

INTEGRATING URBAN AND RURAL RETAIL SUPPLY CHAIN THROUGH ASSERTIVE SOURCING LEAGUE IN INDIA

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Abstract

This is a case analysis of the Assertive Sourcing League (ASL) followed by the urban retailers in Tamilnadu to source the inventories directly from rural farms. The assertive sourcing league has been established by the three heterogeneous partners in the retail supply chain network such as, urban retailers, rural farm-executives, and fleet operators (passenger cabs). The league partners fix the revenue sharing model among them by considering the demand and supply. Since fleet operators are playing the role of consolidation, they are maintaining the data base of the farm executives and other shippers. Fleet operators also established multi-shipper collaboration with other shippers. Group of farmers also established integrated assortment cluster that enable them to bring different commodities at a common place on regular intervals so as to enable the smooth supply of goods on a continuous basis. The aim of the case is to dissect the value proposition of the ASL. The findings contented that ASL consolidates the inventory from different farm owners; retaliates marshalling of freight movements through passenger cabs, enables replenishing the inventory at the right time and fixing competitive service value to have a smooth flow of the inventory from farm to market. The research concludes that inconsistent lead time and high inventory cost reverberates the retailers to move towards the ASL network. Standardised traditional model may not apply to transporting the goods in the retail supply chain. It is imperative that the retailers have to understand the discriminating variables that divide the urban and rural retailing pattern to minimize the transport cost and maximize the service benefits.

Keywords: ASL, Consolidation, Marshalling of goods

I. INTRODUCTION

Mass customization practices followed by the urban retailers make a fundamental impact in the retail supply chain process. Cost of sourcing the inventory through intermediaries has moved exponentially. Conversely, rural farms are ready take the mounting tasks of direct marketing in urban places. Hence retailing units decided to source directly from rural cultivators. Indian retailing giants such as Reliance Fresh, ITC, Spencer and Future groups created “farm-to-fork” supply chain strategy. In India, farmers have limited landholding; so, the urban retailers have to negotiate individually with thousands of farmers. Transporting the farm

products from each farm land to the urban market is a hard job for urban retailers. Reliance retail dropped its cash-and-carry chain when rural farmers opened the wholesale outlets. Tata Chemicals, Unifrutti (Global sourcing firm), Spencer's Retail, Aditya Birla Retail, Mother Dairy Fruits and Future group retail stumbles in their direct-sourcing strategy [6]. Non-availability of cold storage in rural places also fuels the problem of sourcing. To solve this phenomenon, a couple of urban retailing unit in Tamilnadu sign up an agreement with small cultivators and passenger cab operators to enable consolidation of inventory from rural to urban places. Accordingly, the Assertive Sourcing League (ASL) was established, and retailers claim that their supply chain cost has drastically plunged by 33%. As per the ASL, small and medium retailers are outsourcing the consolidation function to passenger transport companies for delivering the inventories to enable the vendor managed inventory. The need for assertive sourcing league gained momentum because it decreases the sourcing problem from multiple rural farms with limited cost to retailers.

2. KNOWLEDGE GAP

Maureen [5] studied the freight rates in rural places and concluded that the urban retailers can utilise the rural labour for the consolidation of inventory because of the comparative cost advantage. Chung [2] research contented that proper sourcing of inventory directly from farms reduces the cost by sharing information and eliminating several steps of negotiation. Acharya [1] discovered that the food chain owners consider working with small and marginal farmers' as a cumbersome job and costlier proposition. Howard [3] established a rudimentary model based upon a case study of a remote farming community in the Philippines. Lazzarini [4] studied net-chain analysis of buyer-supplier relationships and established a "macro-hierarchy" organization structure in supply chain. The present research, analyse the league network created by the farmers, fleet operators and retailers to have smooth supply chain from either side.

3. AIMS

The case analysis was done with the primary aim of dissecting the value proposition of the ASL. The facilitating objectives are established to find solutions to following phenomenon in the retail supply chain.

- What are the supply chain factors that contribute towards ASL ?
- What is the applicability of ASL in rural-urban supply chain?
- How ASL overcome the burden of sourcing from multiple small farms?

4. METHODOLOGY

The study was undertaken in Tamilnadu. Primary data were collected from 112 retailers located in Chennai. Two hundred retailers using passenger cab for their supply chain consolidation services from farm to fork network were identified with the help of snowball sampling. We have received a response from 141 retailers. After the validity test and reliability test, only 112 responses were considered for the research. We used factor component analysis to find out the retailers' responsiveness towards ASL. In the second stage, the applicability and affordability of ASL model has been identified by the discriminant analysis. We have calculated the operational supply chain metrics to measure the effectiveness of the ASL. Finally, we discovered the Heuristic supply chain model using ASL after considering the empirical findings and case study conducted in one of the urban retailing unit.

