SUPPLY CHAIN COLLABORATION OF NAM DOK MAI MANGO EXPORTS FROM THAILAND TO JAPAN

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ABSTRACT

This paper attempts to provide an overview of existing supply chain of Nam Dok Mai mangoes in Thailand and identify strengths and weakness in the supply chain and to develop the supply chain collaboration in the management of fresh Nam Dok Mai mangoes for exports to Japan. The discussion and analysis based on the six case studies of mango export companies, which are the main exporters in Thailand. Semi–structured interviews are conducted to gather data from growers and exporters. A cross–case analysis is applied to examine the collaboration and to compare similarities and differences among six companies. The outcomes of this analysis contribute to the introduction of grower–exporter collaboration in agro–food supply chain. The results demonstrate that information sharing, decision synchronisation, relationship and trust are the keys to improve production capability. Incentive alignment can provide the motivation for increasing growers' performances. Traceability can be determined as a critical issue for product quality improvement in terms of food safety. The collaboration can increase production efficiency. The consistency in good performance can develop trust and long–term relationship in the supply chain. Thus, the value in collaborative supply chain has a positive impact on the agribusiness in terms of increasing competitive advantage.

Keywords: Supply chain collaboration, Mango, Export, Thailand

INTRODUCTION

Although the mango is Thailand's chief economic fruit with great production and export potential, domestic consumption accounts for approximately 90% of its total annual crop yield, while the remaining portion is shipped overseas to serve the export markets. In response to this factual information, the Thai government has placed considerable importance on the domestic mango industry, with an eye to satisfying unmet demand on the part of international consumers, with great emphasis placed on Japan, a prime export market for Thai mangoes.

Agricultural products in the fresh produce category incur high transportation costs due primarily to their limited shelf life, perishable nature and susceptibility to transport damage. This study centres around various contributing factors influential to the achievement of greater potential among growers and exporters, with the purpose of increasing

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their competitiveness, by means of case studies on the production of Nam Dok Mai mango which are exported to Japan.

Initial study findings indicate that the logistical structure of the Thai mango export industry consists of the following major parties; growers, growers' community enterprises/cooperatives, exporters/domestic distributors and export trading companies. Growers are responsible for producing mangos of export quality standard, size grading and quality grading in line with the requirements pre-determined by buyers. The product yields are then sent to growers' community enterprises/cooperatives, which oversee the collection and storage of harvested product yields, as well as subsequent negotiations with exporters/domestic distributors. Export trading companies handle quality enhancement functions and process fresh products into other processed forms.

Costs are incurred in relation to the implementation of each of the above-mentioned activities in the supply chain. Those costs are mainly divided into two groups according to the parties responsible for such activities, namely growers and exporters. In brief, the cost base among growers can be broken down into harvesting and transportation. The cost base among exporters comprises transportation, vapour heat treatment (VHT), packaging materials and management. The empirical studies reveal that transportation is the most substantial portion of the cost base among growers. Unlike growers, transportation cost incurred by exporters is, however, comparatively higher. This is demonstrably evident from the fact that growers bear transportation costs only from the harvest site to the collection/storage area, whereas exporters are responsible for transportation cost from collection/storage areas to VHT facilities and to airports/seaports (Kantabutra, 2010). Therefore, the study investigates the problematic transaction activities which affect product quality and operations costs, as the aim of the study is to develop the integrated supply chain management with regard to Thai mango, namely Nam Dok Mai, for export in order to enhance its competitiveness in the global market.

MATERIALS AND METHODS

Supply chain collaboration

The objectives of collaboration in the supply chain are many, depending on the level of mutual trust, commitment and bargaining power. With various objectives in inter-organisational relationships such as sharing of vision, information, resource investment, risk responsibility, achievement of mutual goals, decision making, planning and problem solving (Lee and Billington, 1992, Spekman et al., 1988, Phillips et al., 2000), there are many benefits to be obtained from the relationships. With collaboration, partnerships can gain the advantage through better performance, better competitiveness, knowledge creation capabilities, revenue enhancements, cost reductions, pricing and increased operational flexibility to cope with high demand uncertainties and market diversity (Hogarth-Scott, 1999, Malhotra et al., 2005, Fisher, 1997).

