

Supply Chain Management Practices in Retail Business

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ABSTRACT

Supply Chain Management (SCM) focuses on improving the performance of the supply chain through the delivery of guaranteed safe, desirable and good quality food in a less cost with effective manner. The increasing transaction costs for intensive agriculture and the need to reduce these costs lie at the heart of interest in agricultural SCM. The present empirical study focuses on the traditional practices in supply chain management of Retail Business. The responses are collected from critical links in the downstream of the supply chain such as producers, traders and retailers.

INTRODUCTION

Supply Chain Management is the envisage as a value-creation process, whereby all firms in a chain link and align with each other to create value for the chain as a whole. Value creation occurs primarily through operations. This is achieved through product transformation (processing) or product enhancement (cleaning, grading, packaging or presentation). Value is also created through the integration of processes along with the chain. The Indian retail marketing predominantly uses the supply chain model i.e., producer-trader-retailer-customer and the sourcing is made directly from producers. India can become a market leader in world horticultural produce through the vertical and horizontal integration of different components of the supply chain process.

OBJECTIVES OF THE STUDY

- The studying of the Supply Chain Management Practices across distribution channels i.e., Producers, Traders and Retailers in Retail Business.
- To identify the supply chain problems in retail business.

- To analyze the variances among the producers, traders and retailers in relation to critical supply chain parameters like delivery time, spoilage, replenishment and shelf-life improvement.

HYPOTHESES

The following hypotheses are setup for the study.

[H.1]: The gap between the promised delivery and actual delivery times is not uniform.

[H.2]: The rate of spoilage varies from one level to another level.

[H.3]: The time taken for replenishment in stock-out situations varies within the supply chain parameters.

[H.4]: There is a difference in methods employed for improving shelf-life among the producers, traders and retailers.

METHODOLOGY

This study is descriptive in nature and relies upon survey method only. Andhra Pradesh is chosen (since our college is in the border of that region) for this purpose based on the contribution of its share in terms of production and growing area to the national agriculture sector in last ten years and it is also one among the top five producers of banana and tomato states in the country as a whole. The study is conducted in three districts for each produce namely, Krishna, Chittoor and Ranga Reddy for tomato and East Godavari, West Godavari and Chittoor for banana. These districts are selected on the basis of area and production of tomato and banana during 1999-2009. A total sample size of 305 producers, 62 traders and 120 retailers are drawn from the population.

A questionnaire is designed for data collection from the targeted respondents such as producers, traders and retailers to obtain the views and level of agreement on Dichotomous Scale and Likert Scale. The data is collected from the selected districts only. The Supply Chain Management Practices are studied by using parameters like procurement of input, use of pesticides, traceability, grading, cleaning and washing, storage facilities, maintenance of buffer stocks, transportation, spoilage and price realization.

DATA ANALYSIS AND RESULTS

The analysis of Supply Chain Management Practices is measured on two-point scale and it is described as follows. The Table 1 shows the comparative responses revealed by the producers, traders and retailers.

Table 1: Parameter-Wise Scores

Parameter	Producers(305)		Traders(62)		Retailers(120)		Total(487)	
	Yes	No	Yes	No	Yes	No	Yes	No
Grading	84(27.5)	221(72.5)	84(27.5)	221(72.5)	73(60.8)	47(39.2)	190(39)	297(61)
Cleaning and Washing	87(28.5)	218(71.5)	87(28.5)	218(71.5)	47(39.2)	73(60.8)	160(32.9)	327(67.1)
Storage facilities	131(43)	174(57)	131(43)	174(57)	50(41.7)	70(58.3)	203(41.7)	284(58.3)
Cold Logistics Facilities	76(24.9)	229(75.1)	6(10)	58(90)	30(25)	90(75)	106(24.9)	319(75.1)
Traceability	49(16.1)	256(83.9)	9(7)	53(93)	7(5.8)	113(94.2)	65(13.3)	422(86.7)
Maintenance of Buffer Stock	90(29.5)	215(70.5)	43(69.4)	19(30.6)	113(94.2)	7(5.8)	246(50.5)	241(49.5)
Buffer Stock Levels	7(7.8)	83(92.2)	12(27.9)	31(72.1)	40(35.4)	73(64.6)	59(24)	187(76)

- Figures in the brackets indicates percentages

TEST OF HYPOTHESES

ANOVA test is conducted to substantiate the hypothesis framed for the study. The Table 2 presents the hypothesis from [H.1] to [H.4] with their respective probability value, calculated value and their significance at 5 percent i.e. $\alpha = 0.05$

Hypothesis 1: Time gap between the promised delivery time and actual delivery not uniform within the levels of supply chain (DELIVERY_TIMES).

From the below ANOVA Table 2, for [H.1], It is calculated for 2 and 484 degrees of freedom, the critical F-Value is 3.014 for $\alpha = 0.05$ and calculated value of one way ANOVA

Table 3 is 1.248. The calculated F-Value is less than the critical value indicating in P--Value with 0.288. Therefore the population means for the three categories on the opinion relating to "Delivery time" is indeed same and it is concluded that the Null hypothesis (H0) is accepted hence the Alternative hypothesis is rejected and confirm that time gap between the promised delivery time and actual delivery uniform within the levels of supply chain management.

