

**Exploring the Link Between
Supply Chain Management and
Transaction Cost Economics:
*A Cursory Evaluation of Export Mango and
Small-hold Banana Marketing in the Philippines***

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Introduction

Philippine agriculture in general faces constraints in productivity and marketing

In tropical fruit industry: inefficiencies along marketing chain abound

Logistics-related remedies are usual prescriptions

But efficiency of the entire marketing chain still needs to be substantially improved



Introduction

Need to frame the issues and constraints in a new light: new institutional economics and microeconomics of agricultural marketing

Supply chain management approach, transaction cost economics perspective

Going beyond the realm of logistics management



This Paper

Issues in agricultural marketing in the Philippines may be better examined from a supply chain management approach (SCM) using a transaction cost economics reasoning

The coordinated supply chain: a governance structure set up to economize on transaction costs

Case studies: Philippine export mango and small-hold banana marketing



The Philippine Tropical Fruit Industry

Tropical fruits contribute largely to the Philippine economy:

- Banana, pineapple, and mango are among the top crops in terms of area, quantity, and value of production
- Also among the country's top agricultural exports in terms of volume and value

The country also figures well in the international trade of major tropical fruits; esp. in world trade in banana, pineapple, and mango



The Philippine Tropical Fruit Industry

Table 1. Agricultural crop areas, Philippines, 2003-2005.

Item	2003		2004		2005	
	in '000 ha	% of Total	in '000 ha	% of Total	in '000 ha	% of Total
Total Crops	11,930.0	100.0	12,231.0	100.0	12,034.2	100.0
Palay	4,006.4	33.6	4,126.6	33.7	4,070.4	33.8
Corn	2,409.8	20.2	2,527.1	20.7	2,441.8	20.3
Coconut	3,216.5	27.0	3,258.6	26.6	3,243.3	27.0
Sugarcane	383.9	3.2	388.6	3.2	368.9	3.1
Banana	408.0	3.4	414.5	3.4	417.8	3.5
Pineapple	47.7	0.4	48.2	0.4	49.2	0.4
Coffee	131.8	1.1	131.2	1.1	128.0	1.1
Mango	155.9	1.3	158.9	1.3	164.1	1.4
Tobacco	41.7	0.3	33.8	0.3	29.6	0.2
Abaca	121.5	1.0	127.5	1.0	136.0	1.1
Others	1,006.6	8.4	1,015.9	8.3	985.1	8.2

Source: Bureau of Agricultural Statistics (Philippines)



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The Philippine Tropical Fruit Industry

Table 2. Agricultural Production by Type of Crop, Philippines, 2003-2005
(quantity in thousand metric tons; value in million pesos at current prices)

Crop	2003		2004		2005	
	Quantity	Value	Quantity	Value	Quantity	Value
Total	71,311.9	330,702.3	75,150.7	383,803.1	73,725.9	409,506.8
Palay	13,499.9	117,989.0	14,496.8	136,994.6	14,603.0	155,668.1
Corn	4,615.6	32,540.2	5,413.4	47,204.8	5,253.2	40,291.7
Coconut	14,294.2	39,023.2	14,366.2	51,718.2	14,824.6	52,775.5
Sugarcane	23,978.4	23,498.8	25,579.2	21,742.3	22,917.7	22,688.5
Banana	5,369.0	30,066.2	5,631.2	35,476.9	6,298.2	43,520.8
Pineapple	1,698.0	10,510.3	1,759.8	8,869.4	1,788.2	9,334.5
Coffee	106.4	3,856.6	102.9	3,943.0	105.9	4,666.5
Mango	1,006.2	14,660.0	967.5	16,137.6	984.3	16,674.7
Tobacco	52.9	2,404.3	48.3	2,094.2	45.1	2,097.6
Abaca	69.8	1,384.2	74.5	1,915.1	74.0	2,422.3
Others	6,621.7	54,769.3	6,710.9	57,707.0	6,831.6	59,366.7

Notes: Details may not add up to total due to rounding.

Source: Bureau of Agricultural Statistics (Philippines)

The Philippine Tropical Fruit Industry

Table 3a. Volume of top agricultural exports, Philippines, 2003-2005.

