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Linking Farmers to Markets Through Cooperatives Vegetables Supply Chain Redesign Options for Kapatagan, Mindanao, Philippines

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“Improving the Efficiency of the Agribusiness Supply Chain and Quality Management
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Nerlita M. Manalili¹

ABSTRACT

The paper looks into the temperate vegetable industry in Kapatagan, an upland community in Mindanao, the Southern part of the Philippines. The intention in general is to identify ways by which smallholder vegetable producers are appropriately linked to markets through cooperatives with the end in view of increasing farmers' income. Specifically the paper documented existing vegetable supply chains in Kapatagan as well as other relevant chains, assessed the various chains' gaps and potentials in view of changing concepts and market requirements with supply chain and agro-industrial concepts as bases and identified entry points for chain enhancements.

INTRODUCTION

Improving agricultural marketing is a never ending thrust of the predominantly agricultural Asian region. Asian farmers have long been saddled with inefficiencies within the production to consumption loop amidst limited resources and changing consumer demands. Previous efforts to address these concerns were mainly focused on building wholesale markets, establishing cooperative assembly points and improved transport and marketing information. However, gains have been lagging behind efforts and challenges are usually compounded with new ones. For instance, farmers have to brace themselves with enhanced competition brought about by global free trade, as new and well equipped trade participants are ushered in, namely: shippers, packers, wholesalers and retailers. New marketing systems where food products are sourced directly from producers and shippers through supermarkets and large distributors without the benefit of conventional wholesale markets, leaves the marketing arena only to a privileged few mostly large scale operators with multinational concerns.

This leave Asian small farmholders all the more unable to compete with imported farm products. The irony of it all is that this is happening in their own domestic market. For these farming sector to survive, they need to be linked to different markets and be made competitive. The path towards that goal, however, is not that paved. To start with, they are dealing with unique products that are seasonal, perishable and variable by virtue of their agricultural and

consequently biological nature. Seasonality leads to supply problems of surpluses or shortages in a situation where demand is relatively constant, perishability requires storage and care in handling as well as speed in delivery, while variability demands sorting and grading among others, all in the name of consumer satisfaction. Secondly, farmers have long been purely production oriented and demands of times required them to embrace a market orientation to ensure that product will reach the market on time and at the best possible form desired by consumer. Lastly, the smallholder farmers are not empowered enough to undertake market linkages on their own and need to be brokered in the process.

The series of activities in agricultural marketing or agribusiness is like a chain where product damage incurred at any one level in the sorting to retailing chain of activities already affects quality and cannot be compensated by extra cautious handling in the succeeding levels. To ensure better coordination of these activities at any level requires supply chain approach. In agribusiness, supply chain is known as a network of stakeholders contributing to the planning, production and distribution of products from farm to plate. The overriding objective of chain management is improved performance through a more effective flow of product.

This chain management at smallholder level is best done through collective effort or through cooperatives. While government and private sector controlled marketing are possible options, in government controlled supply chain, there is always the risk of conflict of interest owing to multiple roles of trading, advisory and regulatory. Private sector controlled chain, on the other hand, is associated with large marketing margins that do not necessarily trickle down to the farmers and are attributed to too many participants in the marketing component of the supply chain.

While success records of cooperative in Asia are not encouraging, cooperative marketing is still being promoted as an approach to meet the problems of smallholders, those of marketable surplus and too much dependence on the private traders (APO 1989). Despite high failure rates, cooperatives by virtue of their size, technology requirement, and proximity to and knowledge of the area of production are still the better option to service the marketing needs of rural agricultural producers. The key to successful marketing is the effective management rather than the level of sophistication of the marketing systems. As such, measures to enhance cooperative performance should focus on improving their organizational management, operational efficiencies and functional linkages. It is within this premise that the paper aims to identify the extent to which agricultural marketing cooperatives can be integrated in agricultural supply chain and help improve farmers' income.

The supply chain focused on by the paper is the vegetable supply chain in Kapatagan, Mindanao, Philippines. It is the same site of the project on "Improving the Efficiency of the Agribusiness Supply Chain and Quality Management for Small Agricultural Producers in Mindanao", jointly carried out by Muresk Institute of Agriculture, Curtin University of Technology; University of the Philippines Mindanao; and SEAMEO SEARCA with fund support from the Australian Centre for International Agricultural Research (ACIAR). The paper draws much of the discussion from the initial results of the said project.

