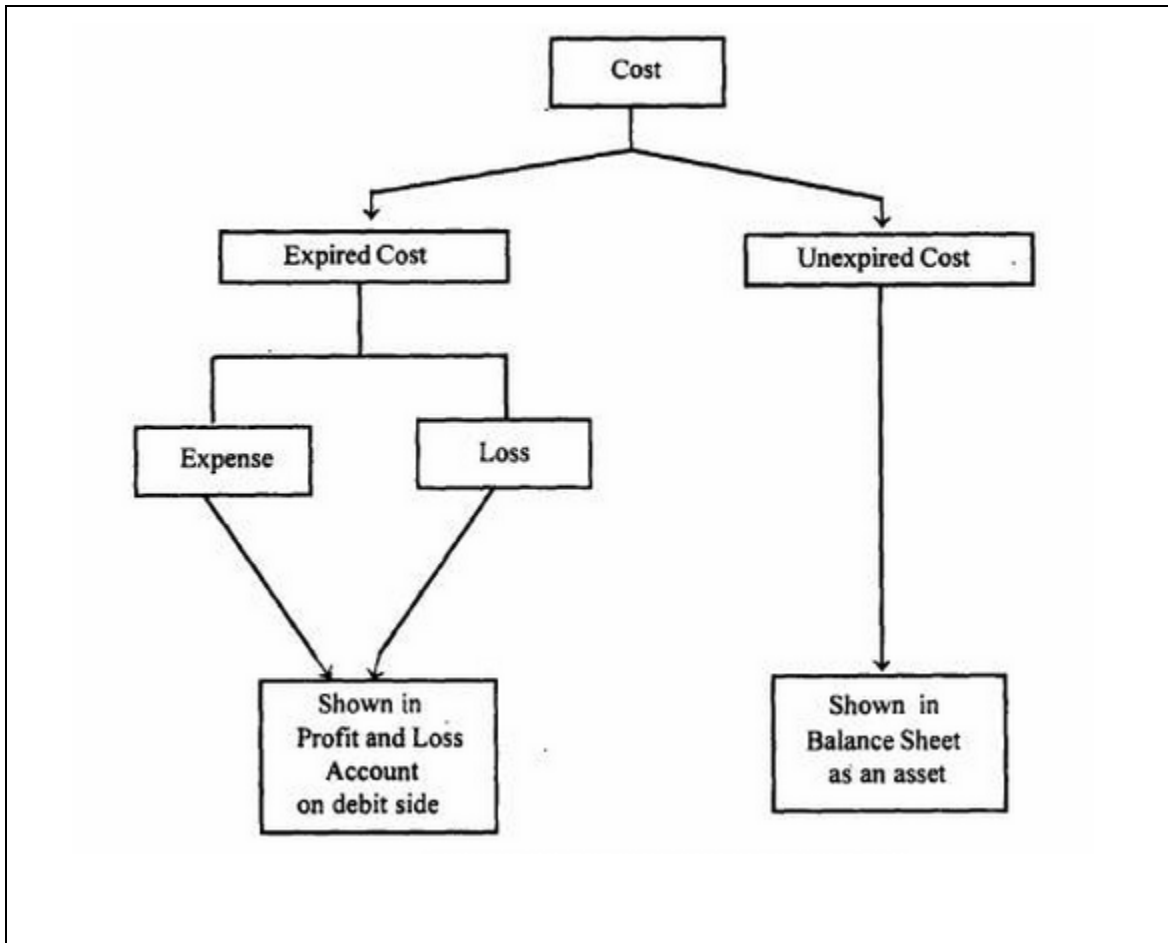
Cost simply means the expenses. Cost is the vital component of any organization. There are so many areas where expenses are being absorbed. By better controlling and managing the costs,

organization can achieve the goal of cost efficiency which will ultimately contribute the organization in lowering the production cost and enhancing the profitability. So, it is essential to critically analyze the different types of cost incurred and costing system adopted in the company along with behavioral aspects.

The term cost is denoted by 'expenses' when the cost is incurred after deriving the benefit. Expense refers to such items as operating, selling or administrative expenses. Examples of expired cost or expense are rent paid for using the building, wages and salaries paid for deriving the services. When the cost is incurred before deriving the benefit it is termed as deferred cost. Examples of deferred costs are insurance premium paid, advertisement expenses incurred and cost of research and development. When no benefit is derived by the incurrence of cost, it is termed as loss. Examples of loss are materials destroyed by fire, salary paid for a period of strike, materials spoiled through bad workmanship, high prices paid for materials because of faulty purchases, wages paid to workers for idle time arising from breakdown of machines. (Thukaram Rao, 2009)

Arora (2009) argues that cost and expenses are used interchangeably but cost should be differentiated while dealing with expense and loss. He defines expense as the portion of the revenue earning potential of an asset which has been consumed in the creation of revenue whereas loss is an expired cost resulting from the decline in the service potential of an asset that generated no benefit to the firm. He supports this argument from the following figure:

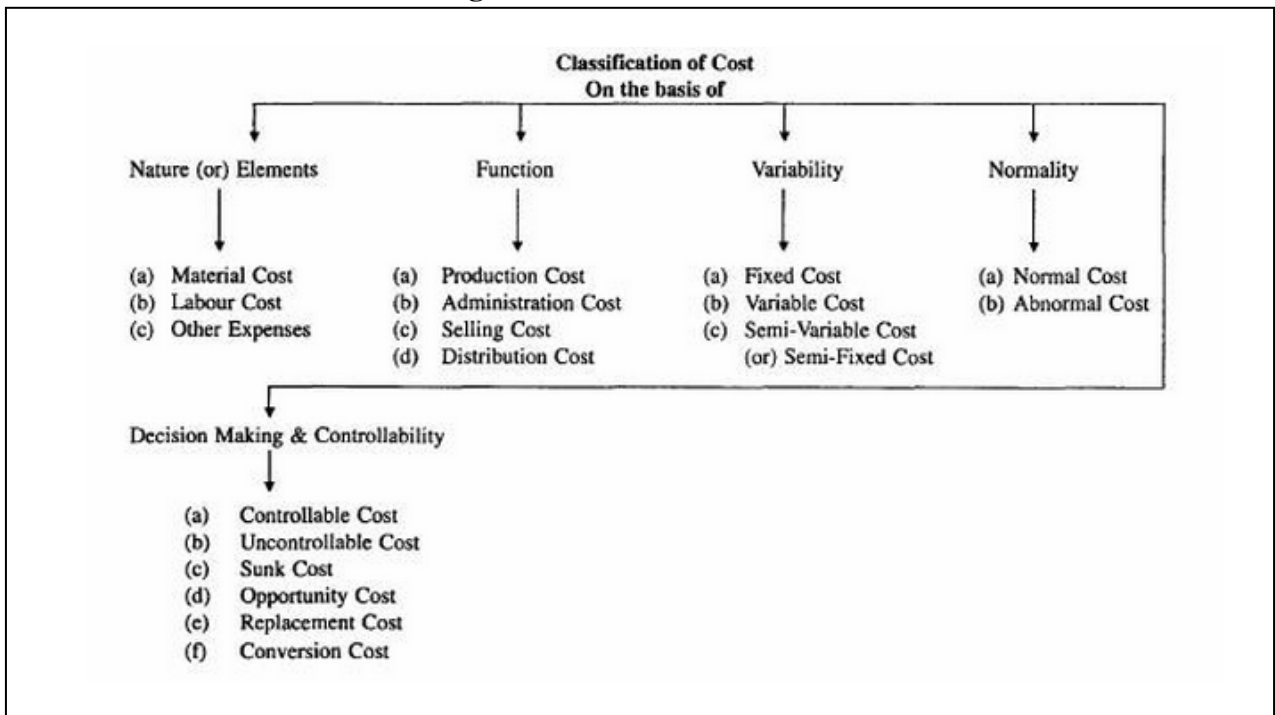
Figure 6: Relation of cost, expenses and loss



Source: (Arora, 2009)

There might be various method of classifying the cost on the basis of its need. Better understanding of cost classification analysis could assist the managers of different responsibility centers to implement and execute cost reduction and control at their responsibility centers which will ultimately enhance the overall cost efficiency of the whole organization. Periasamy (2010), has classified the cost on the basis of Nature, Function, Variability, Normality and Controllability & Decision making and he further classifies the cost in detail as shown in following chart:

Figure 7: Classification of Cost



Source: (Periasamy, 2010)

On the basis of Nature or Elements: Based on elements, it is classified into Material Cost, Labor Cost and Other Expenses. They can be further subdivided into Direct and Indirect Material Cost, Direct and Indirect Labor Cost and Direct and Indirect Other Expenses.

On the basis of Function: The classification of costs on the basis of the various function of a concern is Production cost, Administration Cost and Distribution Cost.

On the basis of Variability: Cost can be classified into Fixed, Variable and Semi Variable cost. Fixed costs are those costs incurred which remain constant with the volume of production. Examples: Rent and rates of office and factory buildings. Variable cost are those cost incurred directly with the volume of output. Example: cost of materials and wages. Semi-Variable costs are those costs incurred, partly fixed and partly variable, with the volume of production. Example: depreciation and maintenance cost.

On the basis of Normality: Costs are classified into normal costs and abnormal costs on the basis of normality features. Normal costs are those incurred normally within the target output or fixed plan.

On the basis of Controllability and Decision Making: On this basis costs are classified as Controllable cost, Uncontrollable cost, Sunk Cost, Opportunity cost, Replacement cost and Conversion cost.

In order to manage the business activity in better and efficient way, it is essential to adopt an ideal costing system. Sharma (2010) describes some important features of the ideal costing system to be adopted in an enterprise which are summarized as follow:

- Preliminary studies regarding type of business, layout, production processes, etc. should be analyzed in detail before introducing costing system. Accurate and complete financial records are to be maintained as costing depends to a great extent upon the reliability of financial accounting data. Proper selection of costing unit, system and organization should be established.
- Timeliness, adequacy and relevant flow of costing information through costs report are evident. It should be economical and flexible enough to absorb dynamic changes in the environment in which enterprise operates. Perfect cooperation among persons in the organization is vital to ensure the reliability of the costing system.
- Periodic review and necessary changes as per need are to be incorporated. Proper coordination with financial accounting and other organizational divisions is to be established to ensure the smoothness of the system.

Thus, cost is a an important factor for an enterprise so it should be critically observed, examined and analyzed so as to fulfill the norms of cost reduction and control program. By continues execution of this program it will assists the enterprise to attain the cost efficiency goal which will ultimately add in overall excellence of the organization.

2.2.4 Profitability

The term profitability simply means the ability of making profit. Profits are the key elements in the enterprise system. In the absence of profit the system would fail to operate. Therefore, the

profit is the dominant goal and profit making should be the main objective in terms of measuring general effectiveness of the organization. In real sense profit is the primary measure of business success in any economy. If the firm cannot make profit, it cannot obtain capital and secure other resources like manpower, materials, machines, technology, etc. and it will be deprived of achieving its objectives in long run. In summary no company can survive long time without profit. The measure of effective performance of business is profit so profit has been the matter of prime importance in any business. “Increasing sales and maximizing profit is the fundamental objective of any business organization. Different organization use different methods and technique to achieve the objective. Some organization use direct methods and other indirect method. One of the methods is sales promotion”. (Rizvi & Malik, 2011)

Collier (2003) describes profit as excess of income over expenses where income is the value of sales of goods or services produced by the business and expenses are the cost involve in buying, making or providing those goods or services and all the marketing and selling, production, logistics, human resource, IT, financing, administration and management cost involve in operating the business. He further segregates profit as gross profit and operating profit supported by following formula:

<p style="text-align: center;">Gross Profit = Sales - Cost of Sales</p> <p style="text-align: center;">Operating Profit = Gross Profit - Expenses</p>

Cost of Sales should be meant as cost of goods sold but not cost of goods produced. Expenses include all other expenses in relation of selling, administration, finance, etc. in the operation of business. It is important to note that cost of sales and expenses may vary between industry and organization. So, there should clear demarcation between cost of sales and expenses. Operating profit represents the profit generated from ordinary operations of the business and is also termed as net profit/profit before interest and taxes (PBIT)/Earnings before interest and taxes (EBIT).

Profitability is the ability of a given investment to earn a return from its use. Satisfactory return depends upon several factors including the nature of business, risk involved in business, etc. If an enterprise fails to earn profit, invested capital is eroded and if this situation prolongs, the

business enterprise may ultimately cease to exist. The efficiency of a business concern is measured by the amount of profits earned. The larger the profit the more efficient and profitable the business become. (Saini & Sharma, 2009)

Growth of any type of business firm depends on profit. The relationship between profit and growth seems obvious: profit provides the funds for growth. A firm can grow internally through investments in development projects in various ways. For example, it can grow by taking advantage of internal economies of scale, or product and industry diversification, or geographical expansion at home and abroad, technology opportunities through research and development, through mergers and acquisitions. In all of this cases, internal funds availability make easier. (Mukhopadhyay & AmirKhalkhali, 2010)

An Oracle Thought Leadership White Paper (2008), defines profitability management can be defined both from a top-down and a bottom-up perspective. From a top-down point of view, profitability management consists of a set of processes and a methodology to bring all costs and revenues together on an operational level, providing operational managers with the insight on how to deploy their resources in an optimal way. Bottom-up profitability management entails the process and methodology of identifying the organization's operational cost and value drivers at a transactional level and aggregating them up to translate their workings into financial results.