ITEM	2003	2004	2005
Volume of Top Exports ('000 MT)			
Coconut Oil (Crude and refined)	1,186.36	959.40	1,152.32
Banana, fresh	1,829.38	1,797.34	2,024.32
Pineapple & Products	500.53	527.56	536.72
Desiccated Coconut	106.80	105.83	125.54
Tobacco, Manufactured	6.32	17.82	21.06
Tuna	85.03	78.33	45.05
Shrimps & Prawns	19.08	15.34	13.28
Fertilizer, Manufactured	319.19	336.03	410.21
Milk and Cream & Products	26.25	32.93	37.55
Seaweeds & Carageenan	41.19	44.26	30.81
Mango, fresh	35.78	33.66	31.27

Source: Bureau of Agricultural Statistics (Philippines)

The Philippine Tropical Fruit Industry

Table 3b. Value of top agricultural exports, Philippines, 2003-2005.

ITEM	2003	2004	2005
Value of Total Agricultural Exports (FOB in Million US\$)	2,311.02	2,506.70	2,691.19
Value of Top Exports (FOB in Million US\$)			
Coconut Oil	504.86	577.79	657.22
Banana, fresh	333.00	326.40	362.58
Pineapple & Products	169.18	176.65	204.28
Desiccated Coconut	95.74	99.74	127.14
Tobacco, Manufactured	40.07	102.37	112.81
Tuna	156.93	155.33	102.01
Shrimps & Prawns	125.46	112.35	95.08
Fertilizer, Manufactured	49.47	66.91	92.27
Milk and Cream & Products	58.81	74.43	79.94
Seaweeds & Carageenan	80.30	89.89	71.90
Mango, fresh	31.01	28.74	26.63

Source: Bureau of Agricultural Statistics (Philippines)

The Philippine Tropical Fruit Industry

Table 4. Percent share of selected Philippine exports in world market, 2004.

Commodity	Trade		Philippine Share (%)
	World	Philippines	
Volume of Exports ('000 MT)			
Coconut Oil (Crude and refined)	2,032.53	959.40	47.20
Banana, fresh	16,262.61	1,797.34	11.05
Pineapple & Pineapple Products	3,532.25	527.56	14.94
Mango, fresh	908.44	33.66	3.71

Source: Bureau of Agricultural Statistics (Philippines)

The Philippine Tropical Fruit Industry

Philippine mangoes:

- the “Carabao Mango” also known as “Manila Super Mango”, is popular in the international market for its distinct sweet taste.
- 95% are consumed locally; of these, 75% are consumed as fresh fruit and the rest are processed into various product forms such as dried mangoes, puree, and juice concentrates.
- Export mangoes are mainly fresh fruits but puree, dried, and concentrated juices have also been finding recognition in the export market.
- Stiff competition in the international market renders need for an efficient marketing system