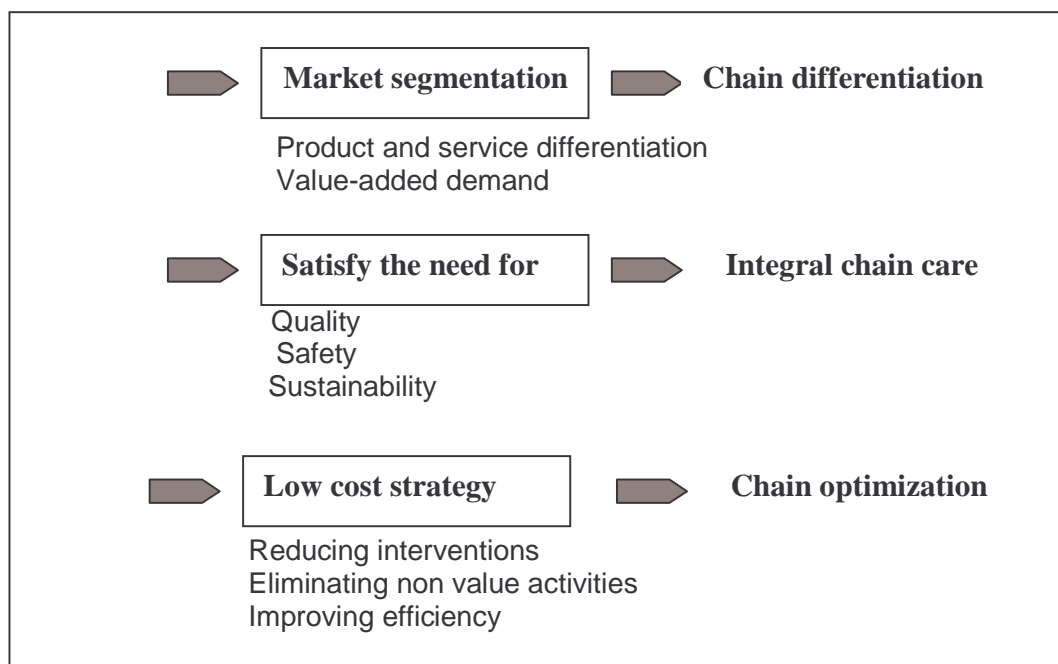
II. OBJECTIVES

The paper's intention in general is to identify ways by which smallholder vegetable producers are appropriately linked to markets through cooperatives with the end in view of increasing farmers' income. To achieve this, the following specific objectives were carried out: a) process documentation of existing vegetable supply chain in Kapatagan; b) assessment of the Kapatagan supply chain in view of changing concepts and market requirements as well as in relation with other relevant chains for purposes of identifying gaps and potentials; and c) identification of entry points for chain enhancement

III. Review of Literature

A. SUPPLY CHAIN MANAGEMENT

A supply chain is a network of organizations contributing to the design, production and distribution of a product from its inception to its consumption by the final consumer, while supply chain management is the coordination and control of all activities within a supply chain with the goal of maximizing values (Sparling and Duren 1998) through lower transaction costs and increased margins (Roekel, et al 2002) and improving performance in one or more quality dimensions such as quality, time, cost, flexibility and environment (Trienekens, et al 2002), all for consumer satisfaction. The nature of product and demand characteristics influence the form the supply chain takes added Sparling and Duren such that if customers want products at the



Boselie (2002)

Figure 1. Current market driving forces

lowest possible costs, the chain will focus on producing high volume standardized products, minimizing production and distribution costs while if demand is for innovation or customized products, the chain will be built to facilitate maximum flexibility and adaptability. Boselie (2002) expressed a parallel view and further referred to the low cost strategy as chain optimization while the innovation and optimization which are ways of satisfying and segmenting the market were referred to as integral chain care and chain differentiation.

These market forces in a supply chain in (Figure 1) drive stakeholders to either adopt low cost strategy or to integral chain care by paying attention to quality, safety and sustainability, and chain differentiation through product differentiation and value adding whenever possible. These are done with due consideration that any planned intervention have critical decisions and outcomes with technical and economic implications. Supply chain interventions have to be assessed in terms of technical feasibility and economic viability, although striking a balance is not that easy since what is technically feasible may not always be economically viable (Fig. 2).

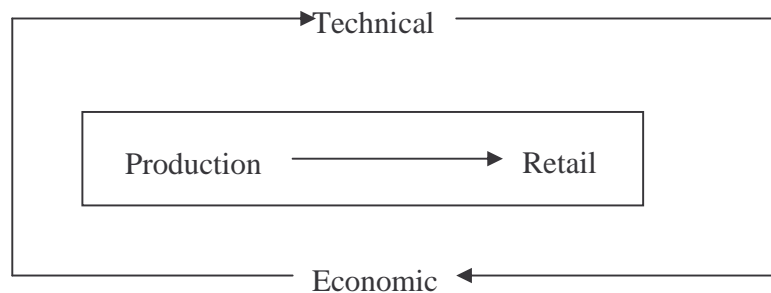


Figure 2. Technical and economic relationship of supply chain interventions

B. Supply Chain Redesign

The steps in supply chain redesign and analysis starts with definitions of redesign objectives followed by the redesign of individual subsystem and the process of interface within the chain. Since the project is still on-going and data analysis is in progress, the most that can be done at this point is to discuss chain improvement on redesign as a process and provide identified options in the case of Kapatagan. All these are undertaken in aid of strategy formulation to enable agricultural marketing cooperatives to help increase return to farmers as well as reduce impediments in the operation of an efficient supply chain.

C. Cooperative Issues and Challenges

Trade liberalization and globalization are market trends that push for cooperative efforts. The International Cooperative Association Asia Pacific regional assembly in 1997 sent the message to WTO that liberalization of agricultural trade should not be regarded as an end itself. Instead, it should only be involved to improve the functioning of agricultural markets, increase farm incomes, eradicate poverty, and promote socially and environmentally sustainable programs. Given the fact that agriculture in the region is usually carried out by family

members, it is their belief that more than ever they need to strengthen cooperative relationships to protect members' interest in the light of the WTO agreements.

Cooperatives still play a major role even at a period where strategic alliances between small and large enterprises are already in. In a study of 71 agribusiness enterprises, Manalili, (1998) found out that the small and medium enterprises (SMEs) still are usually powerless even if they are allied with large corporations (LCs) as they are still dependent on them in reaching their intended market. The study results show that cooperative endeavor afford SMEs greater competencies to directly shape their strategic options and market their produce. Through cooperatives, SMEs have facilitated raw material bulk purchase that reduced operating costs and collective bargaining that improved on prices for their produce. As competencies would have been acquired, cooperative potentials are identified along the area of market information sourcing as well as in technical, operational, and financial enhancement.