Accepting the importance of profitability for the successful operation as well as the long run survival and existence of the enterprise, business enterprises should be more sensitive, critical and serious about organizing and coordinating all business functions that could lead to sustainable growth and prosperity of the whole organization.

2.2.5 Brief review of Inventory Fundamentals

Inventories are materials and supplies that a business or institution carries either for sale or to provide inputs or supplies to the production process. All businesses and institutions require inventories. Often they are a substantial part of total assets. Financially, inventories are very important to manufacturing companies. On the balance sheet, they usually represent from 20% to 60% of total assets. As inventories are used, their value is converted into cash, which improves cash flow and return on investment. There is a cost for carrying inventories, which increases

operating costs and decreases profits. Good inventory management is essential. (Arnold & Chapman, 2001)

The optimal management of inventories is a primary objective for all the firms manufacturing make to stock finished goods. As a matter of fact, inventories have important implications for both the financial and the economic performance of the company; therefore it is widely acknowledged that an optimal inventory management policy allows companies to achieve higher profitability levels. In general terms, inventory management policies should be aimed at lowering the holding costs through higher inventory rotation, but without triggering substantial stock-outs and backorders, caused by demand peaks and/or lead time delays. (Bertolini & Rizzi, 2002)

Inventory plays important role in smooth operation of major activities like production, sales & distribution. Muller (2002) suggests some of the important reason for obtaining and holding inventory as:

- **Predictability:** It helps in predicting the quantity of raw materials, parts, sub-assemblies, etc. required in order to engage in capacity planning and production scheduling.
- **Fluctuations in demand:** We cannot exactly predict the customers demand pattern. Fluctuation in demand pattern is likely to be occurred. So in order to satisfy the customers' demand in every situation, company should maintain adequate inventory level.
- **Unreliability of supply:** Inventory protects the company from unreliable suppliers or when an item is scarce and it is difficult to ensure a steady supply.
- **Price protection:** Buying quantities of inventory at appropriate times helps avoid the impact of cost inflation.
- **Quantity discounts:** Quantity discount in purchase of bulk quantity also leads to hold more inventories.
- **Lower ordering costs:** Companies might prefer to buy larger quantity of an item rather than smaller quantity in order to make savings in ordering cost.

Every company has to hold some kind of inventory for its smooth operation. Quantity and types of inventory depends upon the nature of the company. There might be many ways for the classification of inventories. Arnold & Chapman (2001) classifies inventory as:

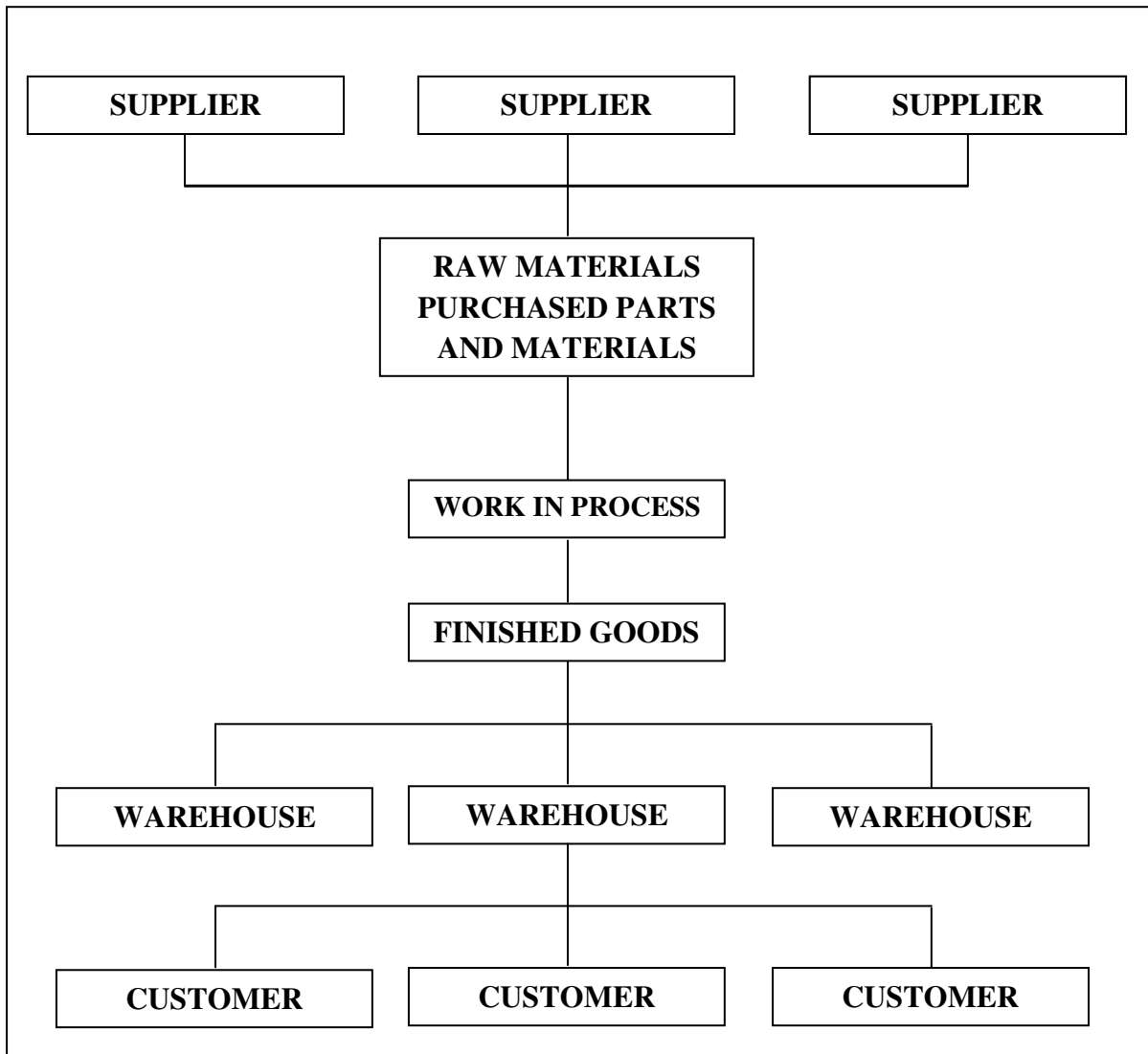
- **Raw materials:** Purchased items that are received but not entered into production process. It includes materials, component parts, etc.
- **Work-in-process (WIP):** WIP represents semi-finished products i.e. it is the state of product which is neither in raw material form nor in finished product form.
- **Finished goods:** The finished products of the production process that is ready to be sold as finished items.
- **Distribution inventories:** Finished goods located in the distribution system.
- **Maintenance, repair and operational suppliers (MROs):** Items used in production that do not become part of the product. It includes tools, spare parts, lubricants, etc.

The risks and costs that are associated in holding inventories as stated by Ramagopal (2008) are:

- **Capital Costs:** Funds are involved and tied-up if we hold inventories. If company uses own sources of funds, it would be the opportunity cost for the company as this fund can be profitably used in other alternatives. If funds have been borrowed, interest would be occurred. Thus, in both cases the firm has to incur cost.
- **Recurring Costs:** Firm incurs recurring costs, in the form of storage and insurance charges, etc.
- **Risk of Deterioration:** If stocks are held for long period of time in storage then quality of goods will be deteriorated. This might hamper the company in the form of losses.
- **Risk of Obsolescence:** Taste and preference of consumer changes with time, technological, etc. which may bring the product to the end as it is not useful with the present need of consumers.

Based on this classification the flow of materials into, through, and out of manufacturing organization can be demonstrated in figure below:

Figure 8: Inventories and the flow of materials



Source: (Arnold & Chapman, 2001)

For manufacturing companies, better inventory management of raw materials and finished goods are equally important. Substantial amount of capital has been tied up in these inventories resulting higher financial costs and ultimately influencing the profit.

Finished goods represent final or completed products that are available for sale. The inventory of such goods consists of items that have been produced but are not sold. A certain level of inventory is needed for smooth sales activities of the enterprise. Different industries follow

different inventory policies according to the nature of their products. There are so many factors like nature of products, seasonality, production process, distribution system, etc. which might play vital role in determination of inventory level of such finished goods. So, finished goods inventory plays a vital role in profit planning of any manufacturing enterprises. A better inventory policy makes the organization better. Actually finished goods inventory is the cause of difference between sales and production. When sales are higher than production, then inventory is brought in use to meet excess sales and hence level of inventory is going to be decreased. Similarly, when production is higher than sales, then the excess production is kept into store and hence the level of inventory is going to be increased. Thus, inventory is the most important part of sales and production. Inventory incurs relatively higher investment and may have significant impact on the major functions of the enterprise and its profit. Therefore, it is essential for a manufacturing enterprise to manage the optimum level of inventory in best possible way. This will enable the enterprise to make significant savings in financial cost and to operate the business activities smoothly.

2.2.6 Cash Conversion Cycle

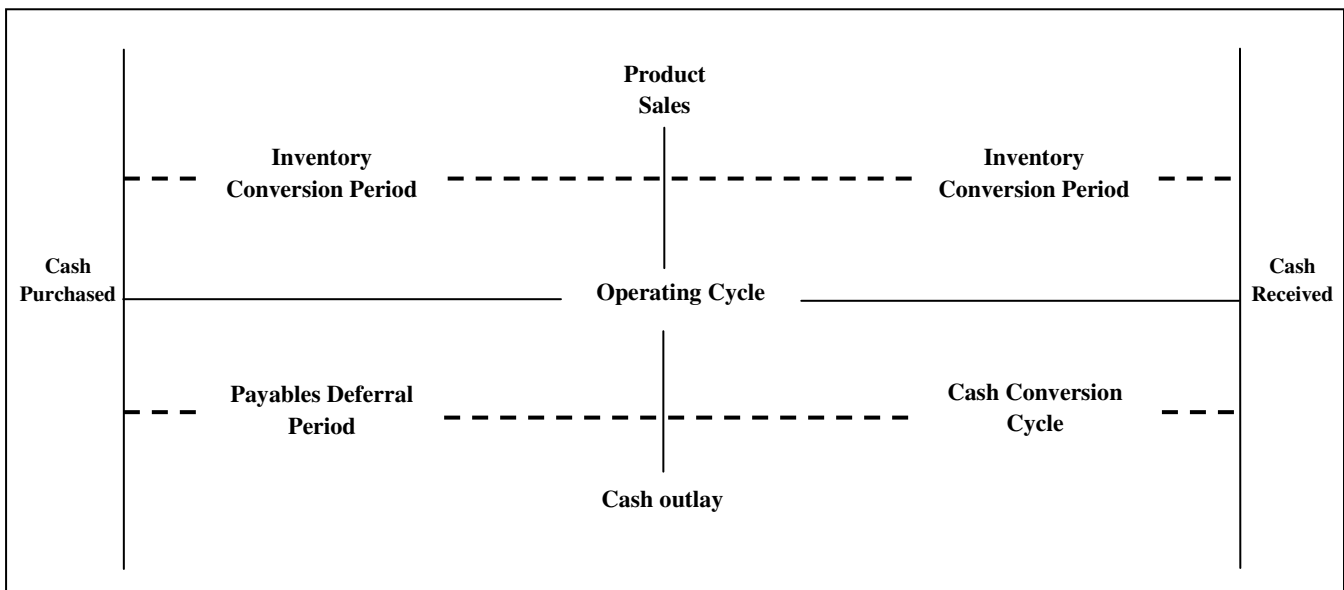
In manufacturing enterprises raw materials are received from supplier on certain credit terms. Those raw materials are converted into finished goods through conversion process. Finished products then sold to customers on certain credit terms. Finally cash is received from those credit customers and paid to the supplier. Thus, there appears a flow cycle of a several components (supplier, raw materials, finished products, customers, cash) starting from supplier and ending at supplier. Time taken to complete one cycle is of vital importance with regards to working capital requirement for smooth and economical operation of the business. In order to achieve better efficiency it is essential to accelerate this cycle as much as possible. This will enable the company in mobilizing the major functions with optimum level of working capital avoiding excess financial expenses in the form of interests, obsolescence, damages, etc.

The cash conversion cycle concept provides an ideal framework for determining the actual amount of cash that must be provided by the firm to finance working capital. This technique focuses on the timing of cash flows as well as on the dollar amounts invested. Timing, reflected in the length of time products stay in inventory or accounts receivable, provides the key to finding ways to reduce the amount of cash investment without jeopardizing sales levels. The

value calculated for the cash conversion cycle is the number of days of sales inventories that must be financed with cash. (Cheatham, Dunn, & Cheatham, 1989)

Cash conversion cycle, the net time interval between actual cash expenditures on a firm's purchase of productive resources and the ultimate recovery of cash receipts from product sales, establishes the period of time required to convert a dollar of cash disbursements back into a dollar of cash inflow from a firm's regular course of operations (Richards & Laughlin, 1986). It can be shown by following diagram:

Figure 9: Cash Conversion Cycle



Source: (Richards & Laughlin, 1986)

2.2.7 Working Capital Concept

Every business enterprises have a practice of sufficient level of funds in order to operate several normal functions like purchase of raw materials, payment of wages and other daily operational expenses, etc. Such funds which are used to perform normal course of business activities are considered as working capital.

