

## EDITORIAL

# Supply Chain Management: Concepts and Application within the Transitional Economies

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## Introduction

Throughout much of Asia, food marketing and distribution is experiencing a period of unprecedented change. Not only has globalization resulted in a dramatic expansion in the market share held by the modern supermarket chains, but with increasing personal disposable income, a significant shift in consumption from fresh food to processed food has been observed (Gehlhar and Regmi, 2005). Furthermore, with rising income comes a greater desire for more variety, more expensive, and higher-value food (OECD-FAO, 2005). Product diversity is increasing as producers, food manufacturers, and retailers strive to meet the demands of increasingly sophisticated consumers (Martech Consulting, 2005). Products are being differentiated on the basis of what they contain and/or do not contain (Centrec, 1999). Some attributes are based on the methods of production, the place of production, the way in which the product has been processed or handled, and the impact that either the production or processing of the product has had on the environment, farmers, and the community.

Traditionally, most of the food in Asia has been distributed and sold through a complex network of wholesale and retail markets. In the wholesale market, prices are determined primarily by supply and demand. However, prices are highly variable day by day and even hour by hour, and both the quantity and quality of the fresh food offered for sale is highly variable, occasioned by

the weather and seasonality of supply (Folley, 1973). For modern retailers, food processors, and manufacturers, these variations in product quality and price and the uncertainty of supply are unacceptable. Not only is it impossible to adequately price the product or to engage in any promotion or merchandizing of the product, but the anonymity which is so often associated with the wholesale marketing of generic food products makes it impossible for the buyer to be able to assure downstream customers that the food is safe or that it has met prescribed environmental and ethical standards. Consequently, in order to maintain product quality and provide a more consistent supply, institutional buyers are purchasing greater quantities of fresh produce from preferred suppliers, with whom they entered into some long-term trading relationship.

For the buyers, engaging in long-term relationships with preferred suppliers may result in various economies of scale and improvements in managing both supply and demand (Wilson, 1996). There are obvious economies of information arising from the reduced amount of time spent in price negotiation and monitoring the quality of the products consigned to the buyer. Buyers can anticipate improved access to a more reliable supply of inputs, improved product quality and performance, and a higher level of technical interaction in the form of developing and launching new products.

For food producers, while these arrangements may not necessarily result in a better price, the relationship provides access to shelf space, a guaranteed market for produce of an acceptable quality, and security through the knowledge that the partners have a financially secure long-term trading arrangement (Hughes and Merton, 1996). In what is arguably a mature and even declining industry, preferred suppliers are rewarded with volume growth, which makes it worthwhile to invest in the economies of scale and improved technology. Various benefits may also accrue from the exchange of sensitive market information. Preferred suppliers get feedback from customers on the consumer acceptability of new varieties and new products and get greater product support and assistance in new product development (Fearne et al., 2001). However, as competition increases, prices generally decline. In order to remain competitive, buyers and suppliers must continuously look for ways to reduce the costs of transacting and to increase the efficiency of their operations.

## **Towards More Efficient Supply Chain Management**

A supply chain is a network of organizations involved through upstream and downstream linkages, in the different processes and activities, that produce superior value for the ultimate consumer (Fearne et al., 2001; Reardon and Berdegué, 2002; Cadilhon et al., 2006).

Value is the worth in monetary terms of the economic, technical, service, and social benefits a customer receives in exchange for the price that it pays

(Anderson and Narus, 1999). Value is achieved when the proper function is secured for the proper cost (Hutt and Speh, 1995). Buyers typically consider product and supplier attributes in a manner that seeks to minimize the various problems associated with purchase and use (Wilson, 1994). Simpson et al. (2002) describe how suppliers have the potential to positively (or negatively) affect customer inventories, product quality, cost, and delivery times. As prudent supplier selection leads to improved buyer performance, price is becoming less important in the decision to purchase (Batt, 2006). Nevertheless, a supplier must be cost competitive even if it offers a superior quality product or more reliable delivery.

Linkages refer to the interdependency that exists between the actors and the activities that they perform (Ford et al., 1998). As the output of one firm becomes the input for another, in food chains, each participant must understand how the quality of the product will deteriorate irrevocably at each stage of the supply chain with inappropriate handling (van der Vorst et al., 2007; White, 2000).

The efficiency of a supply chain ultimately depends upon the efficiency of each individual actor and the linkages that have been established between them (Herlambang et al., 2006; Humphrey, 2005). Effective supply chain management requires cutting costs, ensuring consistency from day to day, and raising product quality and diversity. This can be achieved by improving coordination and logistics systems, contracts with wholesalers and producers, and private standards which specify the quality, safety, volume, and product packaging (Reardon and Berdegué, 2002).

