



Internship Report On
An Analysis of Supply Management of Raw Food Items
The Case of Majestic Enterprise (PVT.) LTD.

By

Md. Kamruzzaman Shovon
ID - 16304150

An internship report submitted to the BRAC Business School
in partial fulfillment of the requirements for the degree of
Business and Business Administration

BRAC Business School
BRAC University
September 2020

© 2020. BRAC University
All rights reserved.

Declaration

It is hereby declared that

1. The internship report submitted is my own original work while completing degree at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

Student's Full Name & Signature:

Md. Kamruzzaman Shovon
16304150

Supervisor's Full Name & Signature:

Mahmudul Haq
Associate Professor, BRAC Business School
BRAC University

Letter of Transmittal

Mahmudul Haq
Associate Professor
BRAC Business School
BRAC University
66 Mohakhali, Dhaka-1212

Subject: Internship Report on “An Analysis of Food Supply Chain Management The Case of Majestic Enterprise (PVT.) LTD.”

Respected Sir,

I am very much grateful to present the internship report, titled to ‘An Analysis of Food Supply Chain Management; The Case of Majestic Enterprise (PVT.) LTD.’, as part of the Bachelor of Business Administration (BBA) Program requirement. It is a tremendous prospect for me to gather data and appropriately understand the topic matter. I have attempted my best to finish the report with the essential information and recommended proposition in a compact and comprehensive manner as possible.

It also has to be mentioned that without your expert advice and cooperation it would not have been possible to complete this report. I trust that the report will meet the desires.

Sincerely yours,

Md. Kamruzzaman Shovon
16304150
BRAC Business School
BRAC University
Date: September 29th, 2020

Non-Disclosure Agreement

This agreement is made and entered into by and between Majestic Enterprise (PVT.) LTD. and the undersigned student at BRAC University.

Acknowledgement

At first I want to thank the almighty for giving me the strength to accomplish my internship at Majestic Enterprise (PVT.) LTD. and finish the report on time. The completion of this internship report would not have been possible without the steadfast support of several people.

I would like to express my most profound appreciation and sincere gratitude to Mr. Mahmudul Haq, my Academic Supervisor, for his invaluable guidance, technical know-how, wisdom and professionalism throughout my work. I am also deeply grateful to Mr. Profulla Das, my Company Manager, who always gave insights, expertise on the subject, comments and a valuable supervision of my internship. They are both excellent mentors and have provided support throughout my work. I would like to extend my heartiest thanks to them for their patience and kind involvement in this study.

At last, but not least, my acknowledgement goes to the people in my life who supported me throughout this process. A special and sincere thanks to my parents and all family members who provided their encouragement in my research.

Executive Summary

Majestic Enterprise (PVT.) LTD. is a processor and exporter of frozen and chilled raw food items, as well as dry food items. The company has been operating since 1998 and exporting its products to Asian and European countries. According to The Food and Agriculture Organization of the United Nations (FAO), agriculture (crops, livestock, fisheries and forestry) accounts for one third of Gross Domestic Product and agricultural products constitute 32 % of the total value of exports. This report aims to highlight how the company manages its supply chain, that is, procures the agricultural products and processes them for value addition, till they serve their foreign clientele. Their procurement process, logistics, operational strategies, quality management, demand forecasting and inventory management, manufacturing process and bottleneck analysis are discussed in the report.

The report starts with the company strategies and how the company procures the raw items from the enlisted vendors. The organization uses a mélange of core strategies to retain or increase the bonding between the organization and the customer. It then moves to how the company processes the raw materials into finished goods effectively and efficiently, managing the inventory levels and the domestic and international quality standards. The EPQ Analysis demonstrates the optimal production quantity (nearly 2 MT) for Vegetables only, with a Production Cycle Time of two and half days.

The forecasting method used is Moving Average Method, to keep an estimate quantity of safety inventory, so that the company do not face shortage of the seasonal items or items that can be found on specific time of the year. As the factory is for processing raw food items, it follows a Batch process as items with similar processing methods are worked on at times. They ship the products by Air and Sea. To conclude, the report contains some problems and hindrances faced by the organization, along with feasible suggestions or recommendations.

Upon completion of my graduate courses, the opportunity to make this internship report on the company provided me to compare the business process with the theories and practices of supply chain management in the organization.

Keywords: Supply Chain Management; Agro Processing; Raw Food Items; Export

Table of Contents

| | |
|---|------------|
| Declaration | ii |
| Letter of Transmittal | iii |
| Non-Disclosure Agreement | iv |
| Acknowledgement | v |
| Executive Summary | vi |
| Table of Contents | vii |
| List of Tables | ix |
| List of Figures | x |
| List of Acronyms | xi |
| 1. Introduction | 1 |
| 1.1 Origin of the Report | 1 |
| 1.2 Purpose of the Study | 1 |
| 1.3 Objective of the Study | 2 |
| 1.4 Limitations of the Study..... | 2 |
| 2 . Methodology | 3 |
| 2.1 Sources of Data | 3 |
| 2.1.1 Primary Sources of Data | 3 |
| 2.1.2 Secondary Sources of Data..... | 3 |
| 2.2 Data Collection Process | 3 |
| 3. Company Profile | 4 |
| 3.1 Historical Background of the Organization | 4 |
| 3.2 Company Vision, Mission and Values..... | 4 |
| 3.3 Company Products..... | 5 |
| 4. Industry Perspective of Agro-food-product Exports | 8 |

| | |
|---|--------------|
| 5. Supply Chain Management of MEPL | 11 |
| 5.1 Operational Strategies | 11 |
| 5.2 Process Selection and Facility Layout | 13 |
| 5.3 Procurement Process | 15 |
| 5.4 Transportation and Logistics | 16 |
| 5.5 Manufacturing Process Breakdown | 17 |
| 5.6 Inventory Management | 19 |
| 5.6.1 Types of inventory | 19 |
| 5.6.2 Demand Forecasting | 20 |
| 5.6.3 EPQ Analysis..... | 22 |
| 5.7 Quality Management..... | 23 |
| 5.8 Productivity | 25 |
| 5.9 Capacity Utilization | 26 |
| 5.10 Bottleneck Analysis | 27 |
| 6. Problems and solutions..... | 28 |
| 7. Conclusion | 29 |
| 8. References..... | 30 |
| 9. Appendix..... | I-III |

List of Tables

| | |
|--|----|
| Table 1: Export scenario of Plant or Plant based products from Bangladesh (<i>in MT</i>) | 9 |
| Table 2 : Difference in prices between MEPL and Competitors | 11 |
| Table 3 : Packing Weight and Packaging | 12 |
| Table 4 : Demand Forecast | 20 |
| Table 5 : Frequency of Occurrences leading to Defect Output | 24 |
| Table 6: Output of Finished Goods | 25 |
| Table 7: Inputs of Production | 26 |
| Table 8: Productivity Calculation | 26 |
| Table 9: Capacity Utilization | 27 |

List of Figures

| | |
|---|----|
| Figure 1: Export Performance Comparison..... | 10 |
| Figure 2 : Supply Chain of MEPL | 11 |
| Figure 3: Product Process Type of MEPL..... | 13 |
| Figure 4: Factory Layout | 14 |
| Figure 5: Overview of Procurement Process of MEPL..... | 16 |
| Figure 6: Overview of Inbound and Outbound Logistics | 16 |
| Figure 7: Flow Chart for Meat..... | 18 |
| Figure 8: Flow Chart for Vegetables..... | 18 |
| Figure 9: Flow Chart of Fishes and Shrimps | 18 |
| Figure 10: Forecasting Graph | 21 |
| Figure 11: Fishbone Diagram | 24 |
| Figure 12: Pareto Chart | 25 |
| Figure 13: Bottleneck Identification in the Supply Chain..... | 27 |

List of Acronyms

| | |
|------|---|
| BAPA | Bangladesh Agro Processor Association |
| BVC | Bangladesh Veterinary Council |
| CCIE | Office of the Chief Controller of Imports and Exports |
| DAE | Department of Agricultural Extension |
| DoF | Department of Fisheries |
| EPB | Export Promotion Bureau |
| ERP | Enterprise Resource Planning |
| FAO | The Food and Agriculture Organization of the United Nations |
| GoB | Government of the People's Republic of Bangladesh |
| MEPL | Majestic Enterprise (PVT.) LTD. |
| MIS | Management Information Systems |
| MOFL | Ministry of Fisheries and Livestock |
| SCM | Supply Chain Management |

1. Introduction

The report is prepared on Majestic Enterprise (PVT.) LTD. a Bangladeshi based processor and exporter of various food items, including raw fish, meat and vegetables, snacks and dry food stuff, operating since 1998. It is Private Limited Company, and the 3 owners are related to each other. The report will represent the company's overview in Supply Chain Management and the overall perspective for the agro processing industry in our country.

According to Investopedia (Investopedia, n.d.), Supply chain management is the management of the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace. Supply chain is the network of all the people, organizations, resources, operations and technology engaged in creating and selling products, from the supplier's supply of source materials to the manufacturer, to its final shipment to the end consumer (Juneja, 2015).

