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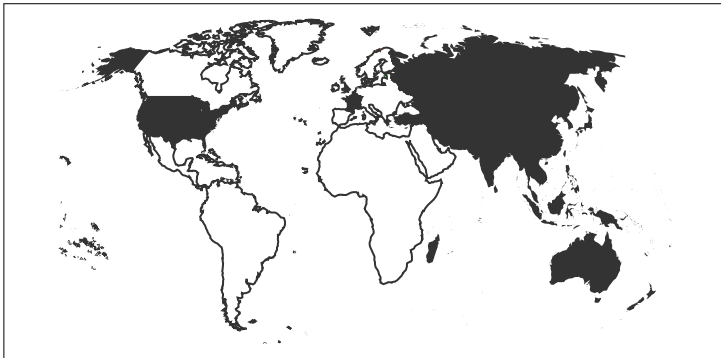
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Adding Value to Fresh and Processed Produce through Product Certification

Togar Alam Napitupulu
Ronnie S. Natawidjaja
Josefina M. Lantican



ESCAP is the regional development arm of the United Nations and serves as the main economic and social development centre for the United Nations in Asia and the Pacific. Its mandate is to foster co-operation between its 53 members and nine associate members. ESCAP provides the strategic link between global and country-level programmes and issues. It supports Governments of the region in consolidating regional positions and advocates regional approaches to meeting the region's unique socio-economic challenges in a globalizing world. The ESCAP office is located in Bangkok, Thailand. Please visit our website at <www.unescap.org> for further information.



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CAPSA-ESCAP

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Objectives

CAPSA promotes a more supportive policy environment in member countries to enhance the living conditions of rural poor populations in disadvantaged areas, particularly those who rely on secondary crop agriculture for their livelihood, and to promote research and development related to agriculture to alleviate poverty in the Asian and Pacific region.

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Togar Alam Napitupulu
Ronnie S. Natawidjaja
Josefina M. Lantican

CAPSA-ESCAP

Jalan Merdeka 145, Bogor 16111

Indonesia

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Foreword

CAPSA-ESCAP has consistently undertaken its mission together with its collaborative partners in the region in addressing the alleviation of poverty through implementation of relevant activities. Inter alia these include providing informed policies to the respective central and local government/policy makers; and equipping farmers, farmer associations and private agribusiness players with information that enables them to take advantage of opportunities that ultimately increase incomes. In the same spirit, it is also in line with the mission of CAPSA-ESCAP to provide researchers with new updates that would further enhance their knowledge, and, in turn, benefit poor farmers and poor communities throughout the region.

In an increasingly open and global economy, product certification is important to ensure that consumers get what they want at a price they are willing to pay. At the same time a premium price structure becomes an incentive for farmers to produce high quality, certified produce. This has happened where farmers from any part of the world were able to penetrate the European market with its EUREGAP certification system. Specifically, mention needs to be made of the upcoming 2015 common economy of ASEAN. With this new open economy, farmers from major producing ASEAN countries such as the Philippines and Indonesia would have no trade barriers for market entry into member countries, except, of course, issues of non trade barriers (NTB) such as certification. This is not an easy endeavor, in particular for small farmers. However, it is time to introduce certification concepts to countries in the region, which is one of the reasons why CAPSA-ESCAP has taken a step in this direction by undertaking this study in two ASEAN-member countries.

The results of the two studies are presented in this working paper titled “Adding Value to Fresh and Processed Produce through Product Certification”. Research was carried out in Indonesia in collaboration with the Center for Agricultural Policy and Agribusiness Studies (CAPAS) located at Padjadjaran University, Bandung Indonesia, and in the Philippines in collaboration with the Bureau of Agricultural Research (BAR), Department of Agriculture of the Philippines. To disseminate the results, workshops in both countries were specifically designed to facilitate exchange of information among

stakeholders. In Manila the workshop was held on 17 - 18 December, 2008, and in Bandung, Indonesia, from 17 –18 November, 2008.

I would like to take this opportunity to extend my deepest appreciation to the government of France for generously providing funds for this study. My sincere thanks also goes to our partners, CAPAS and BAR, for the excellent work of their respective researchers.

December 2009

LeRoy Hollenbeck
Director
CAPSA-ESCAP

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Last, but not least, our deepest appreciation is extended to the staff of CAPAS and BAR who helped in conducting the studies in both countries, and to the many others whose names could not be mentioned one by one, but who contributed directly or indirectly during the study and the preparation of this report.

Togar Alam Napitupulu
Ronnie S. Natawidjaja
Josefina M. Lantican
Rene Chris P. Rivera
Jude Ray P. Laguna
Zumi Saidah
Nur Syamsiyah

1. Introduction

*Togar A. Napitupulu**

1.1 Background

The current trend in world trade of agro-food, and the change in consumer demand patterns for food and agricultural products, have led to a fast growth of multi-national chains of retail stores in major cities in developing countries and growth in domestic retail store chains that penetrate not only big cities and capitals but also even district-level towns. Their presence opens a new market for high quality agro-food. While many products come from overseas, many can also be supplied locally by farmers or farmers' co-operatives or associations provided that they meet the quality and supply standards required by the store.

To study and identify specific benefits from this global economic trend that can be tapped by secondary crops farmers, specifically those living in medium altitude areas, two studies were conducted in two member countries of CAPSA-ESCAP, i.e., Indonesia and the Philippines, with assistance provided by the government of France. Product certification requirements by the retailers, and best practices on product certification by the various producers and processors from farms to retailers, were studied, analysed, and collated.

The project covered Mindanao provinces in the Philippines and West Java province in Indonesia, main producers of fresh produce, such as onions, potato, carrots, leaks, baby corn, cabbage, etc., in varying proximity to major markets, i.e., big cities. In addition, other major horticultural producing provinces were also looked at as comparative locations. A close look at the demand side outlined the retail requirements in terms of quality and product certification, incentives, and other issues. On the supply side, problems faced by farmers in fulfilling consumer/retailer requirements, both in terms of technical, institutional and financial needs, and impediments were scrutinized. Current success stories were documented. The role of the local government and policies were also studied and formulated. The results, in addition to the publication of this working paper, were two workshops conducted in Indonesia and in the Philippines involving the various stakeholders.

The expected ultimate results would be increased sales and production of fresh produce by farmers in the respective regions, while local governments would incorporate

* Senior Researcher/Economist (2006-2009), CAPSA-ESCAP.

local policy toward value added activities and propagate the results to other locations and regions.

1.2 Objectives and framework of the study

Specifically the goal, outcome, output and activities of the study were as follows:

- Goal

Expanded flows of fresh, processed and certified produce from rural areas to urban consumer centres in selected sub-regions in participating countries.

- Outcome

Policymakers and farmer associations in participating countries develop operational frameworks for adding value to fresh and processed produce through certification to take advantage of increased market opportunities.

- Output

- Best practices in local agricultural knowledge systems are compiled and available to stakeholders.
- Participating farmer associations and policymakers understand how to apply best practices in certification systems.

- Activities

- Compile and collect information on post harvest practices, cleaning, handling and packing on the supply side. On the demand side, collect information on pricing, implicit and explicit quality requirements/indicators and current certification activities at all stages of marketing channels
- Identify and analyse linkages between smallholder producers, rural women, specific market segments, local, urban markets and cold store chains.
- Conduct in-country workshops specifically designed for small farmers to enable them to be linked to the dynamic markets.

1.3 Structure of the working paper

The preliminary chapter (Chapter 2) provides a brief review of product certification concept in relation to its contribution to added value fresh and processed agricultural produce and farmer's income. It sets the background and context against which the two studies should be viewed.

Chapters 3 and Chapter 4 present the results of the study in both participating countries, Indonesia and the Philippines, respectively. The last chapter, Chapter 5, provides

some concluding remarks which are basically presenting the conclusions and the policy implications and recommendations put forward by the two workshops conducted in the two countries.

2. Product Certification: Creating Added Value for the Rural Poor

*Togar Alam Napitupulu**

2.1 Introduction

Global trade has significantly changed domestic agricultural products' markets during the last decade. Consumers are increasingly demanding high quality and safe products. Product differentiation, the first **P** of the 4P's of the marketing strategy traditionally practiced in non-agro products has now become a major marketing tool for agricultural products as well. Product differentiation based on what consumers want, as opposed to a homogenous commodity, is now increasingly emerging, of course as one would expect, with price premiums.

In line with the new wave in world trade and the change in consumer demand patterns for food and agricultural products, we now witness rapid growth of multi-national and national retail store chains in major cities in developing countries. Their presence expands the market for high quality fresh and processed food, of which some are supplied from other countries, but many of which are also supplied locally by farmers or farmers' co-operatives or associations provided they meet the quality standards and supply stability required by the store.

Following the growth of the multi-national retail stores we also observe the growth of domestic retail store chains that invade not only big cities and capitals but also are established even in district-level towns. Similar to the multi-national retail stores, these local stores also usually require a particular level of quality of agro-products, different than those sold in traditional 'wet' markets.

This phenomenon is continuously growing with more foreign direct investment and will continue to grow in the future giving opportunity for local producers and processors that would otherwise be captured by imports. The questions are how local farmers can capture the opportunity? Is there any recipe that can be adopted to be able to supply this growing demand? In the end, would the rural poor benefit from this? If not, how can they be part of this new market development and benefit?

* Senior Economist at CAPSA-ESCAP (2006-2009), Bogor, Indonesia.

2.2 Evolution in marketing and logistics

All products, processed or fresh, are undergoing some value added activities or transformations where value is added along the chain from production to consumer. In general, these transformations are performed by many de-coupled companies along the marketing chain. Traditionally, co-ordination among companies in the various nodes along the channel is assumed to happen through the various market mechanisms and arbitrage. Marketing chains have been an object of study by many researchers looking at marketing efficiency generating questions such as: has the allocation of resources at various nodes in the chain been optimal or has the contribution to the value added by each agent in the chain been paid (marketing margin) equal to its marginal value productivity? It is good to understand the marketing efficiency, because its exposition contributes to improvement of the whole marketing system and provides information for business, identifying business opportunities, and presumably more rarely for policymakers in devising policies to improve food safety in the various steps of the marketing systems.

The actual improvements in the marketing system are made by all players themselves, each in the process of pursuing their best interest. In the old days, some companies performed all the processes along the chain and managed them centrally in a vertically integrated fashion. One classical example is when Ford Motor owned much of what it needed to feed its car factories. It owned and operated iron mines that extracted iron ore, steel mills that turned the ore into steel products, plants that made component or car parts, and assembly plants that turned out finished cars. However, with the fast change in consumer behaviour demanding quick variety of products, the one-size-fits-all operations could not be responsive enough to handle non-homogenous products currently demanded. When Henry Ford was once asked about the number of different colours a customer could request, he said, "they can have any colour they want as long as it's black". But today consumers want green apples and red pears, and yellow and purple mangoes. In agribusiness the classic example is the dairy industry, starting with a perishable product and marketing it through a network of small shops and door-to-door retail agents.

Improving efficiency and responsiveness have been widely pursued in non-agricultural products in the last decade with the concept of Supply Chain Management (SCM). Usually, management of the whole system from suppliers to consumers including service providers such as logistics, finance, market research, product design, and information technology, can only be done by one company, which refers to the meaning of management itself. The concept seems to presuppose vertical integration as in the case of

Ford Motor mentioned above. But such an arrangement could only be suited to a situation twenty years or more ago. What then is the current reality?

During the last decade, what has evolved is that under SCM, managing the whole marketing system is done by one virtual management system called 'virtual integration', where each company involved in the supply chain is maximizing efficiency and responsiveness in close co-ordination with other companies. Each company focuses on its core competencies and partners with other companies that have complementary capabilities for the best mix of response and efficiency in delivering the products and services for the market being served. Information technology has become the main enabler of co-ordination of the multitude of companies to 'multi manage' their chains.

For agricultural products, both processed and fresh, co-ordination of all the parties involved in the chain is quite different than those of non-agricultural products. There are some companies that could be easily 'managed virtually' along the marketing channel. But some are relatively difficult to co-ordinate with respect to IT, behavioural, and technological enablers. For instance, all agricultural products, at some stage have to face suppliers of raw materials by farmers. By its nature raw materials are supplied by many small farmers to obtain economies of scale at the next level and the volume required by retailers, frequently as integrators (Reardon, 2005), at the end of the chain to supply the market. Even if they are behaviourally ready to join the supply chain, often times they might not be ready to implement other enablers of the SCM such as adoption of IT and technology as these require a substantial investment. The exception is for large, business-oriented farmers with sufficient economies of scale.

2.3 Product certification as enabler

The decisions made by each company can be grouped into five major components called drivers of SCM, i.e., production, inventory, location, transportation, and information. One way to understand these operations is by using a supply chain operation research model (SCOR) developed by the Supply-Chain Council (www.supply-chain.org) which is organized around the following categories of discussion, i.e., plan, source, make, and deliver.

Plan, refers to all the operations needed to plan and organize the operations in the other three categories. These include demand forecasting, product pricing, and inventory management. Source operations include the activities necessary to acquire inputs to create products or services such as procurement of materials, and credits and collections

(acquisitions of cash). The make activities include the operations required to develop and build products and services, such as product design, production scheduling, and facility management. Deliver operations encompass the activities that are part of receiving customer orders and delivering products to customers. This last operation component constitutes the core connection between companies in a supply chain.

The five areas of improvements, or drivers, are coherently united within each operation activity by the Total Quality Management (TQM) concept. Broadly speaking TQM is both a philosophy of “managing the entire organization so that it excels in all dimensions of products and services that are important to the consumer” (Chase *et al.*, 1995) and the application of generic technological tools such as Statistical Process Control. In other words, TQM can be thought of as a process of ensuring creation of quality or excellence for the consumer, which in the end requires some kind of certification, i.e., product (work) in process certification. In operation jargon, consumer is defined in the context of **next consumer** philosophy, meaning that all steps along the process or chain are consumers, i.e., consumer of the previous process.

Product certification can be done at three stages in the operations. First, certification or assurance at the end of the process, i.e., finished product certification, the process of which is called inspecting quality into the product. Second, certification or assurance in the process of making the product, i.e., building quality into the product. And third, in the design stage of the product, i.e., thinking quality into the product.