Simatupang and Sridharam (2008) present the elements in the mechanism of supply chain collaboration: collaborative performance system, information sharing, decision synchronisation, incentive alignment and innovative supply chain process. The details of these topics are presented below.

– **Collaborative Performance System (CPS)**: The chain members need to jointly determine specific collaborative objectives characterised in terms of outcomes rather than actions, measurable and quantifiable, clear as to a time frame, challenging yet attainable, written down and communicated to all necessary participating members.

CPS often consists of objectives, metrics, target specificity, an explicit time period and performance feedback. An individual chain member is then encouraged to define its own strategy to achieve performance targets based on local market conditions, competition, operating technologies and resources. A balanced scorecard measurement and management system may be used to facilitate collaboration within and between organisations. The balanced scorecard framework describes strategy in terms of strategic objectives, measures, targets and initiatives (Kaplan and Norton, 2002).

– **Information Sharing: According to Lee (2000),** information sharing is the foundation of supply chain integration since decisions on the level of integration are strongly related with decisions on what information should be shared and how it should be shared. Companies have to carefully decide which supply chain partners they should be closely integrated since level of integration bases on various factors such as firm capabilities, the complexity of products, and corporate culture (Cooper et al., 1997). Besides determining with whom companies should integrate, it is essential to consider how a company's activities are related to those of their partners and deciding what information should be accessible established by partners (Cooper et al., 1997, Sivabrovornvatan, 2006). A good practice in enhancing information sharing is to develop a positive and strong connectedness in supply chain such as opportunities to interact, assistance for each other, and channels for communication (Cheng, 2011). Continuous and honestly open communication between/ among supply chain partners will minimise/ eliminate any degree of uncertainty and/or misunderstandings (Moorman et al., 1993, Kwon and Suh, 2004). Thus, collaborative behavior and activities need to be encouraged to establish value–based relationships among members in order to achieve the competitive advantage in the supply chain as a whole (Wang and Wei, 2007, William and Diana, 2007, Cheng, 2011).

Information sharing enables the chain members to improve performance by capturing and disseminating timely and relevant information to enable decision makers to plan and control supply chain operations. Effective information sharing provides a shared basis for synchronous actions by different functions across interdependent firms (Whipple et al., 1999). Quality of information sharing is determined by relevancy, accuracy, timeliness and reliability. Advanced information technology such as decision support systems, enterprise resource planning and the internet can be used to convey up–to–date data about demand planning, product movements, workflow, costs and performance status.

– **Decision Synchronisation**: Independent chain members usually have their own self–interests with limited ability to make individual decisions, probably due to a lack of information and/or knowledge to capture, store, process and decide. Decision synchronisation is the ability to link knowledge and decision rights and to provide synergistic benefits to the chain members. It encourages the chain members to have a sense of belonging in which all decisions work toward a common goal of serving the end customers.

Decision synchronisation may refer to joint decision making in both planning and operational contexts. These joint decisions are used to guide logistics processes inside an individual chain member firm. The planning context integrates decisions about long–term planning and measures such as selecting target markets, product assortments, customer service levels, promotion and forecasting. The operational context integrates order generation and delivery processes, which might be in the form of a shipping schedule and replenishment of the products in the stores.

– Incentive alignment: One of the most important problems of supply chain collaboration is the motivation of its participating members to create value that benefits all the members. Incentive alignment refers to the process of sharing costs, risks and benefits amongst the participating members (Simatupang and Sridharan, 2002). This scheme motivates the members to act in a manner consistent with their mutual strategic objectives, including making decisions that are optimal for the overall supply chain and revealing truthful private information. It covers calculating costs, risks and benefits as well as formulating incentive schemes such as pay–for–performance and pay–for–effort (Simatupang and Sridharan, 2002).