5. MODUS OPERANDI OF ASL

The assertive sourcing league has been established by the three heterogeneous partners in the retail supply chain network such as, urban retailers, rural farm-executives, and fleet operators (passenger cabs). The league partners fix the revenue sharing model among them by considering the demand and supply. Since fleet operators are playing the role of consolidation, they are maintaining the data base of the farm executives and other shippers. The shared understanding of joint objectives among the league members empowered them to make strategic decisions on supply chain that saves time and money on a transaction basis. Urban retailers can have two options- first –they can directly source from farm houses; second – they can source to fleet operators if they are not having direct contact with farm houses. In the second option, the fleet operators identify the farm and the profit margins have been shared based on the revenue model created by the league managers. Fleet operators have also built complete digital convergence media to attract budding needs of urban retailers and guide them at every stage to source the inventory by right time. Fleet operators also established multi-shipper collaboration with other shippers. Group of farmers also established integrated assortment cluster that enable them to bring different commodities at a common place on regular intervals so as to enable the smooth supply of goods on a continuous basis. It enables to have transaction-based exchange of commodities between urban vendors and rural farmers.

6. SUPPLY CHAIN FACTORS

Since the retailers are moving towards pull logistics system from the push logistics system, the inventory system is to be managed objectively. Retailers wish to maintain the stock with the transport operators itself rather than stocking in warehouse. Rapid responses to changing market conditions and savings in time are the foremost factor in selecting the ASL. We used factor component analysis to study the factors that lead to use ASL. After going through the literature review, we have identified nineteen supply chain variables that are essential to have smooth flow of inventory based on previous literature. The responses towards the supply chain variables are measured in a five point Likert's scale. The ratings are quoted from low-end acceptance to high-end acceptance. The Bartlett's test of sphericity rejected the null hypothesis and accepted the alternative hypothesis that the correlation matrix is not an identity matrix. The value of Kaiser-Meyer-Olkin statistics (0.612) is also greater than 0.5. Thus, factor analysis is considered to be an appropriate tool for analyzing the matrix of the 19 variables.

TABLE -I : FACTOR COMPONENT MATRIX

Variables [Reference quoted]	Component				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Order Backlog	.772	.212	.085	-.138	-.039
Tracking	.727	.086	-.072	.382	.065
Schedule Achievement	.712	-.104	-.123	.346	.101
Quick Delivery	.542	.045	-.053	-.447	-.018
Door Delivery	-.398	.201	.245	-.292	.278
Farm Sourcing	-.397	-.091	-.028	.086	.383
Value Added Services	-.287	-.193	-.225	.100	-.042
Upside Flexibility	-.110	.888	-.015	-.083	.057
Damage Free	-.039	.729	-.363	.274	.100
Downside Flexibility	-.148	.668	-.252	-.188	.035
Stock-Out	.077	.065	.693	.211	-.246
Lead Time	.100	.483	.594	.073	-.119
Regulatory Documentation	-.375	-.035	-.430	.393	-.161
Consolidation	-.140	.085	.183	.616	.050
Material Handling	-.366	.076	.292	.425	.006
Freight rates	-.009	-.136	.090	-.193	.587
Transaction Cost	-.112	-.023	.378	.078	.538
Claim Processing	.370	-.122	.007	.060	.471
Packaging	-.090	-.154	.257	-.176	-.357

Principal Component Analysis is used for extraction and seven variables having factor loading less than 0.5 are filtered out. Table 1 shows the result. First factor seemed to capture the farmers' preference towards bus network for achieving the transport schedule in time, reduce order backlog, enable tracing, and quick delivery; hence it is labelled as *marshalling of goods*. Second factor defines the flexibility of inventory movement and handing goods safely; hence it is labelled as *trouble-free operation*. Third factor represents the reduction in stock-out and lead time; hence it is named as *inventory replenishment*. Fourth factor represents *consolidation services* performed by the passenger cabs. Fifth factor describes the freight; hence it is named as *service value*. All these factors account for cumulative variance of 64%. The result indicates that retailers prefer ASL model to maintain their schedule of delivery, inventory replenishment, have trouble free operations and consolidation services at a fair price

The expectations and performance of ASL was measured by creating a Quadrant matrix. It was developed to find out the matching level criteria. The mean performance level and importance level are the two coordinates. The mean performance levels and importance levels are measured with the five point summative rating scale ranging from one to five (Low to high). The factor loading scores are plotted in the quadrant matrix. Figure-1 shows the outcome of the quadrant matrix.