In the report, the current scenario of the company's ongoing activities, the critical situations they face, the process of managing the problems and what can be the feasible solutions to those problems are going to be discussed.

1.1 Origin of the Report

The sole purpose behind creating this report is to complete a part of my B.B.A curriculum, which is the Internship. The company that I joined for my internship is Majestic Enterprise (PVT.) LTD. During the internship, I have learned the implementations of Supply Chain Management (SCM) concepts. The report has been drafted on the overall idea of how MEPL manages the supply chain process, provides logistic till the products are exported.

1.2 Purpose of the Study

Supply Chain Management is of a very strategic importance to any organization and is an essential component for the achievement of the goals of a company. The right product and the correct quantity must be delivered in a timely manner, to appease both producers and distributors. Consumers want to be able to know the location they must go to obtain the goods that they want. Optimized supply chain management can decrease total system cost, inventory and cycle times while significantly increasing stock availability and inventory turns. If these issues can be solved then, it will provide greater profits, improved customer service and competitive advantage to the company. Supply chain management process also help to forecast

the upcoming impacts of current distributors. The reason of this report is to do an in-depth analysis of MEPL about their perception and technique of optimizing procurement, production, storage, transportation and export.

1.3 Objective of the Study

The Government of Bangladesh, (GoB), has a program for the development of the agro-food chains; policy targets for 2020 are ambitious (Food And Agriculture Organization of the United Nations, 2011). They aim to encourage the development of domestic food production and restrict the import of foreign food products. The development of infrastructure, logistics and agro supply chains, including retail, should, according to this policy, lead to better foods for local and foreign consumers. Due to less of awareness on the matter of quality in terms of perishable items, SCM is a very important subject to consider. The objective is to identify how SCM is implemented, and challenges of SCM for the agro product export, mainly fish, meat and vegetables, in case of MEPL.

1.4 Limitations of the Study

There were some limitations and difficulties while making this report. Some of these limitations are stated below:

1. Time was the crucial obstacle for making this report. Some more time was needed to notice and observe the actual conditions, the procedures and everything.
2. As a Marketing Executive, I do not handle all the Supply chain activities of the company. So, it was a bit difficult for me to write up about the whole Supply Chain activities.
3. Privacy was another issue. Though my seniors helped and cooperated with me to make this report more informative.
4. The current pandemic situation minimized my scope to get all the necessary information needed to make my report top notch.

2. Methodology

2.1 Sources of Data

2.1.1 Primary Sources of Data

This report is made from daily internship work experience. Other than that, this report is made from the information provided by-

- Md. Babul Sareng, Managing Director
- Profulla Kumar Das, Manager
- Md. Aslam Sareng, Factory Supervisor

2.1.2 Secondary Sources of Data

Secondary data refers to a data which is collected by someone other than the user. As this report is made from a daily experience, so the information searched from the Internet is used for the discussion of some topics.

2.2 Data Collection Process

The information that was required to do this report was collected by Question and Answer sessions from a variety of employees, both senior and lower level. All of the people was supportive and provided me with all the information being asked for. Also, data was collected from government websites related to agro processing and agro export industry.

3. Company Profile

From its humble beginnings, Majestic Enterprise (PVT.) LTD. saw the significance and the vast potential of agro processing and exporting these items to promote and appreciate the fertile country, and the rich water resources of Bangladesh.

Managing Director: Md. Babul Sareng

Number of Employees: 28

Office Address: Eastern Trade Center, 56 Inner Circular (VIP) Road, 10th Floor, Dhaka – 1000, Bangladesh

Factory Address: 292, Nasirabad I/A, Baizid Bostama Road, Chittagong 4100

Website: <http://www.majesticenterpriseltd.com>

3.1 Historical Background of the Organization

Majestic Enterprise (Pvt.) Ltd. is a manufacturer, processing, export and import company, with the sole purpose of providing best of class service & goods to their clients of various countries. The company was established in 1998 by its Managing Director, Md. Babul Sareng. Agriculture is the single most important sector of the economy. The company wants to harness the potential of the hard working people and to contribute to the agro processing sector. It is an enlisted and an active member of Bangladesh Agro-Processors' Association (BAPA).

3.2 Company Vision, Mission and Values

Vision: To be a global exporter of Bangladesh based Halal food items while keeping the integrity, commitment, values and sincerity.

Mission: Providing our valuable clients all around the world with the best of quality and reasonable pricings, and building a good relation.

Values: We believe the value system has an important bearing on its corporate culture, and determines its behavior towards its employees, shareholders and society as a whole. Our corporate culture is to achieve objectives in environment of fairness, honesty, transparency and courtesy towards the customers, employees, clients and society at large. And we have been successful in keeping a successful clientele since the beginning because of our values.

3.3 Company Products

The Processed and Exported Products:

- Frozen Fish, Chilled Fish, Shrimp
- Dry Fish
- Frozen Meat
- Vegetables (Fresh & Frozen),
- Sweets
- Pickles
- Ready To Cook Snacks
- Foodstuffs

➤ **Frozen Fish, Chilled Fish & Shrimp:**

The company collects all kinds of fishes and shrimps from the producing zones and brought in the factory where these are processed and packed for export by air or sea cargo, as demanded by their valuable buyers. They are highly experienced in terms of the Clean IQF and Clean Block Frozen for clients' preferred system of freezing. Some of the fishes are mentioned below:

Hilsha (*Tenualosa ilisha*), Ruhi (*Labeo rohita*), Katol (*Catla catla*), Boal (*Wallago attu*), Gulsha (*Mystus cavasius*), Koi (*Anabas testudineus*), Telapia (*Oreochromis mossambicus*), Chital (*Notopterus chitala*), Pabda (*Ompok pabda*), Shol (*Channa striata*), Shrimps (*Macrobrachium rosenbergii*) etc

Shrimps: Shrimp production in Bangladesh is almost organic in nature. The unique climate of available sunlight and heat all over the year, and also the water fertility provides optimum conditions to fish and shrimp breeding and growth.

1. Giant freshwater prawn / Golda Chingri (*Macrobrachium rosenbergii*.)
2. Giant tiger shrimp / Bagda Chingri (*Penaeus monodon*)
3. Sea water gray brown shrimps/ Harina (*Metapenaeus monoceros*)
4. White shrimp / Chapda chingri (*Penaeus indicus*)
5. Small shrimps / Icha

- **Dry Fish**: Fish drying to preserve fishes is a timeless concept still nurtured by the many in various districts, especially Chittagong. In this region, dry fish is considered as a delicacy in the menu of the many people. Fish drying is carried out in the selected coastal areas and is processed to meet the demands of many Bengalis abroad.
- **Frozen Meat**: They are one of the leading companies in Bangladesh in terms of exporting meat. Their meat items include: Beef, Chicken, Duck, Mutton, and Lamb
- **Vegetables**: They also export the freshest of vegetables, produced in the most organic way to be enjoyed in various countries. A variety is listed below:

Kachur Mukhi/Taro Cormel (*Colocasia esculenta*), Kachur Loti/Stolon of Taro (*Colocasia shoots/stems*), Kanchi Morich/Green Chili (*Capsicum frutescens*), Lebu /Lemon (*Citrus limon*), Potal/Pointed Gourd (*Trichosanthes dioica*), Shim/Sword Bean (*Canavalia ensiformis*), Kakrol/Teasle Gourd (*Momordica cochinchinensis*), Dhone Pata/Coriander Leaf (*Coriandrum sativum*), Satkara/Melanesian Papeda (*Citrus macroptera*), Danta/Stem Amarnath (*Amaranthus lividus*), Chalta/Indian Dillenia (*Dillenia indica*), Kodbel/Woodapple (*Feronia limonia*), Green Mango (*Mangifera indica*), Green Papaya (*Carica papaya*), Green Banana (*Musa acuminata*), Sazna / Drum Strick (*Monringa oleifera*), Chichinga/Snake Gourd (*Trichosanthes anguina*), Jinghe /Ribber gourd (*Luffa acutangula*), Karola/ Bitter gourd (*Momordica Charantia*), Lal shak / Red amaranth(*Amaranthus gangeticus*), Kachu shak/ Taro leaves (*Colocasis esculenta*), Bean seeds(*Phaseolus vulgaris*), Shalgom/ Turnip (*Brassica rapa*), Barbati/String bean (*Vigna sesquipedalis*), Olive (*Olea europaea*), Jackfruit Seeds (*Artocarpus heterophyllus*), Green Turmeric (*Curcuma longa*), Red Chili (*Capsicum annum*), Red Onion (*Allium cepa*), Chalta (*Dillenia indica*) etc.

- **Snacks & Foodstuffs**: The delicacies of Bangladesh also include various snacks (Ready to Cook) and foodstuffs and our organization is very efficient in processing and exporting these items.
 - ❖ Ready to Cook Snacks – Paratha, Singara, Samucha, Spring Roll, Vegetable Roll, Puri (Lentils filling, Potato filling) etc.
 - ❖ Foodstuffs - Puffed Rice, Chanachur, Chira, Gur (Patali), Vermicelli (Shemai), Isabgol (Psyllium husk), Black Cumin, Butter, Ghee, Mustard Oil, Black Cumin Oil, Rice Bran Oil, Corn Flower.