Working capital refers to that part of the firm's capital, which is required for financing short-term or current assets such as cash, debtors, inventories and marketable securities etc. (Ramagopal, 2008)

Essentially, working capital represents the amount of day-by-day operating liquidity employed by a business. Also known as “operating capital,” net working capital is most often measured as the difference between current assets and current liabilities. In practical terms, the need for working capital financing arises when investments in short term assets (especially inventories and accounts receivable) exceed financing from short term liabilities (trade accounts payable, also known as supplier financing). An optimal level of working capital would be the one in which a balance is achieved between risk and efficiency and requires continuous monitoring to maintain proper level in various components of working capital i.e. cash receivables, inventory and payables etc. (Taleb, Zoued, & Shubiri, 2010)

Working capital requirements might vary depending upon several factors. There is no definite set of rules in order to determine Working Capital needs of a firm. Paramasivan & Subramanian (2009) point out the major factors determining Working Capital need as follows:

- Nature of business
- Production cycle
- Business cycle
- Production policy
- Credit policy
- Growth and expansion
- Availability of raw materials
- Earning capacity

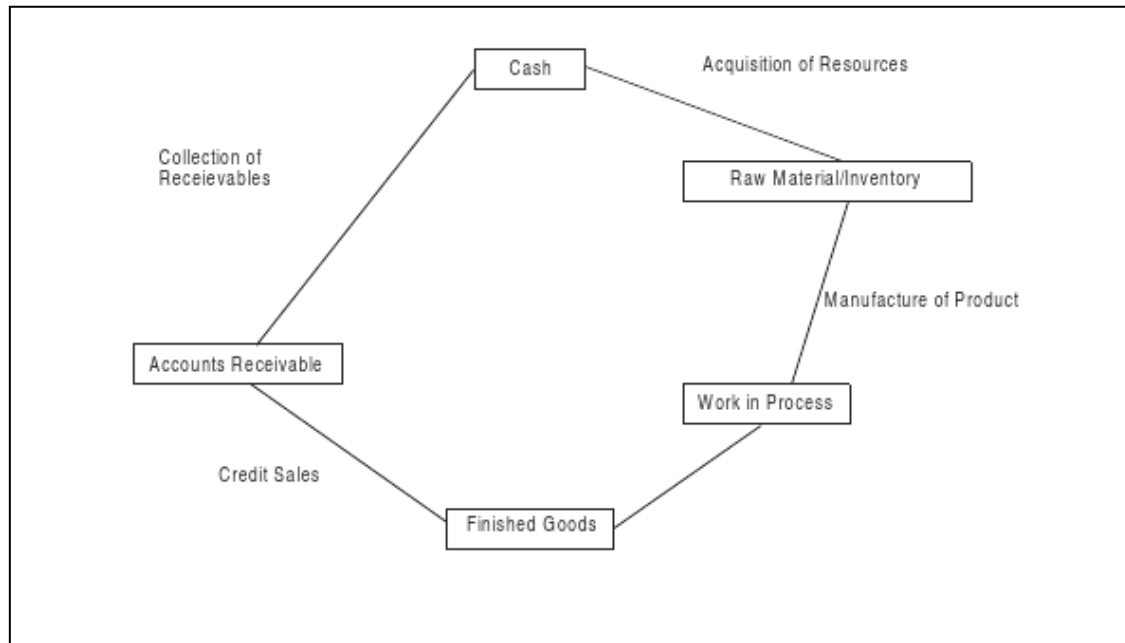
Ramagopal (2008) advocates that amount of working capital need on the Operating Cycle and describes it as the length period required to transform sales into cash through acquisition of resources such as materials, labor, etc. Simply the length of operating cycle is the sum of Inventory Conversion Period (raw materials conversion period, WIP conversion period and finished goods conversion period) and Debtors Conversion Period (period required to convert credit sales into cash). He further points out that a typical manufacturing firm involves three phases in its operating cycle as:

- **Acquisition of Resources:** It includes raw materials, labor, power and fuel, etc.

- **Manufacture of the Product:** It includes conversion of raw materials into work-in-process into finished products.
- **Sale of the product:** Sales can be either for cash or credit. Credit sales result into debtors or accounts receivable.

Operating cycle can be explained in a diagram as:

Figure 10: Operating Cycle



Source: (Ramagopal, 2008)

2.2.8 Cost Volume Profit (CVP) Analysis

Cost, Sales volume and Profit are the vital components in any enterprise. Every enterprise wants to minimize the cost, maximize its revenue and profit by selling its product as much as possible. So, management of cost, sales volume and profit is essential for the success of the enterprise. Moreover, managers should also have the better understandings of relationship among these three components. The relationship among these components can be explained as:

- **Cost-Volume:** Cost and sales volume are directly related. Higher the production/sales volume, higher the cost and vice versa.

- Volume-Profit: Sales volume and profits are also directly related, higher the sales volume higher the profits and vice versa.
- Cost-Profit: Cost and profit are indirectly related. Higher the cost, lower the profit and vice versa.

So, it is essential for managers to seriously go through these facts because success of any business enterprises to a great extent depends on the well management of these three components.

Cost-volume-profit (CVP) analysis examines the behavior of total revenues, total costs, and operating income as changes occur in the output level, the selling price, the variable cost per unit, and/ or the fixed costs of a product. Managers use CVP analysis to help answer questions such as: How will total revenues and total costs be affected if the output level (the volume in CVP analysis) changes- for example, if we sell 1,000 more units? If we raise or lower our selling price, how will that affect the output level? If we expand our business into foreign markets, how will that affect costs, selling price, and output level? These questions have a common “what-if” theme. By examining the results of these what-if possibilities and alternatives, CVP analysis illustrates the profits from those possibilities and alternatives. In this way, CVP analysis guides managers’ planning. (Horngren, Datar, & Foster, 2003)

CVP studies the inter-relationship of three basic factors of business operation:

- a) Cost of production
- b) Volume of production or sales
- c) Profit

The cost of a product determines its selling price and the selling price determines the level of profit. The selling price also affects the volume of sales which directly affects the volume of production and volume of production in turn influences cost. In brief, variations in volume of production results in changes in cost and profit. (Arora, 2009)

Cost Volume Profit Analysis (CVP) is a systematic method of examining the relationship between changes in the volume of output and changes in total sales revenue, expenses (costs) and

net profit. In other words it is the analysis of the relationship existing amongst costs, sales revenues, output and the resultant profit. (Periasamy, 2010)

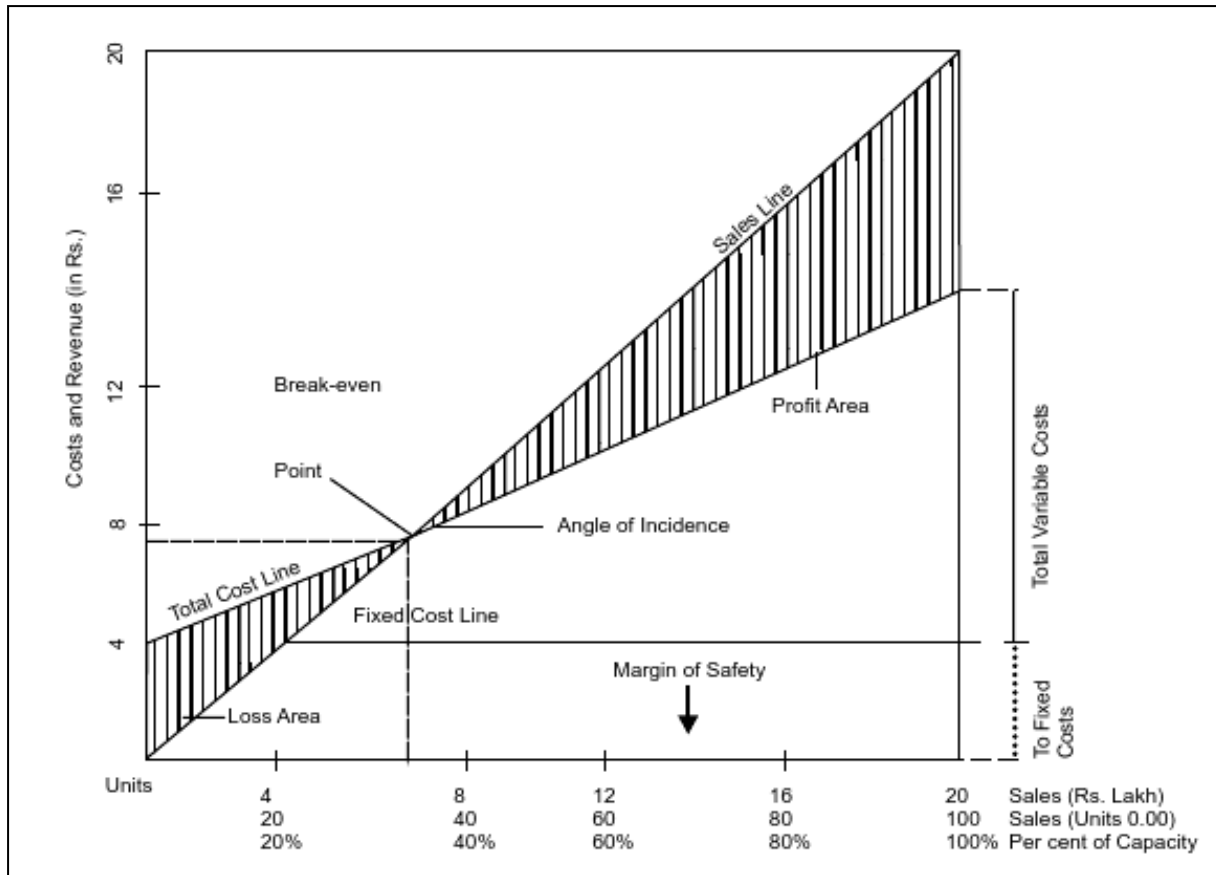
Cost-volume-profit (CVP) analysis is a well-known managerial tool that attempts to specify a firm's cost and revenue functions and the relationships between the two. It is used by managers, accountants, investment analysis, and other interested persons to examine the effects on profit of changes in costs, volume, selling price, product mix and related factors. (McIntyre, 1977)

Arora (2009) further emphasizes that CVP analysis is very much useful to the management in budgeting and profit planning. Net profit are very much influenced by changes in selling prices, volume of sales, variable cost and fixed cost. So, CVP analysis helps in determining the probable effects of these factors on profit.

Break-even analysis is a widely used technique to study the CVP relationship. It is interpreted in narrow as well as broad sense. In its narrow sense, break-even analysis is concerned with determining break-even point (BEP) i.e., that level of production and sales where there is no profit and no loss. At this point, total cost is equal to total sales revenue. (Arora, 2009)

Thus, break-even analysis emphasizes the level of output or activity at which sales revenue exactly totals to costs i.e. there is no profit no loss. So, BEP is the level of sales where total sales revenue equals to total cost. Therefore, it is the bridge between loss range and profit range. If the sale is higher than the BEP volume there will be a profit. In the same way if the sales is less than BEP volume, there will be loss. BEP analysis can be explained by the following diagram.

Figure 11: Break-Even Chart



Source: (Ramagopal, 2009)

Ramagopal (2009) explains the break-even analysis concept in mathematical formula in clear and distinct way as follows:

$$\text{BEP (units)} = \frac{\text{Total Fixed Cost}}{\text{Selling Price Per Unit} - \text{Variable Cost Per Unit}} = \frac{\text{Total Fixed Cost}}{\text{Contribution Per Unit}}$$

$$\text{BEP (in rupees)} = \text{BEP (in terms of units)} \times \text{Selling price per unit}$$

Or

$$\text{BEP (in rupees)} = \frac{\text{Total Fixed Cost}}{1 - \frac{\text{Variable Cost Per Unit}}{\text{Selling Price Per Unit}}}$$

Assumptions underlying Break-even Analysis

The break-even analysis according to Arora (2009) is based on the following assumptions

- All costs can be separated into fixed and variable components.
- Variable cost per unit remains constant and total variable cost varies in direct proportion to the volume of production.
- Total fixed cost remains constant.
- Selling price per unit does not change as volume changes.
- There is only one product or in the case of multiple products, the sales mix does not change. In other words, when several products are being sold, the sale of various products will always be in some predetermined proportion.
- There is synchronization between production and sales. In other words, volume of production equals volume of sales.
- Productivity per worker does not change.
- There will be no change in the general price level.