EXPORT

DOMESTIC

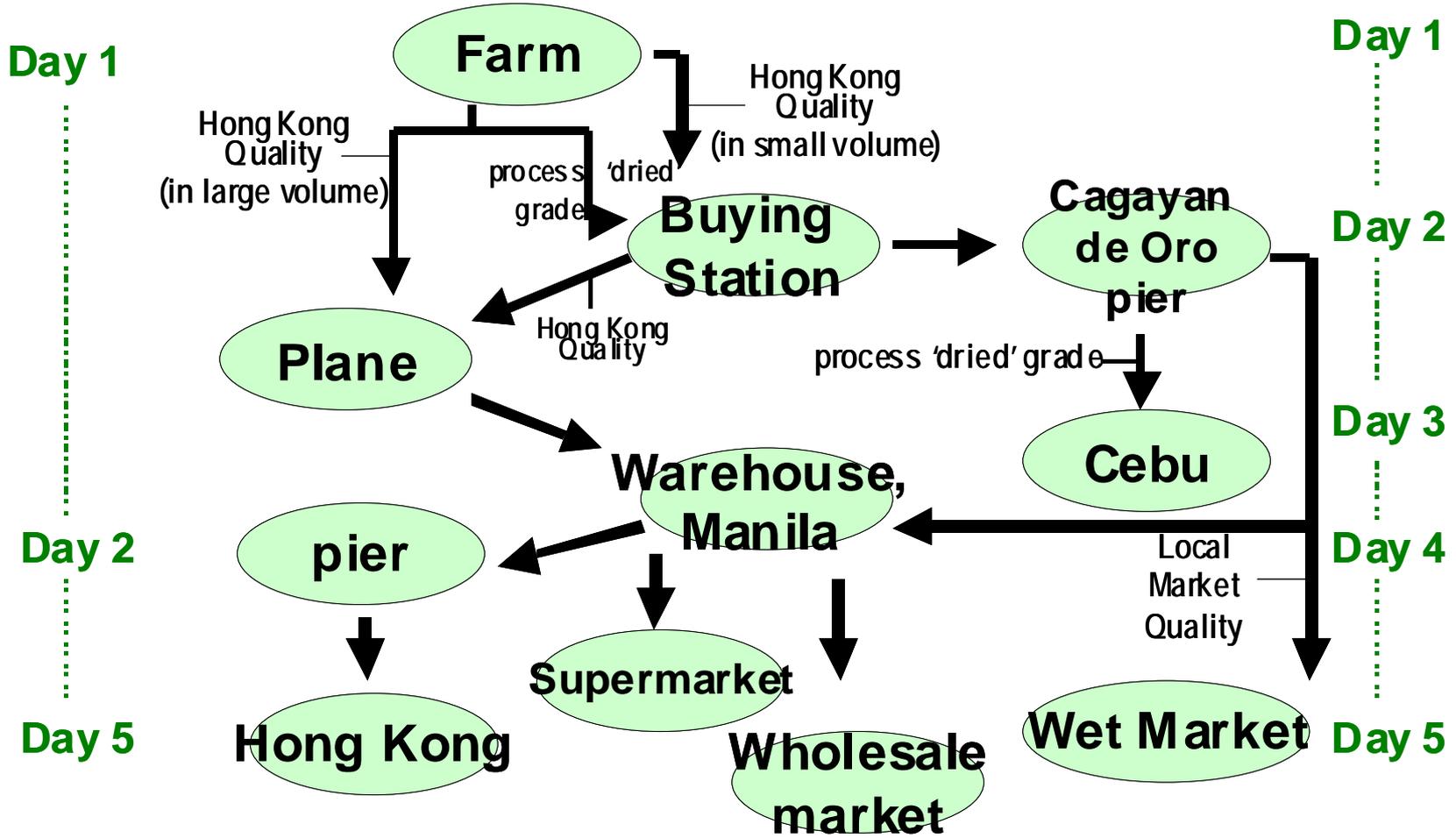


Figure 1. Mango supply chain in Davao del Sur and Davao del Norte, Philippines: product flow (2006).



