

To study supply chain management practices and the performance of marketing channels for fresh fruit and vegetable in Madhya Pradesh

Dr. Anurag Shrivastava

Abstract:- The purpose of this study is to investigate how alternative supply chain management practices adopted by leading supermarkets engaged in fresh fruit and vegetable marketing in Navi Mumbai impact on the performance of the supply chain. We investigate on-going changes in the supply chain using information from leading supermarkets and related players. The information sheds light on how the new supply chain management policies and procedures have affected the cost structures, long-term profitability and organizational viability of the system. The emergence of supermarkets over the last decade or so has profoundly influenced Madhya Pradesh fresh fruit and vegetable marketing system, and the trend is expected to continue into the foreseeable future. The efforts of profit-motivated supermarket giants to sustain a very competitive market have altered traditional production and marketing channels. Evidence suggests that the supermarkets are competing to adopt a range of management strategies to offer quality products, a wider choice, reduced wastage, greater value for money and shorter, but more effective supply chains. The impact of supermarkets on global and local supply chains, and its implications for actors in the supply chains has received much attention in recent years. This research study will utilize standard performance measures to compare performance of competing supply chains including: (i) Satisfaction of stakeholders (supermarkets); (ii) Price performance (profitability); (iii) Labour employment; and, (iv) Efficiency (price stability, timely delivery of orders, quality management). Information will be collected through a series of interviews with the appropriate personnel in the supermarkets concerned and their supply chain partners.

Keywords: Supply Chain Management, Distribution System

I. INTRODUCTION

Madhya Pradesh is the second largest state in the country in terms of area and seventh largest in terms of population. The state has 48 districts. The state is classified as a sub-tropical region. Emergence of supermarkets and their explosive growth over the last 10–15 years has profoundly influenced Madhya Pradesh's fruit and vegetable marketing system, and the trend is expected to continue into the foreseeable future. Efforts made by supermarkets to thrive in a competitive market have altered traditional agricultural production and marketing channels. The supermarkets are competing to adopt a range of management strategies to offer superior quality products, a wider choice, reduced wastage, greater value for money and shorter and more effective supply chains.

The primary aim of this study is to investigate how the alternative supply chain management practices adopted by leading supermarkets for marketing fresh fruit and vegetables in Madhya Pradesh has impacted on the performance of the existing supply chain.

The study was focused on information obtained from leading supermarket chains and other key players in the marketing system with a view to exploring how the emerging supply chain management policies have affected the operations and organizational viability of the marketing system. The paper focuses on changes in the supply side, mainly on the coordination and functioning of supply chain partners and how they have contributed to the effectiveness of the overall system.

In more specific terms, Objective of this study seeks to:

- 1) Identify major changes emerging in Madhya Pradesh fresh fruit and vegetable supply chain system with respect to its organizational and functional aspects;
- 2) Establish to what extent the coordination of supply chains and its key partners have contributed to the transformations in the marketing system and their implications on the operational effectiveness;
- 3) Identify key policy issues that require the attention of public policy makers for further improving the fresh fruit and vegetable marketing system.

The paper is organized as follows. The next section provides a brief background of the literature followed by an overview of fresh fruit and vegetable production and consumption patterns in Madhya Pradesh. Section Three focuses on an overview of the management practices adopted by the supply chain partners and their impact on the performance efficiency of the supply chain. Section Four provides a discussion on the relevant issues, and Section Five concludes the paper.