While the role of cooperatives cannot be overemphasized in village level marketing, the other concern is how to assess capabilities of cooperatives with the end in view of enhancing their operations and enable them to contribute to supply chain efficiencies.

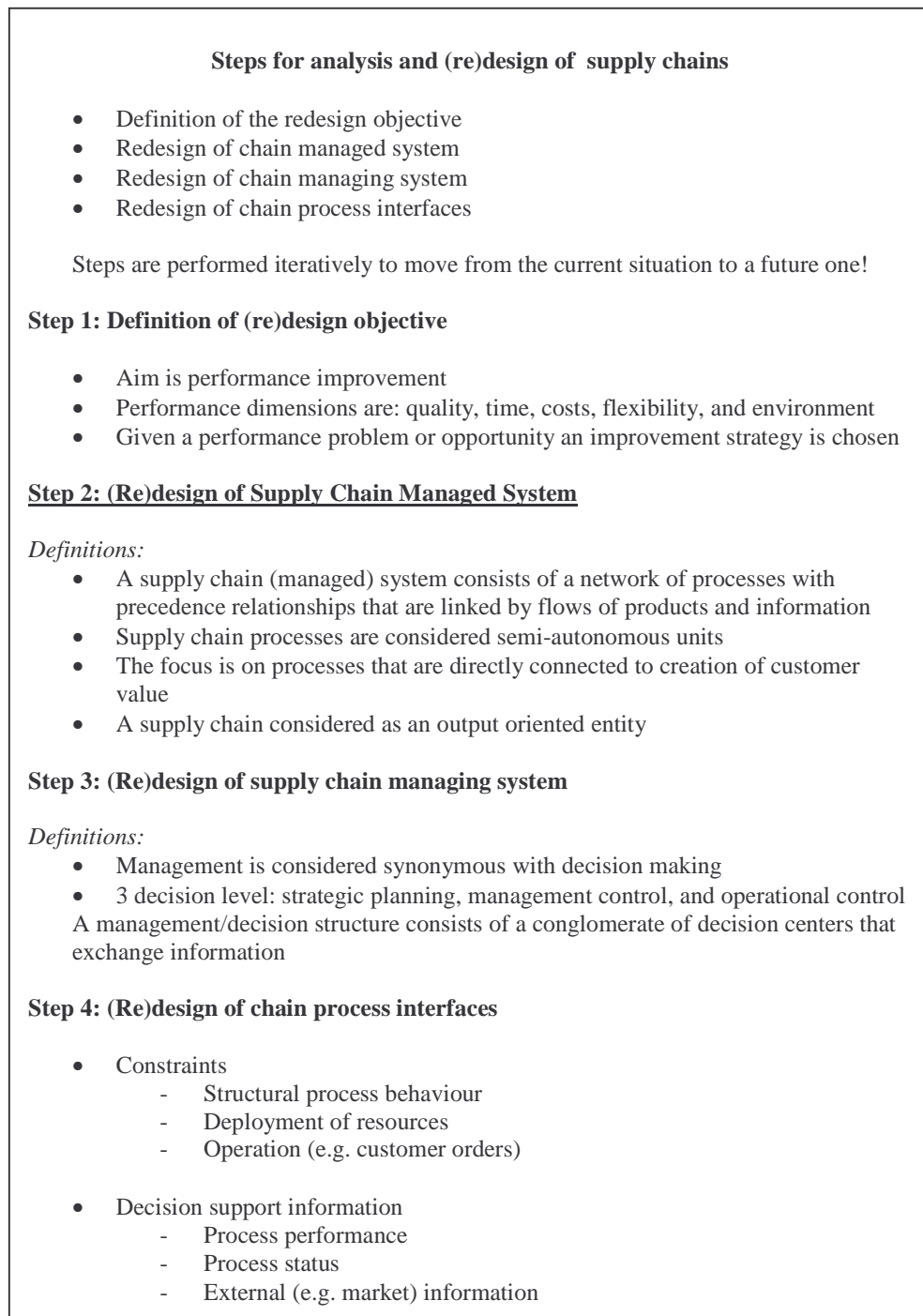
The capability assessment of a village level marketing unit or cooperatives, usually, focuses on the issue of size, appropriateness, and responsiveness to the demands of times. Size is considered owing to the degree of sophistication it connotes. Appropriateness, on the other hand, is considered as a measure of level of fit to varying requirements, while responsiveness, as a measure of one's ability to meet changing requirements. In his study of 52 agricultural marketing cooperatives and using four success measures, namely: a) longevity or number of years in business, b) member business growth, profitability and member satisfaction Bruynis (1995) found out that sufficient business volume, management training, having full time manager, accurate financial reporting and monitoring and using tools such as feasibility studies and marketing agreements to secure business volume commitments, among others are the key to successful cooperative operations.

IV. Methodology

Process documentation and evaluation of the two prevailing supply chain setups in Kapatagan, Davao del Sur namely: through individual farmers effort and through cooperatives was undertaken with the use of structured questionnaires and focus group discussions. Similarly, supply chains of other vegetable producing areas in other provinces of Mindanao, namely: Maragusan in Compostela Valley, Marilog in Davao City and Sumilao in Bukidnon were looked into. The chains were assessed in terms of their ability to deliver and meet market requirements while providing the most potential of increasing farmers income using supply chain and agro-industrial concepts. Supply chain enhancements were arrived at on the basis of market driven redesign strategies, namely chain optimization, integral chain care and chain differentiation.

In as much as the project from which the study was based is still ongoing, the identified options remain as such, until such time that all informations gathered were completely processed and a final evaluation would have been completed.