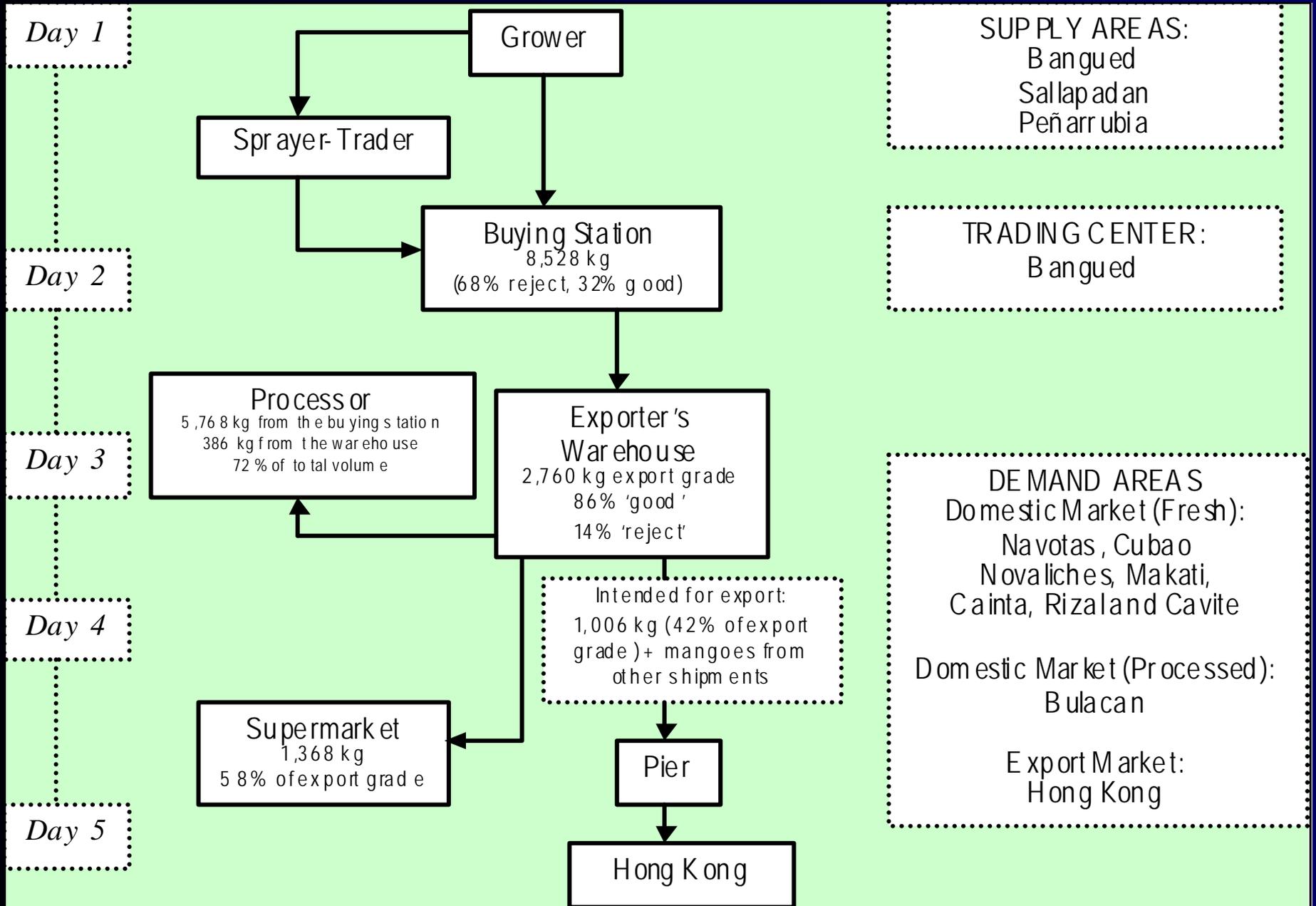


Figure 2. Mango product flow: one shipment from Bangued, April 2006.

Mangoes wrapped and carton-packed (inset are export quality ones)....



Assembly and sorting....