2.2.9 Budgetary Control

A budget is a monetary and/or quantitative expression of business plans and policies, prepared in advance, to be pursued in the future period of time. Budgetary control is the process of determining various budgeted figures for the enterprise and then comparing the actual performance with the budgeted figures for calculating the variances, if any. In this process, first budgets are to be prepared. Second, actual results are to be recorded. Third, comparison is to be made between the actual with the planned action for calculating the variances. Once the discrepancies are known, remedial measures are to be taken, at proper time. Then only, planned results can be achieved. A budget is a means and budgetary control gives the end result. (Ramagopal, 2008)

Budgetary control is concerned with insuring that actual financial are in line with targets. An important part of this feedback process is investigating variations between actual results and budgeted results and taking appropriate corrective actions. Budgetary control provides a yardstick for comparison and isolates problems by focusing on variances, which provide an early warning to managers. (Collier, 2003)

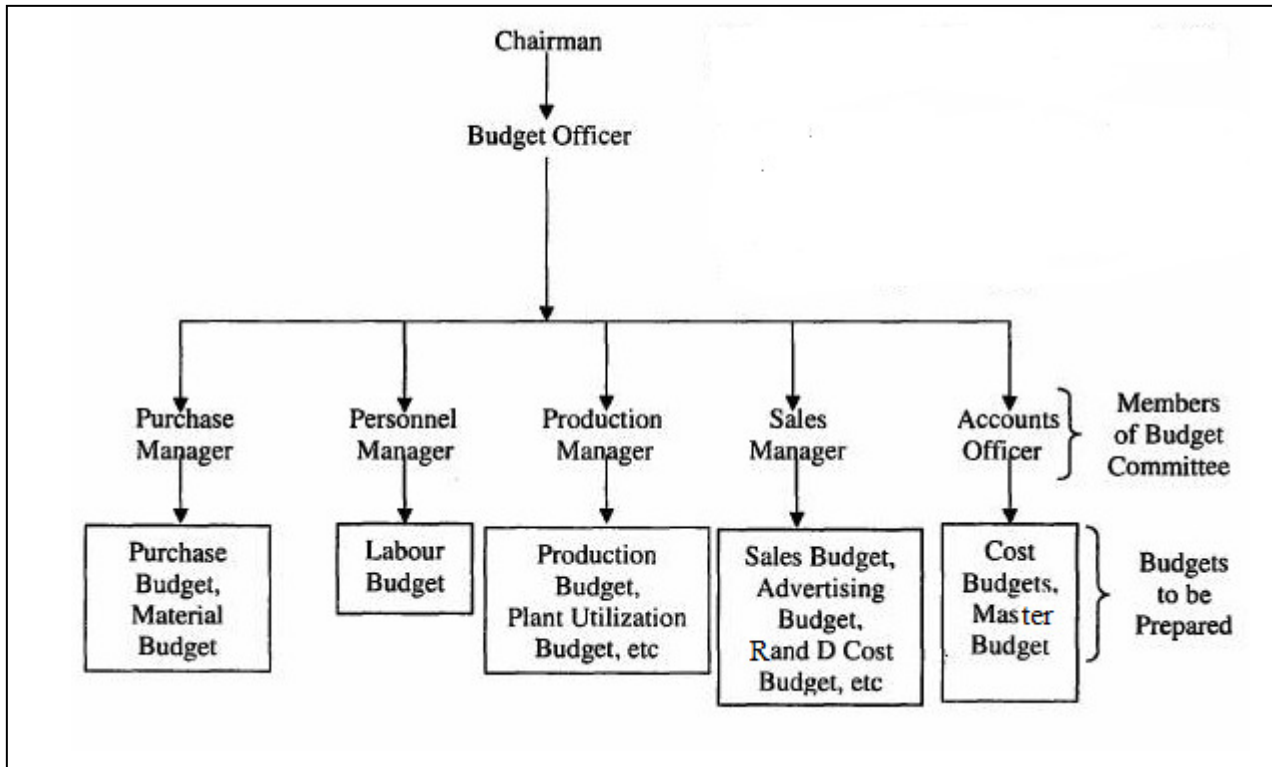
Budgetary Control is the process of establishment of budgets relating to various activities and comparing the budgeted figures with the actual performance for arriving at deviations, if any. Accordingly, there cannot be budgetary control without budgets. Budgetary Control is a system which uses budgets as a means of planning and controlling. (Periasamy, 2010)

Ramagopal (2008) describes the main objectives of budgetary control are as follows:

1. To co-ordinate the activities of different departments.
2. To operate various cost centers and departments with efficiency and economy.
3. Fixation of responsibility of various individuals in the organization.
4. To ensure a system for correction of deviations from established standards.
5. To centralize the control system.
6. To ensure planning for future by setting up various budgets.

It is essential to have a clear organizational structure for the successful introduction and implementation of a Budgetary Control System. This will enable the company to establish the delegation of responsibility and authority among managers and related sub-ordinates of different departments regarding budgetary control procedure. Madegowda (2007) explains this by the following organizational chart describing the budgetary responsibilities.

Figure 12: Organizational Chart



Source: (Madegowda, 2007)

Thus, budgetary control is an important management technique which controls the activities related to income and expenditures of related responsibility centers. While comparing actual result with the budgeted/standard figure, variations are found to appear. These variations might be positive or negative. Continuous observations and application of corrective measures enable the company to control over activities of responsibility centers, like revenue, cost, profit, investment, etc. Flexible budget and variance analysis are the integral part of the budgetary control. So, we briefly review some literatures related to these concept in this section.

2.2.9.1 Flexible Budget

Flexible Budget is also called Variable or Sliding Scale budget, "takes both the fixed and manufacturing costs into account. Flexible budget is the opposite of static budget showing the expected cost at a single level of activity. A flexible budget often shows the budgeted expenses against each item of cost corresponding to the different levels of activity. This budget has come

into use for solving the problems caused by the application of the fixed budget. (Periasamy, 2010)

According to Arora (2009), flexible budgeting can be formulated with the objective of changing the budget figures to correspond with the actual output achieved. This means that the flexible budget can be prepared for various levels of activity, like 70%, 80% 90% and 100% capacity utilization and finally actual level of output achieved can be compared with an appropriate level. Preparation of flexible budget can be demonstrated in the following simple format.

Table No. 11: Simple Format of Flexible Budget

Particular	Level of Activity			
	70%	80%	90%	100%
Sales	xxxx	xxxx	xxxx	xxxx
Less: Variable Costs	xxxx	xxxx	xxxx	xxxx
Contribution Margin	xxxx	xxxx	xxxx	xxxx
Less: Fixed Costs	xxxx	xxxx	xxxx	xxxx
Operating Profit	xxxx	xxxx	xxxx	xxxx

According to Periasamy (2010), advantages of Flexible Budget are as follows:

- In flexible budget, all possible volume of output or level of activity can be covered.
- Overhead costs are analyzed into fixed variable and semi-variable costs.
- Expenditure can be forecasted at different levels of activity.
- It facilitates at all times related factor can be compared, which are essential for intelligent decision are making.
- A flexible budget can be prepared with standard costing or without standard costing depending upon What the Company opts for.
- Flexible budget facilitates ascertainment of costs at different levels of activity, price fixation, placing tenders and Quotations.
- It helps in assessing the performance of all departmental heads as the same can be judged by terms of the level of activity attained by the business.

According to Arora (2009) the usefulness of flexible budgets in comparison to fixed budgets is:

- The figures in flexible budgets are adaptable to any given set of operating conditions
- It is more realistic than a fixed budget which is true only in one set of operating conditions
- Flexible budgets are also useful from the control point of view. Actual performance of an executive should be compared with what he should have achieved in the actual circumstances and not with what he should have achieved under quite different circumstances.
- Flexible budgets are more realistic, practical and useful

2.2.9.2 Variance Analysis

The term "Variances" may be defined as the difference between Standard Cost and actual cost for each element of cost incurred during a particular period. The term "Variance Analysis" may be defined as the process of analyzing variance by subdividing the total variance in such a way that management can assign responsibility for off-Standard Performance. The variance may be favorable variance or unfavorable variance. When the actual performance is better than the Standard, it represents "Favorable Variance." Similarly, where actual performance is below the standard it is called as "Unfavorable Variance." (Periasamy, 2010)

Variance analysis is the process of analyzing variances by sub-dividing the total variance in such a way that management can assign responsibility for any off standard performance. (Arora, 2009)

Periasamy (2010) advocates that variance analysis contributes to control and manage the responsibility so that management can ascertain:

- The amount of the variance
- The reasons for the difference between the actual performance and budgeted performance
- The person responsible for poor performance
- Remedial actions to be taken

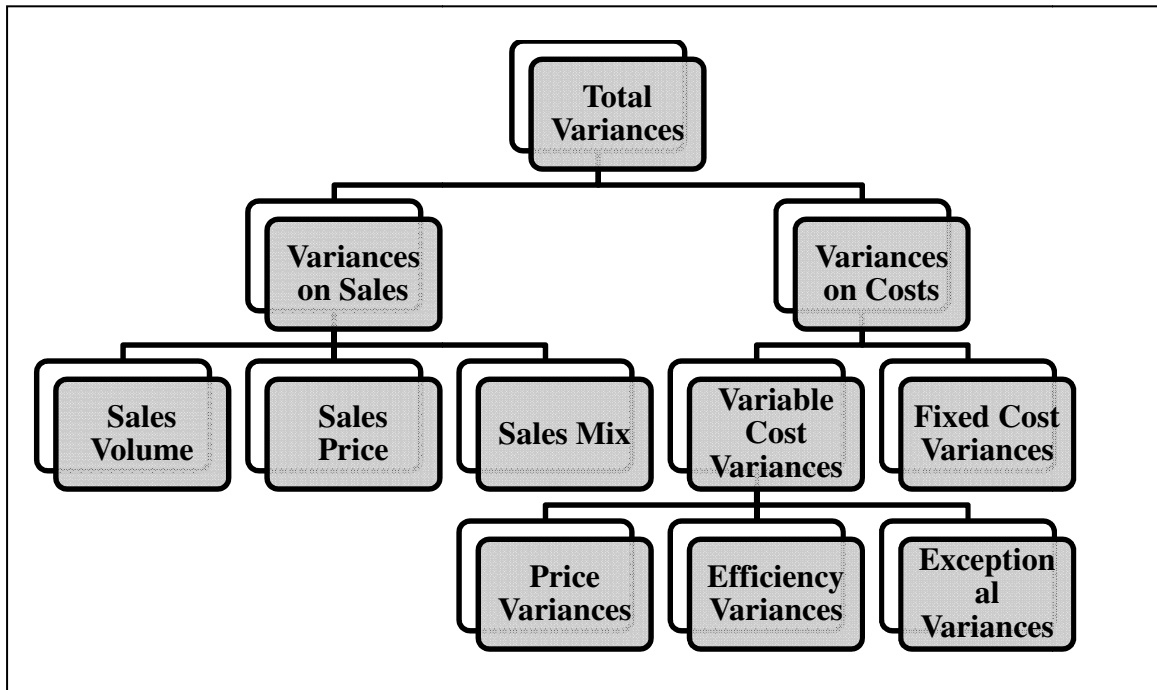
Collier (2003) describes variance analysis as a process of company actual performance against plan, investigating the causes of variance and taking corrective action to ensure the achievement

of targets. He further emphasizes that variance analysis is to be carried out for each responsibility center, product/service and suggests the following steps to be followed:

- Ascertain the budget and phasing for each period
- Report the actual spending
- Determine the variance between budget and actual (and determine whether it is either favorable or adverse)
- Investigate why the variance occurred
- Take corrective action

The variance is a warning signal that triggers an investigation to determine why the planned result was not realized (Kaplan & Atkinson, 1998). So variance analysis basically revolves around the investigation of revenue and costs and making corrective measures in order to have continuous improvement so as to accomplish the overall objective of the organization. This is clearly explained by the following figure showing hierarchy of variances:

Figure 13: A Hierarchy of Variances



Source: (Palmer, 2012)

2.2.10 Brief Overview of Financial Ratio Analysis

Every business enterprises prepare financial statement i.e. income statement and balance sheet with the help of financial transactions occurred during the financial year. Financial statements help in providing financial information like profitability situation, financial position, funds availability, etc. which might be useful for the decision makers. Financial information provided in financial statements cannot be considered as an end on itself because these statements alone cannot fulfill the objective of drawing out meaningful conclusion for the decision makers. The information provided in financial statements could be useful in making decision through analysis and interpretation. So, financial analysis can be used as a tool for judging the performance of the organization and reflecting the actual situation of the organization. It is considered as helpful tool to measure the financial efficiency which is one of the significant elements to achieve goals and objectives of any enterprise. Since it is necessary for an enterprise to maintain strengths and minimize financial weaknesses, so financial efficiency comes to play as vital element in order to achieve the organizational goal. The management of the enterprise should know in what condition the organization is operating or running. If present condition is successfully assessed, then it will contribute the management in predicting the future financial position and taking corrective actions for smooth operation. Therefore, each enterprise needs to analyze its financial position to acquire the knowledge about how efficiently they are performing.

Financial analysis is a methodology designed to provide data for decision makers. It is intended to be flexible enough to assist different users in their decisions. (Riahi-Belkaoui, 1998)

Financial analysis is the process of identifying the financial strengths and weaknesses of the firm, by properly establishing the relationships between the items contained in balance sheet and profit and loss account. (Ramagopal, 2008)

There are various methods or techniques which can be used in analyzing financial statements. One of them is Ratio Analysis which is considered as most powerful tool to analyze the financial statements.