As supply chains are complex systems with numerous activities spread over multiple organizations and often over lengthy time horizons, to improve performance, it is necessary to overlay a coordination system that brings these multiple functions and organizations together as a part of a unified system. However, if the benefits of successful coordination are to be achieved, four variables are considered crucial: trust, decision making, information sharing, and goal congruence (Lejeune and Yakova, 2005).

### **Trust**

Trust is an important factor in shaping effective and efficient supply chains (Biénabe et al., 2007; Batt, 2003). Anderson and Narus (1990) view trust as the belief that an exchange partner will perform actions that will result in positive outcomes for the firm and will not take unexpected actions that may result in negative outcomes. Moorman et al. (1993) define *trust* as the willingness to rely on an exchange partner in whom one has confidence.

While both of these definitions view trust as a behavioral intention that reflects reliance on the other partner, both definitions, in part, capture quite different aspects of the construct. The definition of *trust* given by Moorman et al. (2003) as a belief, a sentiment, or an expectation about an exchange

partner, results from the partner's expertise, reliability, and intentionality. This component of trust, which Ganesan (1994) describes as credibility, is based on the extent to which the buyer believes that the supplier has the necessary expertise to perform the activity effectively and reliably. However, trust also relates to the focal firm's intention to rely on their exchange partner. Ganesan (1994) describes this component as benevolence because it is based on the extent to which the focal firm believes that its partner has intentions and motives beneficial to it. A benevolent partner will subordinate immediate self-interest for the long-term benefit of both parties and will not take actions that may have a negative impact on the firm (Geyskens et al., 1998).

### **Decision Making**

The type of decision-making processes conducted within a supply chain will impact on the nature of the long-term relationships. Buyer-driven supply chains are more regulated and characterized by higher levels of governance and vertical coordination between the supply chain actors (Vorley et al., 2007). In these supply chains, the power is concentrated in the hands of a small number of retailers and food processors.

Power resides in the ability of one firm to make another do what he/she would not have otherwise done (Gaski, 1984). According to French and Raven (1959), power is derived from the more dependent firm's perception of the dominant firm's ability to mediate rewards, mediate punishment, its legitimate right to prescribe behavior, some specific knowledge or expertise, and the extent to which the more dependent firm identifies with the dominant firm. More recently, Johnson et al. (1993) have classified power as either mediated power (reward, coercion, and legal legitimate power) or nonmediated power (expertise, referent, information, and traditional legitimate power).

Kaplinski and Morris (n.d.) describe how activities, actors, roles, and functions are coordinated through power asymmetry. More powerful actors in the supply chain assume responsibility for the interfirm division of labor, monitoring outcomes, linking the discrete activities between actors, establishing and managing relationships between the various actors, and organizing logistics to maintain networks. Ogbonna and Wilkinson (1998) argue that the power to control is not only dependent on the possession of power but also the extent to which other exchange partners have countervailing market power. The presence of countervailing power forces exchange partners to differentiate between the possession of power and its use. Noordewier et al. (1990) describe how, over time, relational norms may emerge between the parties that limit the exercise of power. Granovetter (1985) describes how even in the presence of substantial power imbalances, exchange partners may prefer to operate in ways that are informed by habit, custom, and practice. Relationships may be so embedded that the more powerful firm risks the loss of its reputation should it be found to have engaged in opportunistic trading. Conversely, the frequent use of mediated

power is likely to damage relational norms, cooperation, and accommodation between channel partners (Brown et al., 1995). Overt attempts to directly influence the weaker party through the use of mediated power is generally viewed with considerable disfavor, for it will not only lead to conflict but the relative attractiveness of alternative exchange partners will also increase.

### **Information Sharing**

Communication in marketing channels serves as the process by which persuasive information is transmitted (Frazier and Summers, 1984), participative decision making is fostered, programs are coordinated (Anderson and Narus, 1990), power is exercised (Gaski, 1984), and commitment and loyalty are encouraged (Anderson and Weitz, 1992). Communication enables information to be exchanged that may reduce certain types of risk perceived by any one of the parties to the transaction. Any uncertainty about a customer's or supplier's organizational structure, viability, method of operation, technical expertise, or competence can be resolved by communication between the parties. Communication not only improves the supplier's credibility but may also provide a convenient and simple means of gaining knowledge of the supply market (Cunningham and Turnbull, 1982). Communication also facilitates other elements of the interaction such as adaptations by suppliers and customers to the design or application of a product or the modification of production, distribution, and administrative systems by either party.

As channel members in relational channel structures are more interdependent, a higher level of communication is necessary because exchange partners need to share more information to coordinate activities (Mohr and Nevin, 1990). The establishment of structural mechanisms that provide real-time information and accurate feedback regarding each partner's activities will not only strengthen cooperation but also greatly improve day-to-day performance. Communication clarifies customer's needs and expectations, assists in problem solving and conflict resolution, and greatly improves competitiveness (Tummala et al., 2006).