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Weighing and transporting

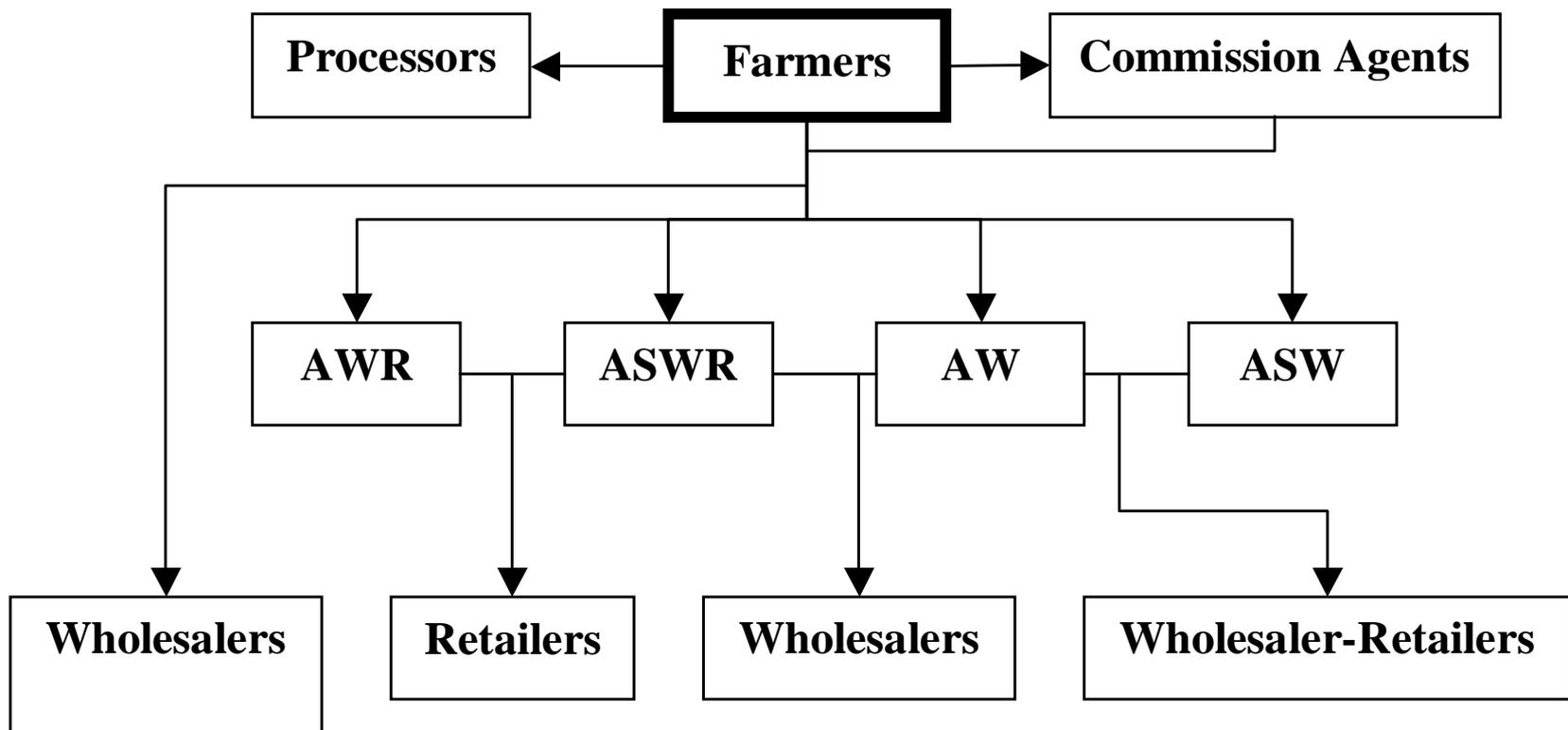


The Philippine Tropical Fruit Industry

Philippine bananas:

- the most important fruit crop in terms of quantity and value of production, and export earnings
- The Philippines is a consistent banana exporter, securing about 10% of the world market share for this fruit
- almost 75% are grown on small-hold farms and are largely consumed domestically
- important in poverty alleviation goal





AWR – Assembler-Wholesaler-Retailer
 ASWR – Assembler-Shipper-Wholesaler-Retailer
 AW – Assembler-Wholesaler
 ASW – Assembler-Shipper-Wholesaler

Figure 3. Marketing system participants and general marketing flow of smallhold bananas, Philippines. (Source: PCARRD 2006)

Small-hold bananas on roadsides....



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...and on hillsides



Bananas at assembly point



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The Philippine Tropical Fruit Industry

Perennial problems:

- Low value addition, improper product handling, inadequate post-harvest facilities, poor infrastructure, and inefficient marketing information flow
- Conventional remedies proposed: raising investment in facilities and infrastructure, pushing government programs on support services

Viewing the problems through a new lens:
transaction costs economics and the supply chain



Why supply chain management

Supply chain management (SCM) the name of the game in domestic and foreign markets

The supply chain: “an association of customers and suppliers who, working together yet in their own best interests, buy, convert, distribute, and sell goods and services among themselves resulting in the creation of a specific end product”

(National Research Council [2000] in Wysocki, et al. [2006]).



Why supply chain management

Conventionally, supply chain management reduces to logistics management: getting the logistics right

However, there are “frictions” or transaction costs along the supply chain that may not be relieved by logistics management

Whenever “frictions” or transaction costs are present, it is inefficient to rely on the market, even when the logistics are right



Transaction Costs

The costs of using the market mechanism

Distinguished from the usual production and marketing costs, which are the costs of transforming inputs into outputs, and moving them along the chain

Costs of contracting, negotiating, and consummating an exchange

Minimizing transaction costs, above the usual logistics problems, can raise efficiency



Sources of Transaction Costs

Information asymmetry

Adversarial relationships

Uncertainty: opportunistic behavior, renegeing on promises, "surprising" opponents

Surveying potential suppliers, ascertaining the quality of the inputs, comparing prices, transporting the products, and assuring quantity and volume all entail transaction costs.