Chain members usually commit to the collaborative efforts if they can realise and capture relevant benefits that contribute to their future survival (Kaplan and Narayanan, 2001). Benefits of collaboration include both commercial gains (such as increased sales) and performance improvement (such as lowered inventory costs) (Corbett et al., 1999). Incentive alignment also involves risk sharing among the chain members in managing demand, supply and price uncertainties (Fisher, 1997). Setting and applying appropriate incentives (such as rewarding responsiveness and sharing the costs of markdowns) motivates the chain members to take decisions that align with the achievement of supply chain profitability (Simatupang and Sridharan, 2002).

– Supply Chain Contract and Contract Farming: Supply chain contract have been extensively studied in operations management, economics, and marketing science literatures (Lariviere, 1999, Tsay and Lovejoy, 1999)The format of supply chain contracts vary in and across industries (Wang, 2002). However, the principal objectives of supply chain contracts are to maximise the total profit of the supply chain, to minimise the costs of overstock/understock, and to share the risks among the chain members (Tsay and Lovejoy, 1999, Arshinder et al., 2008). The contracts counter double marginalisation by minimising the costs of all supply chain members and total costs of the supply chain when the members coordinate as against the costs incurred when the members work independently. From utilising the supply chain contracts which provide intensives to all members, these supply chain members are able to coordinate with greater management of supplier–buyer relationship as well as risk management (Arshinder et al., 2008). The supply chain contracts normally designate the parameters (e.g. quantity, price, time and quality) within which a buyer places order and a supplier fulfils them (Arshinder et al., 2008). For optimal supply chain performance and relationship, the different types of contract are specified for different conditions. In buyback contract, the buyer is allowed to return the unsold inventory to some fixed amount at agreed prices (Arshinder et al., 2008). The manufacturers accept the returns from the retailers when the production costs are sufficiently low and demand uncertainty is not too great (Padmanabhan and Png, 1995). In the revenue–sharing contracts, the supplier proposes the buyer a low wholesale price when the

retailer shares fraction of the revenue with supplier, which supports partners in selecting order quantities that are optimal for the holistic supply chain (Giannoccaro and Pontrandolfo, 2004, Cachon and Lariviere, 2005). In the quantity flexibility contracts, the supplier and the buyer accepts some of the inventory and stock out cost burden. The supplier accepts the change in quantity ordered from the buyer after observing the actual demand. The buyer consigns to a minimum purchase and the supplier certifies a maximum coverage (Tsay, 1999). These types of contracts are described as a response to certain supply chain inefficiencies (Lee et al., 1997, Arshinder et al., 2008).

– Buyer–supplier relationships in an integrated supply chain: Benton and Maloni (2005) stressed that the supply chain relationship of buyer–supplier primarily drives satisfaction of supplier rather than performance. Although the suppliers should be more concerned with their performances even in an environment of supply chain integration, the suppliers appears to be more concerned the nature of supply chain relationship rather than performances. If the power holder attempts to promote satisfaction, a relationship–driven supply chain strategy should be considered rather than a performance based strategy since the former strategy generates the additional benefit of enhancing performance for both parties who aim to thrive in such a competitive global environment. Nonetheless, the different viewpoint regarding the negative view of power within the relationship reveal that not all relationships result in joint benefit that they are not all based on mutual trust as they always require to be, and that trust alone cannot be depended upon (Blois, 1998, Campbell, 1997, Earp et al., 1999, Kalafatis, 2000, Svensson, 2001, Hingley, 2005). Consequently, the positive relational factors such as trust, commitment, collaboration, and mutuality are considered to be a gap in the relationship in terms of the role of power and the management of power asymmetry. Hingley (2005) emphasised that acceptance of power asymmetry was a key first–step to a successful relationship in supply chain collaboration particularly in the agri–food supply chain. Suppliers are advised to be capable of operating within the conditions of imbalanced power and reward. Such imbalanced partnership arrangements appear to offer preferably the most to the more powerful supply chain partner and, consequently result in unevenly shared benefits (Christopher and Juttner, 2000). Accordingly, the trend is to develop exclusive relationships with fewer, favoured, single source or devoted partnerships. In this way, suppliers are described as locked or tied–in (Grunert et al., 1997, Larson and Kulchitsky, 1998) to a form of vertical channel quasi–integration (Howe, 1998, Hingley, 2005).