Ratio is a mathematical relationship between one number and another number. Ratio is used as an index for evaluating the financial performance of the business concern. (Paramasivan & Subramanian, 2009)

A ratio or financial ratio is a relationship between two accounting figures, expressed mathematically. It helps to ascertain the financial condition of the firm. In financial analysis, a ratio is compared against a benchmark for evaluating the financial position and performance of a firm. Ratios help to summarize large quantities of financial data to make qualitative judgment about the firm's financial performance. (Ramagopal, 2008)

There are several types of ratios measuring the liquidity, profitability and solvency position of the firm. Some of the important ratios with short description according to Ramagopal (2008) are as follows:

Current Ratio: It is the relationship between current assets and current liabilities expressed by dividing total current assets by total current liabilities.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current assets are those which can be realized within a short period of time, generally one year. Similarly, current liabilities are those which are to be paid, within a period of one year. Generally 2:1 is considered to be an ideal ratio. If the current ratio is less than 2:1, this shows that cash may not be available to pay current liabilities. Similarly, if the current ratio is more than 2:1, this shows that the company may have an excessive investment in current assets not producing any return.

Inventory Turnover Ratio: It is computed by dividing cost of goods sold by average inventory.

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory at Cost}}$$

Inventory turnover ratio shows the velocity of stocks i.e. it indicates as to how fast the goods are sold. A higher ratio is an indication that the firm is moving the stocks better resulting in better profitability. Therefore, higher stock turnover is better for the profitability sense.

Debtors Turnover Ratio: It is calculated by dividing credit sales by average debtors.

$$\text{Debtors Turnover Ratio} = \frac{\text{Credit Sales}}{\text{Average Debtors}}$$

It indicates the velocity of debt collection of a firm. Higher the ratio, more efficient is the management of credit and collecting from debtors.

Collection Period: It is calculated by dividing days in a year by debtor's turnover ratio

$$\text{Collection Period} = \frac{360}{\text{Debtors Turnover Ratio}}$$

The ratio indicates the speed of collection from debtors. This shows the average number of days for collecting cash from debtors. Minimum days are preferable. The shorter the period of collection, the better is the quality of debtors. A shorter collection period also indicates the efficiency of credit management.

Total Assets Turnover Ratio: Assets are used to generate sales. If the firm manages the assets more efficiently, sales would be more and equally profits would be up. It is calculated by

$$\text{Total Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Total Assets}}$$

It shows the efficiency of utilizing total assets. Higher the ratio, the more efficient is the management on utilization of firm's assets.

Gross Profit Ratio: It is calculated as

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit} \times 100}{\text{Sales}}$$

Where, Gross Profit = Sales – Cost of Goods Sold

This ratio indicates the spread between the cost of goods sold and revenue. High gross profit ratio is a sign of good management between revenue and cost of goods sold.

Net Profit Ratio: Net profit is obtained, after deducting operating expenses, interest and taxes from gross profit. The net profit ratio is calculated as

$$\text{Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100$$

Net profit indicates the overall efficiency of the management in manufacturing, administering and selling the products. Higher percentage of this ratio is preferable.

2.3 Summary of Literature Review

This research work is related to finished inventory investment issues with its impact on profitability. Sales and production are the vital functions for a manufacturing enterprise which determine the level of finished inventory. Therefore, it is essential to review literatures related to sales and production functions in order to constitute the foundation for this study. Therefore, literatures related to production and operation management, forecasting and inventory fundamentals are supposed to assist in constructing the theoretical background of this study.

Profitability is of vital importance and is influenced by various factors. Basically profit is the excess of revenues over expenses. Sale of manufactured goods is the main source of revenue generation but there are several areas in an enterprise which consume expenses. It is essential for an enterprise to minimize the expenses so as to add in profitability. Therefore, literatures related to cost concepts, profitability, cash conversion cycle, working capital, CVP analysis, etc. are supposed to support the profitability aspects of this study.

CVP analysis, variance analysis, financial ratio analysis, etc. have been considered as strong analytical tool in order to address the objectives of this study and to draw out some major conclusions regarding this study.

Chapter 3: Research Methodology

3.1 General Concept

While conducting any research work, it requires definite set of goals and objectives for which research work have been carried out. In order to address and fulfill those research goals and objectives, it is essential to follow the appropriate research methodology. Various authors have defined it in their own ways.

Research is an original contribution to the existing stock of knowledge of our society of making for its advancement. It is the pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for better knowledge through objective and systematic method of finding solution to a social or economical problem is research. (Phophalia, 2010)

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. (Kothari, 2004)

Research refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analysing the facts and reaching certain conclusions either in the form of solutions(s) towards the concerned problem or in certain generalisations for some theoretical formulation. (Dhawan, 2010)

Business research is the process and the tool needed to reduce risk in managerial decision making. Business research is a systematic inquiry that provides systematic knowledge to guide managerial decisions. More specifically, it is a process of planning, acquiring, analyzing, and disseminating relevant data, information, and insights to decision makers in ways that mobilize the organization to take appropriate actions that, in turn, maximize business performance. (Sachdeva, 2009)

Research is a systematic and logical study of an issue or problem or phenomenon through scientific method. (Krishnaswami & Satyaprasad, 2010)

So, it can be synthesized that research methodology is concerned with the solution of the research problem related to social or economical phenomenon following systematic approach or procedure with better management of relevant data and information. By doing so, research problem can be solved systematically and we can analyze various aspects of research work more scientifically. This study is deeply related with the investigation of capital tied up in finished inventory and its impact on profitability in a manufacturing concern, regarding the objectives to analyze, examine and interpret how capital tied up in finished inventory influence the profitability trend in DNPL. It is therefore required an appropriate research methodology. The major contents of research methodology followed in course of this study includes research design, period covered, nature and sources of data, research variables, statistical tools used, research procedure followed, research questions, etc.

3.2 Research Design

While commencing any research work the problem arises that how to prepare design of research work so as to fulfill the research objectives. Krishnaswami & Satyaprasad (2010) describes research design as a logical and systematic plan prepared for directing the research study specifying the objectives of the study, the methodology and techniques to be adopted for achieving the research objectives. It can be considered that research design is the definite procedure or technique which will guide the research work in order to explore the realistic research outcome.

Similarly, Kothari (2004) emphasizes on the need of research design for carrying out a good research because it helps in smooth mobilizing various research operations and it will finally make the research more efficient by yielding maximum information with minimal expenditure of efforts, time and money. A good research design should have the attributes of flexibility, appropriateness, efficiency, economy, etc. So, a good research design is that which minimizes bias and maximizes the reliability of the data collected and analyzed. He further stresses on that the research design should contain:

- A clear statement of the research problem
- Procedures and techniques to be used for gathering information
- Population to be studied

- Methods to be used in processing and analysing data

Thus it can be concluded that research design has an important role in conducting any research work successfully. So, it is essential to formulate the appropriate research design so that it could assist in answering research questions, in setting approaches and strategies to carry out research operations and successful completion of the research study.

The research design of this proposed study is analytical as well as descriptive. The main objective of this analytical and descriptive study is to highlight the degree of impact of capital tied up in finished inventory on profitability in DNPL with respect to many aspects such as sales, production, profits, cost structures, etc. This study is also an examination and evaluation of existing practices on the management of finished inventory in DNPL particularly for a product Real Fruit Juice. The present work is mainly related with quantitative plan of the product Real Fruit Juice. So, analytical approach has been considerably adopted to present and analyze the data. But at the mean time the descriptive approach of the research such as effectiveness of current management of finished inventories, problems of formulating and implementing profit plans, analysis of impact of inventory on profitability, etc. will be tried to explain in words wherever necessary. In this way this study will be considered to comprise both quantitative and qualitative aspects of the study to reach in fulfilling the objectives.

3.3 Population and Sample

Sampling is the process of obtaining information about an entire population by examining only a part of it. In most of the research work and surveys, the usual approach happens to be to make generalisations or to draw inferences based on samples about the parameters of population from which the samples are taken. The researcher quite often selects only a few items from the universe for his study purposes. All this is done on the assumption that the sample data will enable him to estimate the population parameters. (Kothari, 2004)

This research work is related with impact of capital tied up in finished inventory on profitability of DNPL. DNPL produces number of products which can be considered as the population of this study. In order to avoid the complications arising due to handling all these products in this study, we have selected only one product of DNPL i.e. Real Fruit Juice which will be the sample of this study.

3.4 Nature and sources of data

The selection for suitable tools is of vital importance for successful research. The research work may use one or more of the tools in combination. To attain the objectives of this study, both primary and secondary sources of data have been used. The data and information that have been used in this study have been collected from the following sources:

- Official records and publications of DNPL
- Published and unpublished related document
- Books, booklets, magazines published
- Personal approach and interview
- Observation

3.5 Period Covered

The present study tries to cover a time period of five years from 2005/06 to 2009/10 in order to incorporate the research work.

3.6 Research Variables

Research variables play vital role in developing and analyzing the impact of capital tied up in finished inventory on profitability. In order to accomplish this objective, research variables considered in this study are sales, production, inventories, purchase, expenses, capacity utilization, profitability, etc.

3.7 Research Procedure Followed

The following research procedure has been followed for this study:

- The selected books and articles are collected and explored
- Useful primary information and secondary data are used
- Data are described and explained in the light of theoretical basis
- The collected data are presented and arranged in tabulation forms and different statistical, financial and accounting tools are used to extract valuable information relevant for this research.

3.8 Data Analysis Tools

Data collected from various sources are managed, analyzed and presented in proper format and are interpreted and explained whenever necessary. The tools used in this study to describe and analyze are mostly related with accounting, finance and statistics which are as follows:

Mean:

It is the most popular and widely used measure of central tendency. It is the average value of the sample by summing up the given observations.

Standard Deviation:

It is the most popular and widely used measure of dispersion or variability. It is the square root of the squared deviations of sample values taken from the mean. It is denoted by S.D.

Coefficient of Variation:

The coefficient of variation (C.V.) is the relative measure based on the standard deviation and is calculated as the ratio of standard deviation to the mean expressed in percentage.

Correlation and Regression Analysis:

Correlation Analysis deals with the statistical technique which measures the degree of relationship or association between the two or more variables.

The Regression Analysis is the statistical method for determining the nature of relationship that exists among two or more variables and then using that relationship to make estimates or prediction.

Time Series Analysis:

Time Series Analysis measures the relationship of the variables with the time factor. Under this section trend and seasonal variations will be focused to analyze the various variables of this study.

Diagrams and Graphs:

Another convincing and appealing method used in this study for presenting statistical data is the use of Diagrams and Graphs. Diagrams and Graphs do not add anything to the information contained in statistical data but they aid visually so as to bring out the outstanding features of the data.

Variance Analysis:

Variance Analysis measures the difference between actual outcome in comparison to budgeted/standard outcome of concerned variable.

Ratio Analysis:

Ratio Analysis is one of the major financial analysis to get the effectiveness of each item in comparison to another item extracted from balance sheet or income statement.

Cost Volume Profit Analysis:

It is one of the major cost and management accounting tool to analyze the relationship among three vital components of the business that is cost, sales volume and profitability.

Chapter 4: Presentation and Analysis of Data

4.1 General

The previous chapters incorporated introduction of the study, review of literature and the research methodology employed in the study respectively. This chapter of the study will examine the various aspects of sales, production, inventory and profits plans along with their accomplishment system in DNPL focusing on Real Fruit Juice through analyzing and interpreting the data and information gathered from various concerned departments of DNPL. The data and information collected from different sources are presented, analyzed and interpreted in this chapter for attaining the stated objectives of the study. In this chapter the data and information collected from different sources are presented, analyzed and interpreted through different statistical and financial/accounting tools wherever necessary to examine the major variables like sales, production and inventory along with underlying impacts on profit of Real Fruit Juice department.

4.2 Organization of Data

In order to address the objectives of this study, various types of qualitative and quantitative information have been gathered from various sources and will be analyzed using some relevant analytical tools so as to draw some logical conclusions. Those gathered data have been organized and presented in tables 12 and 13.

Table 12: Major Quantitative Details of DNPL as a Whole

(NRs in Lacs)

Year	Sales	Profits	Inventory	Working Capital Loan
2005-06	32270.23	299.75	8557.15	5534.67
2006-07	36608.41	262.44	8829.27	9763.63
2007-08	39476.24	1279.26	11317.82	6089.90
2008-09	43176.83	1416.91	10922.87	5390.87
2009-10	49273.28	1734.83	12147.43	7013.28

(Source: Annual Report, DNPL)

(Note: 1 Lac = One Hundred Thousand)

Table 13(a): Major Quantitative Details of Real Fruit Juice (RFJ)

(Amounts in NRs Lacs)

Year	Sales		Production (KL)	Inventory	
	Qty (KL)	Amount		Qty (KL)	Amount
2004-05	-	-	-	1219.15	463.28
2005-06	35882.15	15921.46	35647.24	984.24	397.95
2006-07	41638.41	19229.24	41150.9	496.73	200.72
2007-08	47290.64	23347.36	47928.30	1134.39	516.34
2008-09	48034.03	26167.45	47761.83	862.19	418.55
2009-10	49982.41	29547.65	50532.22	1412.12	734.31

(1Kiloliter (KL) =1000Liter)

Table 13(b): Major Quantitative Details of Real Fruit Juice

(Amounts in NRs Lacs)

Year	Net Profits	Working Capital	Debtors	Creditors	Interest Expenses	Current Assets	Current Liabilities
2005-06	156.82	3280.39	1719.38	1283.48	341.46	4016.93	1419.41
2006-07	153.44	5872.82	1970.21	1468.37	614.39	5110.44	1632.73
2007-08	665.39	4217.18	2286.71	1703.64	511.73	5508.77	1893.05
2008-09	771.93	3841.59	2159.03	1686.27	448.68	5311.37	1924.41
2009-10	930.76	4439.17	2485.08	1895.13	503.43	6047.12	2144.37

(Source: DNPL, Real Fruit Juice Section)

(Note: *Current Assets* include inventories, sundry debtors, cash and bank balance and advance deposits and other receivables. *Current Liabilities* include sundry creditors (payments payable) and provisions)

4.3 Contribution of Real Fruit Juice in DNPL Performance over Five Years

DNPL produces and distributes a number of products for domestic and international markets. Here an attempt has been made to analyze how Real Fruit Juice is contributing in overall performance of DNPL regarding sales, profit and finished inventory variables over past five years from 2005-06 to 2009-10.