Transaction Costs and Governance Structures

In transaction cost economics literature: transaction costs are economized by assigning transactions to governance structures in a discriminating way

Governance structures are “the organizational frameworks within which the integrity of a contractual relation is decided.”

“...any institutional arrangement that serves to influence the exchange process.”



Transaction Costs and Governance Structures

The shift from a traditional supply chain to a coordinated one can be seen as a response to minimize the frictions in the market and to raise overall efficiency of producing and moving products.

Proposition: The coordinated supply chain is a governance structure formed to minimize transaction costs



SCM and the Tropical Fruit Industry

Analysis of the coordinated supply chain as a governance structure can be anchored on bringing down costs of transacting and contracting associated with marketing the products from the farmer to the middlemen to the retailer and to the final consumer.

Adversarial relationships among the agents, information asymmetry, and opportunism characteristic of the current supply-chaining mode should not prevail.



SCM and the Tropical Fruit Industry

Preservation of quality and quantity along the chain is a must

But requires an incentive structure that allows all players in the chain to internalize this goal.

Coordination and long-term relations among agents is required in a well functioning supply chain.

Information on volume and quality of inputs and products, as well as timing of delivery, need to be available and well disseminated.



SCM and the Tropical Fruit Industry

However, areas for improvement concerning logistics and technology remain fundamental issues that need to be addressed whatever governance structure would eventually arise.



Case Studies on Mango and Banana: Transaction Cost Issues

Price Information Asymmetry at the Farm Level

- In mangoes, growers do not have information on where their produce are destined, whether for the local or export markets.
- Access to such information could have some bearing on price setting at the farm gate.
- But since price signals come exclusively from agents and traders, growers are reduced to becoming mere price takers.



Case Studies on Mango and Banana: Transaction Cost Issues

Adversarial Marketing

- Loyalty of growers with traders is mostly non-existent and hence, repeated transactions cannot be ensured
- “pole-vaulting” tactic is also common among traders, especially in mango
- This disturbs the supply chain due to the inability of the affected trader or exporter to raise the needed volume
- A better option: long-term relations that preserve the integrity of contracting



Case Studies on Mango and Banana: Transaction Cost Issues

Non-differentiated Pricing at the Farm Gate

- In both banana and mango, the buying practice sets the price on an “entire lot” or “all-in” basis, where the trader bulk buys all the harvested mangoes at a single price.
- Price differentiation only occurs when the trader sorts and prices the fruits by quality (size and appearance)



Case Studies on Mango and Banana: Transaction Cost Issues

Farm Gate Prices As Inadequate Signals for Farm Productivity Enhancing Investments

- Pricing system does not provide the proper incentive structure for farmers to invest in quality enhancing technologies and farm management practices
- In banana, this pricing inefficiency is compounded by well-entrenched traditional practice of volume discounting.
- Given no clear internalization of property rights among growers, product quality proves to be their least concern



Coordinated Supply Chaining to Curb Transaction Costs

Supply chain related recommendations, like the “cluster approach” in mango must be situated in the context of transaction cost-governance structure perspective

Informal grouping of farmers promotes collective action and responsibility that may translate to price discounts for bulk purchases of farm inputs and to synchronized pest management practices among farms



Coordinated Supply Chaining to Curb Transaction Costs

Relational marketing between growers and exporters hopes to minimize information asymmetry and the need for layers of middlemen.

A coordinated mango supply chain can be set up for growers and traders that enables full and transparent exchanges of information on prices, quality, and volume, among others



Coordinated Supply Chaining to Curb Transaction Costs

In banana, a key recommendation is to form a strategic cluster that involves synchronization of production and farm gate marketing operations

Acting alone and using the spot market mechanism, it would be costlier for each banana farmer to individually arrange for assembling and transporting the banana harvest to the market



Coordinated Supply Chaining to Curb Transaction Costs

In a coordinated supply chain, maintaining long-term relationships among different actors can encourage preservation of quality and volume along the chain

At the upstream, producers in a well functioning supply chain have the incentives to revise production process to improve quality and volume.