–Traceability in agro–food chain: Opara (2002) mentioned that traceability in agro–food supply chain of new agricultural economy is a preventative strategy in food quality and safety management since the new agricultural economy is characterised by two main features; 1) greater concentration/intensity of farms into smaller numbers with large sizes and increasing influence of contract farming; and 2) the evolution of integrated supply chains connecting producers and consumers. Supply chain collaboration plays an important role in satisfying customer requirements at lowest cost. Although there are several research studies that address the issue of collaboration within the supply chain, almost all of them focus on industrial supply chains. Conversely, there is only a small numbers that address collaboration within an agricultural supply chain. In addition, these empirical studies only focus on the collaboration between the organisations such as exporter and importer. Therefore, the research gap concerns grower and exporter collaboration on

a vertical supply chain collaboration. Most of the literature on supply chain collaboration is from industrial organisation, but there has been little research into the perishable supply chain collaboration between grower and exporter. From this, a key question that needs to be addressed is 'what are the key factors to enhance competitiveness for the mango supply chain?'

In order to examine mango supply chain collaboration, key factors of collaboration have been developed:

1. Information Sharing
   1.1 Collaborative Performance System (CPS)
   1.2 Performance Status
   1.3 Production and Demand Planning
   1.4 Knowledge Sharing
2. Decision Synchronisation
3. Incentive Alignment
4. Supply Chain Contracts
5. Traceability
6. Transaction cost management
7. Relationship

The aim of the paper is to establish the conditions for a more integrated supply chain management of Thai fresh mangoes exported to the Japanese market through an analysis of supply chain collaboration. This study utilises the qualitative research method due to the research focus on "what" and "how" the supply chain collaboration is affected by the mango supply chain management. Multiple research methods are applied in order to achieve the research objectives. It starts from the field survey aimed at observing the overall activities along the supply chain, and to discover the current situation by in-depth interviews with mango growers, exporters, and representatives of government agencies.

The case study method is then conducted through the use of semi-structured interviews involving six major mango exporters. The case study method is selected as it can profoundly investigate and achieve the research objectives. In order to achieve the research aim and objectives, a field survey and in-depth interviews are initially conducted in order to observe overall activities along the supply chain, and to investigate the key activities which can either add value or reduce costs in the supply chain. Then the in-depth interviews with growers, exporters, and authorities of related government agencies are conducted in order to identify the key activities which are problematic. The information so gathered is utilised for developing semi-structured interviews for the creation of the case studies in order to analyse supply chain collaboration between growers and exporters. Finally, the semi-structured interviews with six case studies involving exporters who own vapour heat treatment (VHT) plants are conducted in order to thoroughly explain the relationship and collaboration between the exporter (as a buyer) and the growers (as suppliers).

The first field survey was conducted in 2009 across four regions in Thailand; Central, Eastern, Northern, and Northeast region, where most mango plantations and production facilities are located, according to the Thai Mango Growers Association (2010). Considering the scope of the area of study, 19 groups of mango growers who were considered to be regular exporting producers had targeted production areas which were located in the mentioned regions. Also, six exporters were investigated as part of the fieldwork. These six exporters were selected as being big exporters who own VHT plants and regularly process the VHT for fresh mango exports (DOAE, 2010). The findings from the field survey were from the field survey itself and from in–depth interviews with growers, exporters and related government agents. The interviews were analysed to answer the research objectives; the strengths and weaknesses of existing supply chain management were discussed, and the problematic logistics activities were examined.

The second fieldwork activity and interviews were conducted in 2010. The detailed data collected from the first fieldwork survey was analysed in order to develop the semi–structured interviews to investigate relationships as part of supply chain collaboration. The case study technique was selected in order to analyse the research findings. This was done in order to discuss the factors of supply chain collaboration mechanism that could effectively apply to the supply chain collaboration involved in exporting fresh Nam Dok Mai mango to Japan on the part of each of the six companies concerned. The analysis was linked to the literature review chapter to compare academic theory and practice.