- **Rice**: The dominant food crop of Bangladesh is rice and Bangladesh is the fourth-largest rice producer and is a dominating sector for the livelihood of the rural areas.

Types of rice exported: Aromatic Rice, Miniket, Katari Bhog, Paizam, Najir Shail

- **Spices**: Bangladeshi spices include a variety of spices that are grown across South and Southeast Asia. In every home across the country, variety spices and blends are used to make different and unique tastes in dishes. MEPL exports varieties of spices from the globally recognized producers from our country. The spices exported are as follows:

Turmeric, Chili, Coriander, Cumin, Cinnamon, Curry Powder, Biryani Masala, Prunes (Alu Bukhara), Cardamom, Black Pepper, White Pepper etc

- **Sweets**: In Bangladeshi culture, any good news or occasion and packets of sweets go hand in hand. The organization exports various sorts of sweets such as: Rosogolla, Chomchom, Kalojam, Rosmalai, Sondesh, Lal Mohan, Chana, Sweet Yogurt etc.
- **Pickles**: The pickles are sourced of good quality materials and are made of natural preservatives and no artificial flavor or color is added. Pickles exported are as follows: Mango, Chilli, Olive, Tamarind, Jujube (Kul), Garlic, Mixed Pickles etc.

Images of Products is added to the Appendix.

4. Industry Perspective of Agro-food-product Exports

Bangladesh has been a major player in terms of exporting its natural goods. As a significant proportion of the population is involved in agriculture, and the low labor costs ensure a greater yield. According to Export Promotion Bureau (EPB) data, Bangladeshi exports to Asian countries were USD 41.6 billion in FY 2016-2017 which is 12 Percent of total exports. At the same time, European Union (EU) imported 55.83 percent (USD 9.35 billion) of Bangladeshi total exports and the United States 21.19 percent (USD 7.3 billion). Bangladeshi exports to Asian countries are still low due to absence of proper preferential trade agreements and quality products even though there are huge trade opportunities in the region. Middle East and the European Union (EU) represent the most important export market for the GoB. Presently, among Least Developed Countries (LDCs) Bangladesh is the most prominent exporter to the major global market.

The establishment of watchdog organizations and associations boosted the supply chain as they work hand in hand with the farmers, manufacturers and exporters for ensuring quality, safety and better production means in Bangladesh. They even train the farmers about various concepts, such as Preservation and storage to increase shelf life, Post and Pre harvest handling etc. The organizations are listed below:

- **Bangladesh Agro-Processors' Association (BAPA)** - Established in 1998, it has provided much attention to Good Agriculture Practices (GAP) among the farmers & establishing of Training Institute, Research & Development (R & D) center and ultra-modern Lab in Bangladesh.
- **Bangladesh Fruits, Vegetables & Allied Products Exporters Association (BFVAPEA)** – It provides training, seminar, and advice to the entrepreneurs. It aids in the inspection of the products for business and provides consultation for better yield.
- **Horticulture Export Development Foundation (Hortex Foundation)** – Hortex Foundation was established in 1993 at the patronage of the Ministry of Agriculture, Government of the People's Republic of Bangladesh. It works for the development, promotion and marketing of exportable horticultural/agricultural items.
- **Ministry of Fisheries and Livestock (MOFL)** – It was founded so as to function for the increase in production and productivity in the fish and livestock sector.
- **Department of Fisheries (DoF)** - DoF is a department under the Ministry of Fisheries and Livestock responsible for regulating the fisheries industry in Bangladesh.

| No | Products | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|----|-------------------------------|--------------|------------|------------|------------|------------|
| 1 | Fiber | 709,937.00 | 495,674.00 | 505,714.00 | 677,761.00 | 543,052.00 |
| 2 | Fruits | 1,408.00 | 1,540.00 | 9,522.00 | 5,797.00 | 3,604.00 |
| 3 | Vegetables (including potato) | 43,249.00 | 120,561.00 | 131,369.00 | 65,699.00 | 79,653.00 |
| 4 | Spices | 4,740.00 | 5,423.00 | 12,580.00 | 12,246.00 | 4,626.00 |
| 5 | Tobacco | 26,287.00 | 33,169.00 | 16,575.00 | 29,250.00 | 20,908.00 |
| 6 | Dry foods | 12,490.00 | 23,297.00 | 57,419.00 | 91,108.00 | 108,423.00 |
| 7 | Cereal foods | 1,332.00 | 0.03 | 0.03 | 217.00 | 223.00 |
| 8 | Oils seeds | 3,285.00 | 3,845.00 | 1,257.00 | 1,846.00 | 30,713.00 |
| 9 | Medicinal plants/Goods | 639.00 | 392.00 | 895.00 | 901.00 | 839.00 |
| 10 | Wood/Canes/Bamboo | 686.00 | 380.00 | 227.00 | 1,019.00 | 187.00 |
| 11 | Others | 213,660.00 | 123,069.00 | 78,645.00 | 99,502.00 | 92,190.00 |
| | Total | 1,017,718.00 | 807,355.00 | 814,207.00 | 985,350.00 | 884,422.00 |

Table 1: Export scenario of Plant or Plant based products from Bangladesh (*in MT*)

Source: Quarantine Wing, Department of Agricultural Extension, Bangladesh.

Key Players in the Industry

Vegetables: Program for Rural Advancement Nationally (PRAN), the largest exporter of processed food from Bangladesh, had a vision of creating a huge demand globally of those agro based products produced by native farmers. The key was to process the agro products and increase their shelf-life. Starting their journey to the export market since 1996, PRAN currently exports to over 134 countries. Even in the international market, PRAN is growing everywhere they operate. To accelerate continuous growth, PRAN already set up a production plant in India and production has already been started.

Meat: Bengal Meat Processing Industry is the pioneer in terms of meat production and export. They produce high quality meat and meat products, standard for domestic and International markets. By ensuring the statutory and regulatory requirements and food safety requirements, they are operating on a global basis. By the by, they meet benchmark like ISO (HACCP Inclusive), HALAL and environment license.

Fish: BD Seafood Limited has advanced the way of fine quality sea food manufacturing in Bangladesh with the most modern processing plant designed and engineered with the direct supervision of European Experts. With its beginning from the year 2007, they have a global reputation for providing the most reliable standards of product quality.