II. BACKGROUND

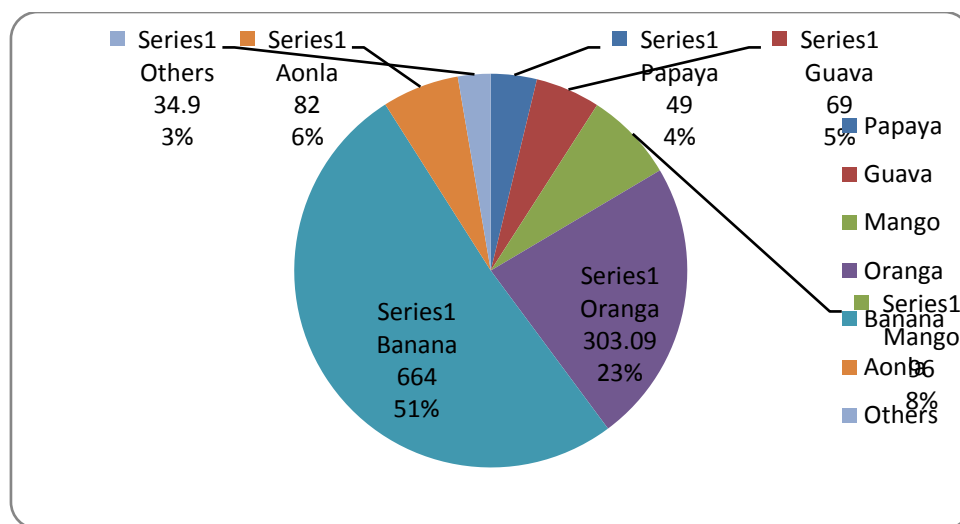
The impact of supermarkets on global and local supply chains and its implications for all actors in the supply chains has received much attention in recent years; e.g. Ghezanet *al.* (2006), Cadilhonet *al.* (2006), Neven and Reardon (2004). Cadilhonet *al.* (2006) use parallel performance measures that are evaluated using data collected through interviews and case studies. Chen *et al.* (2005) investigate the issue of modern agriculture food systems organization and its effects on fresh fruit and vegetable farmers and traditional marketing systems in Asia. They observe that individual small farmers are unable to compete with larger counterparts. If they are to supply the supermarkets, they will have to work in groups. The paper suggests ways for small farmers to adapt to the situation, and for government to respond with changes in their policies. Shepherd (2006) also agrees with the need for government to recognize these trends, to identify ways to support farmers, and to assist existing marketing systems to compete with the supermarket sector.

In Madhya Pradesh, fresh fruit and vegetable supply chains and their management is an area that has not been studied in detail. The information available is limited to more general market- and price-related details on a few specific fruit crops (HARTI, 2003). Other currently available sources of information on this subject are mostly based on secondary data sources (De Silva, 2006; Perera *et al.*, 2006). A study undertaken by Sinhapura (2004) using primary data from a smaller set of supermarkets in Colombo provides more detailed insights but is devoid of field level information.

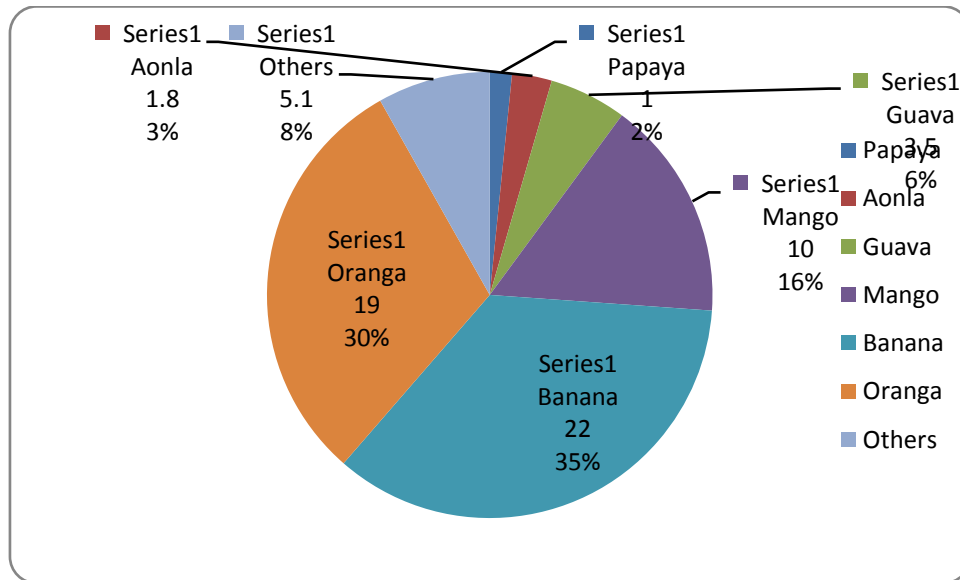
Fruit and vegetable production and marketing system in Sri Lanka: an overview