Figure 3 Supply chain analysis and redesign



Source: Supply Chain Management and Process Oriented Redesign, Jacques Trienekens, Wageningen University, The Netherlands, November 2002

V. Results

A. The Kapatagan Supply Chain

Kapatagan is a vegetable-producing village of gently rolling hills on the slopes of Mt. Apo in Davao del Sur Mindanao, Philippines. Its cultivated vegetable area is 1,500 to 2,000 hectares and it is home to 1694 farming households whose farm size is no more than two hectares on the average. With a year round mild temperature and short day spells, Kapatagan is conducive to raising vegetables such as cabbages, tomatoes, potatoes, carrots, Chinese cabbage, chayote, bell pepper, eggplants, and okra.

1) Structure.

The vegetable supply chain is participated in by seven stakeholders (Figure 4), namely planters/farmers, karyadors who moves products to trading posts on horsebacks, agents who

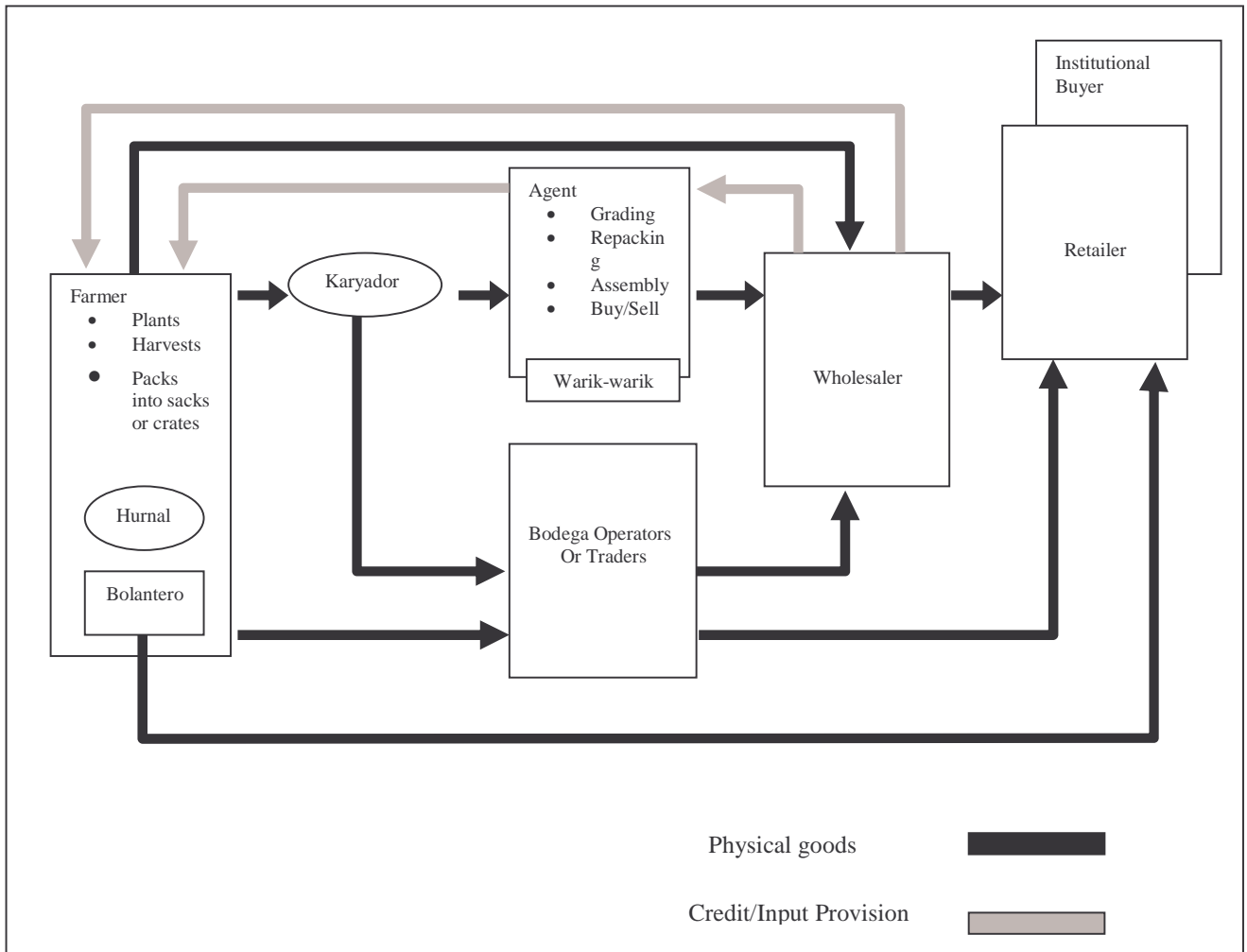


Figure 4 The Kapatagan Supply Chain

likewise double up as financing conduit for wholesalers to service credit requirements of farmers, retailers and institutional buyers. In selling their produce, farmers could either sell it to agents, traders who operates storage facilities known as bodega, wholesalers or to retailers. Note that activities in this chain not course to any cooperative group.