For agricultural products a significant portion of the competitiveness edge is contributed by the sourcing, in particular in determining the supplier of the produce. As quality and continuous supply are the most important factors in agro-food industry, they are also the most important consideration in sourcing activity. In the context of product certification, by the nature of agricultural products itself, it is important in the sourcing activity to make sure that what comes out of the farm complies with retailer (representing the consumer) requirements. This can be done at the three stages of operations mentioned earlier, i.e., at the end of the process (grading and sorting); during the making of the products (handling, storing, and cultivation stage); and at the design stage (deciding on the type of seed to grow and the selection of the technology on how to grow).

Unlike manufacturing, agricultural product retailers are sourcing (pre) finished products; hence, the making of the biological product itself and the cultivation of the produce is in the farmers' hands beyond the retailers' control. Of vast importance is also the fact that many chains deal with perishable produce, which imposes its own very stringent logic to

subsequent steps. What is commonly practiced today in industrialized countries is to have the farming practice audited and certified by a third party. In fact the third party certification goes for all stages of operations, in general.

Similarly, unlike manufacturing products and services, for agricultural products much of the specification on quality is determined by retailers who base their quality requirements on consumer requirements and some compliance with government regulations. We observe for instance the requirements set by EUREGAP in order to accommodate both requirements. In the future, the trends seem to go toward imposing individual requirements by retailers, which is at the same time being used as a competitive weapon against competitors.

A close observation then on the sourcing activity in agro-food industry boils down to product certification, i.e., a mechanism of ensuring that what the consumers want is what they get. What the consumers want may be the same as what the producers claim. In such case, a mechanism still needs to make sure that the produce is exactly as it is claimed. In this assurance process what is essentially involved is some kind of trust. If consumers trust no one, the consumer will do all the checking on the product to ensure that it complies with the requirements set (maybe mentally) by the consumer, or to check that it is as claimed by the producer, or have a third party to do the job.

In manufacturing operations, it is common to have a 'single supplier' philosophy instead of the traditional low cost approach through a bidding mechanism by many suppliers. It is not uncommon for a vendor to take years until they are qualified to be a vendor for a company. In fact once they are accepted as a supplier, they become an extended 'family' of the company. There are some advantages to this method, that is not only in ensuring delivery of high quality products but also suppliers can contribute to efficient, timely, and effective product development and process selection. Edward Deming (quality *guru*) once said in his 14 points for quality improvements management to avoid procurement based on price alone but rather consider total cost and eliminate suppliers whose quality is not acceptable (Martinich, 1997), i.e., a single supplier philosophy.

2.4 How the rural poor can benefit

The above discussion tells us that the new wave in agro-food industry, i.e., international sourcing of agro-food produce by multi-national supermarkets and supply chain management in produce procurements are a result of increased and stringent competitiveness in the market (both global and local) that lead to an effort by any player to

improve efficiency and responsiveness in all aspects of operations. Any possible improvement in any aspect at any level should not be left unnoticed and should be taken advantage of if the business is to survive and grow in the highly competitive market we are facing today. This implies that any entities participating in the supply chain are required to do the same in trying to fulfil the demand of the market.

This also implies that rural farmers, poor or well off, have to align themselves in this effort of improving efficiency and responsiveness in all aspects of business. The reward is substantial but the effort is not easy. Beside the usual economies of scale and substantial amount of investment requirements, this also requires behavioural change, that is, all parties should strive toward an aligned virtual corporate culture.

The question is how rural poor farmers could be involved in and benefit from this wave? Certainly they are not an exception. They, too, have to align themselves or they will be left out. Such alignment often times is beyond the reach of poor farmers, which explains why in many developing countries they rarely take part in the process of globalization and the growing trend of supermarkets. Product certification step by step in the sense of total quality management and single supplier philosophy could be part of the solution. Rural poor farmers should be part of the whole system, that is become an 'extended business unit' of the retailer by providing them the technology, the culture and the economic ability to support themselves. Technology can be derived from certification standards. Simple tools for grading, sorting and packaging could help improve their chance of inclusion in the emerging market of high quality produce.

Experiences from Thailand and India (Buurma *et al.*, Van de Kop *et al.*, 2006) indicate that this is not impossible. What I would suggest is to first try to capture domestic high quality demand by supermarkets. In the case of Indonesia there are some farmers' associations organized by traders who are able to supply local supermarkets, hotels and restaurants with high quality vegetables. For exports markets, a farmer's association is connected by government as third party to an importer and distributor of high quality vegetables in Singapore where technology, financing and the market are provided by the importer.

2.5 Concluding remarks

Growth in the multi-national stores, franchised domestic retail store chains and hotels and restaurants demanding specific high quality fresh and processed, is a new phenomenon in developing countries that should be tapped into by farmers. As this new

development is a result of a more competitive, open global economy, all participating players from farm to table at the end of the chain are required to exercise stringent practices with utmost discipline on all aspects of operations, from planning to delivery. This makes it difficult for rural poor farmers to take part and benefit.

Product certification in broader terms, in particular in the spirit of 'single supplier' philosophy, where farmers are provided with technology, financing, and the necessary culture and management by retailers as co-ordinating company, can be an alternative solution enabling the poor farmers to become a stakeholder in the new wave of market. Instead of going directly to enter the global market, one could start with the newly emerging local/domestic supermarkets with less stringent requirements.

It should be noted that this is not an easy undertaking as most poor farmers are lacking the resources, ability, economies of scale, and, to a certain extent, a culture necessary for success in this undertaking. We believe the role of facilitating could be done by public-private partnerships. In addition, the government can contribute to this success by providing the necessary public goods that facilitate, such as mode of transportation, communications, etc., minimizing transaction costs.

3. Study on Adding Value to Fresh and Processed Produce through Product Certification: The Indonesia Case

*Ronnie S. Natawidjaja, Zumi Saidah, Nur Syamsiyah **

3.1 Research background

Rapid economic growth and urbanization are transforming the retail food sector in the developing countries throughout the world in the last two decades. Restructuring trends in the food retail and the change in consumers' demand have led to a fast growth of multi-national chains of modern retail stores in major cities and growth in domestic retail stores chains that penetrate not only big cities and capitals but also even district level towns. Their presence opens a new market for high quality agro-food product. While many products come from overseas, many can also be supplied locally by farmers or farmers' co-operatives or associations provided that they meet the quality and supply standards required by the store. These changes present great challenges, even exclusion, for small farms, processing and distribution firms, but also potentially great opportunities.

The growth of modern market certainly offers opportunities for farmer and producer associations and other market participants to take advantage of a more consistent demand on high quality fresh and processed produce. However, several studies show that the bulk of local production of fresh produce mostly enters local traditional wholesale markets, and receives small quality rewards. Only a small portion (10-15 per cent) conforms to higher product standards and enters the modern chain (Natawidjaja *et al.*, 2007a).

There has been rapidly increasing competition in the quality of the product domestically. From a health aspect, properly cleaned and handled produce is becoming the most important issue in the fresh supply chain to supermarkets. Competing on cost and quality also requires reorganization of the supply chain. In this case, product certification is important for consumers as a guarantee for safety and standardized products. Responding to the situation and, at the same time, to push forward the export of high value tropical

* Center for Agricultural Policy and Agribusiness Studies, Padjadjaran University, Indonesia.

agricultural products and its competitive advantages, the Indonesian government, specifically the Ministry of Agriculture, is working to build 'country brand images' by instituting broad agricultural product certification standards and codes similar to what is being developed by the neighbouring countries such as ThaiGap, MalayGap, etc. However, the effort seems to have a long way to go to achieve its ultimate goals.

The aim of the project is to study and identify specific benefits from this global economic trend that can be tapped by secondary crops farmers, specifically those living in medium altitude areas. More specifically, the study objectives are (a) to identify and analyse linkages between smallholder producers and specific market segments, local urban markets and cold store chains; (b) compile primary data and information on post-harvest practices, cleaning, handling and packing; and (c) collect information on pricing, implicit and explicit quality requirements and current certification activities at all stages of the marketing process.

3.2 Food market restructuring in Indonesia

There were three distinct periods of modern retail or so called 'supermarket diffusion' in Indonesia from 1970 to 2005 (Natawidjaja *et al.*, 2007a). The first and second periods were in a general period that can be termed the 'pre-take off, domestic cycle' period before 1998. From roughly 1970 to 1983, the modern retail sector in Indonesia was a tiny niche serving expatriates and upper-class Indonesians mainly in Jakarta. Supermarket diffusion became rapid from a very tiny base starting in 1983, peaking in the early 1990s and then declining by the start of the crisis in 1997. This second period was fuelled by overall growth translating into rapid growth in upper-class incomes in Java. This first growth spurt of supermarkets was nearly only of domestic capital retail and was still focused on the upper income segments mainly in Jakarta and a few other large cities on Java where the 'New Order' growth was concentrated. The third period was the veritable 'take off period' of supermarkets when the sector moved from a tiny niche to a large sector and looks set to grow quickly for some time. Several factors appear to have driven the rapid supermarket growth observed since 1998.

Various socioeconomic 'demand-side drivers' were in place: (a) there has been very rapid urbanization: while 42 per cent of population was urban in 2000, the urban share was only 31 per cent in 1990, and 22 per cent in 1980. Extrapolating from the urbanization rate during 1990 to 2000, that would make the urban share in the population about 50 per cent

by 2005 – and most Indonesians are urban from 2006 on; (b) real GDP/capita has grown 3 per cent per year on average over 2000-2004 (PlanetRetail, 2006).

Diet change (globalization trend of food) is also a key part of the restructuring story. For example, the first part of the diet change was the great leap forward of potato (a non-traditional product) consumption. Potato consumption was only 0.5 kg/capita in 1968, and had jumped 8-fold by 1995 to 4 kg/capita, which was the same in 2004 (Adiyoga, 1999). So the big leap occurred in fresh consumption in the 1970s and 1980s and then after that the share of that consumption via processed form increased a lot: in West Java, only 1 per cent of the potatoes went into processing in 1995; by 2005, that figure was 10 per cent. This is part of the overall increase in processed food consumption in the country: consumption of processed foods and beverages increased 30 per cent over 1994-2005 (Natawidjaja *et al.*, 2007b).

The demand-side drivers would appear to be necessary (and were present before the 'take-off in 1998' but not sufficient. There was in addition a massive investment-side spur. As part of the economic recovery programme negotiated with the IMF, retail foreign direct investment (FDI) was liberalized in 1998. The Indonesian government had closed the retail sector to direct foreign investment since 1969 in the effort to protect local retailers. However, there is a loophole in the regulation to enter the Indonesian market through franchise and technical arrangement with local companies. The aggressive entry of foreign retailers took place after the economic crisis that hit Indonesia in 1997. The Indonesian government in January 15, 1998 signed a letter of intent with the IMF stating that the Indonesian government should revoke the ban on foreign investors' entering the wholesale and retail businesses. Later, the opening to foreign investors was legalized by a Presidential Decree No. 99/1998 and a Decision Letter of the State Minister of Investment (Head of Capital Investment Co-ordinating Board) No. 29/SK/1998. The regulations stipulated that licensing procedures and all other requirements that a foreign retailer has to fulfil are the same as those applicable to local large-scale retailers. Interestingly, unlike in the Philippines where FDI liberalization was bitterly contested and slowed (until 2000) by traditional retailers associations (see Cabochan, 2005), in Indonesia there was relatively little opposition, perhaps because it occurred as part of the policy package applied during the crisis.

This led to a rapid influx of FDI in retail, and competitive investments by domestic retailers just as it had in dozens of other developing countries that liberalized retail FDI in the 1990s as part of various structural adjustment and trade liberalization programmes (Reardon and Timmer, 2007). The subsequent economic recovery, the low cost of

investment (relative to home markets), and the liberalized FDI attracted foreign modern retailers to Indonesia, initiated by the entry of Continent and Carrefour (French retailers) which introduced the 'hypermarket' concept. Other foreign retailers entering at that period were Walmart and Giant (Dairy Farm of Hong Kong).

This period may be said to be the initial period of multi-nationalization. This ratcheted up sharply competition by the end of the 1990s and the early 2000s, which induced some consolidation in the retail market. For example, Continent was acquired by Carrefour, Hero Group acquired Tops (the Dutch Ahold), and Hero Group joined Giant to establish Giant hypermarket. Besides business consolidation, a change in modern retail format orientation also took place; i.e. the Matahari Group that previously grew in a department store business format developed a hypermarket format under the name of Hypermart. Local retailers such as Yogya, which started in Bandung as a department store also developed a supermarket format under the name of Griya, and later a convenience store format under the name of Yomart.

Investment in urban real estate also developed rapidly after near collapse in the crisis and real estate market access is crucial to rapid supermarket diffusion. The rate of growth of the supermarket sector in the 'take off period' has been spectacular indeed. From 1997 to 2003, supermarket sales grew 15 per cent per year on average – versus only 5 per cent per year for traditional retailers (Rangkuti, 2004). The supermarket share must have been, by rough calculation, very slight in 1990 judging by the huge difference in number of stores then and now, so the share in retail might have been less than 5 per cent. By contrast, the share in retail in the first half of the 2000s was far higher.

The share of modern retail in the retail market was 21.6 per cent in 2000, and had rocketed to 29.6 per cent by 2004, or an increase of 8 per cent within only 4 years (2000-2004) based on 47 items surveyed in Jakarta. That was a share of an expanding pie, but still, the share of the traditional retailers correspondingly dropped by 2 per cent a year. This rate means that the share of modern retail is about 35 per cent in Indonesia. We note as an aside that while chain convenience stores are numerous, their small size compensates and the overall share of chain convenience stores is only about a quarter of modern sector sales.

There is no reliable source of information about all the retail chains in Indonesia, so there is currently no accurate way to assess the concentration ratio. In general, retail experts agree that the concentration ratio is still relatively low, with many small chains and independent supermarkets beyond these top 8, and thus the modern retail sector is still

significantly fragmented. However, an examination of the top 8 is revealing of several key aspects of the frontrunners, points which we supplement with several observations from the West Java interviews as follows. The total retail banner sales of the top 8 are 4.3 billion USD. The ratio of sales of the first to the last ranked is only five times. But if one looks only at the top 7, the ratio of the first to the last is only 2. This indicates roughly that there has not yet been a process of marked consolidation.

There are two types of domestic-capital leaders. The first is the old domestic chains with department store roots, and the second is the convenience-store focused chain. Moreover, the convenience store chains are opening many stores in the smaller cities and even rural towns, to the point where we heard sharp complaints from the West Java government about ruinous competition from the new convenience store chains as conduits for goods from imports and large-scale domestic processing firms with small-scale local firms in rural towns (*Dinas Perindustrian dan Perdagangan Agro*, Government of West Java Province). The average growth of chain sales 160 per cent over the last five years, a rapid growth rate much faster than income/capita growth.