Agriculture contributes 24% of the State GDP and employs 78% of the total workforce. The net sown area is 47.5% of the total Geographic area (compared to the National average of 46%). The Gross cropped area is 182 lakh ha with a cropping intensity of 124. Small and marginal farmers account for 60% of landholdings and 22% of operated area. Irrigation covers 31% of the net sown area while the remaining 69% of the net sown area is rainfed. Madhya Pradesh with high geographical diversity, eleven agro-climatic zones and varied soil types is better placed for production of various horticultural crops. Horticulture crop covers 2.6% of the gross cropped area in the State. The area under Horticulture is 6.42 lakh Ha, with an annual production of 37.5 lakh tones.

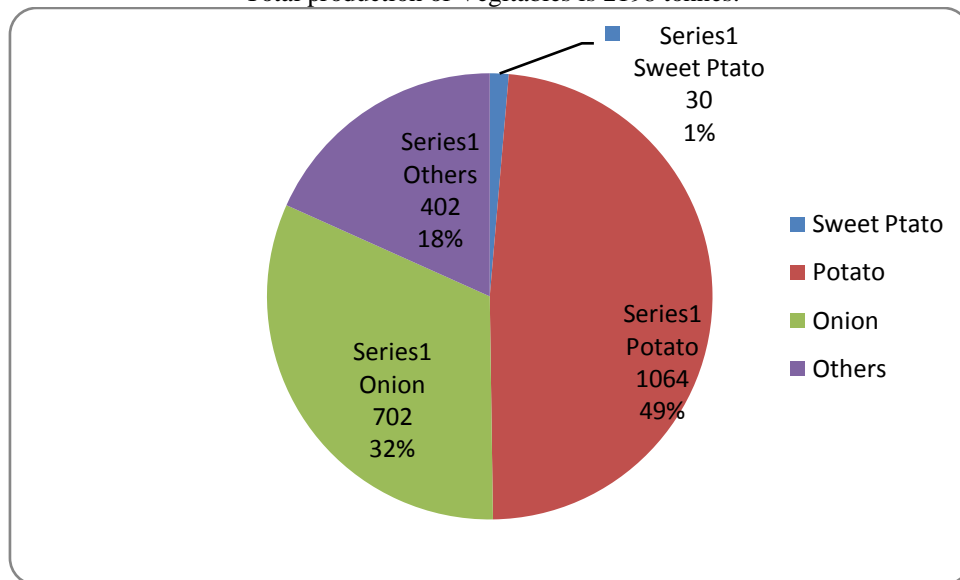
Total Production of fruits is 1226000 Tonnes:



Total area covered for production of fruits is 63000 hectare:



Total production of Vegetables is 2198 tonnes:



In terms of supply, the bulk of the fresh fruit and vegetables produced in the country are grown in the drier parts of Sri Lanka, which accounts for two-thirds of the country's physical land area. This area typically produces "lowland", hot climate fruits and vegetables. Because of its seasonal rainfall, fresh fruit and vegetable production in the dry zone is highly seasonal. On the other hand, in the wet zone, due to a more reliable rainfall intensity and distribution, a wider range of fruit and vegetables are cultivated on a year round basis. The central hills of the country, with their milder climatic conditions, produce temperate vegetables, typically known as "upland" vegetables, throughout the year.