ANOVA TABLE - 2

Hypothesis 1:

Hypothesis	Name of the Variables	Sources of Variation	SS	DF	MS
[H.1]	DELIVERY TIMES	Between Groups	2.57	2	1.28
		Within Groups	498.65	484	1.03
		Total	501.22	486	2.31
[H.2]	SPOILAGE LEVEL	Between Groups	43.57	2	21.78
		Within Groups	151.16	484	0.31
		Total	194.72	486	22.09
[H.3]	REPLENSHMENT TIME	Between Groups	16.94	2	8.47
		Within Groups	503.47	484	1.04
		Total	520.41	486	9.51
[H.4]	IMPROVED SHELF_LIFE	Between Groups	26.89	2	13.44
		Within Groups	196.95	484	0.40
		Total	223.85	486	13.84

- ❖ SS - Sum of Square
- ❖ DF - Degree of Freedom
- ❖ MS - Mean Square

Hypothesis 2: The rate of spoilage in fresh produce supply chain management vary from one level to another level (SPOILAGE_LEVEL)

The ANOVA Table 2 shows, for [H.2], It is computed that for 2 and 484 degrees of freedom, the critical F-Value is 3.014 for a = 0.05 and calculated value of one way ANOVA Table 3 is 69.752. When compare the calculated F-Value with critical, it is found that calculated value is greater than the critical value which is indicated by P--Value with 0.000. Hence the

population means for the three categories on the opinion relating to "Rate of Spoilage" is indeed different and it is concluded that the Null hypothesis (H0) is rejected and alternative hypothesis is accepted which substantiate that the rate of spoilage in supply chain management vary from one level to another level.

Hypothesis 3: The time taken for replenishment in stock-out situations is vary within the supply chain parameters (REPLENISHMENT_TIME)

The ANOVA Table 3 shows for [H.3], The critical F-Value is 3.014 for $\alpha = 0.05$ and calculated value of one way ANOVA Table 3 is 8.143 and the calculated F-Value is greater than the critical value which indicated in P Value with 0.000. The population means for the three categories on the opinion relating to "Replenishment in Stock-out Situations" is indeed different and it is concluded that the Null hypothesis (H0) is rejected hence the Alternative hypothesis is accepted. It is concluded that the time taken for replenishment in stock-out situations vary within the supply chain parameters.

ANOVA TABLE - 3

Hypothesis 2& 3

Hypothesis	Name of the Variables	Sources of Variation	F - Value	P- Value
[H.1]	DELIVERY TIMES	Between Groups	1.248	0.288
		Within Groups		
		Total		
[H.2]	SPOILAGE LEVEL	Between Groups	69.752	0.000
		Within Groups		
		Total		
[H.3]	REPLENISHMENT TIME	Between Groups	8.143	0.000
		Within Groups		
		Total		
[H.4]	IMPROVED SHELF_LIFE	Between Groups	33.04	0.000
		Within Groups		
		Total		

Hypothesis 4: There is a difference in methods employed for improving shelf-life among the producers, traders and retailers (IMPROVED SHELF_LIFE)

From the above ANOVA Table 3, It is indicated that the critical F-Value for 2 and 484 degrees of freedom, is 3.014 for $\alpha = 0.05$ and the calculated value of one way ANOVA Table 3 is 33.040. The computed F-Value is greater than the critical value, which is a significant value indicated in P-value with 0.000. Therefore population means for the three categories on the opinion relating to "Methods employed for improved shelf-life" is indeed different and it is concluded that the Null hypothesis (H0) is rejected hence the Alternative hypothesis is accepted. It is validated that there is a difference in methods employed for Improved Shelf-Life among the producers, traders and retailers.

ANOVA TABLE - 4

Hypothesis 4:

Hypothesis	Name of the Variables	Sources of Variation	Sig (Level = 0.05)
[H.1]	DELIVERY TIMES	Between Groups	Insignificant
		Within Groups	
		Total	
[H.2]	SPOILAGE LEVEL	Between Groups	Significant
		Within Groups	
		Total	
[H.3]	REPLENISHMENT TIME	Between Groups	Significant
		Within Groups	
		Total	
[H.4]	IMPROVED SHELF_LIFE	Between Groups	Significant
		Within Groups	
		Total	

Thus, ANOVA results infer that the time gap between the promised delivery time and actual delivery not uniform within the levels of supply (DELIVERY _TIMES), which states that, farmer's level delay in delivery is more and the same is go on to the next two levels such as trader and retailers. As an independent entity supply chain management reduces the delay in delivery at the downstream. It is proven that the rate of spoilage is varying across the supply chains due the differences in the practices adopted to reduce the spoilage. It also indicates that the shelf-life preserving mechanism in not followed strictly at all levels hence there is a inverse relationship exist within the variables rate of spoilage (SPOILAGE_LEVEL) and the methods adopted for preserving the shelf-life (IMPROVED SHELF_LIFE).

CONCLUSION

From the above study it can be concluded that there is a wide scope for improvement of supply chain practices in Retail Business. Producers have negative apprehensions stating that cleaning and washing activities leads to reduced quality of produce and shelf-life. Grading is recommended not only at producer level and trader level but should continue as the produce is transferred to downstream partners. Grading is an essential practice that must be promoted because in retail business the stages of ripening are very rapid in some varieties and changes from one level of supply chain to another level are wide spread.

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