Smaller, provincial chains were also growing very fast. For example, Yogya had only 25 stores in 2002, and 47 supermarkets and 1 convenience store in April 2006 – a near doubling of stores. A smaller chain, Borma, also based in Bandung, started in 1980, but only started its rapid growth in 1998 in the 'take off period'; it had 15 stores in 2000 and now has 20 stores.

Several of the chains, such as Makro, have important cash and carry operations. These are basically wholesalers selling to small shops and restaurants (the latter category rising very sharply in the past few years) and competing with the wholesale markets. Makro noted to us that some 20 per cent of their sales are direct to consumers as retail.

There are several factors that indicate this trend will continue, and that by 2010 nearly half of food retail will be through supermarkets. Modern retail has quickly penetrated processed and semi-processed products and is now making important inroads in fresh fruit and vegetables as an emerging focus. They are reducing costs and improving their competitiveness as they go. Modern retailers are spreading beyond Java to other islands, and beyond large cities to secondary cities and even smaller towns, rapidly. They see much potential in that spread, feeling that the market is far from saturated except in a few pockets of Jakarta.

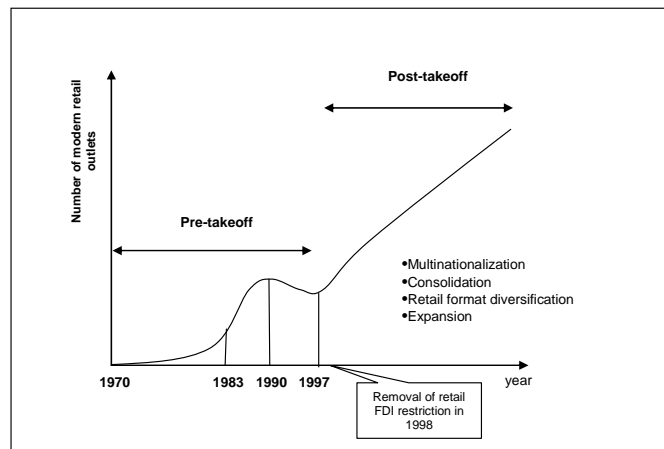
The modern retail market which demands high quality fresh produce in consistent quantity continuously has initiated a modernization of agricultural procurement system down

to production zones. Procurement system modernization has proceeded by far the most in the domain of vegetables. This is partly because it is least feasible and more costly in transport (relative to their prices) to import vegetables, and partly because there are good local sources but with poor supply chains from those sources to the stores. Thus, the modern retailers have shifted en masse, to a large degree, away from use of the traditional wholesale markets toward use of specialized wholesalers. However, that shift is not yet complete, as they still use the wholesale markets directly or indirectly, especially for the many small-share vegetables, and also some of their suppliers in turn source from large wholesalers in the central markets.

The retail and processing 'symbiosis' is a key part of the story. Hence the effect of market restructuring is expected to be via a 'chain rule' of retail affecting processing which in turn affects farmers, rather than the (expected slight) effect of retail directly on farmers.

Food industry in Indonesia was growing very rapidly during the period of 1986-1996 coinciding with 'the pre- take off (domestic cycle)' period of the supermarket (Figures 3.1 and 3.2). There is a clear pattern that sales growth of the food industry was in response to the retail market restructuring which cause domestic market expansion. During this period the industry establishment grew by 45 per cent but the gross sales value grew double (210 per cent) in constant value (1983=100) (Appendix 1). The table shows that the tremendous increase of gross value was achieved mostly by an increase in gross output per industry establishment rather than by number of establishments which means an improvement in production technology.

Figure 3.1 Development of supermarket in Indonesia

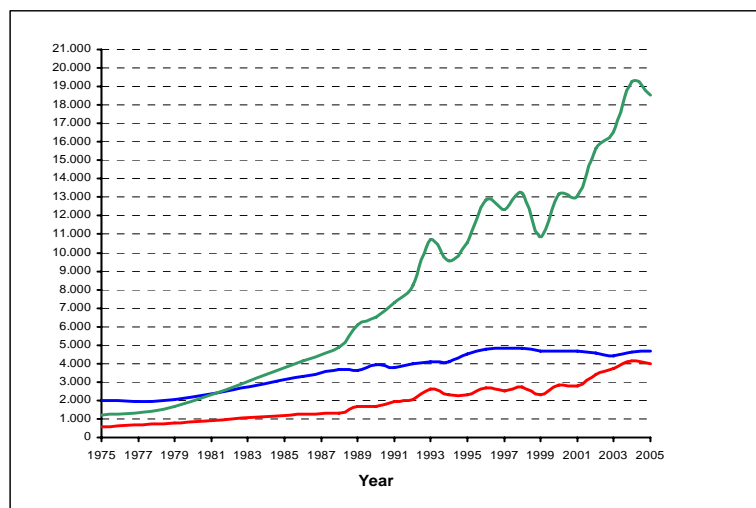


Source: Natawidjaja *et al.*, 2007a.

The industry was hit hard by the economic crisis in 1997; about 462 establishments in the food industry could not survive and disappeared. Before the industry could fully recover from the crisis, there were also a series of domestic energy price increases (fuel, gas, and electricity) which happened mainly in 2003 and 2005. Amazingly, the industry quickly gained back steadily in the period 1997-2005, 51 per cent higher than the output level just before the economic crisis. So, in term of gross output, the industry quickly recovered from the economic crisis since expenditures on consumption were the main drivers in the economic recovery period in Indonesia. The output growth was also part of the impact of retail market restructuring in the period of 'post- take off' after removal of restrictions on Foreign Direct Investment (FDI) for the retail sector in 1998.

In the last two decades, some multinational companies such as Nabisco, Heinz, Arnott's, Danone, Campbell, Nutricia and others developed strategic business alliances with local companies. According to the USDA Gain Report (2004), regulation on trade and investment mostly has been revised to accommodate and encourage higher participation of multinational companies. From the 10 top food companies in Indonesia, 4 are multinational companies. Those are Danone, Nestle, Coca Cola, and Unilever. The other five companies are locals, producing soft drinks, hot drinks, and packages food. Indofood Sukses Makmur, the largest food company in Indonesia, is also the largest instant noodle and wheat flour producer in the world. The company runs a vertically integrated business: from primary production, final processing, through market distribution.

Figure 3.2 Food and beverages industry development in Indonesia



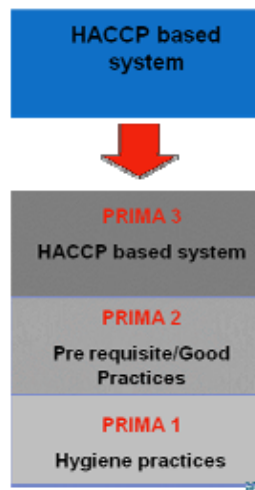
Source: Natawidjaja *et al.*, 2007b.

3.3 Government certification for product standard

To support the food industry development, product standard is needed. In Indonesia, agricultural product standard is formally issued by National Standardization Institution (SNI), the authority who co-ordinates the standardization system in Indonesia. SNI is generally applied voluntarily. Once it relates to human safety and health aspects or environment conservation, its application become mandatory under a technical regulation issued by relevant institution. For SNI in the agriculture sector, Ministry of Agriculture decree no. 481/1996 regulates its obligatory application.

Priority setting during the preparation of food safety on agriculture products by government is based on risk analysis and the use of the HACCP-based system to improve food safety assurance and ensure the effective use of available resources. The HACCP system is a cost effective management tool for food safety assurance, which can be applied to all sections of food chain and agriculture industry, from primary production through manufacturing, distribution and retail, to the point of consumption. It is now recognized as an essential tool to use by the food industry in controlling food contamination and enhancing food safety.

Figure 3.3 The HACCP Based System



HACCP system is adopted nationally under SNI no. 4852-1998 and applied in the agriculture industry as the main tool in establishment of agriculture product food safety. The

implementation of HACCP system in agriculture sector is recognized by the Ministry of Agriculture decree No. 303/1996, a technical regulation on National Standardization System for the agriculture sector. However to be implemented for small scale farmers, HACCP needs to be modified considering local specific conditions.

In order to enhance food safety in agriculture products, the authorized Government institution within the Ministry of Agriculture has issued several technical regulations, for example: Ministry of Agriculture decree No. 303/1996 on National Standardization System in agriculture sector. This technical regulation sets out a standardization system in the agriculture sector, including performing food safety as quality assurance for agriculture products through application of the HACCP system in all stages of agriculture industry activities and inspection system for agriculture commodities with SNI obligatory application.

However, implementation of SNI in the agriculture industry is far behind its capacity in the purpose of national protection on health, safety and environment conservation aspects. Recent experiences in Indonesia show that constraints in application of the regulation are mainly due to the limitation of resources (human resources, technology, information, funding, etc.).

Furthermore, there are external treats that become another constraint to accelerate the quality as well as competitiveness of fresh agricultural products produced by local farmers. As tariff barriers are eliminated, many countries try to find measures to safeguard their domestic interests. Developed countries, which have advantages in technology, information and finance, tend to seize and rule this global market. Using these advantages, they tend to establish more food safety regulations with regard to Sanitary and Phytosanitary (SPS) as well as to Technical Barrier to Trade (TBT).

Our field study in West Java (Bandung) and North Sumatera (Medan) show that the government standard has not been known and used by the market actors, farmers, traders, industry, as well modern retail. Only a very limited number of farmers and traders who are involved in the pilot project of HACCP know the standard; however, it is not known by most farmers.

3.4 Private standard of modern retailers

Most retailers and specialized wholesalers we interviewed in Bandung, Jakarta and Medan agree on the following: (1) throughout Indonesia, the concept of fruit and vegetable 'quality' among retailers and consumers is restricted to the cosmetic and flavour characteristics of the fresh fruit and vegetables; (2) public health and safety standards in

fresh fruit and vegetables are effectively missing in Indonesia so that an incentive does not hang over the heads of the supermarkets to institute safety standards; (3) there is more or less widespread consumer awareness of the importance of fresh fruit and vegetables safety and health, and to the environmental consequences of the production processes; and (4) most Indonesian consumers today readily assume that the nice-looking fresh fruit and vegetables offered by clean and tidy supermarkets are safer to eat when compared with the fresh fruit and vegetables offered in most of the dirty, messy, traditional markets.

Our interviews pointed overwhelmingly to the primary objective of supermarket chains in Indonesia with respect to fresh fruit and vegetables being to increase market share through increased sales, which in turn depends on widening the quality gap and narrowing the price gaps with traditional markets. To meet that dual objective, supermarket chains in Indonesia have been shifting over the past few years away from the old procurement model based on sourcing fresh fruit and vegetables from the traditional wholesalers and wholesale markets toward the use of four key pillars of a new kind of procurement system: (1) specialized procurement agents we call 'specialized wholesalers' and away from traditional wholesalers; (2) centralized procurement through Distribution Centres (DCs); (3) assured and consistent supply through 'preferred suppliers'; and (4) high quality and increasingly safe product through private standards imposed on suppliers.

The first three pillars (organizational change in procurement) together make possible the fourth (institutional change in procurement – that is, the rise of private standards, first for quality and increasingly for safety of fresh fruit and vegetables). Below, we review each of these pillars.

First, there has been a substantial shift by supermarkets in the study countries away from reliance on traditional wholesale markets for procurement of fresh fruit and vegetable. The shift is away from traditional wholesalers toward the use of specialized wholesalers who classify product collected from suppliers, sometimes have their own production, and often have semi-contractual relations with 'lead suppliers', discussed further below. The shift occurred for two reasons: (1) the traditional wholesalers lack quality standards and, in particular, lack consistency in standards; and (2) the traditional wholesalers who used to supply most supermarkets did serve these demanding clients with the best fresh fruit and vegetables they could find on a given date; such 'best' was too often of 'below acceptable' quality, according to the procurement officers of the leading supermarket chains that we interviewed.

Traditional wholesalers do not get involved in any sort of production support programmes, do not usually enter into long term commercial relationships with selected producers (out-grower schemes), and in general buy and sell on a day-to-day basis (spot market). They thus generally lack the capacity to define, monitor, or enforce a quality or safety standard which goes beyond the norm for the wholesale market (e.g., no rotten fresh fruit and vegetables, basic grading of fresh fruit and vegetables according to size and appearance, weights and measures). Since the vast majority of their sales are done with clients who in turn have no particular quality demands, traditional wholesalers also lack the incentive to develop, monitor, and enforce standards from which they will gain little if any benefit. An objective of supermarkets' fresh fruit and vegetables procurement officers is to not find themselves as the weak party in the negotiation process. This is more difficult to achieve with wholesalers than with individual producers, as wholesaling is usually quite concentrated per product rubric.

Second, as an alternative to traditional wholesale markets, supermarket chains in Indonesia are setting up their own Distribution Centres (DCs) to have centralized procurement of fresh fruit and vegetables. Of course this is implemented only when the chain has passed a certain size in terms of number of stores or throughput to justify this shift. Carrefour has gone from 32 per cent centralized in 2004, to 40 per cent in 2006, to 50 per cent by the end of 2008. The main reasons for this procurement centralization are as follows: (1) there are major cost savings from reduced co-ordination costs, and from spending less time ordering and tracking; (2) there are inventory management cost savings, as chains can implement best practice logistics; centralization creates economies of scale and so justifies investments too expensive for small chains with decentralized distribution; (3) there are supervision cost savings as it is cheaper and more effective for the chain to monitor deliveries at only one point rather than per store; (4) there are savings in transport and other transaction costs for suppliers who formerly had to make the rounds of widely dispersed stores on deliveries; centralization also allows suppliers to adjust rapidly to the results of the quality control; (5) centralization helps chains by upgrading their supplier base, as being able to deal in larger volumes without the bother of delivering to many stores makes it more attractive (in sales less transaction costs) for bigger suppliers to sell to the chain; and (6) centralization can bring substantial product cost savings: buying in one place in bulk can mean economies of scale and better bargaining with suppliers; the savings can be substantial.

Third, main supermarket chains and/or their dedicated, specialized wholesalers are switching to lists of preferred suppliers. In the relationships with these suppliers they use new commercial practices vis-à-vis suppliers that reward consistently high performance in delivery. The reasons for shifting to preferred suppliers are as follows: (1) supermarket chains need to reduce the risk of coming up short on a given item and want to minimize the costs of putting in place a procurement system that reduces that risk. Having a list of preferred suppliers falls short of issuing formal contracts, but is not so 'loose' as to merely engage in spot markets and find whatever is on offer and whoever is selling on a given day.