III. RESEARCH METHODOLOGY

Research Type: Descriptive
Sampling: Random sampling
Population: 8345,870
Sample Area: Bhopal
Sample Size: 100

Sampling Techniques: Simple random sampling

The study is based on data gathered from key supply chain partners in the fresh fruit and vegetable marketing system. Data from supermarkets, mostly involving primary data gathered through interviews and case studies, and data from the traditional supply chains, mostly in the form of secondary data, is used. The dual approach allows researchers to gain a better understanding of the processes involved in the marketing system by combining information within the given context. The study seeks to establish the performance of emerging supply chains and their impact on price levels, cost compositions and functional efficiency.

IV. FINDINGS

Key features in conventional fresh fruit and vegetable supply chains

Wide seasonal fluctuations in production with a peak in January to March and a trough in May to June is a predominant feature of the supply chain for fresh fruit and vegetables in Madhya Pradesh. Inadequate storage facilities lead to surpluses during the harvest period and extreme shortages during the off-season. The system therefore exhibits wide seasonal price variation. This situation is more evident in the case of fruits. During the peak supply season, the fresh fruit and vegetable supply system typically records wastage of around 30 to 40 percent (HARTI, 2005).

Prior to the introduction of economic liberalization policies in 1980s, the fresh fruit and vegetable marketing system in Madhya Pradesh was dominated by state sector interventions including the operation of commodity marketing boards, purchasing mechanisms and other interventions. This period was typically characterized by: (i) high levels of production and price risks faced by producers, (ii) The presence of multi-layered and long marketing chains, (iii) Poor product quality at the retail end with little or no choice, and (iv) High price uncertainty for the consumer.

Cost savings from shortened and more secure marketing chains

Intervention by supermarkets has helped to reduce the length of the supply chain. The appointment of a field level representative to purchase vegetables from the grower at the collection points is the major strategy underlying the change. The vegetables collected at the village level collection centre are packed in reusable plastic crates and transported directly to the supermarket warehouse in Colombo by a transport operator using refrigerated vehicles. For cost efficiency, the supermarket outsources the transport. The process, although more expensive than the conventional system, reduces wastage, maintains quality and provides growers with a higher net farm gate price (Table 1).

Table 1: Comparison of the distribution costs of vegetables as a percentage of the selling price in supermarkets and conventional retail shops

Percentage distribution of costs			
Supermarket	Conventional chain marketing		
Farmgate price:	42		27
Handling/transport/packing:	29		15
Commission agents:	-		15
Wastage:		06	16
Retailers margin:	23		27

Selling Price:	100		100

An investigation into the marketing costs for fresh vegetables in one of the leading supermarkets indicated that, for reasons of cost control, their warehouse operations are considered as a separate cost-centre in their management system. This constitutes a new approach under which the warehouse operates as a non-profit, no loss basis. The procurement process is handled by the warehouse operators. The produce brought to the warehouse is graded and packed and sent to the supermarket for sale. The supermarket typically retains a sales margin of around 20–25 percent. The elimination of several intermediate layers in the traditional supply chain has enabled the supermarket to substantially reduce costs, the benefits of which are, in part, passed onto the producer.

Benefits from countering seasonality

The leading supermarket chains in Sri Lanka operate their outgrower systems in both the wet zone and dry zone geographic areas. This arrangement allows the supermarkets successfully to counter the seasonal availability of most fruit and vegetables.

Some supermarkets have even taken a step further and have supervisors and field officers who provide technical advice to the farmers about agronomic practices such as rescheduling of planting dates to overcome oversupply situations. The field-based officers also provide advice on accessibility to credit, fertilizers, and improved seeds and planting materials.

V. CONCLUSION

This study focuses on alternative supply chain coordination practices adopted by leading supermarkets in the fresh produce industry in Madhya Pradesh, and how these practices impact on the performance of the supply channel. The paper places special emphasis on innovative practices adopted by different participants and determines how these practices impact on the performance of market channels, particularly in terms of economic and operating efficiencies.