### **Goal Congruence**

Sustainable long-term relationships often require substantial changes in behavior and attitudes based on common aims, trust, cooperation, mutual dependency, a joint problem-solving approach, team decision making and increased interdependence (Fearne et al., 2001). Some of the greatest costs in developing long-term relationships are in modifying habits, the knowledge of the people involved, and their willingness to modify existing business practices, policies, values, and processes (Tummala et al., 2006).

Goal congruence is defined as the extent to which actors in the network perceive that their own goals will be satisfied by the accomplishment of network

goals (Lejuene and Yakova, 2005). Cooperation in a working relationship implies a joint effort, team spirit, and collaboration to achieve both intra- and interfirm goals. For the exchange partners, there is an expectation of a balanced transaction, reciprocity, and mutuality over time (Anderson and Narus, 1990; Morgan and Hunt, 1994).

According to Macneil (1979), norms of exchange are shared expectations as to how trading partners will and should behave. Cannon and Perreault (1999) suggest that cooperative norms such as flexibility, solidarity, and mutuality reflect how trading partners expect to work together. These norms do not mean that one partner must acquiesce to the other's needs, but rather, it is an acknowledgement by both partners that they need to work together to be successful. Spekman et al. (1988) identify how cooperative relationships establish open lines of communication, nurture and sustain relationships, and develop mechanisms to solve differences by building trust.

While Chojar (this issue) reaffirms the importance of trust and goal compatibility in successful supply chains, information is considered to be the key success factor in managing and coordinating supply chains. Irrespective of the product or commodity, the fundamental objective of all supply chains is to make the chain more responsive to the needs of downstream customers while simultaneously lowering costs. However, neither of these objectives can be achieved without an appropriate flow of information between the supply chain actors. In response to distorted flows of information, individual actors within the supply chain often resort to stockpiling excessive inventory in order to meet anticipated needs. As inventories become progressively larger, the costs of warehousing dramatically increase. Conversely, the failure of upstream suppliers to deliver the product on time, in sufficient quantities, and to the quality standards as specified can appreciably increase the costs of downstream processing and manufacturing and, at the retail level, result in stock-outs and the potential loss of market share. For the supplier, the need to replenish depleted stock or to replace defective products can result in significantly higher transport costs.

Costs can also be removed from the system through the implementation of lean production and total quality management practices, increased levels of outsourcing, international procurement, and improved transport and logistics. As a further means of reducing costs and increasing competitiveness, Chojar gives particular attention to the concept of collaborative planning, forecasting, and replenishment (CPFR) that focuses on information sharing, planning, forecasting, and inventory management. CPFR begins with an agreement between major partners to develop a joint market plan outlining what products are to be sold and promoted and how, within the given time frame, shipments are to be processed and inventory is to be managed.

## Linking Smallholder Farmers to Markets

If supply chains are to be managed, someone in the chain must be responsible for coordinating the many activities that each of the individual actors perform (Batt, 2006). Much of the literature talks about the role of the supply chain captain. However, if someone is to lead, there must not only be a flow of information but also some mechanism by which performance can be measured as it relates to product quality, delivery times, response times, and inventory turnovers.

Manalili (this issue) describes how participatory agricultural chain assessment (PACA) is used as a tool to facilitate a greater understanding of agricultural supply chains and the subsequent identification of appropriate intervention strategies. Developed by the Belgium-based NGO Vredeseilanden, the aim of PACA is to provide a means for smallholder farmers to more actively participate in the decisions that shape the structure and processes of the chain in which they are involved and to ensure that the benefits derived from their participation are commensurate with the activities they perform and the risks endured.

While numerous advantages may accrue to those producers who are able to establish and maintain enduring linkages with downstream market intermediaries, there are numerous impediments. In much of Asia, smallholder producers often live in remote areas, far from good roads and markets. The physical environment can be difficult. Rainfall may be erratic, the soils poor, and crops readily attacked by pests and diseases. Irianto and Harwanto (2009) identify the key problems as the lack of infrastructure, technical information, the lack of finance, and social problems. Murray-Prior (2007) identifies how poverty, high levels of illiteracy, ill health, low social, and political status make it difficult for smallholder producers to embrace the changes required for them to compete in institutional markets that require high levels of management skills, sophisticated production technologies, and economies of scale. Manalili (this issue) identifies the lack of market information, an inability to meet the quality standards demanded by the market, limited access to resources, and limited knowledge of their end consumers as the major constraints limiting smallholder farmers' access to institutional markets.