Table 14: Performance of Real Fruit Juice

(NRs in Lacs)

Year	Overall Sales	Sales RFJ	% Contribution	Overall Profit	Profit RFJ	% Contribution	Inventory Overall	Inventory RFJ	% Contribution
2005-06	32270	15921	49.34%	300	157	52.33%	8557	398	4.65%
2006-07	36608	19229	52.53%	262	153	58.40%	8829	201	2.28%
2007-08	39476	23347	59.14%	1279	665	51.99%	11318	516	4.56%
2008-09	43177	26167	60.6%	1417	772	54.48%	10923	419	3.84%
2009-10	49273	29548	59.97%	1735	931	53.66%	12147	734	6.04%
Total	200804	114212	56.88	4993	2678	53.63%	51774	2268	4.38%

Table 14 shows the performance of Real Fruit Juice with respect to sales, profit and finished inventory compared with those of DNPL as a whole.

Sales Performance: Both overall sales of DNPL and sales from Real Fruit Juice are showing increasing trends over the years. Real Fruit Juice alone occupies major proportion of overall sales ranging from 49% to 60% which is almost in increasing trend. So, we can say that Real Fruit Juice has been a leading product for DNPL and has an important role in overall sales performance of DNPL.

Profit Performance: Like in sales performance, both overall profit of DNPL and profits from Real Fruit Juice are showing almost increasing trends over the years. Here too, Real Fruit Juice alone occupies more than 50% share of overall profits of DNPL over the years. So, we can say that Real Fruit Juice has a great contribution in overall profit performance of DNPL.

Finished Inventory Performance: Regarding finished inventory performance Real Fruit Juice has been performing a tremendous job over the years. Overall inventory investment of DNPL is significantly higher compared to Real Fruit Juice. In other words, Real Fruit Juice has a very low share in inventory investment of DNPL over the years which is good indication of handling inventory issues. The question arises here is “Is it proper to operate with such a lower level of inventory?” We will discuss inventory related issues of Real Fruit Juice later in this chapter.

After analyzing sales, profit and inventory performances of Real Fruit Juice with DNPL as a whole we can say that Real Fruit Juice has been a leading product for DNPL over the years. Success and failure of DNPL heavily depends on the success and failure of Real Fruit Juice.

4.4 Capacity Utilization

Analysis of capacity utilization is an important factor for manufacturing enterprises. Production and sales both plans depend upon the capacity. Higher the capacity, higher the units can be produced. On the other side cost of production also depends upon how well the capacity is being utilized. Cost of production tends to be lower at optimum level of capacity utilization. Lower utilization of capacity increases the manufacturing cost per unit.

Generally there are two cases of capacity utilization in manufacturing concerns namely under capacity and over capacity. Optimal or exact capacity is found rarely in manufacturing concerns. Nearly all Nepalese manufacturing sector is suffering from under capacity utilization problem i.e. they could not have utilized their full capacity. The main causes of less capacity utilization are old machines, lack of efficient management, lack of liquidity position, etc.

Table 15: Capacity Utilization of Real Fruit Juice

Year	Capacity (in KL)	Production (in KL)	Percentage of Capacity Utilized	Remarks
2005-06	64800	35647.24	55%	Under Capacity
2006-07	64800	41150.9	63.5%	Under Capacity
2007-08	64800	47928.30	74%	Under Capacity
2008-09	64800	47761.83	73.7%	Under Capacity
2009-10	64800	50532.22	78%	Under Capacity
Average Percentage of Capacity Utilization: $344.2/5 = 68.8\%$				

The table 15 shows the capacity utilization situation for different years which is found in increasing trend due to increase in production. Although the company is running with under capacity in last five years but good thing is that capacity utilization situation is improving in the years. The average utilized capacity in five years period is 68.8% which can be considered to be

satisfactory. The trend of capacity utilization shows that the company has sufficient capacity of production which it can increase its production if the demand would increase in future.

4.5 Finished Goods Inventory

Finished goods inventory plays a vital role in profit planning of any manufacturing enterprises. Better inventory policy makes the organization cost efficient. Finished goods inventory is the cause of difference between sales and production. When sales exceed production, then inventory is brought in use for excess sales and hence the level of inventory goes down. Similarly, when production exceeds sales, then excess production is kept into store and hence level of inventory goes up. Thus, inventory is very much dependent on sales and production activities of an enterprise. Different industries follow different inventory policies according to the nature of their products. Generally, inventory level of finished goods is determined by nature of the products, seasonality, production process and so many other factors. Inventory represents a relatively high investment and may have significant impact on major functions of the enterprise and its profitability. DNPL has not been found strictly following any inventory policies. But excess of production over sales is stored and sold when needed.

Table 16: Finished Goods Inventory

Year	Opening Inventory		Closing Inventory	
	Unit (in KL)	Amount (NRs in Lacs)	Unit (in KL)	Amount (NRs in Lacs)
2005-06	1219.15	463.28	984.24	397.95
2006-07	984.24	397.95	496.73	200.72
2007-08	496.73	200.72	1134.39	516.34
2008-09	1134.39	516.34	862.19	418.55
2009-10	862.19	418.55	1412.12	734.31

The table 16 shows the fluctuating inventory of finished goods over the years. There is a significant difference between the inventories of each fiscal year which reflects that managers have not been able to trace out an adequate idea about the estimation of market situation and future demands of the products. Are investment made in level of inventory are adequate? Can

such inventory levels fully synchronize the production and sales function? These are the matter of discussion which will be discussed later in this chapter.

4.6 Comparison between Sales and Production

As all goods are produced with an intention to sell, it is most important to see that whether sales are met by production or not. Therefore, it is necessary to analyze the actual production and actual sales figure relating to last five years.

Table 17: Comparison between Actual Sales and Actual Production of Real Fruit Juice

Year	Actual Sales (KL)	Actual Production (KL)	Sales Percent
Reference	1	2	$3=(1/2)*100$
2005-06	35882	35647	100.66%
2006-07	41638	41151	101.18%
2007-08	47291	47928	98.67%
2008-09	48034	47762	100.57%
2009-10	49982	50532	98.91%

The table 17 shows the actual production and actual sales of Real Fruit Juice of last five years. Both sales and production sales and production are found to be in increasing trend. The sales percentage is more than 98% in every year. This shows that out of total production, more than 98% were sold in respective year and remaining were held in stock.

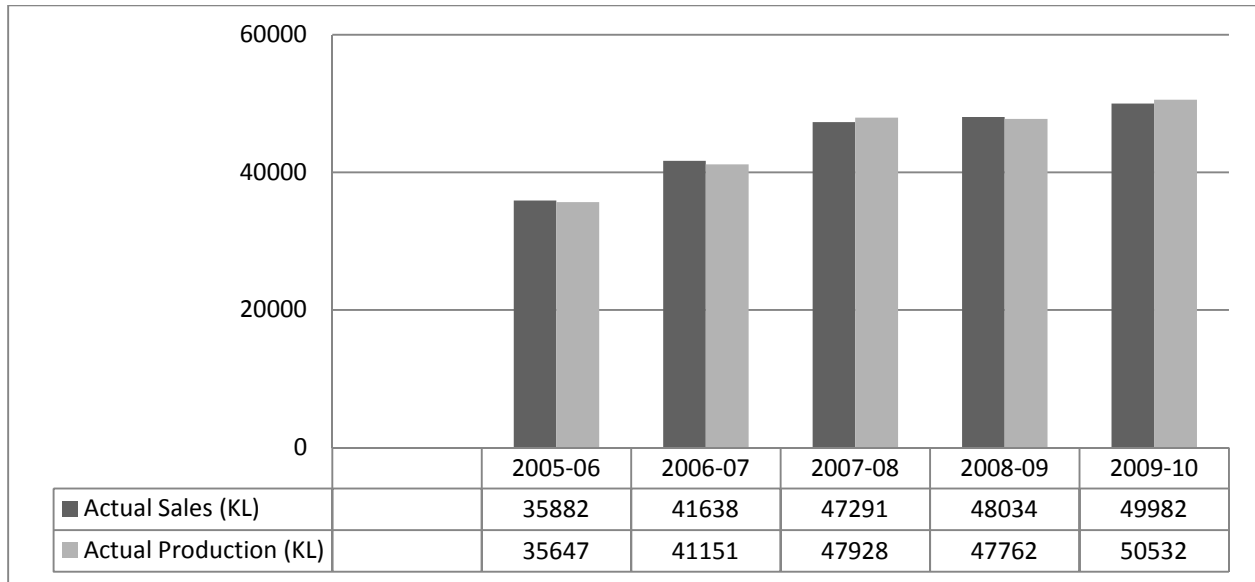


Figure 14: Comparison between Actual Sales and Actual Production of Real Fruit Juice (Bar Diagram)

Figure 14 shows the relationship between actual production and actual sales of Real Fruit Juice over past five year period through bar diagram. We find that sales and production are very much close to each other and are found to be increasing over the years.

In order to find out the nature of variability and correlation between actual production and sales, statistical tools such as mean, standard deviation and coefficient of variation can be used. The summary of these figures can be obtained using Microsoft Excel which is as follows:

Statistical Tools	Sales	Production
Mean	44565.4	44604
Standard Deviation	4704.09	5446.36
Coefficient of Variation	10.55%	12.21%
Correlation Coefficient (r)	0.9977	
Probable Error (P.E.)	0.00138	

These calculations show that the mean value of production is slightly greater than that of sales and coefficient of variation of sales is slightly smaller than production. This shows that sales are more homogenous or uniform than that of production.

Any statistical tool coefficient of correlation can be used to analyze the relationship between sales and production. The value of r is 0.9977 which indicates that there is a high degree of positive correlation between sales and production. The significance of correlation can be tested with probable error. Since, $r > 6 \text{ P.E.}$, this shows that correlation coefficient is highly significant. Though statistically production and sales together show positivity regarding degree and direction of relationship but it would be interesting to investigate these variables in relation to target sales in order to draw some meaningful conclusions about production and sales activities. This will be discussed later in this chapter.

4.7 Analysis of Relationship between Sales, Production and Finished Goods Inventory

An attempt is made here to analyze the relationship between sales, production and inventory of finished goods which will trace out more facts regarding this study.

Table 18: Relationship between Sales, Production and Finished Goods Inventory

(Units in KL)

Years	Opening Inventory	Actual Production	Total Available	Sales Actual	Ending Inventory	Target Sales
Reference	1	2	3=1+2	4	5=3-4	
2005-06	1219	35647	36866	35882	984	48800
2006-07	984	41151	42135	41638	497	50400
2007-08	497	47928	48425	47291	1134	52000
2008-09	1134	47762	48896	48034	862	53800
2009-10	862	50532	51394	49982	1412	55200

Table 18 shows the relationship between sales, production and finished goods inventory of Real Fruit Juice for the five years period.

In all kinds of manufacturing enterprises, while commencing production program, the question arises “What worth of finished goods to produce for the period?” of course, sales target will be the base for the answer of the question. Finished goods to be produced throughout the given period are adjusted according to sales target. Actual production should fulfill the target sales for

that period. But here company has not been able to produce the quantity so as to accommodate the sales target over the years in spite of sufficient unutilized production capacity. This makes us to conclude that company has been facing some serious problems regarding utilization of production capacity.

Here we do not find the significant amount of difference between actual production and actual sales. But there is significant difference between actual production/sales and target sales. This makes us to conclude that company has been facing the problems regarding utilization of production capacity and formulating target sales for future. It is important to mention here that the company is not found to use any reliable forecasting approach while setting sales target for the future. In fact, the company is found to be ambitious in setting sales target without considering related factors seriously. This can be justified by the increasing figures of target sales over the years. Another thing should be noted here is that if DNPL had produced outputs as sales target, it would have to face over inventory problem because actual sales amount were so poor compared to target sales. Target sales have never even been attained. This fact makes us conclude the poor performance of planning officers in setting sales target. Sales target should be revised i.e. it should be attainable.

Adequacy in finished goods inventory is the essential part in manufacturing enterprises. Observing finished goods inventory column we find that DNPL has been lucky enough in getting satisfactory situation of finished goods inventory compared to production/sales figures because the company is not found to face any lost sales/stock outs situation in past. Fluctuations in finished goods inventory makes us conclude that DNPL is not adopting rigidly any particular policy regarding inventory. Therefore, an integrated effort has to be applied to coordinate between sales and production departments which could improve sales and production issues along with inventory.