The explosive growth of supermarkets in Madhya Pradesh has profoundly influenced the fresh fruit and vegetable marketing system, and the trend is expected to continue into the future. Continuing efforts by the supermarket chains to maintain their position in a very competitive market has altered the traditional production and marketing channels in Sri Lanka. The study indicates that the influence of the supermarkets has brought about major improvements in the quality of fruit and vegetables. The study suggests that the supermarkets are adopting a range of management strategies such as the establishment of outgrowers, reduction in waste, and improved transportation and storage, to offer superior quality produce to consumers, to give them a wider choice, uninterrupted supply and greater value for money. Efficient management of supply chains and closer coordination from the farmgate to the consumer will have a strong influence on the future welfare of the consumer and everyone else involved in the fresh produce industry in Madhya Pradesh.

REFERENCES

- [1] Cadilhon, J.-J., Moustier, P., Poole, N.D., Giac Tam, P.T. & Fearn, A.P. 2006. Traditional vs. modern food systems? Insights from vegetable supply chains to Ho Chi Minh City (Vietnam). *Development Policy Review*, 24(1): 31-49.
- [2] Chen, K., Shepherd, A.W. & da Silva, C.A. 2005. Changes in food retailing in Asia: implications of supermarket procurement practices for farmers and traditional marketing systems, AGSF Occasional Paper no. 8. FAO, Rome.
- [3] De Silva, G.A.C. 2006. Crop diversification and marketing. A paper presented at the Council for Agriculture Research Policy (CARP), 15 November 2006, Colombo.
- [4] Ghezan, G., Mateos, M. & Viteri, L. 2002. Impact of supermarkets and fast-food chains on horticultural supply chains in Argentina. *Development Policy Review*, 20(4): 389-408.
- [5] Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI). 2005. A study on marketing on selected fruits in Sri Lanka. HARTI, Colombo. Market analyses 50
- [6] Neven, D. & Reardon, T. 2004. The rise of Kenyan supermarkets and the evolution of their horticulture product procurement systems. *Development Policy Review*, 22(6): 669-699.
- [7] Perera, M., Kodithuwakku, S. & Weerahewa, J. 2006. Vegetable supply chains of supermarkets in Sri Lanka. A paper presented at the Council for Agriculture Research Policy (CARP), 15 November 2006, Colombo.
- [8] Shepherd, A.W. 2006. Quality and safety in the traditional horticultural marketing chains of Asia. AGSF Occasional Paper no. 11. FAO, Rome.
- [9] Sinhapura, D. 2004. Emergence of supermarkets and their implications on domestic food production and distribution system. Unpublished paper, University of Ruhuna, Matara, Sri Lanka.
- [10] World Bank. 2003. Sri Lanka: promoting agricultural and rural non-farm sector growth. World Bank, Colombo.
- [11] George, A.P., Broadley R.H., & Nissen, R.J. 2005. Can Australian horticulture survive and meet the global challenge? *Acta Horticulturae*, 694: 289-294.
- [12] George, A.P., Nissen, R.J. & Broadley, R.H. 2006. Strategic analyses: a key factor in developing horticultural supply chains in transitional Asian economies. *Acta Horticulturae*, 699: 205-211.

- [13] Hofman, P.J. & Ledger, S.N.2006. Using a supply chain approach to guide R&D. *ActaHorticulturae*, 699: 219-226.
- [14] Martin, R.A. and Luxton, P.2005. The successful commercialisation of ZESPRI Gold kiwifruit. *ActaHorticulturae*, 694: 35-40.
- [15] Owen, K., Wright, V. & Griffith,G. 2000. Quality, uncertainty and consumer valuation of fruits and vegetables. *Australian Agribusiness Review*. Paper 4.
- [16] Porter, M.E. 1980. *Competitive strategy: techniques for analysing industries and competitors*. New York, The Free Press.
- [17] **Porter, M.E.** 1990. *The competitive advantage of nations*. London, Macmillan.
- [18] **Porter, M.E.** 2001. Strategy and the internet. *Harvard Business Review*, 2001(March): 63-78.