

# [Literature review on inventory control management finance essay](https://assignbuster.com/literature-review-on-inventory-control-management-finance-essay/)

The Assam Tea Corporation is a pioneer in producing high quality tea having its own processing plant with an excellent implication of inventory control. The main aim of this report is to conduct a literature review on the inventory control management and the operations in practice of the Assam Tea corporation processing plant where I was employed.

The company has an efficient structure of inventory control and has set a standard for other companies in the same operation in that area . The company produces a high quality tea mostly meant for export in the form of CTC and Orthodox tea. The product of the company is world famous for its high quality taste.

They offer state of the art infrastructure in the processing plant with a highly trained employee and efficient way if inventory control. They have various units in the processing plant i. e, starting from the picking up of green leaves which is the major part of raw material. The company has own plantation unit from where the raw material is readily available. Moreover they have tie ups with other local tea gardens to ensure a steady supply of tea leaves. The tea processing unit is a complex mechanical process works under the principle of operation management and inventory control. The function of it is a crucial one which has to deal with seasonal and cyclical fluctuations of demand persisting in the market . The inventory control has to deal with waste management in the unit by finding out the optimum level of demand . The seasonal fluctuations is mainly incorporated with the monsoon season where the production of tea leaves at the peak level. I was assigned with the responsibility of the assistant manager operations in the processing unit.

This report mainly encounters with the various concept of inventory control and its management undertaken by an organisation with stress on inventory and its effective control. It deals with the cost related with the inventory and its profile, Usage of probabilistic estimate of demand and overall role of the inventory control in a tea processing unit . There are various issues how to improvise the situations and improve the competitiveness related to the issues . The method applied to prepare this report with a high concentration on the textbooks and the web-source related to operations management . The information collected through all the experimentations observed and finally resorted to website and standard textbook of operations management.

## 2. Literature Review

## 2. 1 What is inventory

Inventory has a multilevel function in the process unit and the firms used to maintain mainly four level of inventories –

Raw material-This is the unprocessed form of the item which can be utilisied from varied number of suppliers . This form should be used to find out the superior form by removing the supply variability in quality, quanity or time of delivery.

Work-in process(WIP) inventory-This is an intermediary form of inventory when the raw materials undergone a change but not completed.

Maintanence/repair /operations(MRO) inventory-

## 2. 2 INVENTORY CONTROL MANAGEMENT

In this part of analysis importance should be given “ when to order” and “ how much to order”. The model which are based on independent demand can be divided into three.

1. Basic Economic Order quantity(EOQ) model

2. Production order quantity

3. The quantity discount model

## Basic Economic Order Quantity model

This is the most common form of the inventory control technique . The technique is based upon following assumptions-

Production order quantity model

The model is applicable under two situations. Firstly, When the order is placed there is continuous flow of inventory. Secondly, the units are produced and sold simultaneously. In the case of Assam Tea Corporation processing unit both these situations are prevalent. In this model daily production rate is determined on the basis of daily rate of demand.

It is useful when inventory build up is a continuous process over the time and assumption of traditional Economic Order conditions holds valid. It is the situation where the optimum order size Q\* is estimated with an equality in set up cost to holding cost, The production order quantity model:

Q= Number of pieces per order

H= Holding cost per unit per year

P= Daily production rate

d= Daily demand rate or usage rate

t= Length of the production run in days

The final expression for optimal level of inventory Q\* is-

## Probabilistic model with constant lead time

Probailistic model with constant leadtime is highly relevant. In the presence of uncertain demand , the management of the company faces challenges to maintain adequate service level. The service level can be complimented by the probability of a stock out is……To reduce stock out the company can hold inventory as safety stock.

Whereas if Reorder point= ROP= dxL

With the addition of safety stock, the expression becomes= ROP= dxL+SS

However annual stock out costs= The sum of the unit shortxthe probabilityxThe stock out cost per unitxthe number of orders per year

## 2. 2 COST OF INVENTORY

In case inventory control analysis there are various costs involved in the overall process. The cost of inventory is calculated in the form of unit values. However major segment of the inventory cost can be discussed as follows-

THE CARRYING COST OF INVENTORY

In this segment of costs of carrying items of inventories are included. This is the cost of running a warehouse, cost that are incurred on handling and counting, costs involved in special storage , damage and lost, insurance, tax and wornout costs.