These can, in fact, be considered 'contracts' in the broad sense of Hueth *et al.* (1999) which includes informal and implicit relationships in which there is some cost (tangible or intangible) to not performing. (2) Constituting the list of preferred suppliers requires an initial act of selection, and that selection screens farmers who cannot meet supermarket requirements (cost, volume, consistency, safety, quality, ease of transaction), and thus reduces search costs. (3) The information exchange linked to a preferred supplier relationship means that the suppliers can 'internalize' the requirements and so supervision costs, and the counterpart, costs of product rejection, can be minimized. (4) In what we call in the next section 'active relationships' with preferred suppliers, supermarket chains can resolve problems of generalized or idiosyncratic market failure in factor markets for their suppliers. For example, they can help with credit and agronomic advice. In the sense of Eswaran and Kotwal (1985), the chain can also resolve the problem of the missing market for management services by helping the supplier establish crop calendars and undertake commercial planning, even planning for income diversification.

3.5 The role of specialized supermarket wholesaler on product quality

In the dynamic process of modernization, the study has noted the emergence of several types of new suppliers which are new in purpose, market segment focus, and mode of operation compared to the traditional wholesalers. These types of suppliers emerged to supply high volumes to supermarkets and other modern segments like specialty stores and food service, with the requisite stability of volumes and consistency of quality. That, in turn, implies producing or collecting (from wholesalers or from contracted farmers or from both) the product, sorting, minimally processing, packing, and delivering to stores or supermarket chain distribution centres a variety of products.

Several types of these emergent suppliers are: (1) specialized/dedicated wholesalers without own production and with own production and outgrowers; and (2) commercial agricultural companies with own production and outgrowers. These new actors are different from regular traders since they also arrange farmers to follow planting schedules and giving technical assistance in farming and post-harvest handling. They have been linking farmers to the more dynamic and prospective market.

Bimandiri is an example of specialized dedicated wholesalers to modern markets. They started the business in 1992 as a 'traditional wholesaler' to restaurants and hotels. It was just a stall in the local wholesale market in Bandung. In 1994 they approached local supermarkets (including Matahari and then Wal mart). During this period they bought from other wholesalers and from lead farmers (larger small farmers or medium farmers who own-produce as well as collect from 3-10 smaller farmers in the farmers group) who delivered to their small warehouse. Starting in 1998, they became solely dedicated to Carrefour, and up to today mainly supply to Carrefour. They were in fact selected as Carrefour's best supplier in Indonesia in 2006 (BISNIS, Indonesia-www.bisnis.com, 08-May-2006).

Bimandiri supplies tomatoes, potatoes, pineapple, and now mango. In order to assure quality and consistent volumes for their client, from 1998-2004 they used a very 'hands on' approach by working closely with farmers groups, such as Aspirasi and Mekar Buah discussed in section 3.4., as well as with a mango farmers group in Pematang and a variety of other groups. Bimandiri noted that it had a lot of problems with farmers breaching contracts. This approach seemed to them to involve more cost than benefit and since 2002/03 they have maintained preferred-suppliers lists but moved away from close technical assistance and credit, and also sourced from local large wholesalers to complete orders.

In 2005 they invested in a larger distribution centre. In 2006, they noted that the recently heated-up competition (and the driving down of prices via using cheap imports as a key strategy since 2003) in the retail sector had translated into tight, even very tight, margins for them, and the emergence of the tension cost of making the various monitoring, storage, selection, and transport investments wanted by the retailers, and indeed a rise in many of their input and materials costs – versus the diminishing margins that they can earn from these relationships. Key clients like Carrefour have reduced this problem for them somewhat by moving the payment delay from 14 to 7 days, as noted above.

Lyco Farm and Bukit Organik are examples of commercial agricultural companies with own production and outgrowers specialized in supplying the modern market. Lyco Farm started with its own 0.2 ha in 2000, and then rented 3.0 ha from small rice farmers and an

absentee landowner. Fatmi, owner and founder of Lyco Farm, became one of the members of a farmer group selling to specialized wholesalers for supermarkets (mainly Yogya in Bandung) who provided loans, technology assistance, and fronted inputs. By 2003 she moved away from that to produce low-pesticide produce (mainly tomatoes, hence the farm's name) and marketed directly to modern retailers.

She obtained certification of low-pesticide by the government (Sucofindo). She has to renew the certification each half year; it is costly, some 600 thousand rupiah (60 USD). Low pesticide to them means they want no-pesticide from her by 2010. She also sells to PT Enviro Green in Jakarta, and hotels and restaurant. She gets a very substantial price premium (400 per cent) from the supermarkets for the low pesticide product (relative to the traditional wholesale market where she could not get a differentiated price for it). She also has seven farmers on contract scheme, 0.75 per farmer. She provides seeds, fertilizer, and irrigation for them to produce also on part of her rented land (a type of share cropping on rented land). She needed a truck for her marketing.

Bukit Organik is similar to Lyco Farm but focused on organic vegetables. Bukit Organik is a family business with highly trained family members (including an agronomist with a degree from Satyawachana University in Central Java and a certificate from the Organic Training Centre in Puncak; there is also a trained marketing specialist). Starting in 2000, Bukit Organik managed 1.4 hectares of family land under organic vegetables; by 2005, they operated 6.0 ha - owned 4.0 ha and rented-in 2.0 ha. They moved from own-production only to a contract farmer scheme in 2003 where Bukit focuses on technical assistance and marketing, and has a farmers group of 5 farmers sharecropping the land Bukit operates. They pay 3-4,000 rupiah/kg to the farmers, and then Bukit sells to retailers at 6-7,000 rupiah. The supermarket then sells to the consumer at 10-12,000 rupiah/kg. Note that like the other commercial farmers we studied, they have made their operations multi-locational – with operations in Lembang, Ciba and Arjasari.

They started by selling to a handful of Bandung supermarkets (aimed at A consumers). Now they sell to 10 Bandung supermarkets and 12 stores in Jakarta. Their clients include Yogya Lifestyle Stores, Setrasari, Ranch Market, Healthy Choice, and Alfamart (all focused on consumer A mainly, and also B). Very importantly, Bukit entered a joint venture with the retailer Ranch Market in 2005; the chain puts up 70 per cent of the capital and they share a distribution centre in Jakarta and Ranch sells the product at their own chain and wholesales it to other chains – and the goal is to export. They do not have international organic certification, just the local one (Sucofindo).

Some supermarkets and specialized retail stores requires certification for organic products. However, there is no requirement for fully organic system certification; chemical residue test from a certified laboratory is sufficient (residue test for *imidakloprid*, *cypererhin*, *diazinon*, etc). Most of farmers and suppliers get their samples tested at Agro Chemical Lab, West Java Agricultural Office in Lembang and Sucofindo Lab in Bandung. Organic system certification is only required for export.

In concentrated horticulture zones, the study estimates 5-10 per cent of small vegetable farmers are starting to participate in sales to the modern retail market channels, mainly via the new suppliers mentioned above and a few groups directly. Very few of them have their product certified for chemical residue. This condition shows a low penetration of the modern market restructuring in to the farmer's level. Interestingly, the farmers participating in the new channel are small farmers – but they are the upper stratum of small farmers in terms of education, landholdings, and capital. Some of them already invested in irrigation tanks and green houses. Their profit rates are also 10-30 per cent higher than farmers in the traditional channels. Even more, farmers with free chemical residue certification received 50-100 per cent higher profit than traditional channel.

3.6 Value chain analysis: value added through certification

To clearly see the impact of certification to farmers, we will compare three value chains, traditional market channel, modern market channel without and with certification. To make the analysis simple, we will apply the exercise to tomatoes only. The analyses show that the chain to supermarket with certification created the highest total value added in which the specialized supermarket wholesaler creates the highest value added. In contrast, the supply chain to a traditional market creates the lowest value added where the traditional retailer creates the highest value added. The following is an analysis of value chain of each channel.

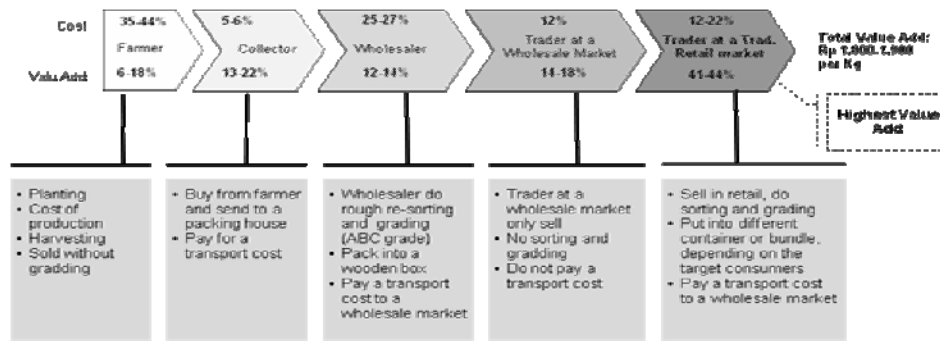
3.6.1 Value chain of traditional market channel

Rural collector bought harvest from farmer in the field without grading. Collector then transports the harvest and sells to a wholesaler at his packing house. The wholesaler performs sorting, grading and packaging. The trader from the retail market buys a mix ABC grade in a box at the wholesale market. He then loads-unloads, stores and sells in the traditional retail market in Jakarta.

Only few post harvest function performs in this chain. The total chain cost is Rp 1,281-1,597 per kg. The traditional retailer spent 12.2 per cent of the cost mostly for loading

unloading, transport, weighing, and commission. The chain creates value added at Rp 1,800-1,900 per kg which 41.4 per cent is received by the traditional retailer, the highest value added in the chain.

Figure 3.4 Value add of tomato on traditional market channel

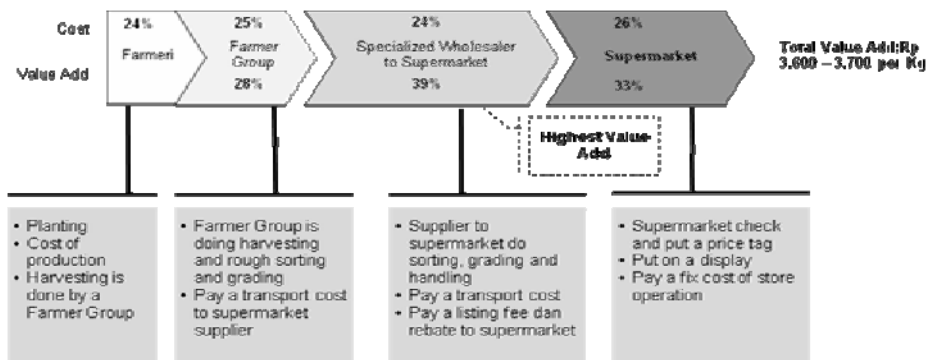


3.6.2 Value chain of modern market channel without certification

When a farmer harvests tomatoes, he calls the farmer group. After harvest, procurement staff of the farmer group sorts and grades the harvest at the field. The group charges a service fee of 10 per cent. By arrangement, the group sells and delivers graded tomatoes to the specialized supermarket wholesaler.

The specialized supermarket wholesaler received the tomatoes at his packing house. He re-grades and packages, transports and pays a rebate and fee (25 per cent of cost) to supermarket. Overall, the wholesaler has spent Rp 481 per kg. This chain creates Rp 3,600-3,700 per kg value added and the supermarket specialized wholesaler received 33 per cent of the total value added, the highest value added in the chain.

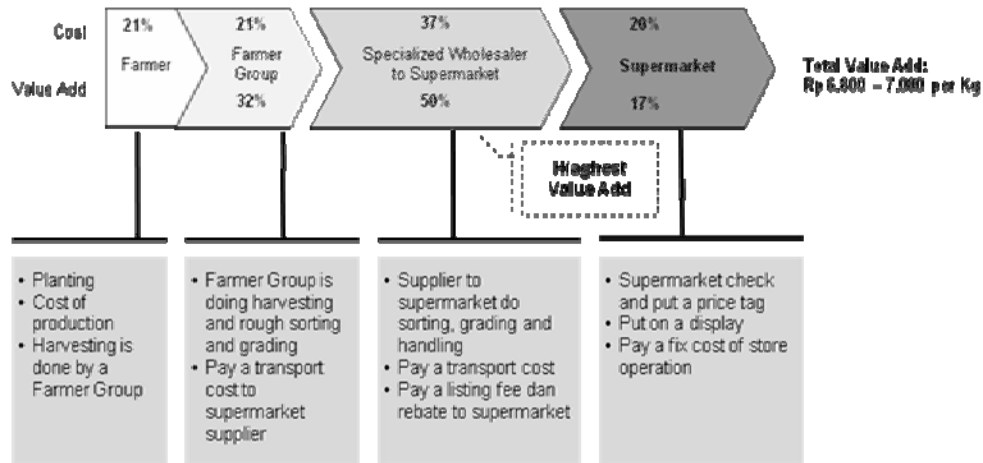
Figure 3.5 Value add of tomato on modern market channel



3.6.3 Value chain of modern market channel with certification

Similar to the last market chain, when a farmer harvests tomatoes, he calls the farmer group. After harvest, procurement staff of the farmer group sorts and grades the harvest at the field. The group charges a service fee of 10 per cent. By arrangement, the group sells and delivers graded tomatoes to the specialized supermarket wholesaler.

Figure 3.6 Value add of tomato on modern market channel with certification



As we can see, since certification is done by the supermarket supplier, most of the benefit is received by the wholesaler. In money value, farmers and farmers' groups also gain from the certification, but in term of percentage, the farmer and groups lose their value added share from 49 per cent to 42 per cent.

However, the wholesaler to supermarket also has to pay a rebate and fee (34-47 per cent) which becomes the highest portion of the cost. At the supermarket's retail-selling price of Rp 9,200 per kg, the chain creates Rp 6,800-7,000 per kg value added. The specialized supermarket wholesaler received 50 per cent of the total value added, the highest value added in the chain.

3.7 Conclusion

High increase of consumer's demand on fresh and processed food induced the food market restructuring in Indonesia, signified by the rapid growth of modern market and food industry. There is an urgent need for food safety assurance and product standard supporting the industry.

Chapter 3

The Ministry of Agriculture has set out a standardization system in agriculture sector including performing food safety as quality assurance for agriculture products through application of the HACCP system in all stages of agriculture industry activities and inspection system for agriculture commodities with SNI obligatory application. However, its implementation is far behind. The standard is little known by the food sector and producers.