2) Process

Production, postharvest and marketing activities undertaken are of the barest minimum as follows:

a. Production

As per production survey, results showed that

- farms are not specialized where several crops are grown either together in different parcels or in a system of rotation.
- In terms of cropping pattern, there is no clear pattern that can be associated with the time of year
- costs of production are high and only cash inputs are calculated, leaving family labor unaccounted for
- low crop productivity reflects production inefficiencies that unless addressed no amount of improvement in the succeeding steps will lead to supply chain efficiency enhancements.

b. Postharvest

Packaging

- are of the simplest form where sacks are used for sayotes, leafy vegetables Cabbages, and pechays and wooden crates for tomatoes and potatoes.
- Sacks or crates are usually fitted to the brim
- top of the sacks are left uncovered and exposed subject to handling/tying bruises

Transportation

- The first level of product movement is from farmers to assembly or trading
- This is done either the kargadors or karyadors

Storage

- Storage facilities are of the typical enclosed hall with the barest amenities, usually the ground floor of a two-story abode or a portion of the single floor type
- Dimly lit with its wide doors, the only source of light and ventilation
- Functions as sorting, bagging/packing and storage area

Trading

- A covered trading post with cemented flooring and open sides is available but not fully functional, although strategically located along the roadside
- Trading post has become too high for the horses to go up to during unloading as soil in the periphery flooring had been eroded
- Traded vegetables are just deposited around the trading facility under direct sunlight, uneven dusty and rocky ground and left on that condition until trading transaction has been completed and truck for loading has arrived, which could last for hours
- The trading could either be initiated by the seller or the buyer (needs detailed description of the process) where the initiation process is followed by commodity inspection, weighing (using portable scales too small in size compared with the size of the sacks/crates and finally marking of the sacks/crates) by the buyer who likewise records the weight of the then traded vegetable. Seller waits until collecting trucks arrives while buyer moves on to the next seller
- Rarely cash transfer occur at trading time as sellers are usually paid by the buyers upon return trip from Kapatagan after vegetables have been sold to market destinations.
- Kapatagan are piled up next to each other with out semblance of care sometimes lightly kicked or even stepped on to control from rolling or falling, or even used as sitting place either by the seller or buyer while waiting for the final loading.

Hauling

- Vehicles used for loading vegetables are usually uncovered trucks (forward with open sides or the enclosed type large jeeps (weapon carriers) with windows
- Wooden crates of tomatoes are usually loaded side by side with sacks of leafy vegetables leaving lots of opportunities for bruising and other damages while in transit
- Truck loaders who are regular features of trucking services throws sacks/crates atop trucks or pushes hard inside jeeps oblivious of handling damages. They usually sit atop loaded vegetables while vehicle is in motion or while waiting for other goods to be loaded

c. Marketing

Most of the 207 farming households-respondents from Kapatagan sell their vegetables to buyers mostly wholesalers servicing wet markets. Only about 14 percent of the total respondents tried to go into retailing (Fig. 5). Half of the vegetable buyers servicing Kapatagan are residents of the area, while the rest come from areas as far as

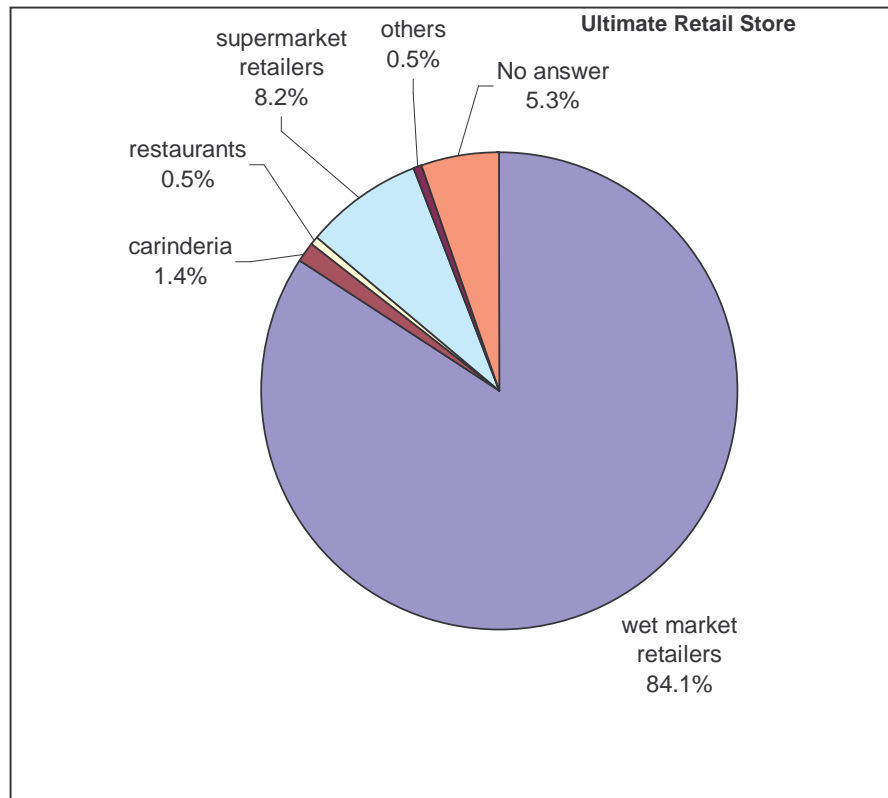


Figure 5. Ultimate retail store

two hours drive. These nonresident buyers are mainly from Davao where a big wholesale market called Metro Circle is located.

In terms of buyer selection the farmers' choice of buyers is greatly dependent on the latter's pick up arrangement of produce (89.2%), with strong customer base, most competitive price (85%), of good reputation (80.8%), and financially able (78%). More than half (53%) of the respondents feel that buyers should be able to supply farm inputs. Majority of respondents (85%) have [referred trading partners whom they have been dealing with for about five years.

While majority of vegetables growers perceived that consumers give high importance on buying vegetables of desired variety, size, shape and color, free from pests and diseases and physical damage/defects, it does not necessarily follow that these perception are translated into efforts to improve quality of produce.