THE ORDERING OR SET UP COST

This is the cost which is associated with placing an order and replenishment. This cost includes all the form of orders, establishment cost needed to ensure it, inspection and receiving cost, handling the vendor invoice and the cost necessary to meet unexpected situation.

This may be a cost of skilled mechanic charged as per his technical specification. There are various arguments whether the cost of the skilled mechanic is a fixed cost . But Kaplan (1988), all the costs involved in the long term is virtually variable cost where in that period a person can be fired, a plant can come to shutdown.

INSUFFICIENT CAPACITY COST

The cost involved here is meant to avoid the stockout cost. In the case of production process , it is the emergency cost needed for emergency replacement of the production equipment to enhance the output level, cost involved to speed up the process, rescheduling and assigned work in split up version.

SYSTEM CONTROL COSTS

This is the type of cost appeared in the operation process as per selection of decision system. This includes acquisition, storage, maintanence and computation of the data. The treaining instituted by the organization and employee verification is also falls in the category costs.

In Assam Tea Corporation , there are a number of costs involved in different level of operation processes . The green leaves are initially plucked from the plantation unit and allowed to undergo different processes like picking , wilting , bruishing , oxidation/fermentation , firing, yellowing, shaping, drying and curing to get the final product.

In the processing unit , one of the major cost incurred by the company is warehousing the tea product as well as the green leaves. If the fresh leaves are not stored properly there is a greater possibility of being dried up and becomes waste. The insurance cover and tax are also one of the component.

The cost of placing an order is one of the significant part of the processing unit. There is an inspection unit in the company which takes account of quality control in the unit. There is the cost of technicians expertise in that specific line During the peak season as the production process is a complex mechanical one. During the peak season , especially during monsoon, there is always extra cost of utilizing extra-capacity, expediate the process. In that situation temporary workers are employed on the basis of shift duty with overtime bonus has to be paid.

The company has to bear the cost on information system and its maintanence as it uses a data warehousing software. With the present environment of rapid change in the technology the company has to provide training for skill enhancement training to its manpower. This has been done with “ Tocklai Tea Research Centre”, one of the leading Tea research institute . The training cost and performance analysis cost is formed as one of the cost.

## KEY VARIABLES IN INVENTORY MANAGEMENT

## 1. REPLENISHMENT LEAD TIME

It is the time between placing an order and to meet the final demand of the customer physically.

## 2. REORDER POINT

It is the point of the inventory level where the replenishment of stocked item takes place.

## Where ROP= dxL

where d is the demand per day, L is the leadtime for a new order in days

## 3. SAFETY STOCK

A buffer stock to meet up an uneven demand.

## OPERATION PROCESS UNIT OF TEA

The Assam Tea Corporation has its processing unit for production of CTC() and Orthodox tea in the form of ……. which account for almost 80% of the main production whereas the other form of teas are produced at paltry 20%.

The tea processing begins with flushing of tea from Camellia Sinensis(Botanical name of tea) and after that it is dried for brewing of tea, oxidization of leaves and , stopping oxidization , drying of leaves , and oxidation has a main part to bring the final flavor of tea.

The company produces variety of tea through different processes which can be visualised with the aid of flow-chart diagram.

The process itself starts from the left hand side of the flow chart with the operation of stocking into raw material or fresh green leaves. The processing unit of the Assam Tea Corporation is highly engaged in production of black tea and green tea which constitutes 80% of the output whereas other constitutes 20% of the total production.

For obtaining a black tea(the red coloured flow chart) as the final product it can be seen in the diagram that after getting the fresh leaves the process undergoes with indoor witting, the CTC with full oxidation rolled to the drying unit done through desiccation and finally drying at optimum temperature, the black tea can be obtained.