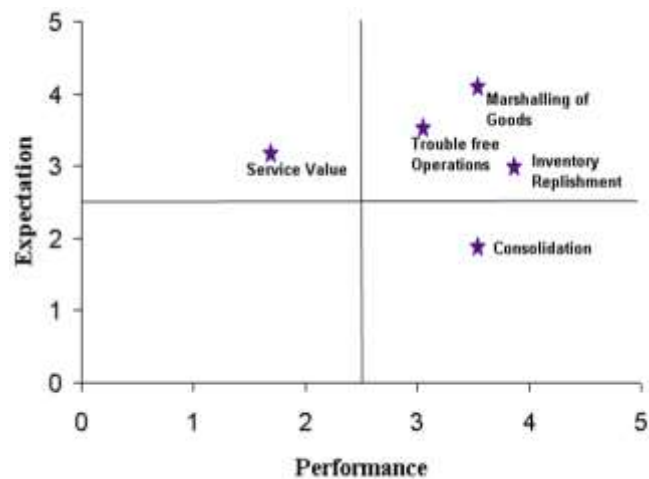


Fig 1. Quadrant Matrix

The variables “marshalling of goods”, “inventory replenishment” and “trouble free operation” are given more importance and performance by the ASL model. The performances towards consolidation services are high. Service value needs more weight, but its performance level is below average in ASL mode. The result indicates that expectation and performance level match in case of demand-driven supply chain variables such as marshalling of goods, inventory replenishment and trouble free operations. However, there is a mismatch between expectation and performance levels in case of data-driven supply chain variables such as consolidation and service value. This reflects that ASL model is suitable for shipping semi-perishable commodities; since it needs demand-driven supply chain system. Based on the findings, we establish the value proposition of assertive sourcing league as follows:

Assertive Sourcing league is a demand based supply chain model among the urban retailers, shippers and farm owners. ASL consolidates the inventory from different farm owners; retaliates marshalling of freight movements through passenger cabs, enables replenishing the inventory at the right time and fixing competitive service value to have a smooth flow of the inventory from farm to market.

7. APPLICATION OF ASL IN SCM

A competent supply chain system is able to provide a positive rapport among the suppliers, narrow down the demand-supply gap, reduce the inventory lead time and pave way for on-line decision making. Hence we decided to measure the core competencies of ASL by measuring the incremental paybacks as to retailers. We have devised seven interrogations in the five point Likert scale to gauge the incremental benefits of ASL over the direct farm to fork strategy. The interrogations scores are mentioned in table 2.

TABLE II : COMPETENCIES OF ASL

Down-loading Constructs	Average Score	Up-loading Constructs
Complex relationship with suppliers	.....2.76.....	Trouble-free relationship with suppliers
Tracking is complex	.....3.35....	Tracking is easy
Increase Stock-out	.....3.07.....	Decrease Stock-out
Increase in multiple purchasing activities	.....3.41..	Decreasing in multiple purchasing activities
High Transaction Cost	.....2.89..	Low Transaction Cost
High lead time	.....2.52.....	Less lead time
Off-line communication	..1.94.....	On-line communication

The scores for variables such as relationship with suppliers, tracking, stock-outs, procurement channel, transaction cost and lead time are higher than 2.5 (more than 50%). It indicates that by implementing ASL, retailers can get incremental benefits. Even though, ASL is successful in demand-driven supply chain system, it lacks in technology-driven SCM operations due to insufficient on-line communication system prevailing in rural places. The supply chain metrics were calculated to find out the supply chain efficiency.

TABLE - III
 OPERATIONAL METRICS

Sl.No	Metrics	Mean Score
1	Percentage of invoices successfully processed	91.2
2	Percentage of goods transferred without transaction errors.	78.5
3	Percentage of damage-free goods	90.3
4	Capacity Utilisation for fleet operators (under Shipment log mode)	60.4
5	Delivery Cycle time (Days)	3.5
6	Order backlog time (Days)	3
7	Cost Savings in Supply chain	31.8%

The percentage of goods transferred without transaction errors is not as much as other SCM operations because of the reason that the usage of electronic communication devices is fewer. The delivery cycle time is high due to scattered farm locations.