RESULTS AND DISCUSSIONS

1. Findings of case studies the research findings of six cases of mango exporters are described as following;

Case A: Company A is an integrated mango exporting company whose own orchards produce mangoes, and whose VHT plant processes them for export. The production capacity of Company A is very large. Their main production yield is from the company's orchards, but the company also uses external mango suppliers to support the volume of supply. The company therefore has two kinds of suppliers, the internal supplier (the company's orchardist) and external suppliers (other mango growers). Company A thus collaborates with two groups; the internal supplier and the external suppliers.

Within the same company, Company A and the internal supplier establish a collaborative relationship throughout the supply process concerning information sharing, decision synchronisation, incentive alignment, traceability, financial sharing and institutional trust. Mutual goals and benefits should be clearly stated in CPS so that each party realises its tasks and responsibilities. Information should be regularly shared in order to encourage maximum performance and enable prompt responses to change. It must be emphasised that decision synchronisation is vital in creating a sense of belonging, that will lead towards reaching common goals.

On the contrary, the supply chain management of the external suppliers needs to improve since Company A mainly focuses on its internal supplier, rather than external suppliers. Though these external suppliers are experienced and skillful, information should be shared regarding CPS establishment, performance status monitoring, joint production and demand planning, and knowledge sharing. Decision synchronisation should be considered as this is an important

process of building a sense of belonging. If Company A and its external suppliers consider that they are the same team, collaboration in the supply chain will be greatly developed

Case B: Company B is a pioneer in the mango business, not only in exporting Thai mangoes to the Japanese market but also in developing the VHT machine. Its strength is that it is a Japanese company and therefore knows the cultural and behavioural preferences of Japanese customers. In addition to this, their punctuality in paying (a Japanese characteristic), is greatly appreciated by its growers. Company B focuses on maintaining long–term relationships with its suppliers, aiming to support them and to develop increased production capabilities with them. The company therefore prefers to invest in reliable and trustworthy suppliers and the suppliers in turn prefer to work with a repuTable: company.

Case C: Company C is a mango exporter and a VHT service provider under the governance of DOAE, with whom it has an agreement regarding developing the production capability of growers. The company focuses on knowledge and information sharing with its suppliers. Seminars, meetings, and field trips are organised to educate growers and develop relationships between growers and the company.

The company sets mutual goals at CPS with an incentive alignment. Growers who outstandingly achieve their goals are selected for reward. This incentive strategy is intended to enhance the production capability of growers and the competitiveness of the company.

Case D: Company D is a family business, which has experience in trading mangoes for several decades and generations. Resulting from this, the company has developed long–term relationships and trust with its suppliers. The company and its suppliers provide two–way sharing of knowledge to help each other develop their production capability and stimulate R&D.

Although the company and the supplier do not officially set objectives of collaboration or mutual goals, the supply chain could be guided by the operational activities in the supply chain. For greater supply chain performance, the supply chain collaboration should be systematically developed by CPS.

Case E: Company E is a Thai company whose joint venture companies are Japanese. The company has a "win–win" policy involving co–ordination and collaboration of its supply chain members. The company has developed contracts to provide long–term support to its suppliers in order to enhance their growers' production capabilities and strengthen relationships.

The company contributes R&D for production development and shares new knowledge with its supplier. However, some aspects need to be developed for true collaboration, such as decision synchronisation, incentive alignment, and supply chain contracts. The supply chain contract should be properly applied in practice for real benefits to both parties.

Case F: Company F is a new mango exporter. The company's establishment is supported by a cooperative of a province where the company's VHT plant is located. The company aims to encourage agricultural production by its R&D. As an amateur in mango exports, Company F, unlike others, does not yet have any partnerships with Japanese joint venture companies and therefore has to construct its own production, demand and marketing plans. Furthermore,

the company is as yet uncertain of who its suppliers may be, so that it has to purchase mangoes from intermediaries during the mango off-season. Because of this, information sharing, decision synchronisation, incentive alignment and financial sharing do not appear in this case.