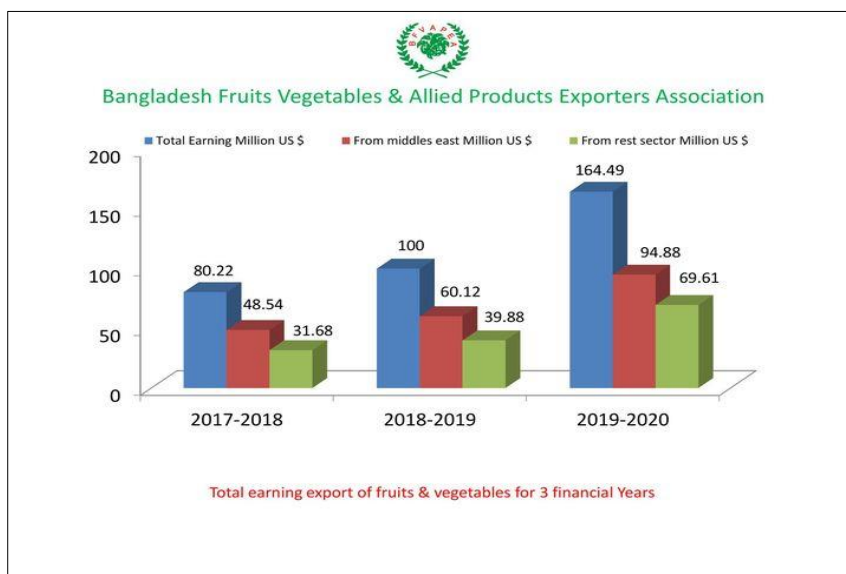


Figure 1: Export Performance Comparison

5. Supply Chain Management of MEPL

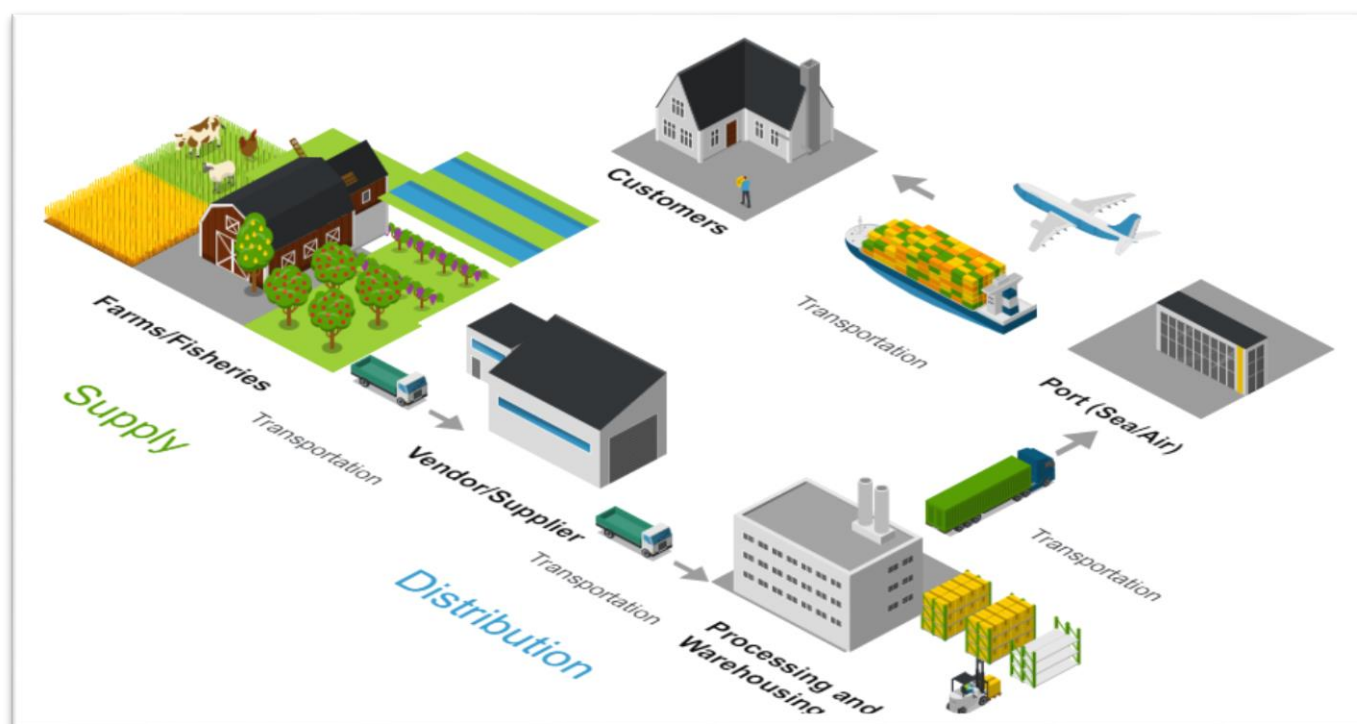


Figure 2 : Supply Chain of MEPL

5.1 Operational Strategies

- Pricing Strategies:** MEPL is one of the pioneers in the agro processing industry, and the Managing Director ensures that it can provide products in a competitive price range, given that the amount ordered is enough to fill a 20 Feet or 40 Feet cargo container, in case of a By Sea shipment. A close estimate of the differences in the price range of some regularly exported items are mentioned in the Table 2.

| SI No | Name of Item(s) Exported | Difference in Competitors' Price and MEPL's Price (In \$/Kg) |
|-------|--------------------------|--|
| 1 | Beef (Frozen) | \$ 0.15 to \$0.25 |
| 2 | Kakrol (Frozen) | \$0.05 to \$0.15 |
| 3 | Green Chili (Frozen), | \$0.1 to \$0.2 |

Table 2 : Difference in prices between MEPL and Competitors

From the table, it can be observed that MEPL can provide in much less overall pricing compared to their competitors.

- **Managers and Workers:** The employees of MEPL are cooperative. They briefed about the activities they do, and the overall processes of the factory. Moreover, they seemed to be experienced and sufficiently efficient to get the job done, manually or by a machines. The Manager, Mr. Profulla, is working in this industry for the last 20 years, and he knows Fishes and Vegetables like the English alphabets.
- **Product and service design:** The products are processed and packed according to the criteria of the client. In addition to the brand of MEPL called “Matribhumi”, some clients want their own label on the packaging. Thus, they provide the design for the packaging and labelling to MEPL, and MEPL aids the client by making the packaging and pack the products in them. MEPL mainly uses Primary and Secondary packaging. Primary packaging is the packaging which mostly touches the products and the Secondary packaging is the mega cartons in which the packed products are stored.

The table shows some products and their packing weight.

| Sl. No. | Name of the product | Packing Size (Primary)/ Carton | Weight Per Carton |
|---------|--|-----------------------------------|-------------------|
| 1. | Koi (Whole Clean IQF) <i>(Anabas testudineus)</i> | 800 gm x 20 Units | 16.00 Kg |
| 2. | Ayer (Steek Clean B.F.) <i>(Mystus aor)</i> | 900 gm x 12 Units | 10.80 Kg |
| 3. | Potol/ Pointed Gourd | 400 gm x 25 Packs | 10.00 Kg |
| 4. | Green Banana | 900 gm x 15 Packs | 13.50 Kg |

Table 3 : Packing Weight and Packaging

Please see the appendix for images of product packaging.

5.2 Process Selection and Facility Layout

- Process Type: The factory in MEPL follows a Batch Process, as high volume of a product type, that is, vegetable, meat or fish is processed at the same time and under the same conditions. For instance, when the company processes meat, they continue to do so until the requirements for a consignment is fulfilled. Then they set up the processing floor again, equipment and labor to process the next product type. The serial of the product type to be processed depends upon the volume of that item or item type procured.

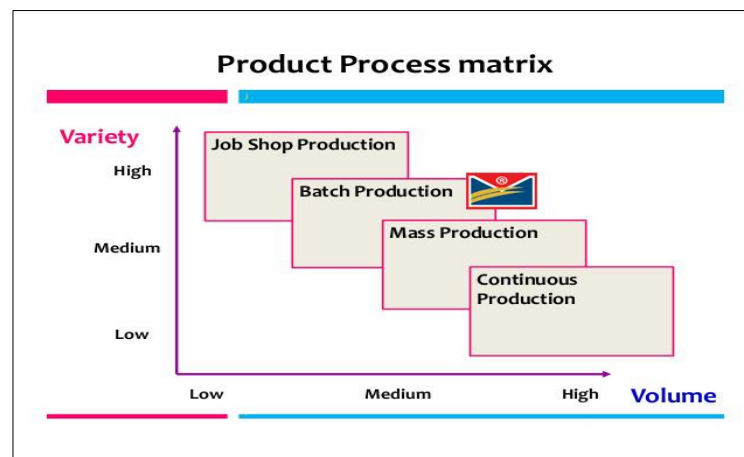


Figure 3: Product Process Type of MEPL

- Facility Location: The processing of the raw food materials and storage is done in the company's own processing and storage facility in Chittagong. Chittagong is the commercial capital of Bangladesh, and is a prime location considering export. Being in the same city as the Chittagong Export Processing Zone and the ports, it provides some safety time and minimizes some costs, as the finished goods are transferred by freezing covered vans and then loaded onto cargo containers. Also, skilled labor is available which plays a significant role for the processing of raw materials and handling of finished goods.
- Layout type: MEPL follows a Process Layout as all workers performing similar tasks are grouped together, so that the activities are well synchronized from the raw materials being entered the factory gate, till they are packed and stored in cold storage and send out when needed. The factory itself is designed for the mentioned Process Layout, where a vast amount of similar goods with similar or same processing activities are undertaken in batches. The items are to be handled with care as they are perishable and is subjected to high levels of scrutiny in terms of hygiene and quality before export.