On the other hand, demand for high quality product, consistent and standardized, has created a 'private standard' imposed by modern retailers to suppliers and producers. This standard is now become an effective tool in ensuring food safety and quality to the modern retail customers. The study shows that product certification standard gives value added to farmer, and the whole value chain.

4. Adding Value to Fresh and Processed Produce through Product Certification: The Philippines Case

*Josefina M. Lantican**, *Rene Cris P. Rivera***, *Jude Ray P. Laguna****

4.1 Introduction

This study was undertaken in collaboration with the United Nations - Centre for Alleviation of Poverty through Secondary Crops Development in Asia and the Pacific (CAPSA). Started in July 2008, the general objective of this study is to analyse and identify specific benefits derived from the rapid growth of the dynamic market, in particular from the product certification perspectives that can be tapped by secondary crops farmers, especially those living in medium altitude areas. The specific objectives are:

1. To identify and determine the linkages between the smallholder producers and specific market segments, local, urban markets, and cold store chains;
2. To determine the post-harvest practices of smallholder producers like cleaning, handling, and packing;
3. To determine the pricing, implicit and explicit quality requirements/indicators and current certification activities at all stages of the marketing channel; and
4. To provide basis for the preparation of training resources/materials specifically designed for small farmers to enable them to be linked to the dynamic market.

The project covers Benguet in the Cordillera Administrative Region (CAR) and Mindanao, specifically Cagayan de Oro City where vegetables grown in the plateaus of Bukidnon and Misamis Oriental are brought to the Agora market, the major vegetable trading post in the city. Primary data and pertinent information related to post harvest practices like cleaning, handling, and packing were collected from the producers, wholesalers, and retailers. Information on pricing, implicit and explicit quality requirement/indicators and current certification activities at all stages of the marketing channels, were also elicited. Other information was also taken from relevant past studies.

* Technical Adviser, Department of Agriculture – Bureau of Agricultural Research, Diliman, Quezon City

** Technical Support Staff, Department of Agriculture – Bureau of Agricultural Research, Diliman, Quezon City

*** Technical Support Staff, Department of Agriculture – Bureau of Agricultural Research, Diliman, Quezon City

The role of the local governments and policies were also studied and analysed. Results of the study will serve as inputs for the production of training materials for farmers/farmer associations.

The study focused on temperate and semi-temperate vegetables grown in the highlands of the Philippines. Surveys were conducted by the project team in the major vegetable growing highlands of the country, the Cordillera Administrative Region (CAR) and Northern Mindanao. Primary and secondary data and information related to the marketing of highland vegetables in the respective areas were collected, in order to assess the marketing system adopted by the smallholder producers. Respondents were the highland farmers, farmer association/co-operative leaders, wholesalers, wholesaler-retailers, and retailers. A number of supermarkets in Metro Manila were included in the survey to determine their roles in the supply chain. Secondary data were collected from the Bureau of Agricultural Statistics (BAS), the regional offices of the Agribusiness and Marketing Assistance Division (AMAD) of the Department of Agriculture (DA), and from relevant literature. Data and information gathered were analysed to identify and determine the linkages between smallholder producers and specific market segments, local, urban markets, and cold store chains.

The results of the study were presented in the regional and in-country seminars/workshops, specifically in Bandung, Indonesia and Manila, Philippines. The workshops were attended by representatives of relevant agencies, highland farmers' associations/co-operatives leaders, and other stakeholders. Training resources/materials specifically designed for small farmers were prepared to enable them to link to the dynamic markets. The results of the study will also be posted on the Web for wider dissemination.

4.2 Background

The Philippine agricultural sector is a significant segment of the Philippine economy, contributing 14 per cent to the Gross Domestic Product in 2007. Of the country's total employed labour force, 36 per cent is in the sector of agriculture and fisheries. About two-thirds of the total population is situated in the rural areas. The Philippine government continuously gives full support to the sector to further its development by allocating a significant portion of its total budget. Even with the government's support, a lot of farming families still live below the poverty line which can be attributed to the low and unstable income generated by farming/fishing activities.

Value-adding is one of the activities the Philippine government presently promotes to augment the incomes of families involved in farming. This is being tapped, along with other development programmes, as a tool to utilize unused labour in many farming communities, which is significantly composed of women. But this vision of value-adding is still in the process of materialization. Still, a lot of farmers sell their unprocessed produce to the traders, improperly cleaned and packed, in dire need of getting paid in cash at the soonest possible time. Meanwhile, various post-harvest practices are being promoted for farmers such as proper handling of their produce. Cleaning and proper packaging of produce is now being practiced by some farmers in many agricultural areas in the country. Yet, a large amount of produce is still wasted due to improper post-harvest handling and lack of attendant infrastructure and facilities.

Farming in the country is in a continuous process of modernization. Farmers being open to new technologies could help a lot in making agriculture a more productive sector. But in some cases, the problem of improper use of modern technologies adversely affects the sector. Overuse of pesticides and unsanitary handling of produce are some of the many problems the current farming system in the country faces. These bad agricultural practices have harmful effects on the produce but are usually not visible in plain sight, not to mention the fact that too much application of fertilizers and pesticides unnecessarily entails higher production cost. Produce grown using proper agricultural practices and traditionally grown crops (using inorganic fertilizers and pesticides) might even look similar when brought to the market. Some harvests are even brought to the market with traces of pesticide residues beyond tolerable limits, which is definitely harmful and unfit for human consumption. Knowledge about these practices affects negatively the demand for agricultural products, creating uncertainty in the quality of goods available in the market. Making sure that the products being brought to the market are clean and safe would greatly help ensure the sustainability of the supply chain and ensure the safety of the buying public. Having a good system will guarantee and help assure consumers of product quality and safety.

Good Agricultural Practices (GAPs) certification is deemed to solve the problem of bad farming practices. It guarantees consumers that agricultural products are properly produced and handled until they reach the consumer. Three years after the certification programme's initial implementation in the Philippines, a lot of farmers are still unaware of the process of certification. Some who are familiar with the programme find it hard to meet the requirements. Monetary problems and practicality often times hinder the farmer's desire to be certified. Certification is free but there is a fee of PhP 15,000 (US\$ 337) for

laboratory testing for every commodity to be certified. Since most markets do not require certification, farmers find it more practical not to apply for certification.

Consumers of agricultural products in the country rely on their basic knowledge in checking product quality only through appearance. But due to the growing concern on the effects of food quality on human health, a lot of consumers have started to become wary of the quality of the food they consume. The market, on the other hand, offers no reliable system to verify the quality of primary agricultural products. Fresh agricultural products in the market are seldom certified as having gone through good agricultural practices or organic farming. In instances where an agricultural product is certified, it commands a much higher price compared to traditionally grown crops. These premiums, which are acceptable to middle to high income consumers as ensuring safety and promoting good health, are intangible benefits that are not found in cheaper products. This opportunity for higher prices of produce, GAP or organic certified has yet to be realized by farmers.

As product certification is still in its initial stage, Filipino farmers typically plant their crops, harvest their produce and bring them to the market in a traditional manner. It is through an internal guarantee system that quality verification commonly takes place. The consumers rely entirely on the word of the producers. GAP certification has been introduced in the country since 2006. Since then, only one farm in the country has been certified. This only manifests the unpopularity of product certification in the country, which can be attributed to several intervening factors.

Although the adoption of certification in the country is slow, it is expected that it will eventually pick up as producers and suppliers learn more about the benefits that can be derived by taking advantage of the growing consumers' preferences for safe and healthy food. Domestic consumers, like their foreign counterparts, are slowly shifting their tastes and preferences from just buying based on price and physical appearance (e.g. cheapest or largest cauliflower) to purchasing based on other factors such as social, economical, environmental dimensions that went into the production and handling of the product, as numerous studies and research have found. They may consider health benefits like amount of protein or nutrients found, or religious slants such as *halal* preparation or *kosher*. Consumers are willing to pay higher prices or premiums for fresh or processed produce that meet their tastes and preferences just as long as they are guaranteed that what they buy is what the product is claimed to be. Many buyers today are prone to opt for products that undergo good agricultural practices or are organically grown.

But to ensure that these products are indeed what they are said to be, as guaranteed by the producer, the concept of standards and certification comes into play. Standards and certification are not just to safeguard the consumer or buyer, but they benefit producers and suppliers as well through improved farm record keeping, organized production calendars/activities and lower input costs (less dependence on pesticides and fertilizers). In addition, standards and certification not just benefit the individual agents but the society as well, through environment-friendly production techniques, improvement in labour practices and prevents oversupply as buyers are able to distinguish the real products from the fake. Such is the case of mangoes exported from a country in Central America being peddled in the US market as Manila mangoes, posed as coming from the Philippines. Without the proper certification seal, the buyers are misled to purchase the produce only to find out later, through taste, that it did not actually come from the Philippines which they prefer.

4.3 Review of literature

Studies on the importance of information on the proper function of markets started with the work of Akerlof in 1970. In his work, Akerlof discusses how uncertainty on quality makes businesses suffer, which then explains the existence in the market of various institutions that guarantee and insure product quality. This problem of uncertainty of product quality currently exists in the market for agricultural produce.

Most food products can be classified as credence goods, of which quality cannot be known to the consumers even after consumption (Anania and Nistico, 2004). This only signifies the existence of information asymmetry in the market for food products, wherein the seller knows more than the consumer about the quality of products being sold in the market. In the existence of information asymmetry in the market for agricultural products, methods of signaling, reputation, and certification are said to solve the problem. Among these methods, certification of the farm and its growing processes shows the most promise (Ward *et al.*, 2004). Through certification, unobservable credence attributes are transformed into observable search attributes, thus solving the problem of signaling product quality (Auriol and Schilizzi, 2003).

Self-certification, where an individual farmer certifies the quality of his produce does not seem as effective as independent certification, i.e. third party or government (Ward *et al.*, 2004). Independent certification always dominates self-certification (Auriol and Schilizzi, 2003). But given the right market incentive, voluntary certification will take place. High quality items sell at a premium above cost (Shapiro, 1983), which serves as an incentive to

produce high quality products and inform the consumers about it. To persuade the greatest number of consumers to purchase their products, producers can increase the information available to the consumers through labelling (Golan *et al.*, 2000). But the market is less likely to generate price premium for the certified product if the demand for the certified good was small relative to the overall demand, and if the costs of certification were significant and the amount of new demand created by certification was modest (Sedjo and Swallow, 1999).

If the consumers value labels, the certified product would gain a competitive edge over those that are not (Blend and Ravenswaay, 1997). Certification is a quality cue that is highly valued by people with certain socio-economic and demographic characteristics, and it usually works with the educated consumers. This makes certification useful in creating niche market (Dimara and Skuras, 2003). Labelling decisions may enhance economic efficiency by helping consumers to target expenditures toward products they most want (Golan *et al.*, 2000). Certification divides the product in the market into groups of high quality and those that are not. The emergence of two differentiated products in the market leaves consumers and high-quality producers better off, while low-quality producers are worse off, resulting then in an increase in the production of high quality products (Zago and Pick, 2004).

The government is known to have a number of policy tools at its disposal to correct the problem of asymmetric information (Golan *et al.*, 2000). Government intervention in solving this problem is usually in the form of providing standards and services for certification.

4.3.1 Guidelines on standards and certification of agricultural exports

Liu (2007) came up with a manual for regulations, standards and certification of agricultural exports as a guide for developed and developing countries to ensure that their products meet the requirements of countries that import fresh and processed agricultural products. The manual was commissioned by the Food and Agriculture Organization (FAO) which consists of governmental standards or regulations and import requirements as well as main voluntary private standards and certification programmes. The manual explains the details of organic agriculture certification, as well as the main requirements and how to get certified. It also includes sections on opportunities and constraints as well as the addresses of agencies that conduct certification.

According to Byers, Giovanucci and Liu (2008), the transparency in pricing, or when the seller and buyer understand what goes into the price of certain commodities such as the cost of standards and certification, market functions are improved. The study added that in order for a certain market to be sustainable, sellers or producers must have a clear signal

for sustainability – the price premium on better products that meet the standards preferred by consumers and certifying that what is being purchased is indeed genuine. Without this mechanism of ensuring that the producers' money is worth investing to meet the demands of the market, the supply chain may easily be disrupted.

As in the case of the market for fresh produce in the Philippines, producers are reluctant to certify their products because of the lack of incentive to do so; demand in the market is not stable, thus, preventing the emergence of a sustainable supply chain. Standards and certification do not just add value to the product but eventually cut production costs and streamline farm operations making the supply chain from farm to eventual packing or packaging more organized, minimizing loss, thus creating channels that are more efficient. A country's product differentiation based on appearance and taste alone allows other developing countries to enter the highly competitive market for certified goods, such as GAP certified or organically grown commodities, be it domestic or international.

For example, cabbage produced from the province of Benguet in the Philippines tastes sweeter than those produced in some other highlands in Mindanao, even if both are grown in almost homogeneous agro-climatic conditions. But certain production practices may influence the quality and taste of such product, such that many a consumer can differentiate the products once they have grown accustomed to them, and expect to get what they pay for. Products that pass off as being so-called organic but actually are not, tend to lose their share of the market as soon as buyers discover that what they are buying is not the same with what they used to. Differentiating a product, for a more feasible scheme is what a country needs in order to fare better in the international market if it lacked the necessary edge to be competitive as bulk raw material supplier. Process-oriented strategies best fit developing countries, which are the main sources of fresh produce. Aside from this opportunity, it also preserves their natural production resources (Byers, Giovanucci and Liu, 2008). As supported by Dimara and Skuras (2001), the concept that product differentiation associated with geographic location and traceability is advantageous in targeting urban consumers that prefer authentic and traditional products. These types of consumers are more educated, thus have greater earning and buying capacities, providing more incentives for exporting countries to produce more to meet their demands.

4.3.2 Good agricultural practices

The ASEAN has its own manual on good agricultural practices. This manual provides the common standards for the ASEAN nations to adopt or harmonize with. The aim of the document is to prevent risks that may occur from production, harvesting up to post-

harvest handling of fresh fruits and vegetables and facilitate trade within and outside the region. It is divided into four modules that include food safety; environmental management; workers' health, safety and welfare; and produce quality, which address risks and harmonizes the other three modules. It shows the process that considers all factors in the supply chain, be it land, labour, capital and other factors of production. The formulation of the ASEAN GAP emerged from the growing concerns for food safety and quality, environmental impact and sustainability of agriculture in the region. The code plays a significant role on the supply side by ensuring that farmers produce are economically viable, preserve the natural resource base while adhering to their social and cultural values. While on the demand side, it addresses the concerns of consumers on food safety and quality.