8. ANATOMY OF ASL MAPPING

There are two shipping models used in ASL. We identified the three strategic themes (marshalling of goods, capacity utilization and diplomacy) of the ASL model under three stages (pre-delivery, delivery and post-delivery) and shows how achieving them would translate into real value for the retailers. First model is a revenue sharing model – which follows the concept of “to have outright sourcing”. The retailers transfer entire sourcing system to the fleet operators at the price fixed by the league partners. It is a value driven approach for the farm owners, whereas, it is the demand-driven approach for urban retailers. The fleet operators are taking the challenges in sourcing the inventory from different farms. The league partners fix the price by considering the demand at an earlier stage to create a good diplomacy. Figure -2 depicts the revenue sharing model of the among league partners.

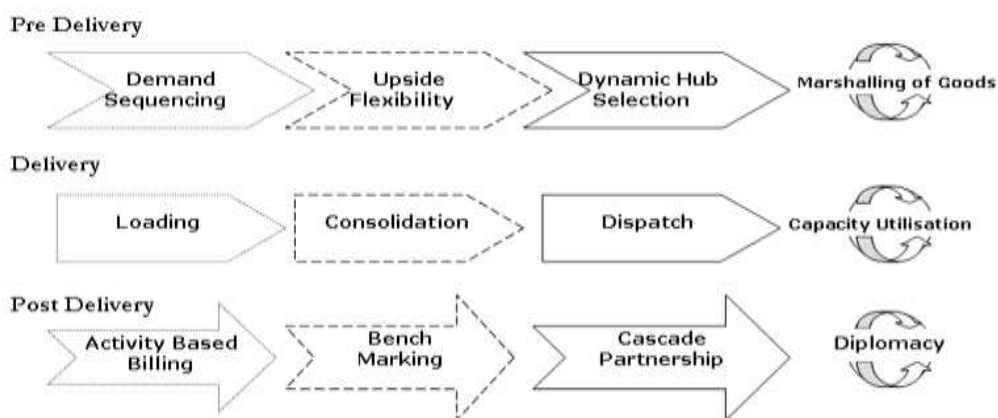


Fig .2 Revenue Sharing Model

Second model is the shipment log model – which follows the concept of “to ship”. The retailers directly source from different farm owners located in different places. The freight charges are fixed by the league partners. It is a response-oriented model for fleet operators, whereas cause-oriented for urban retailers. The fleet operators directly pick up the inventories from the farm "hubs". The capacity utilization depends upon the hub and spoke model used by the fleet operators. All the fleet operators are using the electronic communication system to run their truck at almost full capacity. This enables to have smooth Vendor Managed Inventory system.

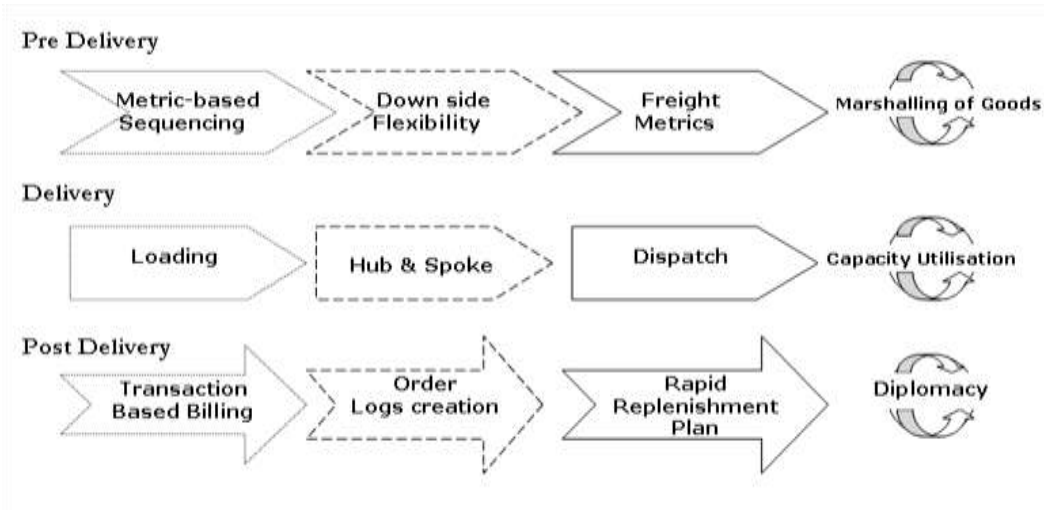


Fig .3 Shipment log model

At the tactical level, this consortium-based approach is essential to address the consistency of freight flows between rural and urban places. It involves direct farmer-to-vendor negotiations and commitments based on volume and timing.