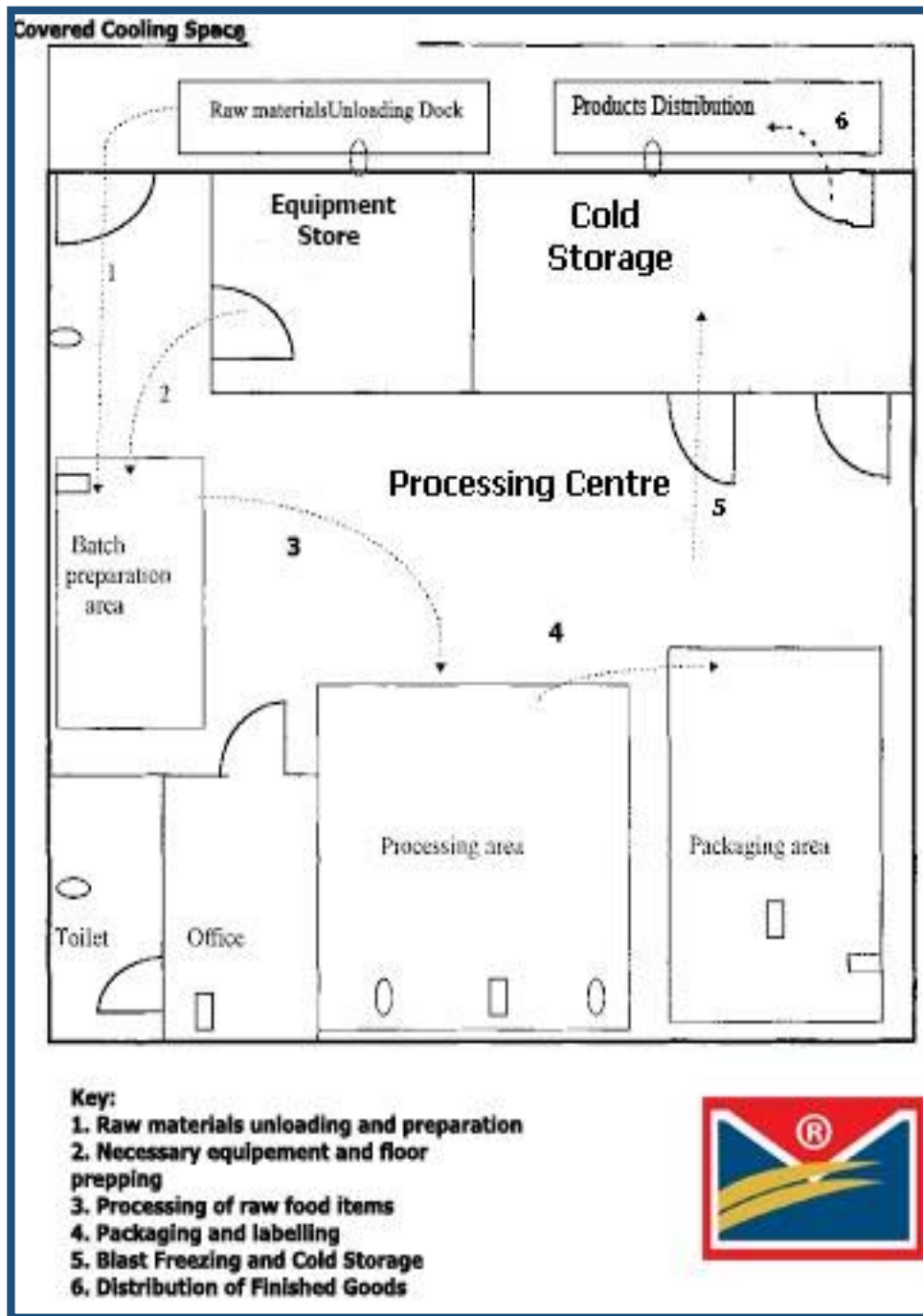


Figure 4: Factory Layout

5.3 Procurement Process

The purchasing process is Centralized Purchasing, as the final decision has to be issued and approved by the Manager.

MEPL generally relies on its usual suppliers from different parts of the country, with whom the company is doing business for a long time, that is, their enlisted suppliers. In some cases, new suppliers are inquired to get more competitive prices. For each product type, they have multiple vendors who supply the company within a very short time.

- Pre Purchase procurement: As the potential buyer of the food items communicates their interest to do business, they provide the company with a list of the items with an estimated amount preferred, for a quotation. The company sends the amount and item to the relevant supplier to get the latest prices. The prices of the items fluctuate according to season, weather and other conditions. A Proforma Invoice is sent to the potential buyer.
- Placing Orders and Purchase: According to the final negotiations for pricings, and adjustments in amount with the potential buyer, orders are placed to suppliers, who will shortly gather the items and transfer to the company's facility. Purchase orders are made with the terms and conditions of payment, with negotiated prices.
- Post Purchase activity: As the facility receives the products, the products are checked and sorted, then received after weighing. The payment process starts with the amount received after the sorting. After adjusting the invoices, the amount which does not meet the standards are sent back to the supplier with the new invoice. The supplier is paid according to the terms and conditions of the Purchase Order.

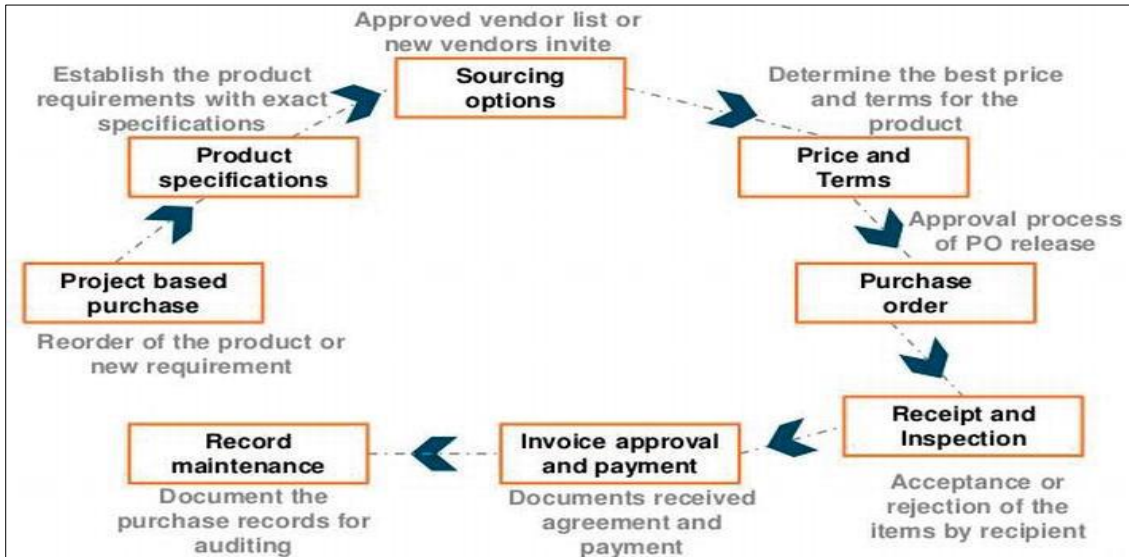


Figure 5: Overview of Procurement Process of MEPL

5.4 Transportation and Logistics

Logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. According to the Council of Supply Chain Management Professionals (previously the Council of Logistics Management.), logistics is the process of planning, implementing and controlling procedures for the efficient and effective transportation and storage of goods including services and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements and includes inbound, outbound, internal and external movements.

MEPL tries hard to optimize their transportation model to reduce costs, but unfortunately the company does not own any vehicles. For that reason, they are prone to inconveniences at rush times.

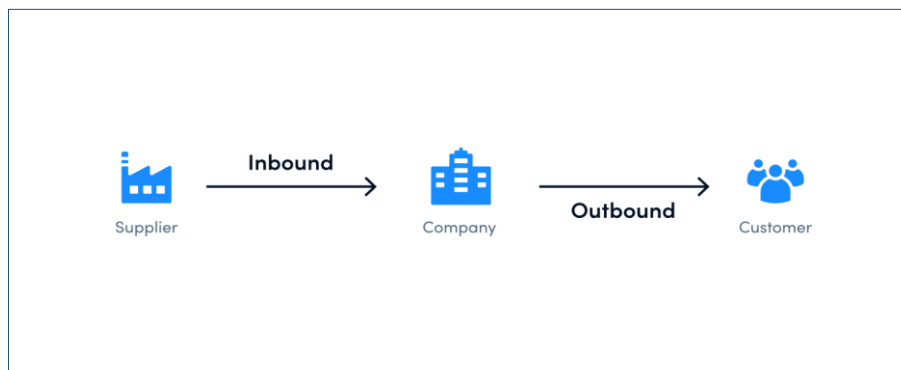


Figure 6: Overview of Inbound and Outbound Logistics

Inbound logistics: Inbound logistics refers to the receiving, storing and distributing raw materials for use in production. Agreements between the suppliers and MEPL are made in terms of inbound raw materials for MEPL, so that some costs are undertaken by the suppliers, when they provide the raw materials. Usually, as the products are sourced from different parts of Bangladesh, the inbound logistics costs increases the overall costing, decreasing the profit margin. When the products are delivered to the factory in CTG, they are sorted and received to be processed and stored. The faulty or products that are not up to the mark are returned to the supplier.

Outbound logistics: Outbound logistics refers to the transportation, storage, and delivery systems that bring the products to the customers. Outbound logistics is the way the finished products are delivered to their destination. As the finished goods are ready to be shipped, they are taken to EPZ by covered vans, where Freight Forwarders are pre-contracted to serve as an expert link in the supply chain. A freight forwarders main objective is to arrange transportation for MEPL, i.e., shipping lines, to move goods to the final point, and handle the goods before and during loading in the cargo container. They can use a variety of shipment types, including vessels, airplanes, trucks, and railroads, and often use intermodal methods for a single shipment. MEPL generally undertakes By Air or By Sea shipments to send the products to the foreign clients.

5.5 Manufacturing Process Breakdown

MEPL has a huge selection of products and they rely on their suppliers to get the best of quality materials. The overall steps of processing and manufacturing are more or less similar, as they are following the Batch Process.

The core process starts right after unloading the raw materials and letting them cool down in the cooling area. They are then washed and checked for any inconsistency before, to be laid on the processing tables afterwards. Workers, following all the preprocessing hygiene and safety measures, start working on the raw food items, i.e., sorting and grading, cutting, cleaning, weighing, and finally packing and labelling. As soon as the packed products leave the processing tables, they are sent to the Blast Freezer with a temperature of -40° C for rapid freezing of the products. In case of Fishes or Shrimps, the products may also be Individually Quick-Frozen (IQF) or Block Frozen (BF). The products are packed in final cartons, stored in a cold storage room, with -20° C temperature until they are to be shipped out.

Kindly refer to the following figures illustrating the Flow Charts of the manufacturing processes.