While for green teaTthe green coloured flow chart) after steaming and panning it is rolled to get the desirable form and finally dried to get green tea. The whole system of operation can be divided into following important parts-

## 1. Picking

A terminal bud and two leaves are plucked from Camelia Sinensis.

## 2. Wilting

With an oxidation done in the presence of enzyme , the tea leaves are wilted to remove the excess water from leaves.

## 3. Brushing

To expediate oxidation , the tea leaves are let to fall in buckets and rolled over by wheels.

## 4. Oxidation/Fermentation

The major operation of oxidation was to break down the the chlorophil and relax the tannin, as the leaves are kept in a climate control room.

## 5. Kill green/Firing

To stop the oxidation at desired level and restore the flavor this step is done.

## 6. Yellowing

It is done in a close container after firing to obtain beverage of yellow tea.

## 7. Shaping

After yellowing it is rolled into stripe wrinkles

## 8. Drying

This is done to get the ultimate product or tea for sale.

## PROBLEMS RELATED WITH INVENTORY CONTROL IN TEA PROCESSING UNIT

In the tea business it is the monsoon which has a direct effect on the production of the green tea leaves which is the main raw material for the processing . In case , there is good rainfall the yield of the leaves goes up and supply becomes steady. In that season the production unit of the tea garden is at greater stress with low lead time which means shorter time gap in the production system to wait, move, que and set-up and run time for each component produced. On the contrary, if there is low rainfall, the production of green leaves drops and lead time is more as the supply flow is less.

However , risk factor is present during the time of high production , the tea leaves needs extra care so that it should not expose to moisture and in that case extra manpower is needed on shift duty basis to expedite the process. In the Assam Tea Corporation processing unit , the production and sales takes place within a day. In this situation production order quabtity model is relevant as the firm is receiving its raw material over a period of time within a day which directly comes from the plucking unit. An optimum level of Q\* is calculated to control the inventory.

## Recommendations

In the view of the above discussion an optimum level of inventory can be obtained by reducing the waste in the following steps.

1. Inventory Planning

An ideal inventory planning can take place with the arrival of new one immediately after the last unit sold/dispatched.

2. Establish order cycles

In case of business with seasonal cycles it is important to establish a relationship of demand between sellers and suppliers.

3. Balance Inventory level

Inventory level should be balanced looking into the matters related to market and budget.

4. Review Stocks

The stocks should be reviewed as the obsolete one is equivalent to a dead capital.

5. Follow up of stocks

The management should take the key decision about disposal, replacement and discontinuance of different inventory base.

## INVENTORY PLANNING DECISION IN TABULAR FORMAT

## COST AND OTHER IMPORTANT FACTORS

SERVICE REQUIREMENT

CUSTOMER ORDERING CHARACTERISTICS

In this category , the most important part is customer expectations and competitive practices, time management and influence on customer.

Order characteristics include order timing and size, information about large orders on the basis of standing orders.

In the tea processing unit , the customer always is in prompt mode as the order has to reach the market and meet the price fluctuation in the auction market.

DEMAND PATTERNS

SUPPLY SITUATION

Demand pattern is always governed by variability and seasonality. Another important part is presence of substitutes and ability to forecast.

The green tea leaves as an inventory effected by variability of the weather condition and effected by rainfall which determines yield of the tea leaves and it is the three quarter of the month the supply is streamlined and one quarter is without any production. The presence of substitute is low

and as there is high fluctuation in the market forecasting is not an easy task.

This a challenging part as to narrow down the lead time , the processing unit has to avoid any waste . At the same time reliability depends upon the flow of the inventory and at the same flexibility can be ensured with additional work force on call which can also expidiate the process.

COST FACTOR

NATURE OF THE PRODUCT

Again the cost factor is governed by stock out cost which is also a probabilistic measure, there is also cost of carrying and space

The nature of the product is perishable and moisture will make it obsolete

OTHER ISSUES

In the tea processing unit the crucial point is power supply and mechanical efficiency.