Almost all of the respondents (97%) are not transacting with cooperatives. In fact almost half of them (44%) have not known any successful cooperative and those who did (21%) considered Kapatagan Livelihood Integrated Development Cooperative (Kalideco) as a successful cooperative

B. Cooperative Endeavor in the Vegetable Supply Chain

The supply chain activities in Kapatagan are no different from those of other temperate producing vegetable areas in Mindanao. However, the length and number of stakeholders vary

as well as the nature of cooperative involvement. A comparison of the vegetable supply chain in Mindanao is presented in figures 5 to 8.

1. The Kapatagan Livelihood Development Cooperative (KALIDECO)

Cooperative undertaking in Kapatagan is not that successful just like in any other areas in the country. There used to be six cooperatives operating in the area, namely: KALIDECO, MAREFAMULCO, KAFAMULCO, KAREFAMULCO, KYMPCO, and KIDECO. Of the six only KALIDECO (with farmers, kargadors and traders as members) is operational and has been so far the past nine years. KALIDECO's success has been attributed to closed financial and operational monitoring, attributes lacking in the five other cooperatives. In line with its assembly, hauling and storage services (Fig. 6), Kalideco has just recently added information facilities with specific features as follows:

- Communication facility of Kalideco has been in commercial operation for the past six months
- Used by trader’s men or agent to inform traders/financiers the volume of vegetable available
- Used by farmers occasionally to get information on Cagayan prices and supply available
- Call fees charged are 30% higher than regular call charges
- Accepts service call where intended call recipients are informed of the time of day the caller expects him to receive his call. A ₱20 service fee to inform recipients is added on to call charges

Marketing used to be an activity engaged in by Kalideco, however, bad experiences with fly by night traders or non Kapatagan resident traders made them to discontinue marketing services.

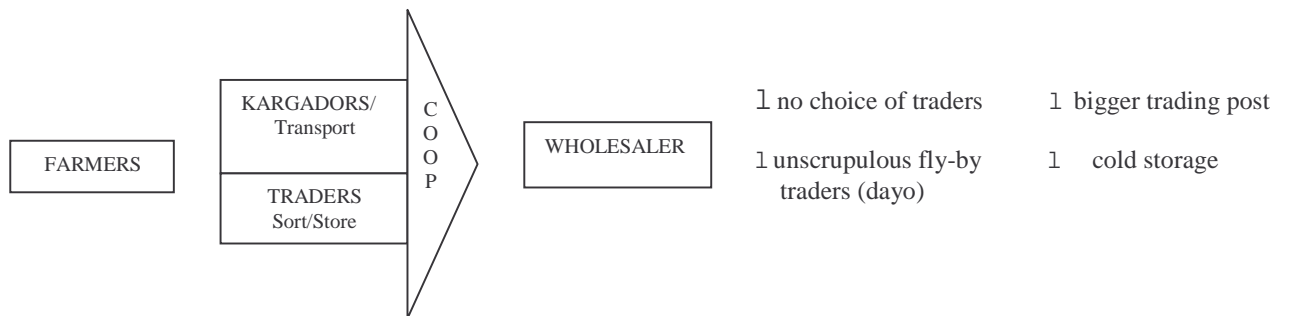


Figure 6 KALIDECO

2. Marilog

The cooperative role in the Marilog vegetable supply chain is mainly on input provision (Fig 7). For marketing to be a cooperative activity is on the wishlist of farmer cooperatives. Their major problems are production related particularly pest infestation and soil acidity

3. Maragusan

Cooperative role in the Maragusan supply chain includes credit and marketing services (Fig 8). Of all the cooperatives visited, that in Maragusan seems to be the strongest whose capitalization has grown from 700 to 1.8 million pesos in a span of 10 years. The cooperative success was attributed to strict adherence to by laws, good management and monitoring and control measures. The only problem the Maragusan vegetable farmers have is the inaccessibility of their produce during bad weather. To further enhance cooperative activities Maragusan farmers look forward to having refrigerated vans so they can move their products to the market faster.

C. Firm Managed Vegetable Supply Chain

The farm visited in Sumilao, Bukidnon operates as a family owned corporation where production and postharvest activities are undertaken by the farm, the marketing by an independent firm in Manila (Fig.9). Products are transported in refrigerated vans to the airport and airlifted to the institutional buyer, a fast food chain in Manila. While the firm is affected by changing customer requirement, business is still good and a planned expansion is in the offing.

D. Supermarket Driven Vegetable Supply Chain

A number of supermarkets in Manila were visited to assess their potentials as future markets for the Kapatagan vegetables. At the onset, potentials were promising judging by the planned expansion nationwide, Mindanao included, by the supermarkets visited. The S&R and Big R supermarkets, for instance, are planning to expand from their 2-3 store level to 10-15 by year 2003. Further assessment, however, shows that currently there is no market matching between the supermarkets and Kapatagan vegetable producers in terms of quality, volume and payment terms. The supermarket driven supply chains are shown in Figures 10, 11 and 12.

The supermarkets' assessment of the Mindanao vegetable industry is that it is just a small one, Davao particularly. With their concept of one supplier one store, Davao's vegetable volume is too small to meet their requirements, more so Kapatagan. Even if volume is met, there is still the problem on the supermarkets' preference to deal with a single individual for a particular area, regardless of whether they are source from a single or multiple producers which currently is far from the situation in Kapatagan.

Quality is likewise a non-matched area as there is no meeting point, judging from the way the Kapatagan vegetables are handled and from the rigid quality requirements of the supermarkets. A supermarket even cited that vegetables from Mindanao particularly carrots are not as good tasting as those sourced from Luzon.