4.8 Analysis of Sales Plans and Trends of Real Fruit Juice

Sales are the main source of revenue generation for every enterprise. All other functions like production, purchase of raw materials, labor requirements, arrangement of finance etc. heavily depend upon the fact that what sales revenue the company wants to achieve in order to generate sustainable profit for its long term survival. So, sales are no doubt the crucial part of the enterprise. Therefore, it should be planned so that it could be realistic and attainable with

maximum utilization of available resources. The sales plan shows the quantities of each product that the company plans to sell and intended selling price. It provides the production of total revenue for the future periods. Past sales data might play important role in setting sales plans for the future periods. Company can achieve better accuracy and better performance in formulating sales and other plans learning from past sales performance. In this section we will try to examine past sales performance of Real Fruit Juice through various analytical tools by taking last five years data into account.

The attempt begins to examine annual sales trend of Real Fruit Juice. A statistical tool, Least Square Method can be used to analyze the trend of actual sales and to estimate the possible future sales for the given year. Least Square Method shows the relationship between time (years) and actual sales. To fit the straight line trend, time is considered as independent factor and sales as dependent upon time.

Fitting Straight Line Trend by Least Square Method

(NRs in lacs)

Year	Actual Sales (Y)	X	X ²	XY
2005-06	15921.46	-2	4	-31842.92
2006-07	19229.24	-1	1	-19229.24
2007-08	23347.36	0	0	0
2008-09	26167.45	1	1	26167.45
2009-10	29547.65	2	4	59095.3
N=5	∑Y=114213.16	∑X=0	∑X²=10	∑XY=34190.59

Base year assumed to be 2007/08, hence $\sum X=0$

The straight line trend $Y_c = a+bx$ where

$$a = \frac{\sum Y}{n} = \frac{114213.16}{5} = 22842.63$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{34190.59}{10} = 3419.06$$

$$Y_c = 22842.63 + 3419.06X$$

This equation shows the positive relationship between year and actual sales. If the past sales trend continues, sales will increase by Rs. 3419.06 lacs per year. Thus it can be said that the trend of actual sales will be in increasing direction in future.

The next analytical tool we want to use is the seasonal index. This tool will help in analyzing whether DNPL's product "Real Fruit Juice" exhibits any seasonality character. Seasonal Index shows the degree and direction of sales patterns in selected time dimensions (seasons). For this purpose we have arranged the past 5 year actual sales data in chronological order in accordance with four quarters and computed as follows:

Computation of Seasonal Indices of Real Fruit Juice

(NRs in Lacs)

Year	1st Quarter (April-June)	2nd Quarter (July-September)	3rd Quarter (October-December)	4th Quarter (January-March)	Total
2005-06	4321	5432	3864	2304	15921
2006-07	5138	5842	4454	3795	19229
2007-08	6571	6913	5647	4216	23347
2008-09	6984	7637	5916	5630	26167
2009-10	8109	8473	7459	5507	29548
Total	31123	34297	27340	21452	114212
Averages	6224.6	6859.4	5468	4290.4	22842.4
S.I.	109	120.12	95.75	75.13	400

$$\text{Grand Average} = \frac{\text{Sum of 4 Quarters Averages}}{4} = \frac{22842.4}{4} = 5710.6$$

$$\text{Seasonal Index for 1st Quarter} = \frac{\text{1st Quarter Average}}{\text{Grand Average}} \times 100 = \frac{6224.6}{5710.6} \times 100 = 109 \%$$

$$\text{Seasonal Index for 2nd Quarter} = \frac{\text{2nd Quarter Average}}{\text{Grand Average}} \times 100 = \frac{6859.4}{5710.6} \times 100 = 120.12 \%$$

And so on.

It is quite clear from the calculations that Real Fruit Juice exhibits absolute seasonal character. Seasonal Index (S.I.) for 2nd quarter is highest compared to other quarters. The next better is for 1st quarter. Lowest S.I. is found for 4th quarter. Seasonal Indices depict about the seasonal character of the product. Higher seasonal indices indicate that there is high demand of the product in that period. In context of Nepal, six months from April to September weather condition is warm and humid. So, consumers consume more of these beverages. This is why

consumption rate becomes quite high which is reflected by S.I. figures of these two quarters. Three months from January to March are cold seasons and rate of consumption becomes quite low which is reflected by S.I. figure of 4th quarter. So, the company should be more aggressive and sensitive to apply maximum efforts for better results regarding these peak seasons and could be a bit relaxed for dull seasons.

The next analytical tool further we want to use is the Sales Performance Appraisal which will explain in detail about success rate of attaining targets. For this purpose we have arranged and organized the past five year data of Real Fruit Juice into four quarters with target, actual and % of achievement as shown in table 19 (a) and 19 (b).

Table 19 (a): Real Fruit Juice Target and Actual Sales Trend by Quarters

(Units in KL)

Year	1 st Quarter		2 nd Quarter		3 rd Quarter		4 th Quarter		Total	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
2005-06	14200	9688	16200	12201	10200	8612	8200	5381	48800	35882
2006-07	14600	11117	16600	12658	10600	9661	8600	8202	50400	41638
2007-08	15000	13289	17000	13998	11000	11444	9000	8560	52000	47291
2008-09	15500	12826	17500	14026	11400	10856	9400	10326	53800	48034
2009-10	15800	13695	18000	14345	11600	12595	9800	9347	55200	49982
Total	75100	60615	85300	67228	54800	53168	45000	41816	260200	222827

(Source: DNPL, Real Fruit Juice Section)

Table 19 (a) represents the actual data relating to target and actual sales of Real Fruit Juice over past five years divided into quarters.

Table 19(b): Percentages of Achievement of Sales Target by Quarters

Year	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	Total
2005-06	68.2	75.3	84.4	65.6	73.5
2006-07	76.1	76.2	91.1	95.4	82.6
2007-08	88.6	82.3	104	95.1	90.9
2008-09	82.7	80.1	95.2	109.8	89.3
2009-10	86.7	79.7	108.6	95.4	90.5
Total	80.7	78.8	97	92.9	85.6

Table 19(b) represents the percentages of target achievement calculated on the basis of table 19(a) by using the relation $[(\text{Actual}/\text{Target}) \times 100]$ and shows the clear picture of sales performance of Real Fruit Juice in two ways (Year wise and Quarters wise).

If we observe year wise, DNPL is found to be struggling with attaining targets. Success rate in achieving target is higher for 2007-08 and lower for 2005-06. Success rate is found to be in increasing trend over the year. The overall success rate in 5 years period is 85.6% which can be said satisfactory. But it is important to note that wide variation between target and actual performance suspects about honest and intelligent performance of either planner or performer. If we observe quarter wise, DNPL is not found to meet the targets except in 3rd quarter of 2007-08, 4th quarter of 2008-09 and 3rd quarter of 2009-10. In these quarters, success rates in attaining the targets are more than 100%. We further observe that success rates in attaining targets for each quarter are found to be improving to a great extent over the years. The overall success rate for 3rd quarter in 5 years period is highest (97%) compared to other quarters. The next best figure is shown by 4th quarter. 1st and 2nd quarters together show the poor performance in attaining targets.

It will be more interesting to further analyze the overall sales performance of each quarter in five years period by taking seasonal indices into account which will draw out some meaningful conclusion regarding sales performance.

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Seasonal Indices	109	120.12	95.75	75.13
Success Rate	80.7%	78.8%	97%	92.9%

Seasonal indices of 2nd and 1st quarters shows higher figures and tells about intensity and importance of these quarters for prosperity of the company. But success rates in attaining targets for these quarters' shows the poor figures.

3rd quarter seems satisfactory. 4th quarter is dull season and success rate in attaining target is over 90% which is also good. This analysis shows that DNPL has not been able to address the variations in peak seasons target and demand successfully. This makes us to suspect on intelligence and honesty of planners and performers of concerned departments.

Though Real Fruit Juice shows the increasing annual sales trend with seasonal properties, DNPL has to be serious in formulating plans and policies in order to address the sales issues.

4.9 Analysis of Production Trend of Real Fruit Juice

Production of finished goods is of vital importance for all kind of manufacturing enterprise. So it is essential to examine the degree and direction of production trend of the enterprise so as to address the sales revenue generation. Least Square Method can be used to analyze the trend of actual production and to estimate the possible production for a given time period. This method assumes that the production is consistently changed with the change in component of time series. To fit the straight line trend, time factor is considered as independent factor and production as dependent upon time.

Fitting Straight Line Trend by Least Square Method

(Units in KL)

Year	Actual Production (Y)	X	X ²	XY
2005-06	35647.24	-2	4	-71294.48
2006-07	41150.9	-1	1	-41150.9
2007-08	47928.30	0	0	0
2008-09	47761.83	1	1	47761.83
2009-10	50532.22	2	4	101064.44
N=5	∑Y=223020.49	∑X=0	∑X²=10	∑XY=36380.89

(Assumed 2007/08 as base year)

The straight line trend $Y_c = a + bx$ where

$$a = \frac{\sum Y}{n} = \frac{223020.49}{5} = 44604.10$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{36380.89}{10} = 3638.09$$

$Y_c = 44604.10 + 3638.09X$

The straight line trend of production shows that the production will increase by 3638.09 units in KL per year. This is positive indication for addressing any increased sales in future. Moreover, the company has sufficient unutilized production capacity.

4.10 Analysis of Profit Patterns of Real Fruit Juice

Profit is the major element of each and every business enterprises for smooth operation and long-term survival of the business in order to fulfill the socio-economic development of the society and the nation as a whole. In modern business, effectiveness and efficiency of any business organization are measured from profit prospective. Keeping all other variables (sales price, costs) constant, the profit patterns of Real Fruit Juice for five years period have been presented in table 20.

Table 20: Profit Trend of Real Fruit Juice

(NRs in lacs)

Year	Profits	% Change $\frac{P_n - P_{n-1}}{P_{n-1}} \times 100$	Remarks
2005-06	156.82	-	-
2006-07	153.44	2.15	Decrease
2007-08	665.39	333.65	Increase
2008-09	771.93	16.01	Increase
2009-10	930.76	20.57	Increase

Table 20 shows that profit is increasing year by year from 2005-06 to 2009-10 except in the year 2006-07 where profit decreases by 2.15% than previous year. We find the rapid jump in profits in 2007-08 which is 333.65% of profits of 2006-07. Profit trends of Real Fruit Juice shows the prosperous future of the enterprise.

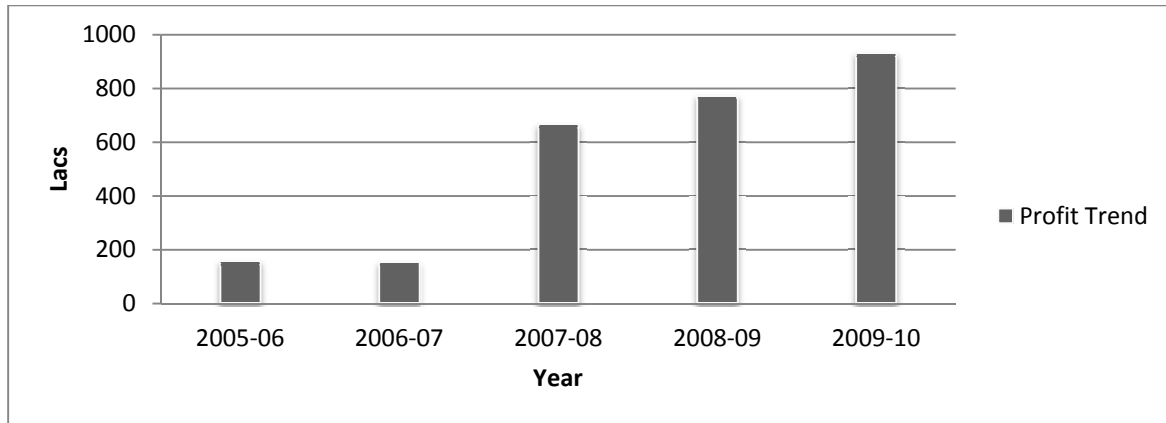


Figure 15: Profit Trend of Real Fruit Juice (Bar Diagram)

Figure 15 shows that profits of Real Fruit Juice are in increasing trend over the years.

The least square straight line trend method can also be used to analyze the trend of net profits in order to estimate the possible future profit for the given period.

Fitting Straight Line Trend by Least Square Method

(NRs in lacs)

Year	Profits (Y)	X	X ²	XY
2005-06	156.82	-2	4	-313.64
2006-07	153.44	-1	1	-153.44
2007-08	665.39	0	0	0
2008-09	771.93	1	1	771.93
2009-10	930.76	2	4	1861.52
N=5	∑Y=2678.34	∑X=0	∑X²=10	∑XY=2166.37

(Assumed 2007/08 as base year)

The straight line trend $Y_c = a + bx$ where

$$a = \frac{\sum Y}{n} = \frac{2678.34}{5} = 535.67$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{2166.37}{10} = 216.64$$

$$Y_c = 535.67 + 216.64X$$

The straight line trend shows that the profits will increase by Rs. 216.64 lacs annually. In other words we can say that if the profit trend of past years will continue for future the profits will increase over the years by Rs. 216.64 lacs.

Thus, after analyzing profit patterns and trends of Real Fruit Juice of last five years, it can be said that DNPL is exhibiting healthy performance with regards to Real Fruit Juice operation and is expected to continue in forth coming period.