We employed the discriminant analysis to identify the variable that divides the decision to prefer shipment log model and revenue sharing model. The retailer’s preference is considered as the criterion variable. The predictor variables are identified based on the past researches. The predictor variables were measured in five point scale. The Wilks’ lambda (0.59) is significant and hence two group discriminant analysis was carried out. The canonical correlation associated with this function is 0.82. The square of this correlation indicates that 67% of the variance in the variable is referred by this model. Table – 4 shows the coefficient value of F.

TABLE-IV: **STRUCTURE MATRIX**

Predictor Variables	Coefficient
Schedule Achievement	.672
Tracking	.426
Consolidation	.342
Damage Free	.321
Reduced Stock-Out	-.267
Reduced Lead time	-.252
Transaction Cost	.121
Upside Flexibility	-.118

The significance of the univariate “F” ratio indicates that only “schedule achievement” factor significantly differentiate the decision to prefer either shipment log model or revenue sharing model. If the schedule achievement period (as expected by retailers) is flexible, retailers prefer shipment log model otherwise they prefer revenue sharing model. Hence, the result indicate that the retailers prefer revenue sharing model for sourcing perishable inventories as it need regular commitment to fulfill the day-to-day demand. Shipment log model has been preferred by retailers for sourcing semi-perishable inventories as it replenishment period is higher than the perishable inventories.

9. CASE OF A VENDOR

Kannan departmental store is one among the biggest departmental stores and has more than 20 retail units in Tamilnadu. It follows "hub and spoke model" and procures vegetables from more than 1500 small size farmers. The vendor has partnered with more than 250 cultivators and six fleet operators throughout the state of Tamilnadu. They are also having 24 mini-truckers for trans-shipment of vegetables among their units and for outbound logistics. To reduce the bull-whip effect and phantom effects in supply chain, they are following vendor managed inventory system. The demand as predicted by them is informed to cultivators in advance. The seasonal products' demand and supply are matched well by the vendor based on the feedback received from customers. Every day the firm procures around 3.5 tons of farm products through different fleet operators in Tamilnadu. Around 450 inventories are covered with this model. Traditional FSL classification of inventory system is followed by the retailing unit. They follow shipment log model for procuring semi-perishable products ("S" and "L" categories) and revenue sharing model for perishable products ("F" category). Accordingly, the supply chain cost reduced by 45%, while using ASL model. The gap between demand and supply of perishable products narrow down by 60%. The transportation model used by them is depicted in figure 4.