Supply Chain in other vegetable producing areas in Mindanao

Figure 7 Marilog

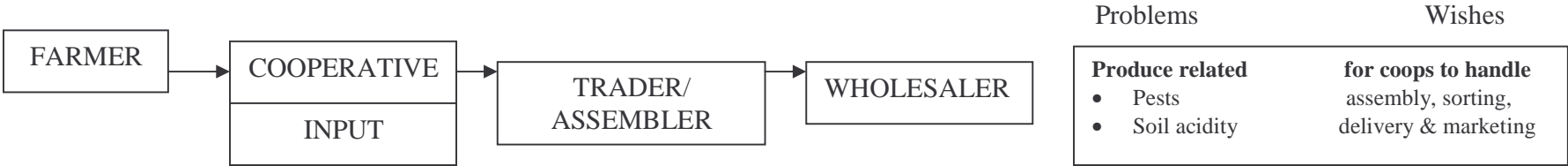


Figure 8 Maragusan

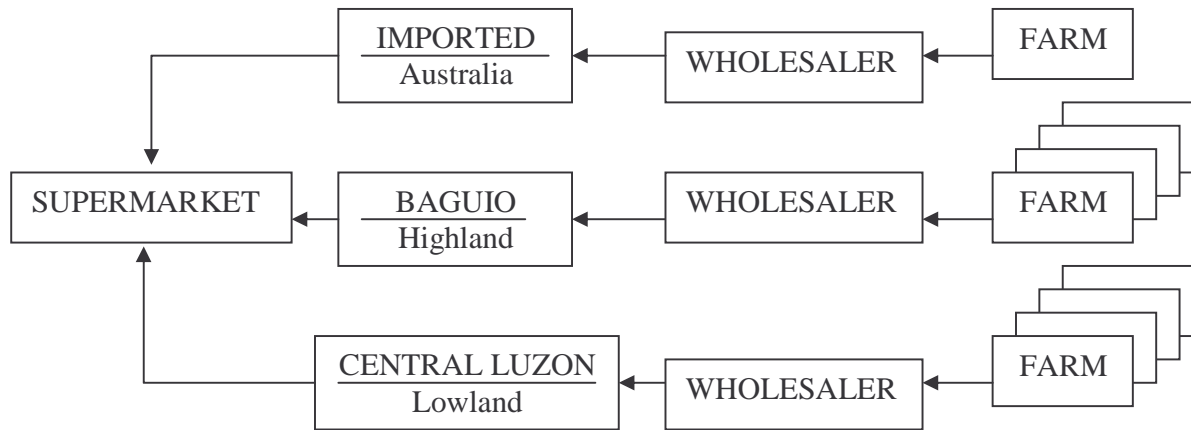


Figure 9 Firm Managed Supply Chain



Supermarket driven vegetable supply chain

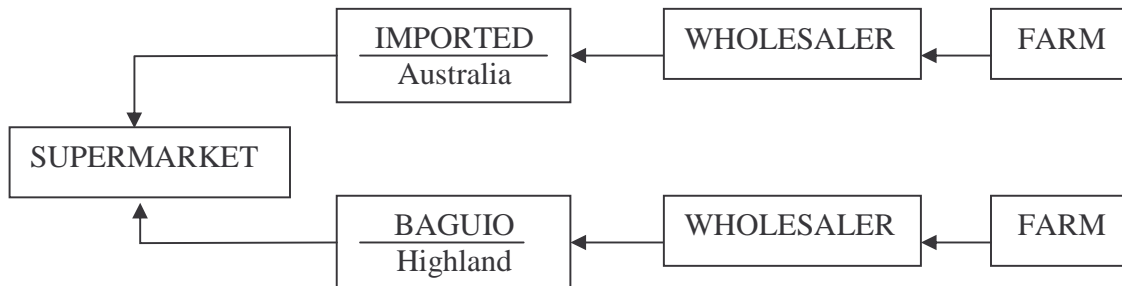
Figure 10 S&R Stores (2 stores)



Scheme

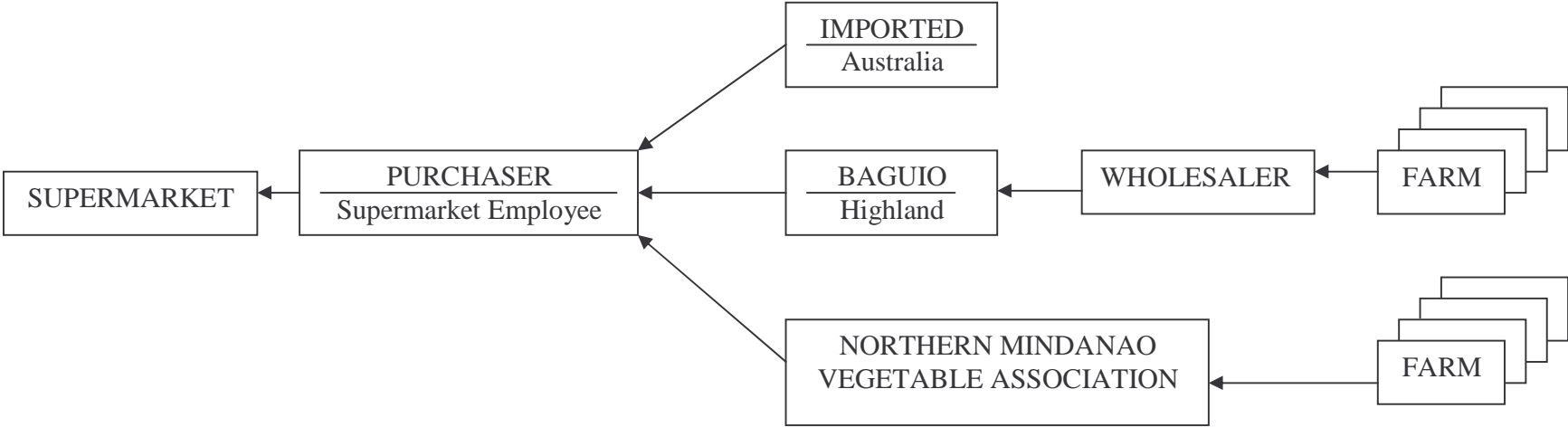
- One supplier one store
- Spot check forms monthly
- Weekly order placement on daily volume requirements
- 15-90 days payment (Average 30 days)