In describing mango supply chains in Vietnam, Nissen et al. (this issue) admirably illustrates how farmers are completely unaware of how the way in which they harvest and handle the fruit impacts upon downstream market intermediaries' and consumers' satisfaction with their product. At the farm level, the indicators used by farmers to determine fruit maturity are many and varied. Trees are either strip-picked or harvested 3 to 4 times at intervals of 7 to 15 days. Fruit that was too hard to reach was often left on the tree until it fell naturally, but when prices were high, fruit was often harvested immature.

Less than 50% of the farmers practiced any form of grading, preferring to sell mixed grades at a lower price rather than reject third-grade fruit. Finally, most farmers believed that the amount of damage incurred to the fruit during transport was only in the order of 1% to 2%.

At the wholesale level, the major problems faced by wholesalers were that most suppliers did not deliver the quantity and quality of fruit at an agreed price, the fruit was not of uniform size, and fruit losses were high because rotten, shrivelled, or ugly fruit had not been removed. Transport problems and the distance over which fruit had to be transported resulted in a significant reduction in weight because of moisture loss, and inappropriate packing led to bruising and greatly accentuated the incidence of sap burn.

At the retail level, most retailers experienced difficulty in obtaining good-quality fruit. Most suppliers did not deliver fruit of the desired quality; there was much variation in size, and most retailers complained about the amount of damage inflicted during transport. Losses during transport were thought to be between 5% and 10%, with a further 10% being lost during storage as a result of stem-end rot and anthracnose.

At the consumer level, some 52% of consumers indicated that they experienced problems when selecting fruit at the point of purchase due to uneven ripening. Some 18% of consumers indicated that the fruit was not sweet enough, with 14% complaining about excessive sap burn on the skin. Over 30% of consumers indicated that the fruit rotted, shrivelled, or withered too quickly.

A similar study by Concepcion et al. (2006) identified significant differences between the perceptions of Filipino vegetable farmers and their market intermediaries about the nature of consumer demand. Their divergent, often erroneous ideas and concepts about vegetable quality contributed to waste and inefficiency in the Mindanao vegetable supply chain.

In an empirical examination of the perceived differences in offer quality between Western Australian rock lobster exporters and their respective Japanese importers, Batt and Morooka (2003) revealed that Western Australian exporters needed to give greater consideration towards enhancing the value of their product offer by providing continuous product support, more timely market information, and responding better to importers immediate needs rather than to attempt to compete on price. Building upon the concept of market orientation, Storer et al. (2003) proposed that the more a supplier understood the needs of its downstream customers, the better the firm would be able to meet the needs of the ultimate consumer.

Not only do most smallholder producers lack the business skills, market knowledge, and political empowerment that might otherwise enable them to overcome many of the institutional impediments (Shepherd, 2007), most smallholder producers have too few assets to withstand the effects of price fluctuations and opportunism (Biénabe et al., 2007), price cuts, and the

cancellation of orders (Riisgaard et al., 2008). Their asset base is generally insufficient to meet the volume, consistency, and year-round availability of downstream customers and to accommodate the long delays often associated with payment.

Through two case studies, Digal (this issue) illustrates the importance of both technical assistance and credit in linking smallholder farmers to modern supply chains. However, while technical assistance and credit are important inputs for smallholder farmers to improve their production capacity, channeling credit into downstream market intermediaries may also have a positive effect, provided that the market intermediaries do not behave opportunistically. In the case of Normin Veggies, Digal demonstrates how those farmers who received technical assistance and a loan of PhP 8,000 to purchase seeds, fertilizers, pesticides, and labor were able to generate a profit when their produce was sold to supermarkets. In the case of the Upland Marketing Foundation Inc. (UMFI), as the farmers struggled to find a sustainable market for their organic rice, UMFI decided that instead of just providing information and training, the foundation would itself engage in selling the community's product to mainstream supermarkets. As the marketing facilitator, UMFI had to borrow sufficient cash to pay the farmers cash on delivery, while it had to wait 30 to 120 days to be paid by the supermarkets.

Kasarjyan (this issue) describes how, with the collapse of the Soviet Union, the lack of sufficient collateral precluded many smallholder farmers and food producers in Armenia from accessing credit. The lack of capital negatively affected farm productivity and product quality which limited the export potential and the subsequent development of efficient and responsive agricultural supply chains.

Yuniarti et al. (this issue) illustrate how, with only a modest capital investment, smallholder food manufacturers in Lumajang Regency, Indonesia, are able to process and market deep-fried banana chips. Processing not only produces a more marketable consumer product with a greater shelf life, but it substantially increases the income for smallholder producers. With an input cost of between Rp 3190 to 6250 to purchase the fruit, the final product is sold for Rp 16,000 to Rp 22,000 per kilogram.

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