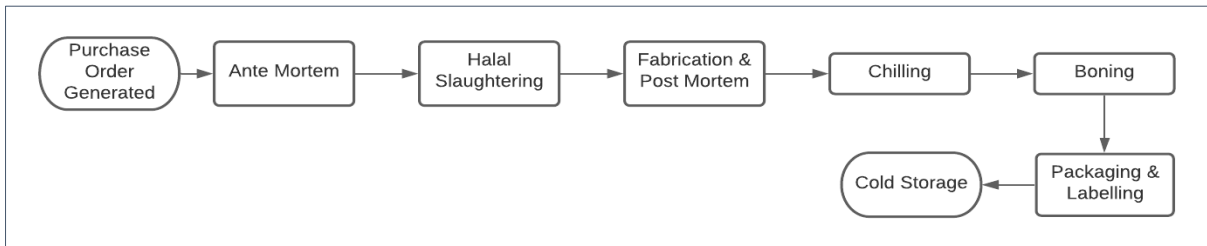


Figure 7: Flow Chart for Meat

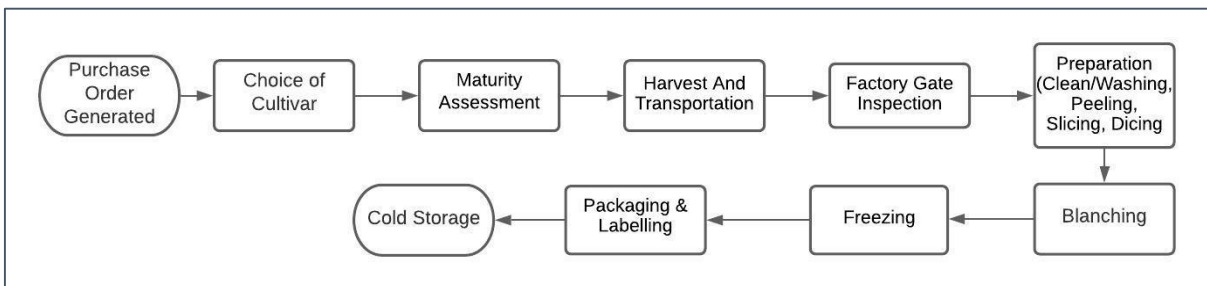


Figure 8: Flow Chart for Vegetables

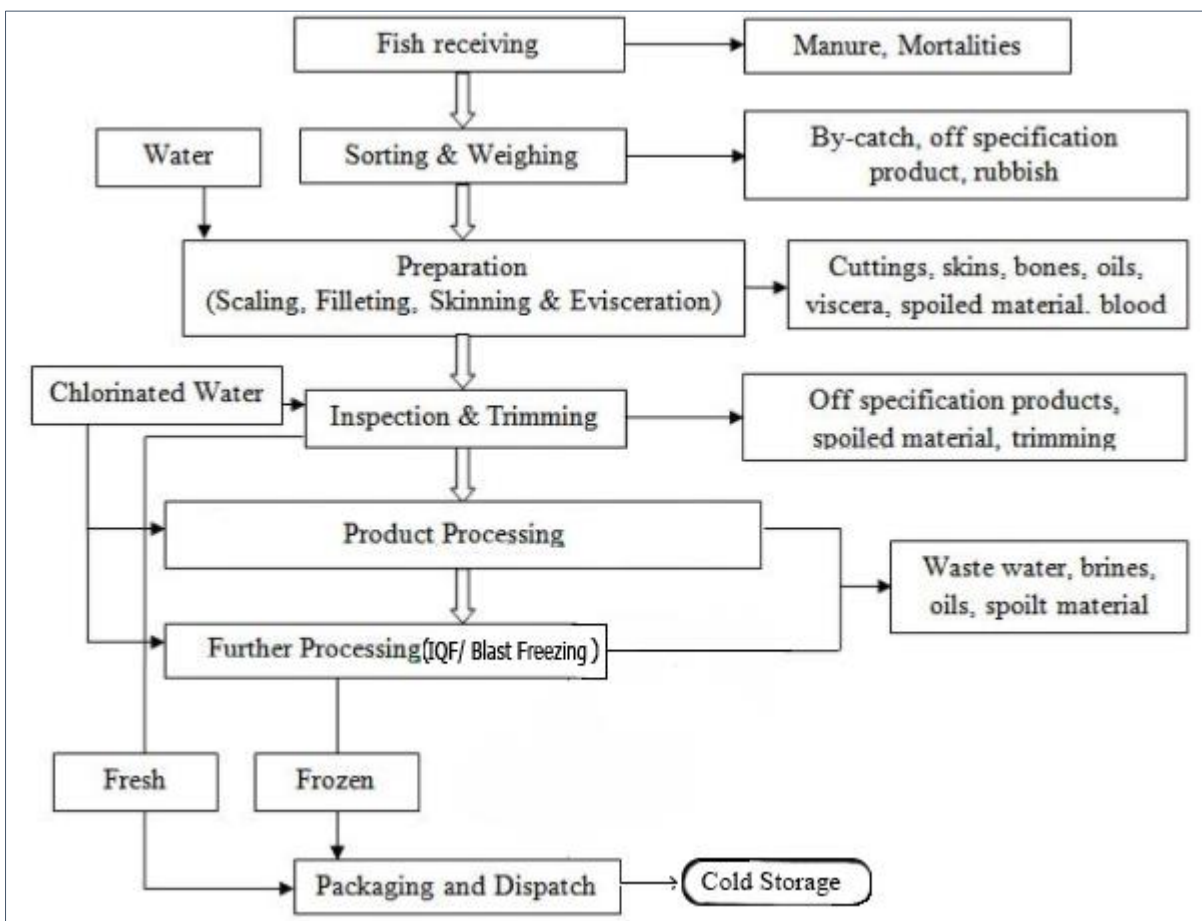


Figure 9: Flow Chart of Fishes and Shrimps

5.6 Inventory Management

According to **Inventory management** refers the management of raw materials, components and finished products, along with processing and warehousing the items. The organization, MEPL uses **Perpetual Inventory System** for counting their inventory as they receive and store a large amount of raw materials, and though the lead time is not very high, they need to monitor and update their inventory level on a basis of when they are received, moved or transferred from one location to another or scrapped.

As they procure from domestic sources, the **Lead Time** for procurement is usually between 3 to 10 days. It can increase when there is any drastic change in weather conditions or political situation.

They follow **Weighted Average Inventory Accounting System**, as the costs associated with variety of the products are a bit difficult to be assigned specifically to an individual unit. Thus they average it on the total amount of each category of the product after production.

5.6.1 Types of inventory

- **Raw Materials** – Fresh and Unprocessed Vegetables, Meat, Fish straight from the source.
- **Work In Process** – The items in the Processing Area of the factory, where they are handled by the workers till packing.
- **Finished Goods** – Packed and Labelled items stored in the Cold Storage
- **Pipeline Inventory** – Raw Materials on their way by Trucks or Covered Vans to the factory from different regions of the country.
- **Safety Stock** – MEPL does not keep safety stock of the regular items they process, rather they keep a stock of the Seasonal Items, which is only available on certain times of the year. Items such as Green Mango, Sheem, Sheem Seed, Jackfruit, Green Chili, Kakrol etc are procured, processed and kept in the Cold Storage during the season. The organization keeps around 30 MT in average safety stock all around the year.

ABC Classification of Inventory

The ABC analysis suggests that inventories of an organization are not of equal value. Thus, the inventory is grouped into three categories (A, B, and C) in order of their estimated importance.

Category A – Meat

Category B – Fish

Category C – Vegetables

5.6.2 Demand Forecasting

According to Mr. Babul, their demand is forecasted on basis of the previous data, and they follow the **Moving Average Method** to get an estimate of the demand. They used to estimate the demand by considering total 3 years, which according to Mr. Aslam, the factory supervisor, provides a minimum level of production the organization must acknowledge. Let us look an example of the demand of vegetables below.

| Year | Actual Demand (in MT) | Forecasted Demand (in MT) |
|------|-----------------------|---------------------------|
| 2010 | 2354.34 | |
| 2011 | 2379.71 | |
| 2012 | 2318.52 | 2381.53 |
| 2013 | 2468.99 | 2424.56 |
| 2014 | 2386.09 | 2463.76 |
| 2015 | 2569.47 | 2552.6 |

Table 4 : Demand Forecast

The operations are to be recognized and set months before the **Peak months**, as it takes some weeks to reach the desired output in reference to the demand, and 2 to 3 weeks for the shipment to reach the foreign port, in case of sea shipment.

❖ *Customer Order Cycle Time = actual delivery date – purchase order creation date*

It can be stated the **Customer Order Cycle Time** for MEPL is 8 weeks to 10 weeks.

Moreover, their Peak Months per year start from 3 months before Eid Ul Fitr, as they have to supply the most variety of items to the foreign clients at least 15days before Ramadan starts in the buyers' country and during the first 2 months of the year, having a good demand of the fresh produce of vegetables.

Let us consider the year 2018 for which:

- January, February: High Demand of fresh vegetables
- March, April, May: Peak Months as demands increased for Eid Ul Fitr in June
- June, July, August, September, October: Normal Operations
- November, December: Activity level increased as demand for seasonal vegetables increased for the upcoming months

To illustrate, suppose on a scale of 1 to 10, 1 being there is no demand and the highest demand is 10, for the year 2018.