With regard to relationships, the researcher found that it is too early to judge any particular relationship's interval as either short or long term, since Company F is very new to the business. The company realises the importance of collaboration and relationship in the supply chain, however, and plans to work on these issues to improve performance

2. Cross-Case Analysis

In this section, the cross-case method is selected for analysing six companies in order to compare similarities and to contrast differences in terms of the findings. This section integrates six Table: s in order to summarise the cross-case findings in Table 1.

Table 1: A Summary of Cross-Case Analysis

The factors of analysis	Company A		Company B	Company C	Company D	Company E	Company F
	Internal Supplier	External Supplier					
1. Information sharing							
1.1 Collaborativeperformance system (CPS)	Mutual goals/benefits	Customer demand	Mutual goals	Mutual goals	Customer demand	Mutual goals	Customer demand
1.2 Performance status	Routine	Short notice	Routine	Short notice	Routine	Short notice	Short notice
1.3 Production/ Demand planning	Joint planning	Seasonal	Seasonal	Seasonal	Seasonal	Seasonal	Seasonal
1.4 Knowledge sharing	R&D	List of chemical uses	List o of chemical uses, production techniques	List of chemical uses, production techniques	R&D	R&D	List of chemical uses
2. Decision synchronisation	Joint decision	No	Grading activity/Transport	Grading activity/Transport	Grading activity/Transport	No	No
3. Incentive alignment	Mutual benefits/ risks	No	No	Yes	No	No	No
4. Supply chain contracts	Institutional trust	Contract Farming	Contract Farming	Contract Farming	Contract Farming	Contract Farming	Contract Farming

Table 1: A Summary of Cross-Case Analysis (continue)

The factors of analysis	Company A		Company B	Company C	Company D	Company E	Company F
	Internal Supplier	External Supplier					
5. Traceability	Basket labeling	Basket labeling	Basket labeling	Basket labeling	Basket labeling	Basket labeling	Basket labeling
6. Transaction cost management	Complete	No	Complete	Partial	Partial	Partial	Partial
7. Relationship	Institutional trust	Long-term	Long-term/ Mutual Trust	Long-term	Long-term/Trust	Long-term	N/A

The main principle is to discuss the supply chain collaboration of six companies, and also identify the factors that help to improve it. It is also necessary to evaluate the supply chain collaboration mechanism and its application. The next study provides a clear understanding of the mango supply chain collaboration in Thailand, and examines the outcomes of such collaboration. The following section contains details of the cross-case analysis of six exporting companies.

Considering all factors of supply chain collaboration mechanism discussed above, it is apparent that Company A (in collaboration with internal supplier) demonstrates the best performances in contrast to Company F. With its internal supplier, Company A was performing as a prototype of good practice in supply chain collaboration. This was in contrast to the performance with its external supplier since the Company tended to base all production processes on its own. Since Company A was the largest conglomerate agribusiness in Thailand, it had experience of the management of an integrated supply chain and buyer-supplier relationships, whereas Company F was a new entrant to the business and had limited experience and tenuous connections. However, it had to consider that Company A's performance was only with its internal supplier since they operated within the same company. As such, the company could monitor conveniently and control all supply chain activities. In addition, Company A's case was very unique since Company A was the only company, in Thailand, which owned the entire production system. Accordingly, Company A appeared to be the best performer in terms of the implementation of supply chain collaboration mechanisms. However, in practice, this case could not be implemented fully in other developing economies.