In the Philippines, The Code of Good Agricultural Practices for Fresh Fruits and Vegetable Farming (GAP--VF) is a set of consolidated safety and quality standards formulated by the Philippine Department of Agriculture. This is based on the Hazard Analysis of Critical Control Points (HACCP) and quality management principles with emphasis on the profiles of the farm, namely: 1) location, 2) structure, 3) environment (soil/nutrients), 4) maintenance (hygiene and cleanliness), 5) practices/methods/techniques (such as pesticide and fertilizer application, pest and disease management, post-harvest handling), and 6) management (farm records, traceability, staff training). This code aims to reduce risk of food contamination, be it bacterial, microbial, chemical or other substances hazardous to the consumers' health. Additional benefits of the programme are worker safety and the protection of the environment. These standards cover the farming activities from production up to post-harvest handling at the farm gate, trading post or packaging/packing locations prior to retail selling. According to the GAP-FV, produce that presents a high risk to food safety, such as sprouts or fresh cut products are not covered. In addition, this code may not be used for the certification of organic and genetically modified products. -FV certification may be awarded to individual farms, growers or produce market organizations (PMOs).

The Bureau of Agriculture and Fisheries Product Standards (BAFPS) under the Department of Agriculture (DA) has been tasked to come up with the guidelines for certification of GAP-FV farming in the country. The certification committee is spearheaded by the BAFPS and composed of representatives from other agencies of the DA and other concerned government institutions and a representative each from the private sector, namely, Non-Governmental Organizations (NGOs) or Peoples' Organization (POs) and the academe. Upon granting of certification, the awardee is allowed to use the official mark

'Good Agricultural Practice for Fruits and Vegetables Farming'. Despite the GAP-FV code and guidelines for certification, only a very few number of farms or producers have applied for certification. This is not only due to the lack of information dissemination, but mostly due to lack of incentives. Suggestions have ranged from ensuring a market or demand for GAP-FV certified products to enforcement of GAP-FV to all suppliers of wholesale product to retail outlets. The BAFPS has already conducted a number of trainings/orientations on GAP-FV delving on technology practices as well as post-harvest handling, sanitation and use of inputs. At present, the BAFPS has set the standards for a number of fruits, vegetables, and cut-flowers. Vegetables cover broccoli, bulb onions, cabbage, carrots, cauliflower, lettuce, tomato, and taro leaves.

4.3.3 Organic agriculture

According to the Agriculture and Agri-Food Department of Canada, organic produce can be classified under six (6) categories: 1. **Organic**: no chemicals have been used for more than three years; 2. **Organic in transition**: no chemicals have been used for a period between six months and three years; 3. **No pesticides**: no chemical pesticides have been used; 4. **Reduced pesticides**: the use of chemical pesticides is reduced more than 50 per cent of the average pesticide application; 5. **No chemical fertilizer grown**: products grown without chemical fertilizer; and 6. **Reduced fertilizer grown**: products where the use of chemical fertilizers is reduced to less than 50 per cent of the average fertilizer use.

In the Philippines, the Department of Agriculture issued in 2006 an administrative order outlining the implementing rules and regulations (IRR) of Executive Order 481 for the promotion and development of organic agriculture in the Philippines. This IRR prescribes the implementing procedures, processes and networking arrangements with the various stakeholders to promote, develop and sustain organic agriculture. These are in accordance with the National Organic Agriculture Program; the functions, duties and powers of the National Organic Agriculture Board (NOAB), the National Technical Committee (NTC) and the Technical and Administrative Secretariat of the NOAB and the NTC; and the responsibilities of government departments and agencies and other entities with respect to the implementation of the Administrative Order.

Despite these developments, only a few farmers/producers have applied for certification despite the growing demand for organically grown fresh produce in the domestic and world market. In lieu of applying for certification a number of organizations have instituted a sort of internal guarantee system to protect consumers from other so called 'organic' products that are flooding the market. Despite the higher price or premium for

organic produce, farmers tend to stick to conventional farming practices due to a number of factors such as lack of a ready market for organic produce and the farmer-trader/wholesaler relationships that are existing and most consumers are still bent on buying traditionally produced fresh and processed products given the overall high prices of other food and non-food products.

Organic agriculture in the country has caught on the global trend through the initiatives of the Center for International Trade Expositions and Missions (CITEM) under the Department of Trade and Industry, which is responsible for the promotion of exports in the Philippines by establishing the Organic Certification Center of the Philippines (OCCP). Philippine members of the International Federation of Organic Agriculture Movements (IFOAM) – Asia began the ground work for the OCCP. The OCCP is a private institution, the only certifying body accredited by the Philippine government.

The Benguet State University (BSU), along with other few organic farmers, sets the pace for producing a wide range of organically grown vegetables and fruits. It also promotes the use of their locally produced organic fertilizer. Though organically grown produce fetches a higher price, this is mainly due to the high labour requirements and cost, but organic agriculture experts are optimistic that these will go down once the technologies have been perfected. BSU has an internal guarantee system for farmers who would like to market organically- grown produce. The La Trinidad Organic Agriculture Producers (LATOP) also uses an internal guarantee system and producers are labelled according to the number of stars (the higher the star, the closer the farm is to being completely organic). The rule of thumb before a farm can go into organic farming is allowing the land to fallow the same number of years as the application of fertilizer (e.g. 5 years of fertilizer application = 5 years of fallowing), but most farms allow at least three years for the land to fallow before beginning to plant.

At present, a number of farmers in the Philippines growing chicken, herbals, rice, vegetables, and vinegar had been certified. So far 14 farms around the country had been given certification. It is estimated that the demand for organic produce is growing at the rate of 20 per cent annually.

4.3.4 Incentives/disincentives in the adoption of product certification

The increase in the global trade in fruits and vegetables in the ASEAN region and throughout the world as brought about by the WTO regime has made product certification necessary as a means to fare better in the international market. This makes it imperative for the traders to cater to the demands of consumers which have been changing due to

emerging preferences for safe and good quality produce, let alone other aspects such as environmental concern and protection of workers health, safety and welfare.

Changes in the food consumption pattern, especially in developed countries, as exemplified by those in North America, was induced by rising purchasing power, education level, urbanization, and evolving lifestyles, combined with the decline of food prices relative to other goods (Byers and Liu, 2003). Awareness of the importance of safe and good quality produce has also become pronounced with the occurrence of food crises in the late 1990's in the region caused by food contamination. This necessitated the government, the food industry, and consumers to adopt more effective monitoring systems for food production and distribution. The quality of produce also relates to the system of production and trading and its impact on society and environment. It covers the social and environmental or cultural issues, such as effect on workers, fair returns to producer, environmental impacts, and animal welfare.

The fast rate of urbanization, increasing population in the ASEAN region, and increasing demand in developed countries could offer trade opportunities which food producers could take advantage of. This could be in the form of getting a fair share of the global market, inducing farmers to increase production and command premiums for their guaranteed produce. The decision of farmers, producers, or exporters to get their products certified is influenced largely by the prospective benefits they could derive from the system. Foremost of these are the economic benefits that could be derived from the adoption of the system by individual farmers (Hobbs, 2003). These broadly encompass an increase in stabilization of revenue and/or reduction in costs. Aside from the production of food for sale, may facilitate an increase in revenues through increased returns to family farm by way of increasing food for home consumption. Other incentives may include the farm household's multiple goals like reduction of farm labour (accruing from workers' higher productivity), protection of farm assets for future generation, and so on.

On the downside, the farmers' decision to apply for certification, especially in developing countries, could be thwarted by the concern on the burden it could place on them. Complying with new standards usually entails additional costs for suppliers. Investments are often necessary to upgrade production and obtaining and maintaining certification is costly. Although certification benefits the entire food chain, the cost of private food safety and certification are almost always borne by the suppliers, the farmers, the processors, and exporters. Small suppliers may not be able to afford such costs and could

be left out of the value-added market segments, unless they group themselves into associations to attain economies of scale.

But despite the aforementioned constraints, there are cases where standards required by private entities actually benefit food producers in several ways. Complying with standards may improve market access through enhanced product quality and improve the image of the producer or supplier. Standards and certification not just safeguard the consumer or buyer, but they benefit producers or suppliers as well such as improving farm record keeping, organized production calendars/activities and lower input costs (less dependence on pesticides and fertilizers). In addition, standards and certification not just benefit the individual agents but the society as well, through environment-friendly production techniques, improvement in labour practices and prevents oversupply as the buyers are able to distinguish the real products from the fake.

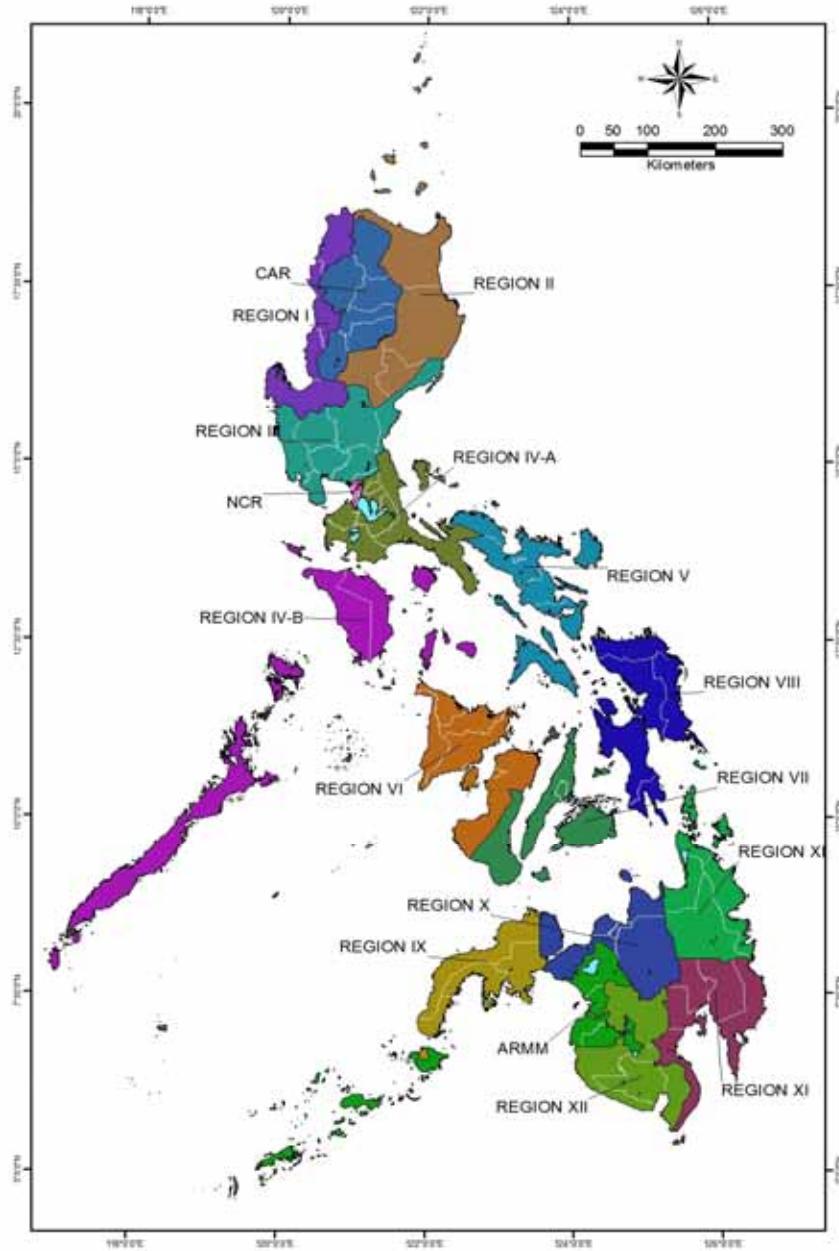
The new trend obtaining in the international food trade signals a lucrative market for food exporters. According to the Food and Agriculture Organization, the market for certified foods is growing 2-3 times compared to conventional products. With certification, products from certain areas of the world are hard to duplicate and are able to target premium market. Examples are the mangoes from Guimaras Island province, solo papaya and pineapples, and muscovado sugar, all coming from the Philippines. Standards and certification do not just benefit large farm owners/traders but small scale farmers as well, by adding value through the practice of good agricultural practices or going totally organic by which farmers can fetch higher prices or premiums. The global and domestic demand for GAPs or organically certified produce is increasing and will continue to increase as the issues of food safety are being constantly raised at world conferences and forums. The population today is not content with having enough food, but demands to have access to safe food. The government would play a significant role in persuading the producers/sellers not just to meet the volume demanded by the consumers, but provide them with clean and healthy food.

Both big and small food producers/exporters must be able to recognize the bright potential the international food market can offer. Global retail sales of organic food is estimated at US\$ 34B in 2005 based on studies and industry sources (ITC, 2006) and the growth of this market has been recorded to be up by 43 per cent from 2002 to 2005 (IFOAM, 2006). According to FAO (2005), global sales would reach to almost US\$ 70B by 2010, assuming a constant growth of 15 per cent per year. In Asia, particularly Japan, the estimated retail value of genuine organic products has been at US\$ 350M.

4.4 The highland vegetable industry in the Philippines

The Philippines is an archipelagic country measuring 300,000 square kilometres. It is a mild tropical country where a diversity of plant species abounds. Owing to its terrain, many farms are found on high elevated areas that are adaptable for growing of temperate and semi-temperate vegetables, especially those above 800 metres above sea level. The major vegetables grown are tomato, Irish potato, carrots, cabbage, snap beans, cauliflower, broccoli, and lettuce. Grown on a lesser scale are bell pepper, cucumber, celery, green peas, and other minor species. The most adaptable areas for temperate vegetable growing are the highlands of the Cordillera Administrative Region (CAR), which is the northernmost region of the Philippines. The most notable of which is Benguet province, where the mean temperature is 17°C and the monthly temperature varies from 15.5°C in January to 18°C in May.

Figure 4.1 Map of the Philippines



Another area known for temperate and semi-temperate vegetable growing, despite being located at lower altitudes and with lesser area for cultivation, is the plateaus of

Bukidnon and Misamis Oriental, in Northern Mindanao. Highland vegetables are also grown in other regions of the country but in small quantities, as allowed by the agro-physical conditions. But on an aggregate level the other regions contributed significantly to the country's total highland vegetable production.

