

## **SUPPLY CHAIN MANAGEMENT OF COTTON DURING COVID-19**

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### **Abstract**

The supply chain plays a dynamic role in movements of goods and services in the economy of a country. . As and when, it is afflicted by either by internal defaults or external blows, it inflicts heavy losses on the industries whether measurable or not. The outbreak Covid-19 in March 2020 in India had almost slowed down the wheels of the economy. The preventive measures ordered by the Government for the purpose of controlling its impact have adversely affected the supply chains in business.

Every industry or business possesses its own traditional and conventional supply chain from suppliers to producers and from producers to customers. The paper attempts to examine and highlight the impact of Covid-19, on the supply chain. It attempts to examine the effect of the pandemic on supply chain of cotton from cotton growers to the cotton spinning mill in Vidarbha from March 2020 to December 2021. The distribution margin i.e. the gap between the cost of goods received by the producer and the sales revenue of the supplier, denotes the efficiency of supply chain. The effective and efficient supply chain causes to minimize the distribution margin. The paper finally concludes that the distribution margin in the case of single phase supply chain in case of cotton increased by 1.68 per cent due to the impact of the said virus in the country.

### **Introduction**

Supply chain relating to cotton from field to factory has always been fascinating on account of its multi-lateral aspects and functions. The continuing period of pandemic i.e. since March 2020 has given birth to a few new specific hurdles resulting in enhancing the cost of transportation accompanied with both visible and invisible losses. In turn, it resulted in enhancing the cost of goods to a mill producing yarn. The Chairman of South Indian Mill owners Association, Coimbatore, Mr. P. Somasudnram (1) giving vent to new problems in new situation in the supply chain said, "The pandemic Covid-19 has inflicted considerable loss not only on humanity but also the economy of the several nations in the world including India. It has crippled many industries and services including transport and allied service ventures. The strong Textile Industries could not remain unaffected by the ills of the deadly virus. The supply chain of cotton simply from the farm to factory gets mutilated by unscrupulous elements in to a substantial extent".

### **Concept of supply chain management**

The supply chain management signifies the management of flows of goods as well as information from certain suppliers to certain producers and thereafter to certain customers for the purpose of minimizing the margin between the price suppliers receives and producers or customers ultimately pay. It may be called the distribution margin. W.H. Sheldon (2) remarks, "The gap between the final price the supplier of any economic commodity receives and what the consumer pays it is the distribution margin that depends on a number of contractual and non-contractual factors; and management of the supply chain aims at minimization of the distribution margin". Hence, the efficiency of supply chain that gets reflected in the distribution margin concerning the particular 2957850ndent upon on economic and commercial factors continuously and constantly changes on many counts. The efficiency and effectiveness of supply chain of economic commodity cause to restrict the length of period and the scale of distribution margin.

The outbreak of the virus of Covid-19 in India in March 2020 that still continues has given redoubtable blows to the economy of country in more than one way. Like many countries in the world, the government of India issued strict orders for prevention of the pandemic which cast it shadows on the supply chain of commodities. The consequences of the lock-out declared by the Government of India on March 22, 2020 had its direct impact on:

- [i] Movements of transport of goods and services,
- [ii] Employment of casual workers due to ban on the number of people in a group;
- [iii] Presence of employees reduced to 50 per cent in all offices without distinction,
- [iv] Ban on movement of people as customers even through private conveyance, and
- [v] Reduction in the duration of shops and business establishments.

Hypothesis: I

The cost components in the supply chain of any commodity is the product of time, distance, modes of transport, and miscellaneous services as well as certain visible and invisible losses. When the economic environment is ill, the factors increase the cost and reduce the efficiency of the supply chain. Hence, these factors are taken into the account.

Hypothesis II

The ban on movements of goods during nights and on 50 per cent attendance of employees in offices including of mills had caused to delay the simple decisions at the work places; These restrictions although inevitable in the given situation created many problems in management of supply chain. In substantiation of these hypotheses the following objectives are formulated.

Objectives

The objectives of this paper are:

- (1): to examine the major changes due to the Covid-19 in the conditions affecting the distribution of goods from the supplier to producer; and
- (2): to highlight the impact of these changes on distribution margin indicating the efficiency and effectiveness of supply chain.