With regard to the practical implementation in the circumstances of developing economies, Company B appeared to be the best performer and it also provided good lessons to be learnt particularly with regard to issues of transaction costs and relationship management. Company B prioritised the importance of mutual trust and long-term relationship as key factors in driving supply chain collaboration. The company implemented its relationship-based strategy to select suppliers who gained satisfaction from their preferred-supplier status. The company developed CPS as the first milestone to setting clear mutual goals and benefits with supplier(s). The information and knowledge was shared frequently and routinely in order to monitor the performance and prepare to react to change or uncertainty

which might occur due to the dynamic nature of competitive business. The mutual trust and long–term relationship were developed accordingly. In comparison, it was found that other companies (except in the case of Company A regarding collaboration with the internal supplier) prioritised the performance of the suppliers rather than relationship and trust. Even though long–term relationships were developed in some cases, only Company B could gain mutual trust with the supplier(s). Consequently, the transaction cost could be shared and minimised. This indicated that relationship–driven strategy was important in developing mutual trust in supply chain collaboration as Benton and Maloni (2005) argued, the relationship–driven supply chain strategy was preferred to performance–based strategy for improving supplier satisfaction in buyer–supplier relationship.

CONCLUSION

Six case studies are selected with regard to export companies which own VHT plant. Seven supply chain collaboration factors are conducted for cross–case analysis. These are information sharing, decision synchronisation, incentive alignment, supply chain contracts, traceability, financial sharing, and relationships.

The cross case analysis illustrates similarities and differences between each company as shown in Table: 1. Only company A can achieve the CPS concept, their supplier is owned by the same company and they share both mutual goals and benefits. Moreover, the outcome shows that it is fundamental for every company to share a list of chemicals used. Nonetheless, most of the companies attempt to develop supply chain collaboration by sharing knowledge such as production techniques.

In order to enable supply chain collaboration, the CPS should be constructed as the beginning process of setting mutual goals, common interests, clear expectations, benefit sharing, and performance monitoring. Information sharing is one of the keys to achieving collaboration. Apart from the flow of products, information flows should be consistently linked to monitoring the performance of the members of the supply chain in conducting related supply chain activities.

The mango exporting business is very competitive and the flow of information is very dynamic. A quick response is needed from each supply chain member. The information should be regularly shared for greater responsiveness. However, it was found that most companies and their suppliers share only fundamental information (lists of chemical uses and applications) and informed quick response regarding changes in customer demand. This causes the problem of product scarcity during the mango production off–season. To solve the problem, the company and the supplier should consistently share related information in terms of production/demand plans, current performance, and time lines. Decision synchronisation should be applied for effective decision–making. The decision synchronisation can be described in the mango supply chain activity in terms of grading activity and transport. This benefits all parties in the supply chain as they can share their interests, capabilities and limitations when asking for support from other participating chain members.

The outcome shows that most companies outsource the grading and transport activities to their growers. These represent the development of collaboration between grower and exporter. However, only one company provides

incentive to their growers, which indicates a lack of incentive alignment. In addition, traceability is a fundamental requirement in terms of the export of agricultural goods. All companies apply a basket–labeling system in order to track and trace the source of a product. To achieve collaboration between grower and exporter, the relationship is an important factor. The outcome shows that most companies are agreeable with regard to having a long–term relationship with the growers.

The supply chain contract as part of contract farming should be considered in terms of practical implementation. Effective contracts should benefit all related parties. Although mango growers need the support of the DOAE and the Mango Growers Association in terms of price, the issue of product return and repurchase could be implemented regarding unaccepTable: product quality e.g. due to disease, insect, and chemical contamination. To motivate the performance of growers, incentive alignments should be applied. Company C is a good example of implementing incentive alignments with its suppliers, as the company provides a reward to those suppliers who have provided an outstanding performance.

With regard to relationships, it was found that all companies and suppliers prefer a long–term relationship. However, the number of suppliers should be a concern. Too many suppliers may lead to ineffective relationship management as it adds to costs, particularly with regard to facility support. Company D is an example of this issue. Although the company has a long–term relationship with its suppliers, the large numbers of suppliers obstruct the ability of the company to provide support.

In summary, this chapter presents six case studies and cross–case analysis. The analysis shows the collaboration between growers and exporters in the mango supply chain. Some factors already show evidence of collaboration. However, some factors require more collaboration between growers and exporters. In order to enhance the competitive advantage, supply chain collaboration should be developed. Mentzer, et al. (2001) stated that once collaboration begins with key supply chain members, it finally becomes routine, and the focus could turn to new relationships.

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