4.11 Analysis of Inter-Relationship among Sales, Profits and Inventory Investment

An attempt has been made here to analyze the inter-relationship among sales, finished inventory and profits of Real Fruit Juice for past five years so that it could draw out some logical conclusions about this study.

Table 21: Analysis of Inter-Relationship among Sales, Profits and Inventory of Real Fruit Juice

(NRs in Lacs)

Year	Sales	Profits	Inventory	% Profit on Inventory	% Inventory on Sales
2005-06	15921	157	398	39.45%	2.50%
2006-07	19229	153	201	76.12%	1.04%
2007-08	23347	665	516	128.87%	2.21%
2008-09	26167	772	419	184.25%	1.60%
2009-10	29548	931	734	126.84%	2.48%
Total	114212	2678	2268	118.08%	1.98%

Table 21 shows the inter-relationship among sales, profit and inventory in detail. Sales, profit and inventory columns over five years period shows positive/direct inter-relationship to a great extent i.e. increase in sales are accompanied by increase in profits and inventory levels.

Profit rates in relation to capital tied up in inventory levels are showing positive/ increasing trend from 2005-06 to 2008-09. It is dropped down in 2009-10. But overall rate in five year is 118.08% which is very healthy figure and indicates about satisfactory handling of inventory issues in order to maintain the pace of profitability.

Last column shows the percentage of inventory on sales of Real Fruit Juice over past five years which ranges from 1 to 2.5%. This seems very much favorable but indicates about two facts.

First: The product Real Fruit Juice is fast moving. Once the product is produced it does not have to remain long in stores i.e. the time gap between inventory and sales is lower. Due to short period of expiry on such products, this seems favorable situation for the company in order to avoid losses due to expired products. Since the product also shows the seasonal character, the company should be more sensitive in adjusting the utilization of production capacity in accordance with seasonal demand because in a situation with seasonal differences company cannot produce to stock in low season for sales in high seasons. So, it is essential to maintain the flexibility in utilizing production capacity in order to avoid losses due to expired products.

Second: Though the company did not have to face lost sales/stock out situation in past, it seems a bit risky to operate with such lower level of inventory. Because in case of failure in production, it would be problem to meet the demand for that failure period with such lower inventory levels and lost sales situation might arise which leads to affect the goodwill and profitability of the company.

4.12 Analysis of Financial Position

Financial analysis is an important tool for judging the performance of the organization which presents the actual situation of the organization. It helps in measuring the financial efficiency which is one of the significant elements to achieve the goals and objectives of any enterprises. It is essential for an enterprise to maintain the strengths and minimize its financial weaknesses in order to attain an overall excellence in its operation. Since financial efficiency is the vital element to achieve the goal, the management body should know in which condition the

organization is running. If present condition is assessed, then management can predict the future financial position and can take corrective action before it fails. Corrective action taken on time helps to improve financial position in years to come. So, each enterprise needs to analyze its financial position to acquire knowledge about how efficiently the company is being operated. In this section, we are intended to analyze the financial performance of Real Fruit Juice of DNPL using several ratios with interpretation by taking past 5 years data into account.

Table 22: Financial Ratios

Types of Ratios	Formula	2005-06	2006-07	2007-08	2008-09	2009-10
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	2.83:1	3.13:1	2.91:1	2.76:1	2.82:1
Stock Turnover Ratio (times)	$\frac{\text{Sales}}{\text{Inventory}}$	40	95.67	5.2	62.4	40.3
Days of Inventory (days)	$\frac{365}{\text{Stock Turnover Ratio}}$	9.1	3.8	8	5.8	9
Debtors Turnover Ratio (times)	$\frac{\text{Sales}}{\text{Debtors}}$	9.3	9.8	10.2	12.1	11.9
Average Collection Period (days)	$\frac{\text{Days in Year}}{\text{Debtors Turnover}}$	39.2	37.2	35.8	30.2	30.7
Return on Sales (%)	$\frac{\text{Net Profit}}{\text{Sales}} \times 100$	0.99	0.80	2.85	2.95	3.15
Return on Working Capital Employed (%)	$\frac{\text{Net Profit}}{\text{Working Capital Employed}} \times 100$	4.79	2.61	15.76	20.09	20.97

Table 22 represents the various financial ratios computed with the help of quantitative details described in table 13 (a) and 13 (b). The detail analysis of these financial ratios is described as follows:

Current Ratio: A company should have sufficient current assets that give a promise of cash to come to meet its commitments to pay its current liabilities. Standard measure of this ratio is 2:1 i.e. total current assets should be two times of the total current liabilities. Lower ratio indicates that there would be the prospect that the company might be unable to pay its debt on time whereas, the high ratio indicates that the company may have an excessive investment in current assets that do not produce any return. Observing the five years computed current ratios, we find that company has higher current ratios compared to standard. This indicates that company has

been investing excessively in current assets than required. Company is found to operate in quite defensive mode. This indicates about improper management of working capital. Later on this chapter we will separately analyze about utilization of working capital loans and its impact on profitability and remedial measures to improve the working capital prospects.

Stock Turnover Ratio: It indicates as to how fast the goods are sold. A high ratio is indication of good inventory management. Stock turnover ratios of Real Fruit Juice are quite good. Company achieved higher ratio (96 times) in 2006-07 but in rest of years it ranges from 40 to 62 times. This indicates that the finished products do not remain in stock for long time i.e. Real Fruit Juice is fast moving item for DNPL. This can be better understood and supported by Days of Inventory (DI). It is satisfactory situation for beverage products to have such range of ratios as expiry dates of such products are generally of short period of time.

Debtors Turnover Ratio: It indicates the velocity of debt collection of a firm. This ratio has not standard measure for comparing the result. But higher should be considered better. High turnover means high sales by using low debtors. Higher the ratio more efficient is the management on collecting the debtors.

The company has satisfactory debtors' turnover ratios which are in increasing trend over the years. This indicates about efficient management of debt collection from its credit customers. Decreasing trend of Average Collection Period (ACP) also supports better collection management of the company.

Return on Sales (Net Profit Margin): It is the base of selling the product, if the turnover is high and fast then even lower margin could also fulfill the desire profitability condition otherwise the firm should expect high net profit margin.

For this firm, trend of first two years rates are not satisfactory. But after that it is showing significant improvement over next three years.

Return on Working Capital Employed: Most companies have to manage sufficient funds in order to smoothly operate day to day business activities. These funds are properly utilized in several resources in order to maintain the balance the level of working capital. Improper utilization of working capital funds leads to affect the financial expenses, profitability situation

and loss of goodwill towards its suppliers. Higher ratios are indication of better utilization of working capital funds.

For this firm, trends of first two years rates are not enthusiastic. But after that it is improving over the last three years. Though rates are in increasing trend, but it is also important to examine whether working capital is properly being utilized or not, which will be discussed later in this chapter.

4.13 Analysis of Working Capital Loans Utilization

Every business enterprises need sufficient funds in the form of working capital in order to operate its day to day business activities without any interruption. Management should be careful while estimating the amount of working capital requirement for certain period of time. Working capital requirement for an enterprise depends on various factors like days of inventory, days to collect from its debtors, days to pay its creditors, unexpected demand growth, extra stocks of raw materials, and advances to suppliers for regular supply of materials and so on. It is a complex task for an enterprise to estimate the precise amount of working capital funds requirements. Both over and under estimation of working capital fund requirement are harmful for the enterprise. Over estimation leads to increase the unnecessary investment in current assets which do not produce any return. Due to higher cost of such funds, the company has to bear the burden of extra financial expenses which ultimately affects the profitability situation. Under estimation hamper the day to day business operation. Though company has to bear lower financial expenses, but other negative effects are even worse like loss of goodwill and trust towards customers, suppliers and other parties. So the company always tries to maintain the optimal level of working capital funds so that it could logically invest in company's resources for smooth day to day business operation. Past experience could contribute in such estimation to a great extent.

Now here an attempt has been made to analyze how well Real Fruit Juice section of DNPL has been utilizing the working capital funds for its day to day operation by taking past five years data into account. For this purpose, we have arranged the concerned data with some useful and logical computations.

Table 23: Real Fruit Juice Working Capital Funds Utilization Trend

(NRs in Lacs)

Year	Overall Working Capital Loans	Working Capital Loans allotted to RFJ	% of Working Capital allotted to RFJ	Financial Expenses allotted to RFJ	Rate of Interest	Excessive Investment in Current Assets	Rough Estimate of excess Financial Expenses
2005-06	5535	3280	59.2	341	10.40%	1178	123
2006-07	9764	5873	60.1	614	10.45%	1845	193
2007-08	6090	4217	69.2	512	12.14%	1723	209
2008-09	5391	3842	71.2	449	11.69%	1462	171
2009-10	7013	4439	63.3	503	11.33%	1758	199

(Note: Excessive investment in current assets has been computed referring to financial ratios. Excessive investment in Current Assets= Excess current ratio × Current Liabilities for the Period) for example (2005-06) → $0.83 \times 1419 \rightarrow 1177.77$ and so on.

Table 23 shows the practice of Real Fruit Juice section regarding working capital funds utilization and its impact on profitability over the past five years.

Overall working capital loans mean loans for the DNPL as a whole which shows the fluctuating character. There is a lack of uniformity over the years. Similarly working capital loans allotted to Real Fruit Juice section also show somewhat same trends. But when we see the percentage of working capital funds allotted to Real Fruit Juice section, Real Fruit Juice alone occupies the major portion of working capital funds out of total funds ranging from 59.2% to 71.2% over the years. Financial expenses in relation to working capital funds used by Real Fruit Juice have been shown in next column. Average rate of interest charged on such funds are shown in next to financial expenses column. We can see that the rate of interest is more than 10% in each year. Cost of funds in Nepalese context is quite higher. Therefore, it is essential for an enterprise to estimate and maintain the optimum level of working capital funds in order to avoid additional financial expenses. Now the question arises, how well Real Fruit Juice has estimated and utilizes its working capital funds over the years? Are they optimum? If not than what are the

consequences of misappropriation of working capital funds? These are the serious matters of discussion. Referring to current ratios in analysis of financial position we come to know that Real Fruit Juice has unnecessary excessive investment in current assets which have been shown in second last column. We have also estimated roughly the amount of excess financial expenses charged to Real Fruit Juice section with related rate of interest and shown in last column. We can see that Real Fruit Juice has not been able to avoid excessive investment in current assets over the years. In other words it has been struggling to estimate and utilize working capital funds properly. This affects the profitability because significant amount of interest has to be paid for such excessive working capital funds. If the company had avoided such excessive working capital funds, profitability situation of Real Fruit Juice could be even more improved than they were.

Chapter 5: Conclusion

Following are the major conclusions regarding this study supported by some suggestions:

- Sales performance of the company seems satisfactory but it could be more improved over the years than what they were. The company has not been able to meet the peak season sales target successfully over the years.

Sales plan is the foundation for all other plans like production, raw material purchase, labor and other expenses, etc. Therefore it is essential to pay more attention regarding its formulation and implementation. The company should seriously consider about deep review and analysis of competitors strategy, market share, promotional strategies, past sales data and trends, sales team performance, transportation and distribution channels, etc. while formulating sales plans and targets for future.

- Company is found to be struggling with utilizing production capacity. Production function of the company is dependent on sales performance. If sales increase in future, the company should be able to utilize the production capacity in order to address the increased demand because the company has sufficient unutilized production capacity. Increase in production will lead the company to attend the economy of scale in manufacturing expenses which ultimately contributes in company's profits.
- Regarding finished inventory, the company does not have a practice of keeping large quantity of the product. Rather it has been operating with comparatively lower inventory levels. Due to fast moving nature of the product, the company has been able to avoid excessive investment in finished inventory. But it could be risky to operate with such a lower inventory level because production failure and unexpected peak demands could lead to lost sales situation for the company resulting loss of goodwill and trust along with losing opportunities of sales and profits.

In order to address this unfavorable situation, company should follow suitable inventory policy like uniform inventory policy or certain percentage of next period demands, etc. By adopting such policies, level of finished inventory could increase but the company will be able to avoid the risks involved in relation to finished inventory to a great extent.

- Profitability of an enterprise is dependent on several factors related to sales, production, inventory, working capital utilization, etc. But basically profits are dependent on

revenues and expenses of the enterprise. Real Fruit Juice shows positivity regarding trends of sales, production and profits. Performances of most of the variables influencing profitability have shown positive and satisfactory results over the years. This study has explored that profits could be more improved than they were. So, we recommend the company to concentrate on maximizing revenue and minimizing expenses. For this purpose the company should establish a cost control and reduction cell which would monitor and regulate the expenses incurred in the company on regular basis identifying controllable and uncontrollable nature of expenses. This could help the company in contributing even more profits to overall DNPL.

- The company wants to be in safe side regarding its day to day business operation. Therefore it has been practicing to operate with excessive working capital funds than required over the years. There is a lack of intelligent utilization of these funds in their resources. Due to higher cost of these funds, company has to bear large amount of financial expenses affecting the profitability.

The company should be serious in addressing the issues related to working capital funds and its utilization in future. In order to address working capital issues, periodic review of current assets and current liabilities positions and trends (monthly or quarterly) could give the better knowledge in estimation of working capital funds requirements for the future periods. Further company should also gradually tighten the credit terms to its customers and lengthen the credit terms by its suppliers maintaining good relation. This will generate more funds available which could reduce the working capital funds requirements.

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