Assessing Effectiveness of Coordination in Food Supply Chain: A Framework

Rajesh Kr Singh, Delhi Technological University, New Delhi, India

ABSTRACT

Agriculture sector plays very crucial role in the economic growth of India. For sustaining its further growth, supply chain of agriculture sector needs to be strengthened. Agriculture sector is facing lot of challenges due to poor infrastructure, unorganised retail market, poor adoption of modern technology and overall inefficient supply chain. There is strong need to develop linkages between farmers and food processors and markets. Lack of coordination is the major problem in food supply chain. It is causing major loss to country as a whole. This study has tried to identify major factors responsible for coordination in the food supply chain. Further, a framework has been developed to quantify the effectiveness of coordination in the supply chain. This has been further illustrated with a case of food supply chain. This framework can be also useful for supply chains from other sectors to quantify its effectiveness and further improve their respective performance.

Keywords: Coordination Index, Effectiveness, Food Supply Chain, India, Performance

1. INTRODUCTION

In India, agriculture sector, accounts for about 25 percent of gross domestic product (GDP) and employs approximately 70 percent of the country’s work force. India’s share in global food trade is only 1.2 percent, despite being one of the three major agrifood producers of the world (WTO, 2004). Among developing countries, Argentina, Brazil and Thailand are emerging as major exporters (US$38.4 billion trade flows) as compared to India and China (US$23.67 billion trade flows) – the two largest producers of agrifood globally. In recent past after liberalisation of Indian economy in 1991, India has got major boost in area of manufacturing and service sector but agriculture sector has not grown as per its potential. Lot of scope still exists in this sector to grow.

Presently, agriculture sector is mainly working as unorganised manner. In the agriculture sector, the supply chains of some items have remained unchanged for decades. Over 90 percent of food is sold in unorganised markets,
with organised business accounting for just 2 percent of the market (Economic Times Intelligence Group, 2003).

In India, about 60 percent of food quality is lost in the supply chain from the farm to the final consumer. Consumers sometimes pay about 35 percent more than what they could have paid in case of efficient supply chain. The farmers in India get around 30 percent of what the consumer pays at the retail store. 60-80 percent of the price that consumers pay goes to traders, commission agents, wholesalers and retailers (Economic Times Intelligence Group, 2003). Compared to this, farmers can receive better margins in developed countries. Developed countries have better transport facilities, cold storages, smooth roads and other networking facilities. These factors lead to coordinated supply chain thereby reducing overall lead time and other operational losses. Different laws and regulations for ensuring food quality and safety are more stringent in developed countries. Now Indian Govt is also taking many initiatives to improve professionalism in the food industry and for encouraging fair competition among players. According to the Indian Ministry of Trade and industry, approximately 20 percent of food produced in India is wasted. This waste may be due to improper handling and storage, pest infestation, poor logistics, inadequate storage and transportation infrastructure, post-harvest losses and finally intermediaries take large portion of the earnings which should go to farmers. On average, goods pass through six or seven middlemen before consumers can buy it resulting in tortuous journeys, big mark-ups and poor quality. Intermediaries are main obstacles in Indian food supply chain irrespective of nature of items.

According to Sachan, Sahay, & Sharma (2005), some of the reasons for the existence of these intermediaries in the grain supply chain are:

- Age-old historical loyalty of farmers to their agents, because these agents provide debt to the farmer;
- Local understanding and relationships with transporters,
- Lethargy on the part of government and ngos to educate farmers regarding other options,
- Lack of guidelines and rules in the development and supply of produce staples;
- Organised cartels between commission agents, wholesalers and transporters,
- Lack of scale in terms of what each farmer produces, sheer numbers of small farmers drive down bargaining power; and
- Lack of effort in development from front-end players (retailers) and institutions.

Major challenge for food supply chains is to develop effective coordination among all members of the supply chain. This study will try to identify various factors responsible for coordination in food supply chain so that its performance can be improved. This paper is organised as follows. Next section discusses literature review. It includes performance issues and factors responsible for coordination. It is followed by development of framework for evaluating the coordination index of food supply chain. It has been illustrated with an example of Indian food supply chain. Finally conclusion is given.

### 2. LITERATURE REVIEW

In this study, literature review has been divided into two sections. First section discusses performance issues of food supply chain. Second section discusses coordination issues in food supply chain.

#### 2.1. Performance Measurement of Food Supply Chain

In present globalised market, consumers across the world demand for safe and nutritional food, quality, just-in-time delivery, etc. Producers from developing countries such as India and other south Asian countries, a majority of whom work without state-of-the-art technologies and
Hybrid Multi-Objective Methods to Solve Reentrant Shops
www.igi-global.com/article/hybrid-multi-objective-methods-solve/74729?camid=4v1a