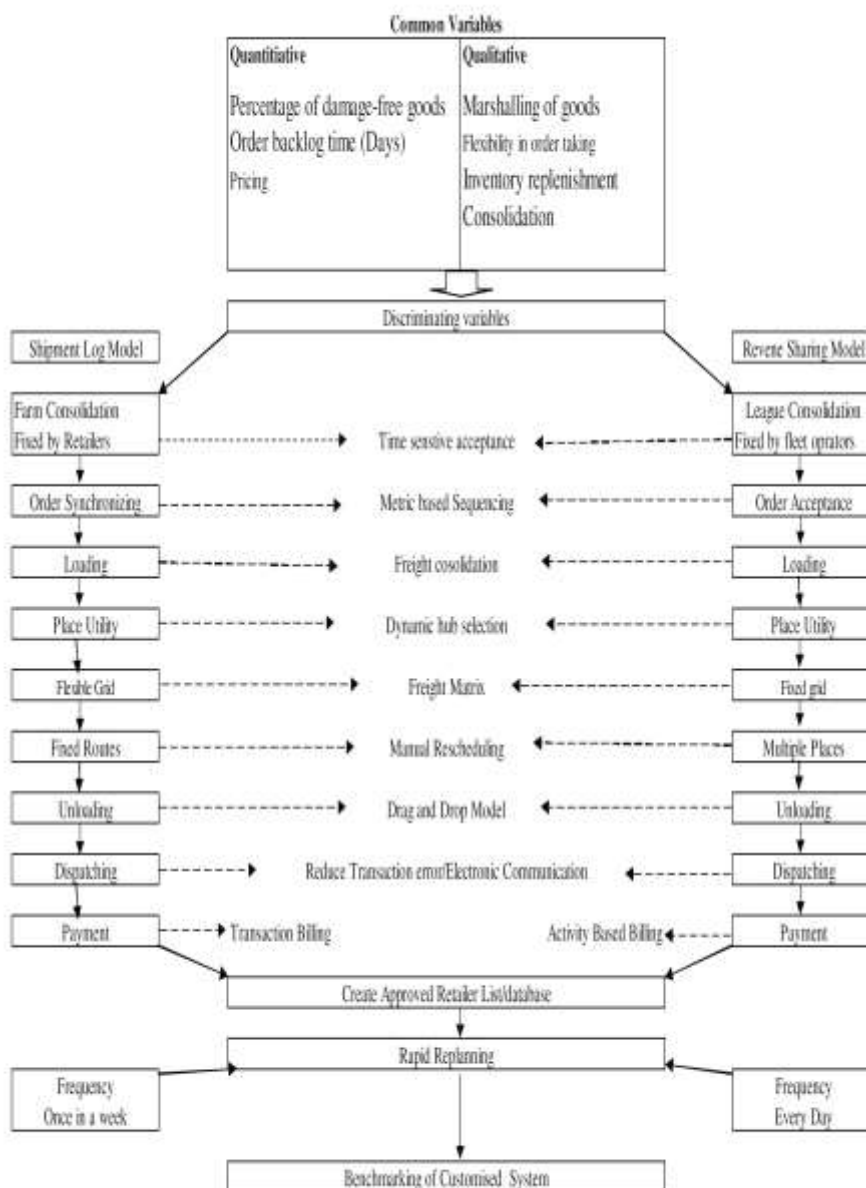


Fig. 4. Heuristic Transportation Model

However, during festival seasons, they are using their own trucks to source the inventory from the farm directly. To create a good rapport among the league partners they are organizing trade fairs. For example, during the summer season, where mango is available in plenty, they used to organize “mango mela” (window display of different varieties of mango). During these fairs, customers can also meet farmers. This enables to create a good affinity among the farm-owners, customers and fleet operators.

10. FINDINGS AND CONCLUSION

The ASL supply chain model is fit for demand-driven supply network of the urban retailers. The core competency of the model is marshalling of inventories. Due to ad hoc relationship with retailers and non-compliance of electronic communication system, the percentage of invoices successfully processed is low. Allocative efficiency of passenger transport is more likely to be achieved in a competitive market than the trucker who ship only bulk quantities. The burden of sourcing from multiple rural farms has been shifted to the fleet owners in ASL model. The structure of direct-to-urban market model is simple, despite its size, allowing supply chain models for urban retailing units to be optimized without undue difficulty. The choices regarding transportation of goods through passenger services will require tactical planning of smaller shipment size and the opportunity cost. Conversely, retail supply chain managers effectively articulate the importance of competitive supply chain management through passenger transport system for satisfying the needs of rural customers. Hence, we conclude that inconsistent lead time and high inventory cost reverberates the retailers to move towards the ASL network. Standardised traditional model may not apply to transporting the goods in the retail supply chain. It is imperative that the retailers have to understand the discriminating variables that divide the urban and rural retailing pattern to minimize the transport cost and maximize the service benefits. The heuristic transportation strategy model provides improved visibility across the supply chain. Supply chain transformation is essential to overcome the resistance in change in data-driven model to demand-driven model. If the cultural hurdles in the transformation strategy are brought down, the retailers can effectively articulate the importance of competitive supply chain management through league partners and create multi-level marketing strategy.

REFERENCE LIST

- Acharya S.S, Agribusiness in India: Some facts and Emerging issues, *Agricultural Economic Research Review*, Vol 20 2007, pp 409-424
- Chung C, (2003) Economics of supply chain management, traceability, and commodity promotion in food and Agricultural industries, Working paper, Oklahoma state university, Stillwater,
- Howard, D. 2007, "Testing the Veracity of Supply Chain Management Technology in a Developing Country - Context: A Case Study of Agriculture in Bacolod , The Philippines", *International Technology and Management Review*, pp. 1-11
- Lazzarini1 G, Fabio R. Chaddad, Michael L. Cook (2008), Integrating supply chain and network analyses: The study of net chains, *Journal on Chain and Network Science*, pp7-22, Wageningen Academic Publishers
- Maureen Kilkenny, (1998) Transport costs and rural development, *Journal of Regional Science* Vol 38, No 2 pp 293-312.
- Rasul Bailay, (2012). Retail Inc. stumbles in direct sourcing of fresh produce. *The Financial Express*.