Research Methodology

[1] Size of sample selected

Exhaustive and inclusive study of chains of supply of major commodities would hardly pinpoint the impact of the pandemic on their efficiency and effectiveness. Moreover, (i) the variations of distribution margins varying largely with respect to various goods, (ii) the distances between the suppliers and producers, (iii) the expanse of their spread (iv) variety of modes of transports of goods, (v) range of differences in labour wage rates, (vi) the percentage of losses of materials during transports, etc., cause to make the supply chains indeterminate and the margins of distribution unrealistic and ambiguous.

[2] Specifics of supply chain selected

Supply chain is a generic term and therefore in order to examine the impact of particular incident on the supply chain, it should be as specific as possible and meaningful. This paper attempts to examine the effect of the said virus on the management of supply chain, the specifics of which are as under:

The supply chain relates to the economic commodity of cotton bales between 160 first lot being 40 bales;

The supplier is an individual cotton grower at Pulgaon in Vidarbha region supplying traditionally to the spinning Mill at Achalpur in the same covering the distance of about 150Km.;

The cotton bales are dispatched by a transport company in three equal trips with the time gap of three weeks after the first consignment to avoid the problems of storage at the mill premises;

The intermediary has been charging 11.35 per cent commission on the value of the cotton bales for arranging-

Loading and unloading of cotton bales,

- ii. Formation of bales from cotton *bonds* at farmers place,
- iii. Weighing of tucks and goods,
- iv. Insurance for goods during transports, and
- v. Incidental obligatory activities.

(e) The transport charges are paid by the farmer and finally reimbursed by the mill;

(f) Loss in weight of cotton bales as measured at the mill gate exceeding 13.45 per cent is to be compensated by the supplier.

[3] Calculation of Distribution Margin

The following formula is based upon the proposition initiated by Dr. N.Ranganthan,(3), South India Textile Research Association, Coimbatore,

$$Dm_{L1} = V_{L1} + \{ [ F_{L1} + W_{2L1} + T_{L1} ] (1+x) (1+i)_p \} (1+b) - \{ Sr_{L1} \}$$

$Dm_{L1}$  = Distribution Margin for the supply of Lot-1;

$V_{L1}$  = Value paid by producer of for cotton receive as per contract for Lot-1;

$F_{L1}$  = Transport fare for Lot-1;

$W_{2L1}$  = Loading and unloading expenses for Lot-1;

$T_{L1}$  = Road and entry taxes on Lot-1

$(1+b)$  = forwarding charges of 11.5 per cent on sales revenues from Lot-1;

$(1+r)$  = waste multiplier when more than 3.5 per cent,

$(1+i)$  = rate of interest on value of goods remained unmoved- 12 Per cent per annum;

$Sr_{L1}$  = Sales revenue received by cotton grower from the producers for Lot -1

[4] Limitations

In order to make specific study of change in distribution margin on account of the impact of the virus on supply chain relating to cotton movement from the cotton grower to the particular spinning mill within a short range of 150 Km, the following limitations are observed;

[i] Instead of considering the total annual sales of the concerned cotton grower, the one lot prior to and similar lot during the Covid19 were highlighted;

[ii] Normal conditions of sale and delivery of cotton bales for one lot are worked out;

[iii] Only limited information was given by the cotton grower due to confidentiality;

[iv] Other conditions were gathered from prevailing normal convention and traditions;

[v] Cotton for 60's count Prices per bale was as decided by the Maharashtra State Cotton Federation and in some cases by the Cotton Corporation of India.

#### Assumptions

While undertaking this study, certain following assumptions are deemed necessary for the purpose of reasonableness:

[a] the prices of cotton bales and the quantity communicated orally by the cotton growers are assumed to be realistic;

[b] Usually, the MSCF and CCI announce the minimum support prices relating to the different branded quality of cotton like vaghad. Varlaxami. etc., but spinning mills buy cotton on the basis of counts; For example, cotton for spinning 60's counts cannot be used for 80's counts of yarn;

[c] The conventional contractual conditions are strictly observed by buyers and sellers and hence, no contracts in writing are made by the parties;

[d] Similarly forwarding agents and transporters provide their services by words of mouth only; hence the information they supply cannot be verified from any published sources and assumed to be realistic;

[e] Dr. T.N. Solanki, (4) from the Bombay Textile Research Association, (BTRA), said, “The waste multiplier concept while measuring the loss of quantity of cotton is far from reason because a number of unfair tactics have been in vogue for increasing weight of cotton bales. Its inclusion is only of academic excellence”. This notion is indirectly carried out in this study.