Coordinated Supply Chaining to Curb Transaction Costs

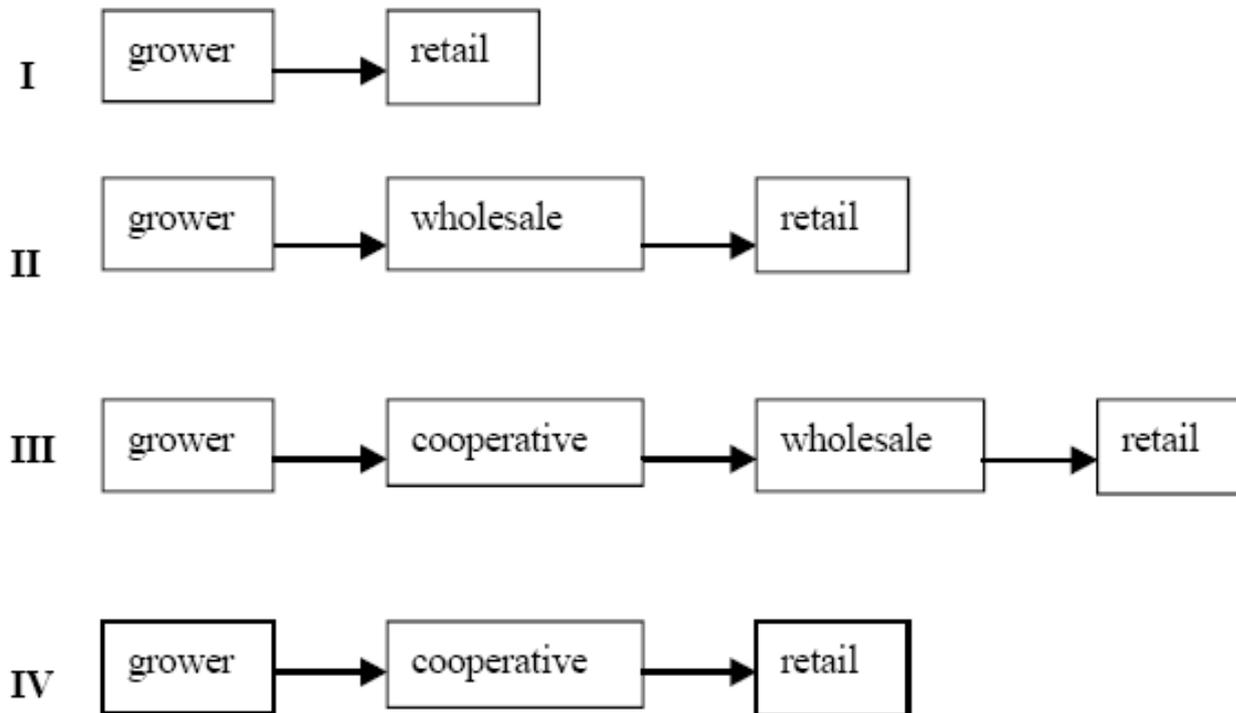
And at midstream, the middlemen, who source products from growers, will necessarily maintain the quality, and deliver the products to the final retailers.

Hence, maintaining contractual relations along the chain minimizes uncertainty and the producers' collective action rids the farm gate with disadvantageous price setting arrangements cited previously



The Case of Fresh Produce in the Netherlands

The cooperative auction (mode III) turned out to be the dominant governance structure to minimize transactions [Bijman 2006]



Annex Figure 1. Four marketing channels for fresh produce In Bijman [2006]

Concluding Remarks

The current traditional supply chaining modes cultivate relational contracting problems, asymmetry of information, and adversarial relationships

Traditional views of marketing efficiencies are thus inadequate.

Minimizing these “frictions” or transaction costs under a coordinated supply chain regime may translate to an efficient marketing system.



Concluding Remarks

The coordinated supply chain through the lens of transaction costs:

- Long-term relations and trade among agents are more personal.
- Contracting is done effectively and interdependence is prevalent.
- Information-sharing and decision-making are made more efficient throughout the chain than if the traditional market mechanism is used.



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