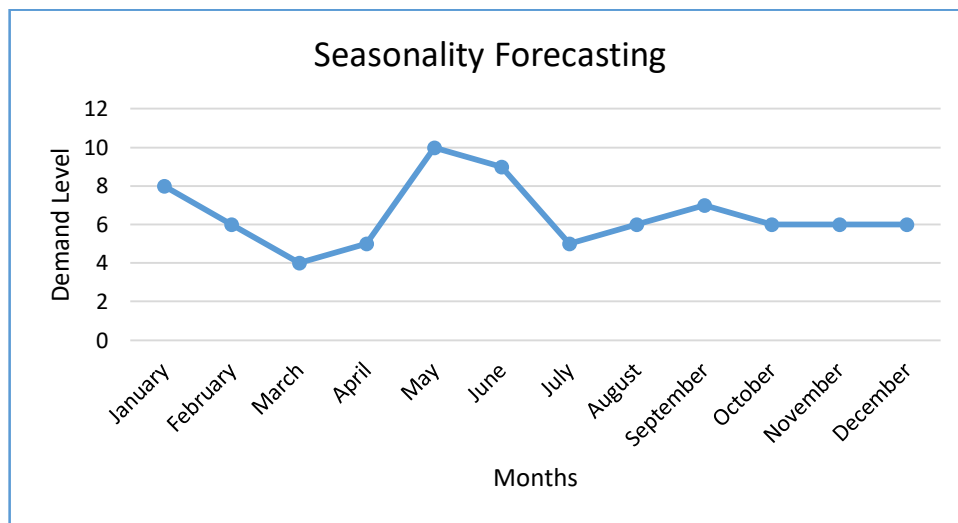


Figure 10: Forecasting Graph

5.6.3 EPQ Analysis

Economic Production Quantity Model (EPQ) is being followed by MEPL to find out the optimal amount of production which would reduce inventory cost by balancing the inventory holding cost and average fixed ordering cost.

For instance, MEPL processed and packed 200MT of vegetables for the Fiscal Year 2018-2019. The factory operates 260 days a year and had a capacity for processing 1.8 MT of any raw material per day. The carrying cost is 0.2 BDT/Kg/Day. The setup cost is 1 Tk/Kg

- $D = 200,000\text{Kg/Year}$
- $d = 200,000 / 260 = 769.2 \text{ Kg/Day}$
- $p = 1800 \text{ Kg/Day}$
- $H = 0.2 \text{ Tk/ Kg}$
- $S = 1 \text{ Tk/Kg}$

The optimal size of the production run for vegetables = Q^*

$$Q^* = \sqrt{\frac{2DS}{H(1 - \frac{d}{p})}} = \sqrt{2 * 200,000 * 1 / 0.2 (1 - 769.2/1800)} = 1869.07 = 1870 \text{ Kg}$$

The length of each production run = **Run Length** = $Q^*/p = 1870/1800 = 1.04 \text{ Days}$

The Cycle Time for the optimal production quantity = **Production Cycle Time** = $Q^* / d = 1870/769.2 = 2.43 \text{ Days}$

5.7 Quality Management

As MEPL exports its items, the products have to meet **international quality standards**. The certifications are issued by the organizations of the Government of the People's Republic of Bangladesh (GoB), responsible for inspection and testing of the products, per shipment. Moreover, several procedures are to be maintained from procurement till storage to maintain quality. The workers are decontaminated before entering the processing room, and clean working dresses are given. They have to wear hair nets, gloves, boots, masks and aprons during work time.

For fishes and shrimp, the quality assurance system, aided by up to date microbiological tests and an efficient quality grading personnel and continuous personal monitoring, is always operational from the entrance of raw products and exit of finished products. The factory is Moreover, the Department of Fisheries (DoF) inspects the products at the factory and issues the Salubrity Certificate, guaranteeing the safety for export.

The company processes Halal meat, under the rules and regulations of the GoB, also ensuring the taste and freshness. The hygienic conditions of the factory, including the tests of the meat items and certifications from Bangladesh Veterinary Council (BVC) meets the international standards.

Phytosanitary Certificate is issued by Department of Agricultural Extension (DAE) for vegetables, fruits and dry food items. After the processing is done, MEPL applies for an inspection of the products. After the routine check and test, the company gets its deserved certificate.

Each of the mentioned Certificates are to be obtained per consignment before export.

Quality Certificates acquired by MEPL: Bangladesh Standards & Testing Institution (BSTI) Certification, International Organization for Standardization ISO 9001:2015 Certification, Hazard Analysis and Critical Control Point (HACCP) Certification.

As like any activity is subjected to error, there are problematic causes, external or internal to the organization, which leads to lesser quality or defects in the output of the final goods. The **Fishbone Diagram** and the **Pareto Chart** shows the causes leading to substandard goods.

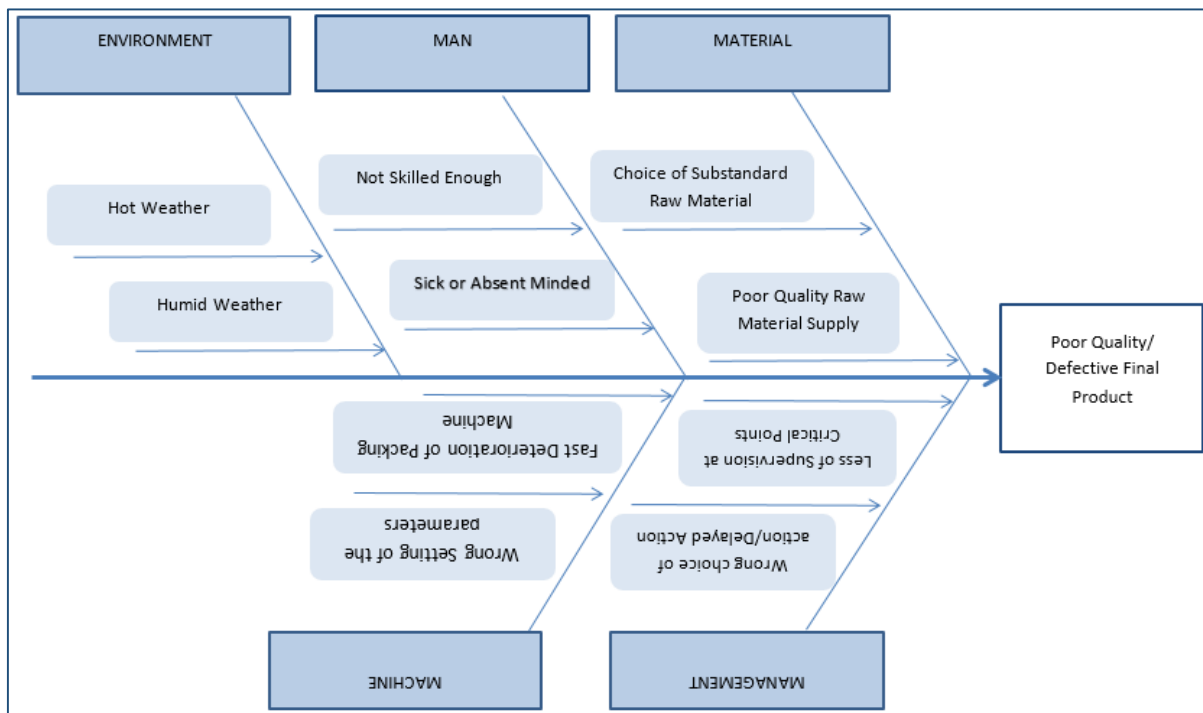


Figure 11: Fishbone Diagram

| Causes of Defects (22.08.20) | Frequency Of Occurrence |
|------------------------------|-------------------------|
| Low Quality Input | 29 |
| Lazy or Unskilled Worker | 25 |
| Power Failure | 21 |
| Machine Capability | 16 |
| Wrong Supervisor Decision | 9 |

Table 5 : Frequency of Occurrences leading to Defect Output

A sample of 100 defected output were chosen from 22.08.2020 to 25.08.2020 while production was going on. Their main causes was tallied and noted to form the Pareto Chart

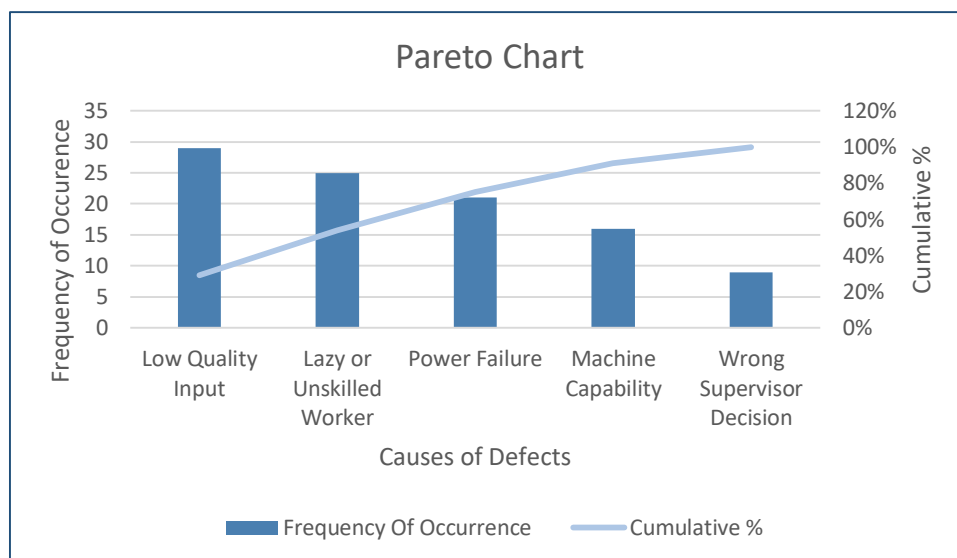


Figure 12: Pareto Chart

5.8 Productivity

In the following tables, Productivity Calculations for MEPL has been conducted. The Output is the amount of finished goods produced in the Fiscal Years, in Kg.