4.4.1 Area planted

For the last five years the area planted to temperate vegetables in the country averaged to 41,978 ha. Benguet, together with its adjoining provinces in CAR, had the biggest cultivated area, averaging 15,505 ha or 35.7 per cent of the country's overall average area grown to temperate and semi-temperate vegetables. Going south in the Philippines, Northern Mindanao has an arable area of 3,479 ha, or 8 per cent of the national average. The rest of the regions had a combined area of 24,188 ha. On the national scale, the biggest land area is devoted to tomato, covering 17,394 ha, followed by cabbage with 7,739 ha and carrots with 3,806 ha (Table 4.1). Snap beans and Chinese cabbage tail along with 3,322 ha and 3,252 ha, respectively.

Table 4.1 Average area planted to major highland vegetables in the Philippines, 2003-2007

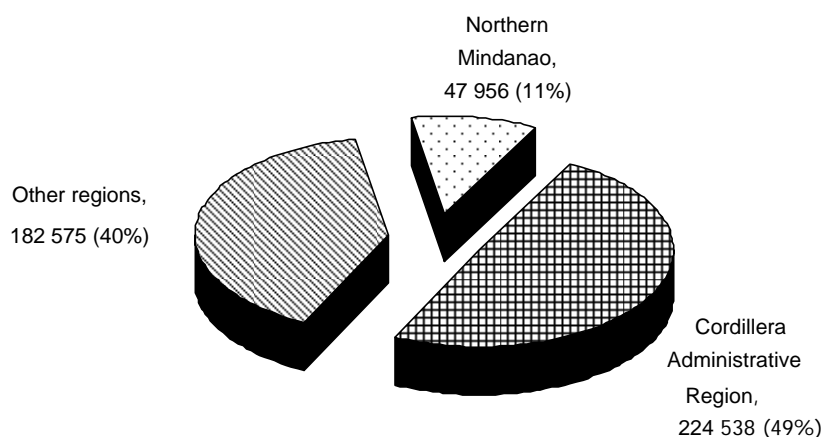
Vegetable grown	Area (ha)	Share to national average (%)
Tomato	17 374	41.39
Cabbage	7 739	18.44
Irish potato	5 945	14.16
Carrots	3 806	9.07
Snap beans	3 322	7.91
Chinese cabbage	3 252	7.75
Lettuce	339	0.81
Broccoli	201	0.48
Total	41 978	100.00

Source: Department of Agriculture – Bureau of Agricultural Statistics, Philippines.

4.4.2 Average production

For the same period, the country produced an average of 455,069 metric tons of temperate vegetables annually. The biggest volume of output was posted by tomato with 169,095 metric tons, followed by cabbage and Irish potato with 98,178 metric tons and 79,125 metric tons, respectively (Table 4.2). CAR produced an overall volume of 224,538 metric tons annually, about half of the country's total production. Northern Mindanao shared 10.5 per cent of the total output, and the rest, by other regions (Figure 4.2).

Figure 4.2 Production of highland vegetables in the Philippines, by region, 2003-2007



Source: Based on the result of the study team survey, July 2008.

Table 4.2 Average production of major highland vegetables in the Philippines, 2003, 2007

Vegetable	Average production (mt)	Per cent of national average production
Tomato	169 095	37
Cabbage	98 178	22
Irish potato	79 125	17
Carrots	41 317	9
Chinese cabbage	38 558	8
Snap beans	12 974	3
Cauliflower	11 122	2
Lettuce	2 674	1
Broccoli	2 027	0
Total	455 070	100

Source: Department of Agriculture – Bureau of Agricultural Research.

4.4.3 Consumption

Highland vegetables produced in the country are all consumed domestically, with little quantities being exported. The per capita consumption of both temperate and tropical vegetables in the Philippines stands at 39 kilograms annually. Philippine vegetable consumption is low as Filipinos are not fond of eating vegetables except when prepared as salads. Preparing salads takes much time, such that they are seldom served as part of the

meals of households. Vegetables are usually eaten in small bits, as ingredients in main courses of meat or fish. Among the low-income households, vegetables are mostly eaten as the main dish, together with small portions of dried fish or fish paste and rice. When the consumption of sweet potato and mungbean is included, intake could reach 44 kilograms. This is way below the 146-182 kilograms per capita recommended by WHO/FAO (Batt *et al.*, 2007), and is much lower than the average consumption of 80-100 kilograms in developed countries. The local vegetable consumption is also behind those of other Asian countries such as Thailand (60 kg), China (98 kg), Taiwan (122 kg), and Japan (137 kg). If the consumption of 69 kg recommended by the Food and Nutrition Research Institute (FNRI) is to be followed, the country needs to increase vegetable production by almost 80 per cent (The National Research, Development, and Extension Agenda and Program for Vegetables, 2003).

4.5 Marketing of highland vegetables

4.5.1 The Cordillera Administrative Region

The highland vegetable growers in CAR are generally grouped into associations/co-operatives composed of members numbering to several hundreds. The associations/co-operatives interviewed by the project team have 300 to 800 members. These are further grouped into federations or co-operatives for reasons of attaining economies of scale and bargaining power. The Benguet Vegetable Farmers Federation (BVFF), for example, is composed of 76,000 farmers while the Marketing Co-operative of Benguet Farmers is composed of 80,000 farmers. The BVFF is composed of farmers' co-operatives and associations covering the 13 municipalities of Benguet province. The pursuit for the common good of the members instills cohesiveness among them, specially, in transporting the produce to the vegetable trading post in La Trinidad municipality which is 4-5 hours travel from the biggest vegetable-producing municipality of Buguias in Benguet. As many are small landholders tilling one-half hectare of land (except those affiliated with the Benguet Vegetable Farmers Federation who own an average of 2 ha), pooling their produce and maximizing the carrying space of trucks or vans that bring the produce to the La Trinidad vegetable trading post has become the traditional practice to minimize hauling costs. Each truck or van has a carrying capacity of 1.5-2 tons.

Based on the study conducted on the flow of vegetables grown in CAR to La Trinidad and Baguio City during the period 2001-2003, the annual volumes exhibited an increasing trend (Pekas *et al.*, 2004). From 41,446 metric tons (MT) in 2001, the volume

more than doubled to 83,759 MT in 2002 and later to 128,571 in 2003. The major vegetables traded included potato, cabbage, Chinese cabbage, carrots, snap beans, and chayote. Based on the interview with the president of Baguio Vegetable Farmers Federation, the daily volume of vegetables brought to the La Trinidad trading post reaches 1,200 MT. daily. This is equivalent to about 438,000 MT annually. The daily volume traded during the month of December increases two-fold due to increased planting done by farmers during this time to take advantage of the cooler temperature which is ideal for vegetable growing and the increased demand brought about by the Christmas festivities. During this month, vegetables brought to the trading post are estimated to reach PhP 1.5 million daily (equivalent to about US\$ 31,250). On a yearly basis, the total value amounts to PhP 258 million (US\$ 6.3 million). As in the previous years, the major vegetables sold are cabbage, potato, carrots, Chinese cabbage, lettuce, broccoli, and chayote.

Due to the insufficiency of production and price data on minor vegetables, the total value of highland vegetable production in CAR is difficult to determine. But according to the Division Chief of the Agricultural Marketing Assistance Division of the CAR Regional Field Unit of the Department of Agriculture, the value of the vegetable trading industry at La Trinidad is estimated to run to PhP 20 billion (US\$417 million) annually.

The farm gate prices of the vegetables vary according to kinds, grades and extent the vegetables are trimmed, cleaned, and packed. There are marked differences in pricing between produce that are clean and unclean among some vegetables. The difference is most remarkable in lettuce, where the difference could reach 30 per kg. For bell pepper, the difference is PhP 24 per kg, as shown in Table 4.3.

Table 4.3 Farm price differences between clean and unclean vegetables at La Trinidad trading post, July 2008

Vegetable	Farm gate price (PhP/kg)		Price differences (PhP)
	Unclean	Clean	
Cabbage	15	25	10
Potato	15	-	
Carrots	16	19	3
Bell Pepper	56	80	24
Cauliflower	13	15	2
Broccoli	13	15	2
Lettuce	30	60	30
Leek	5	6	1

Source: Based on survey conducted, July 2008.

The big differences in prices could be attributed to the cost of labour involved in trimming, cleaning, and packing vegetables. Trimming and cleaning vegetables are either done in the farms by the farmers or not done at all. The wholesalers do the activities in the

trading posts through hired labour. The wholesalers interviewed at La Trinidad hire labour for cleaning, trimming, and packing the produce. Labour costs are lower than the minimum wage set by law, but in some cases free board and lodging is provided. The wholesalers trading cauliflower paid the labourers PhP 150 each, working for five hours plus free board and lodging. To clean 10 to 15 sacks of the produce, 1 to 3 labourers are needed to work for 5 hours. For broccoli, the cost of labour for cleaning and packing is PhP 150 per 8 hours of work. Some labourers are paid on a monthly basis. For example, a cabbage wholesaler pays his labourers PhP 4,000, plus free board and lodging. They work from 3:00-6:00 p.m. cleaning and packing 300 kilograms per day. In most cases, the farmers maintain live-in labourers who are paid PhP 150 per day for cleaning vegetables. Most of the labourers are males.

Cost of production

Most of the highland farmers in CAR do not know exactly the returns they derive from vegetable farming as they do not bother to keep farm records. Based on the interview with the federation leader, the growing of vegetables per hectare per planting season requires about PhP 22,000 capitalization. The major cost is incurred on the application of fertilizers (combined organic and inorganic) and pesticides. The costs of these inputs range from PhP 700 to PhP 2,000 per application per hectare, depending on the rates of application. The cost of vegetable growing varies across locations and is a function of several factors such as soil types, climatic factors, level and quality of inputs, technology, prices of inputs, managerial ability of the farmer, and so on (United Nations Development Programme, 2005). Labour cost incurred in land preparation (done manually), application of fertilizers and chemicals, and harvesting add significantly to the total cost. Most of the labour is hired, with family labour representing a small share of the total cost.

Insights on the costs of producing vegetables prevalently grown in Mountain Province (in the Cordilleras) like cabbage, carrots, and lettuce will give a bird's eye view of the different costs involved in growing other highland vegetables. Based on the UNDP study, the cost of producing cabbage in 2005 amounted to PhP 2.76 per kilogram, of which 42 per cent consisted of organic manure and inorganic fertilizers. For carrots, production cost varies by season. During the dry season, an additional cost is incurred due to irrigation. Producing a kilo of carrots cost PhP 10.10/kg., of which 57 per cent was material cost. Of the total material cost, fertilizer represented 29 per cent. Pesticides which are applied 3 times a week cost PhP 1.25/kg, equivalent to 16 per cent of the total cost of production.

Labour cost of fertilizer and pesticide application, hauling, and harvesting comprised almost 28 per cent of the total cost.

As to lettuce, the cost of producing a kilo amounted to PhP 16.33. Of this, hired labour represented 90 per cent of the total cost due to intensive care and management requirement in growing. Material cost, which consisted of seeds, fertilizer, and chemicals amounted to about PhP 2.77 per kilogram.

Post-harvest activities

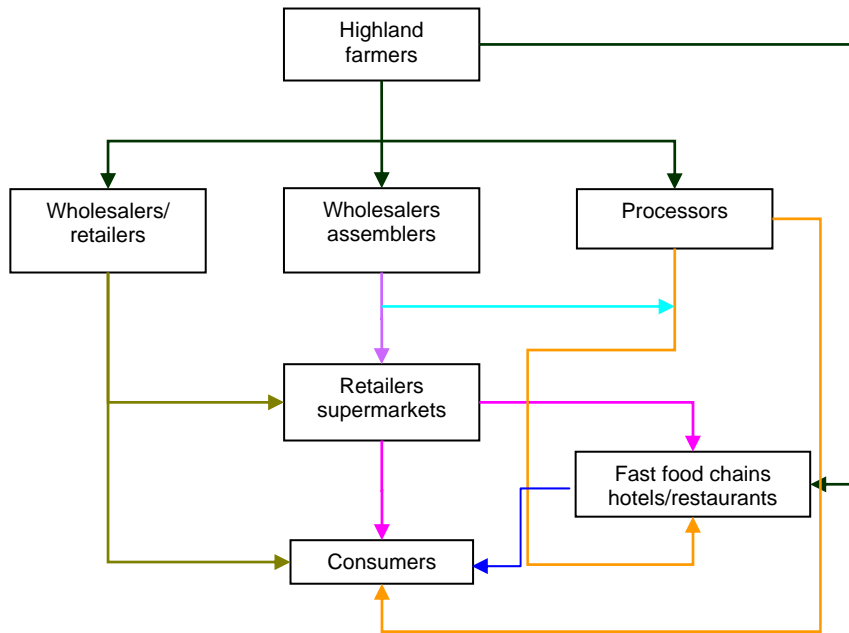
Upon harvest, vegetables are customarily brought by farmers to the La Trinidad Vegetable Trading Post through vans or jeeps. In the case of cabbage, this is where the farmers trim the produce to remove the damaged outer leaves during transport and handling. This process entailed a loss of 20 per cent to the farmer. Cabbage is then classified as first class and second class. Second class cabbage does not have outer leaves, such that significant loss of weight is incurred after trimming. This loss added to the costs incurred by the farmer in transporting the produce which was not sold.

For carrots, the produce is brought to the private trading post located across the La Trinidad trading post established solely for carrots. This provides the place where cleaning and selling facilities are available. The traders take charge of cleaning, sorting, and packaging of carrots. The produce is placed in gunny sacks and sold to truckers/traders. As to lettuce, the produce is partially cleaned at the farm before transporting to the La Trinidad trading post. At the trading post, lettuce are trimmed and sorted according to size by the traders.

Product destination

The farmers sell their produce to wholesalers/traders who later sell to other wholesalers, wholesaler-retailers, or retailers as diagrammed in Figure 3. It takes 4 to 8 layers of traders before vegetables reach the final destinations. The farm gate prices of vegetables increased tremendously when the produce reaches the retail outlets in CAR. The farm gate prices received by the highland farmers ranged from 22-74 per cent of the retail prices in the region owing to the many layers involved in the supply chain (Table 4.4). The price mark-ups at the retail outlets at CAR ranged from 35 per cent (for native *pechay*) to as high as 356 per cent (for *chayote*) from the farm gate prices.

Figure 4.3 The highland vegetable supply chain in Benguet



Source: Based on the result of the study team survey, July 2008.