Figure 11 Shopwise (3 stores)



- Multi-supplier
- 90 days payment scheme

Figure 12 Big R Stores



Another major non-matched point is the terms of payment. Supermarkets usually pay suppliers on a 30 day term. Farmers, however, need to be paid as soon as their goods are sold by their traders, and a week payment term is already too long for them. This points to the length of fund bridging that the traders shoulder and this could very well be where the farm gate and trader price differential goes.

If a market matched between Kapatagan vegetable producers and supermarkets are to be pursued, then the areas that the project has to look in depth are quality, volume, price and purchase payment terms.

VI. Analysis and Initial Findings

A number of issues surfaced in the course of the initial assessment of the post production activities and potential market and they are as follows:

1. Determining appropriate post harvest production facility requirement

The inadequate post harvest facilities and the seeming lack of quality awareness on the part of the vegetable producers are enough indicators that post harvest is a major concern in the area. The problem, however, does not end there owing to a difference in opinion as to what facilities are needed more so prioritized.

A case in point is cold storage. A government line agency is working on the putting up of cold storage in a nearby area. Some farmers, however, are of the opinion that a refrigerated van will meet their requirements more than a cold storage. While ideally one is a requirement of the other, a post harvest plan based on a well conducted need assessment coupled will reduce conflicting view on the issue. This conflict if not appropriately addressed will only pull efforts apart when actually their objectives are geared towards the same goal, that of improving the quality of Mindanao's produce.

2. Farming Decisions Greatly Anchored On Financial Availability and Source

The farm decision of producers are dictated by their financial requirements and if ever met further dictated by source, the same way that the mode of payment for their produce once harvested provides the incentives or disincentives to produce more. This being the case a deeper look into the types of financing source and the purchase payment terms required by the farmers and how they are currently met by the traders will very much enhance analysis of the supply chain.

3. Farmers Turned Traders

There are cases cited where farmers turned into traders. Documenting success and failure aspects of the said role switch will enrich further one's understanding of the chain. The ease or difficulty of entry to trading activity by a farmer will be gained from the said documentation. Likewise, questions as to whether the farmer turned trader have in any way help alleviate the problems of the farmer group from where he originated as well as what the impacts on the state of social relationship of the former to the latter are interesting insights to look at.

VII. Identified Supply Chain Redesign options

Following Trinekens (2002) steps in analyzing and redesigning supply chains, the Kapatagan supply chain will assess in terms of the managed system or the components of the chain itself, the managing system or the decision-making component, which in this case is targeted to be the cooperatives and the interface between the two. For the purpose of the paper and in as much as project data analysis are still in process the redesign activity undertaken is only at the managed system part. The rest will be undertaken once a complete evaluation would have been warranted.

The Managed System

In the case of Kapatagan the following options may be considered depending upon the supply chain redesign objective.

| objectives | Strategies | Entry points | Identified market | Supply chain model |
|--------------------------|---|--|---|---|
| 1. chain optimization | Low cost strategy <ul style="list-style-type: none"> • Reduce intervention • Reduce efficiencies | Transport, sorting and storage activities by karyadors/agent be done by cooperative | Wet market (where low cost strategy will work) | Marilog and Maragusan model (assuming road network will allow) |
| 2. Integral Chain care | Meet requirements on <ul style="list-style-type: none"> • Quality • Safety • Sustainability • innovations | In addition to #1 <ul style="list-style-type: none"> • quality control w/ standards • staggard planting • credit services | Supermarkets (Mindanao based for a start) there is price premium for quality | S&R, Shopwise and Big R model |
| 3. Chain differentiation | Segment Market, find your niche <ul style="list-style-type: none"> • add value | All of #2 plus special attention to deliver a customized | Select an institutional buyer | Sumilao, Bukidnon model |

| | | | | |
|--------------|---|--|--------------------------------------|-----------|
| b. Variation | <ul style="list-style-type: none"> differentiate product | product For enhanced control, coop run enterprises on <ul style="list-style-type: none"> trucking postharvest processing | Supermarkets and other market niches | New model |
|--------------|---|--|--------------------------------------|-----------|

VIII. CONCLUSION

A. A market orientation is a prerequisite of the vegetable industry (or any agricultural industry) for that matter for reasons as follows:

- an oversupply out of a poorly planned production is a sure ticket to negative return on investments
- the perishable nature of products cannot withstand prolonged storage or unnecessary physical movement in case of sudden market shift out of erroneously identified market

B. While potentials are greatest when prices in the market are high, the greater challenge is to survive the lean times to be able to stay in the market in time for the peak points

C. Basic to any agricultural chain enhancement is ensuring that efficiencies at the production side is addressed as no amount of post production chain improvement will substitute for a poor product

D. Cooperatives are still seen as the way to link smallholder farmers, to markets and enhance their income. However, cooperatives integration to any supply chain must be well assessed in term of potential contribution to the chain in a way that it will lead to smoother product flow at while at the same time meeting market requirements.

E. Supply chain approach has a lot of promising potentials particularly at a village level marketing or cooperative undertaking. However, redesigning supply chains more than market satisfaction should likewise be able to meet farmer aspirations for only then can sustainability in the chain be achieved.

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