- Total Productivity = Output / Input
- Partial Productivity = Output / Single Input

| Year | Vegetables | Meat | Fish | Total |
|------------------|------------|--------|---------|---------|
| 2017-2018 | 180,000 | 20,000 | 90,000 | 290,000 |
| 2018-2019 | 200,000 | 30,000 | 120,000 | 350,000 |
| 2019-2020 | 230,000 | 50,000 | 150,000 | 430,000 |

Table 6: Output of Finished Goods

| Year | Total Output (in Kg) | Labor Cost (BDT) | Machine Cost (BDT) | Avg. Materials Cost (BDT) | Manufacturing Overhead (BDT) |
|-----------|----------------------|------------------|--------------------|---------------------------|------------------------------|
| 2017-2018 | 290000 | 8,038,500 | 7,067,500 | 15,396,000 | 1,916,500 |
| 2018-2019 | 350000 | 9,699,000 | 8,715,000 | 18,764,000 | 2,030,000 |
| 2019-2020 | 430000 | 11,812,500 | 10,870,000 | 23,112,500 | 2,485,000 |

Table 7: Inputs of Production

| Year | Total Output (in Kg) | Labor Productivity (Kg/BDT of Labor Cost) | Materials Productivity (Kg/BDT of Labor Cost) | Machine Productivity (Kg/BDT of Machine Cost) | Manufacturing Overhead Productivity (Kg/BDT of MOH cost) | Total Productivity (Kg/ BDT of Labor, Material, Machine, MOH cost) |
|-----------|----------------------|---|---|---|--|--|
| 2017-2018 | 290,000 | 0.036 | 0.041 | 0.019 | 0.15 | 0.009 |
| 2018-2019 | 350,000 | 0.036 | 0.040 | 0.019 | 0.17 | 0.01 |
| 2019-2020 | 430,000 | 0.036 | 0.040 | 0.02 | 0.17 | 0.01 |

Table 8: Productivity Calculation

5.9 Capacity Utilization

The capacity utilization rate measures the proportion of potential economic output that is actually realized and is displayed as a percentage.

$$\text{Capacity Utilization} = \text{Actual Output} / \text{Potential Output} * 100$$

The factory layout changed around the last months of 2019, as they increased the number of processing tables, on which more workers can work simultaneously.

| Year | Line of Business | Total Output (in Kg) | Design Capacity (Kg) | Utilization (%) |
|-----------|------------------------------|----------------------|----------------------|-----------------|
| 2017-2018 | Processing of Raw Food Items | 290,000 | 468,000.00 | 62.0 |
| 2018-2019 | Processing of Raw Food Items | 350,000 | 468,000.00 | 74.8 |
| 2019-2020 | Processing of Raw Food Items | 430,000 | 520,000.00 | 82.7 |

Table 9: Capacity Utilization

5.10 Bottleneck Analysis

In production, a bottleneck is one process in a chain of processes, such that its limited capacity reduces the capacity of the whole chain, according to Wikipedia.

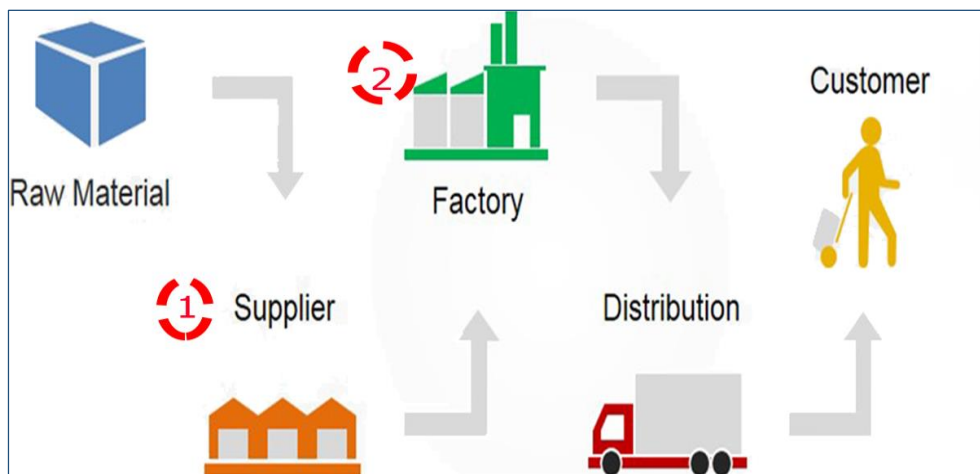


Figure 13: Bottleneck Identification in the Supply Chain

When orders are placed, there is a huge rush as the buyers want their goods as soon as possible. Bottlenecks are identified in the marked 1 and 2 of the figure above, that is, from the suppliers' end and in the organization's factory.

1. Supplier: If there is any drastic change in weather or the political situation, the lead time for procurement of the raw materials increases. The overall production capacity is decreased due to the mentioned reasons.

Recommendation: Alternative Raw Material Sourcing from places nearby the factory.

2. Factory: The time it takes to produce a certain amount of finished goods varies highly with the worker's mentality and experience. Moreover, processing of the vegetables, fish and meat takes up the highest resources compared to any other activity to produce the relative lowest output.

Recommendation: Automation of the processing activities.

6. Problems and solutions

Though the company has been in this line of business for 2 decades, there are some identified problems on which the organization can work upon to further increase efficiency and decrease total operational costs. They are discussed below.

1. Inventories are not monitored effectively and economic quantity of inventories is not properly tracked. The feasible solution is to use integrated inventory tracking and maintenance approach.
2. The percentage of wastage is high due to power shortage, worker's mentality or experience and input of substandard raw materials. Automation in the processing of vegetables would reduce wastage. In terms of fish and meat, skilled workers are to be employed or the current employees should undergo training sessions.
3. Marketing efforts undertaken are minimum by the company. MEPL does not preach their brand Matribhumi in sufficient amount to the global market, rather than sticking to buyer's preferences in Branding. Some consignments of the organization seem like an outsourcing work for another company.
4. Most of the employees, even in higher positions are technologically challenged. Also, the implementation of IT is not visible. Using Enterprise Resource Planning (ERP) and Management Information Systems can increase the speed and accuracy of the process flow drastically.
5. During Peak Months, the company fails to meet efficiency standards as they do not pre plan their Master Production Schedule. It causes a lot of confusion at times of processing the raw materials. Hiring experienced Factory Managers might resolve their factory related difficulties.

7. Conclusion

Majestic Enterprise (PVT.) LTD. is a popular organization in the field of agro export in Bangladesh. Though their growth is slow, they have been very consistent in providing their clients best of quality products in various countries including huge amount of food items, as well as hardware, crockeries, and many other miscellaneous items. From the starting of the Fiscal Year 2019-2020, the Managing Director has started redeveloping their Business Model in order to be more competitive in the market, and agile in production. With advancement in management techniques and use of MIS will surely put MEPL as one of the key players in the industry in the near future.

References

1. *Food And Agriculture Organization of the United Nations*. (2011). Retrieved from <http://www.fao.org/in-action/food-safety-bangladesh/activities/value-chains-and-street-foods/en/>
2. *Investopedia*. (n.d.). (Dotdash Publishing) Retrieved from <https://www.investopedia.com/terms/s/scm.asp>
3. Juneja, P. (2015). *Management Study Guide*. Retrieved from <https://www.managementstudyguide.com/logistics-and-supply-chain-management.htm>
4. *Material Handling & Logistics News* . (n.d.). <http://mhlnews.com/global-supply-chain/council-logistics-management-become-council-supply-chain-management-professional>.
5. Wickramaarachchi, W. (2017). Export Promotion and Global Market Access for South Asian.
6. <http://www.bapabd.org/>
7. <http://www.epb.gov.bd/>
8. <https://mofl.gov.bd/>
9. <http://www.fisheries.gov.bd/>
10. <http://www.hortex.org/>

Appendix



Picture 1: Raw Materials (Fish)



Picture 2: Raw material (Vegetables)



Picture 3: Fish Processing



Picture 4: Vegetable Processing



Picture 5: Cold Storage



Picture 6: Quality Inspection and Packaging



Picture 7: IQF Preparation



Picture 8: Primary Packaging (Fish)



Picture 9: Secondary Packaging (Mega Cartons)



Picture 10: Primary Packaging (Vegetables)