#### Observations

Table 1 given below presents the relevant data collected from the concerned cotton growers and forwarding agents etc., who have been traditionally working in tandem with both the cotton growers and mills for the lost more than ten years; they all participate in business as partners maintaining due business interests of each other; The major participating components described in the aforesaid formula are portrayed in the Table.

[1] The sales revenue from 40 bales of cotton was around Rs.25.64 lakhs before the advent of Covid19 which went up to Rs. 28.88 lakhs during the outbreak registering the increment of 11.21 per cent due to its impact; what was noticeable that the MSCF and CCI considering the adverse effect of monsoon did not pegged up the MSP by more than 3.25 to 5.75 per cent for different varieties of cotton;

[2]The second element of the supply chain is the transport of goods from the supplier to the producer; in this context, the cost transport increased by 16.36 per cent certainly not exclusively due to the pandemic; the constant rise in the prices of diesel and petrol before and after the pandemic had in fact added the cost of transport;

Table Information Relating to Supply Chain- Sale and Delivery of Cotton to the Mill

No.	Particulars	Before Covid 2019	During Covid 2021	Variation (per cent)
01	Cotton Bales -40 bales	25,64,000	28,88,000	11.21
02	Transport Freight, etc.,	18,800	22,600	16.36
03	Loading/unloading	4,800	6,000	20.00
04	Taxes/Cess etc.	8,750	12,450	30.15
05	Forwarding Charges*	25,600	28,800	11.21
	Total	26,21,950	29,57,850	11.31

[\*Figures relating to waste multiplier, period of storage, rate of interest etc., are not furnished by the parties, hence, the figures remain bare of those items.]

[3]The third component, i.e., loading and unloading expenses, increased by not less than 20 per cent from pre-to the post Covid-19 period; the considerable rise was on account of reduced number of workers working for more than nominal period of loading and unloading at the higher than legal wage rates; many casual workers had left for their houses due to fear of the epidemic;

[4] The substantial rise in the payment of road and entry taxes by about 30.15 per cent was as a consequence of the outbreak of the disease; the local self governments in order to meet the additional cost on medical facilities had temporarily raised the rates of entry tax; the impact was obviously visible;

[5] The last significant element of costs in the supply chain relates to miscellaneous services of forwarding agents; the increment of about 11.21 per cent seems be normal in the wake of disturbing economic conditions of the country including rural areas;

[6] The total value of the consignment of 40 bales of cotton from the cotton-grower to the spinning mill increased from Rs. 26.29 lakhs in the beginning to Rs. 29.75 lakhs during the period of the epidemic, registering the considerable rise of 11.31 per cent; and

[7] The distribution margin, is the difference between the amount of sales revenue received by the cotton grower and the total cost the amount of which the producer i.e. the spinning mill finally bears; according to data given in the above table the distribution margin surged from 2.21 per cent to 3.89 per cent on account of the Covid-19, during the period taken into consideration.

### Conclusions

The impact of the pandemic on the single phase of supply chain in respect of cotton clearly demonstrates its impact on the distribution margin that surged by 1.68 per cent when only: (a) Single commodity of single quality in a single phase to a singular producer at the single phase of the supply chain is taken into consideration; and (b) Both the supplier and producer have the business relationship long and traditional that needed no much commercial, legal and economic consideration.

Conclusively, the impact of Covid-19 on supply chain of goods was substantial and less controllable. The closest business relationship could not assuage the increase in the margin of distribution. Every tragedy in human life entails economic ills.

### Summary

This paper is an attempt to examine and study the impact of the outbreak of the pandemic on the management of supply chain. It pertains to specific, simple, short chain of supply of cotton bales from the cotton grower to a mill producing yarn. The impact of changes in the conditions in of supply of goods and employment of workers has its influence on the, managing the supply chain. The efficiency of the supply chain is normally indicated by the distribution margin i.e. the difference between the cost of goods received by a producer and the sales revenue received by the supplier. The lower the distribution margin, the greater would be the effectiveness of the supply chain.

This study highlights the cost components such as transport cost, forwarding charges, loading and unloading of goods, and losses the quantity of goods due to handling and efflux of time. It is concluded that due to the impact of Covid-19, the distribution margin increased from 2.21 to 3.89 per cent in case of single phase of supply chain of cotton goods.

### Key Words

Distribution margin, structural variations, waste multiplier,

### References

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