Table 4.4 Farm gate, wholesale and retail prices of vegetables in the Cordillera Administrative Region, 2007 (PhP per kilogram)

Vegetable	Farm gate price (PhP)	Wholesale price (PhP)	Retail Price (PhP)	% price mark up from farm to retail
Habichuelas	n.a.	20.02	n.a.	
Bell pepper	34.47	46.02	n.a.	
Broccoli	22.77	27.86	n.a.	
Cabbage	8.9	13.41	23.59	165
Carrots	14.48	28.99	47.29	227
Cauliflower	15.9	24.13	n.a.	
Celery	19.37	23.76	n.a.	
Chayote	3.35	4.97	15.29	356
Cucumber	14.82	19.84	n.a.	
Onion (leeks)	16.98	23.01	n.a.	
Pechay (Baguio)	5.83	10.63	n.a.	
Pechay (Native)	21.2	26.94	28.52	35
Irish potato	19.73	22.48	35.01	77
Tomato	14.09	16.35	36.23	157

Source: Department of Agriculture - Bureau of Agricultural Statistics.

Vegetables in La Trinidad are mostly brought to Manila, with the rest sold to neighbouring provinces in northern Luzon and in central Luzon. The rest of the produce are brought to as far as the provinces of Laguna, Cavite, Batangas, the Bicol Region, and Romblon province in Southern Luzon and to Cebu province in Eastern Visayas.

Pricing scheme

The traders in the La Trinidad vegetable trading post occupy booths which differ in sizes and types of produce sold. Payment is not made immediately after sale by the traders. In some cases, farmers are paid after the produce has been sold by the traders, especially those who provide loans to the farmers. If they obtain credit in advance, they are required to sell the produce to the trader-lender. But some farmers opt to sell to those who offer higher prices and sometimes even lower, provided they are paid immediately. In the case of cabbage, the traders sort them upon receipt depending on the type. The produce is then packed in plastic bags weighing 20 kg per bag. It is in the booths where buyers go and bargain with the traders. The selling prices of cabbage depend on the bid prices of the Manila traders since the bulk of the produce is bought by them. When a final price is reached, the traders automatically deduct a fee of PhP 0.50/kg from the farmers who sell the produce inside the booth. The buyers have the option to return the produce to the sellers in case of poor quality.

The vegetable supply chain

Farmer's level

Based on the UNDP study, the cost of transporting vegetables from the farm to La Trinidad comprises 30 per cent of the production cost. There are other marketing costs involved which vary according to the kinds of vegetables sold. In the case of cabbage, trimming entails a loss of 20 per cent of the volume of the produce brought and this is charged to the farmer. Further, the cost of the produce which is not sold is added to the loss on the part of the farmer. Moreover, the farmer pays a fee of PhP 0.50 to the trader if he sold his produce inside the booth. The cabbage growers got a price margin of PhP 2.64/kg, based on a selling price of PhP 6.50/kg and production and marketing cost of PhP 3.86/kg (Table 4.5).

For carrots, the cost of packing and transporting the produce to La Trinidad trading post amounted to PhP 2.91/kg, of which 50 per cent is transport cost. Other costs shouldered by the farmers are hauling (27 per cent) and packaging (4 per cent). There is also a loss incurred during transport from the farm to the trading post of about 20 per cent of

the total volume handled. At a price of PhP 16.58/kg paid by the local traders, taking into consideration the loss and costs at the farm level, the margin of the farmer amounts to P1.99/kg.

Table 4.5 Costs incurred and price margins obtained in the highland vegetable supply chains, 2005

Supply chain	Total cost (PhP/kg)	Selling price (PhP/kg)	Price margin
First class cabbage			
Farm level	3.86	6.50	2.64
Local wholesaler	6.74	7.00	0.26
Terminal wholesaler	10.36	13.33	2.97
Retailer	16.38	30.00	13.62
Carrots			
Farm level	11.27	16.58	5.31
Local wholesaler	19.74	20.90	1.16
Terminal wholesaler	25.90	32.50	6.60
Retailer	35.55	36.00	0.45
Lettuce			
Farm level	19.14	36.00	16.86
Local wholesaler	36.90	41.00	4.10
Terminal wholesaler	52.62	60.00	7.38
Retailer	63.05	72.50	9.45

Source: United Nations Development Programme, 2005.

As to lettuce, the cost of transporting the produce from the farm to the La Trinidad trading post amounted to PhP 2.82/kg and with other production costs of PhP 16.33/kg, the value of one kg of lettuce at the trading post amounted to PhP 19.14/kg. At a wholesale price of PhP 36.00/kg, the farmer is left with a gross margin of PhP 16.86/kg. But with a loss of about 37.5 per cent, the net margin to the farmer after deducting all his costs is reduced to only PhP 3.36/kg.

The wholesaler's level (at Benguet)

The total cost of the assembling function done on cabbage by the local traders in La Trinidad was PhP 6.24/kg in 2005. This comes mostly from the amount spent on handling which cost PhP 0.04/kg. The local wholesalers got a net margin of PhP 0.26/kg based on a selling price of PhP 7.00/kg. For carrots, total assembling cost amounted to PhP 1.34/kg, consisting mostly of cleaning, sorting, and packaging. At a selling price of PhP 20.90 and marketing cost of PhP 19.74, the traders could get a margin of PhP 1.16/kg.

For lettuce, the trader entails a loss of 37.5 per cent due to trimming, but this is charged to the farmer. Moreover, the trader sets a mark-up of PhP 5.00/kg they handled and deducted the amount from the farmer. There is no cold storage facility available at the

post for lettuce such that lettuce is vulnerable to spoilage. The only cold storage facility available is located 2 kilometres away from the trading post. The cost incurred by the wholesaler, as well as by the assembler, at the trading post amounted to PhP 0.40/kg. Given a fixed mark-up of PhP 0.5/kg (which are deducted from the farmer's sale), the net gain of the local assembler is about PhP 4.60/kg.

Compared to the farmers, the local traders get lower margins for first class cabbage, and carrots. While farmers get margins of PhP 2.64/kg and PhP 1.99/kg from first class cabbage and carrots, respectively, the traders get PhP 0.26/kg and PhP 1.16/kg. But for lettuce, the farmers get lower margins of PhP 3.36/kg than the traders' at PhP 4.60/kg.

Terminal wholesaler

The terminal wholesalers (those coming from Manila) buy 500 tons of cabbage daily from La Trinidad for transport to the final market in Divisoria, Manila. The bulk of the cost of transporting the produce is spent on fuel. Moreover, a fee of PhP 500 per 20-ton truck is paid at the expressway's toll gate by the trader. Aside from Metro Manila, cabbage is traded in other provinces in Southern Luzon to as far as the provinces in Eastern Visayas. The terminal wholesalers get margins of PhP 2.97/kg for first class cabbage.

For carrots, the produce bought are packed in gunny sacks and loaded onto trucks. The total cost incurred amounted to PhP 25.90/kg. At a price of PhP 32.50/kg the terminal wholesaler got a margin of PhP 6.61/kg. As to lettuce, transporting it from La Trinidad to Manila entailed a fuel cost of PhP 1.60/kg. As in other highland vegetables, the main market is Divisoria. The bulk of the cost shouldered by the terminal wholesaler was spent on transportation, at PhP 4.00/kg. The wholesalers got a margin of PhP 7.38/kg.

Retailer's level (Metro Manila)

Wet market retailers in Metro Manila buy most of the vegetables they sell from the Divisoria trading post. For cabbage, they spent about PhP 2.00/kg in bringing the produce to the wet markets where they are further cleaned, trimmed, and sorted. The retailers incur about 10-20 per cent loss due to spoilage. For first class cabbage, retail price was PhP 30/kg, giving a price spread of PhP 16.67. With the retailing costs of PhP 3.05/kg and loss of PhP 6/kg, a net profit of 7.62/kg was realized.

As in cabbage, the bulk of the retailing cost of carrots is spent on transporting from Divisoria to the wet market. The retailers derive only a price margin of PhP 0.45/kg. Similarly, the cost of transporting lettuce to the wet markets was PhP 2/kg. Normally lettuce is sold in plastic bags, like other vegetables. Retailers trim lettuce almost daily to remove

dried leaves and spoiled portions until finally sold. This entails a loss of 20 per cent from the total volume purchased by the retailers. Retailers incurred net losses of PhP 5.05/kg.

The Metro Manila supermarkets

The main sources of fresh and processed produce of some of the major supermarkets in the capital city of Manila are farmer associations; large, medium, and small farm size owners-traders; traders; and some buying agents. Each type of vegetable is sourced from either a single farm or a group of farms. Some traders are able to supply all types of vegetables while others can only deliver certain groups of vegetables. Based on the survey conducted, the major vegetables supplied to supermarkets are asparagus, bell pepper, broccoli, cabbage, carrots, cauliflower, celery, chayote, cucumber, onion (leeks), Chinese cabbage, *pechay* (native), potato, and string beans. The common mode of payment is by check, usually a couple of days after delivery of the produce. Some supermarkets have separate sections for organic produce and traditionally grown produce. Almost all supermarkets require that produce delivered are clean and/or packaged. Based on the survey, carrots are the most purchased semi-temperate vegetables, necessitating an average delivery volume of 500 - 22,840.24 kg per week or 11,670.12 kg/week (Table 4.6).

Table 4.6 Average volumes of selected vegetables purchased by major Metro Manila supermarkets, 2008

Vegetable	Volumes delivered per week (kilograms)
Asparagus	10 996.67
Bell pepper	2 947.59
Broccoli	1 734.61
Cabbage	8 636.12
Carrots	11 670.12
Cauliflower	925.77
Celery	1 067.31
Chayote	7 884.80
Cucumber	5 318.47
Onion (leaks)	1 053.37
Chinese cabbage	4 117.35
<i>Pechay</i> (native)	2 818.79
Potato	5 844.06
String beans (sitaw)	2 359.57

Source: Based on survey conducted, 2008

The average selling prices of major semi-temperate vegetables vary according to seasons (wet and dry season) and agro-climatic factors such as typhoons and heavy monsoons. There are also major price differences between the purchasing prices and the

selling prices of vegetables in supermarkets. Mark-up prices ranged from 16 per cent to 212 per cent, as shown by carrots and celery (Table 4.7).

Table 4.7 Average buying and selling prices of vegetables at major Metro Manila supermarkets, 2008

Vegetables	Buying prices (PhP)	Selling prices (PhP)	Mark-ups (%)
Asparagus	256.10	331.00	29
Bell pepper	91.00	114.00	25
Broccoli	168.00	217.00	29
Cabbage	37.00	50.00	35
Carrots	64.00	74.00	16
Cauliflower	126.00	155.00	23
Celery	42.00	131.00	212
Chayote	20.00	26.00	30
Cucumber	37.00	49.00	32
Onion (leaks)	62.00	100.00	61
Chinese cabbage	37.00	47.00	27
<i>Pechay</i> (native)	37.00	46.00	24
Potato	41.00	50.00	22
String beans (sitaw)	31.00	40.00	29

Source: Based on survey conducted, 2008.

Vegetables labelled as organic fetched higher prices compared to traditionally grown produce. The difference in prices sometimes reaches 256 per cent as in the case of cucumber (Table 4.8). Organic vegetables on display were distinguished from those conventionally grown by attaching labels, guaranteeing that they were organic. But the produce claimed to be organic did not bear the certification seal issued by the legitimate certifying body. As the customers were not aware of the authentic labels required by the certifying body, they trust that what they were buying was really organically produced. This is a major problem that has to be addressed by the appropriate authorities to deter other suppliers from labelling their produce as organic just to fetch higher prices.

Table 4.8 Price differences between traditionally and organically grown vegetables at major Metro Manila supermarkets, 2008

Vegetables	Regular price (PhP)	Organic (PhP)	Difference
Bell pepper	145	310	114
Carrots	69	86	25
Cauliflower	225	375	67
Cucumber	47	168	256
Potato	72	120	67

Source: Based on survey conducted, 2008.

Organic and GAP certification

Most of the supermarket managers interviewed were interested in learning more about organic and GAP certification and requested that they be furnished information materials and invited to trainings on organic agriculture and GAP. They wanted to ensure that their customers are buying clean and safe, fresh, and processed produce and are eager to capture the certified organic produce niche market. As a significant part of the population is turning to more healthy lifestyles, the demand for organic and GAP certified produce shows high potential. It is the responsibility of the government and the respective certifying bodies to ensure that vegetables that enter the supermarkets pass the necessary requirements before being given permission to use the organic or GAP seal.

Government support to highland farmers

The Department of Agriculture (DA) provided highland vegetable farmers with facilities necessary for preserving the quality of the produce to minimize post-harvest losses. The DA, through its staff bureau, the Bureau of Post-Harvest Research and Extension (BPRE), constructed a **mini-processing plant** in Benguet for growers to clean their produce for export at the trading post. But based on the interview with the president of the Benguet Vegetable Farmers Federation, the produce coming from the facility was rejected by the supposed buyer, Dole, Philippines, a major exporter of fresh produce and by the domestic market as it did not reach the quality specifications required.

BPRE also built the agricultural tramline in Benguet to ease the burden of hauling production inputs up to the farm and fresh produce from the mountains of the cordillera to the nearest roadside. The manual transport of the produce has been a big problem for farmers as it is too cumbersome and entails much higher cost of marketing their goods. Based on the computation of BPRE, a kilometre of tramline cost about PhP 1 million to build, but this did not necessarily mean that 2 km would cost PhP 2 million. The power house or motor that run the tram has a fixed cost, hence only the cost of extending the tramline is added to the total cost. Likewise, the cost of the other components would also increase as the length is extended. But constructing a tramline using materials such as cables, pulleys, carts or carriers, posts, a powerhouse, and loading/unloading platforms was 11 times cheaper than the construction of a farm-to-market road of the same length. BPRE estimated that hauling costs using manual labour were at times higher than the actual market price of the produce being transported. Based on Bureau's published report, one farmer reported that manual transport of vegetables in Atok, Benguet costs Php 1 per kg (sometimes higher depending on the weather and topography). With the construction of the

tramline, a hauling fee of PhP 0.40 charged per kg enabled the farmer to reduce his transport cost by as much as 60 per cent. Transport time was also minimized while manual hauling would take an hour. With the tramline, it was lessened to just three minutes, ensuring the freshness of the produce, minimizing cost, and allowed vegetables to fetch more reasonable prices that would be beneficial to both the farmers and consumers.

Despite the potential benefits, the tramlines constructed in Benguet are, at present, not functional. The facility has deteriorated due to wear and tear and exposure to the elements. Maintenance and rehabilitation costs were high, preventing the operation of the facility.

BPRE also provided refrigerated vans to the farmers of Benguet. But the number vans is insufficient to accommodate the produce as these are also utilized by meat traders in marketing the products.

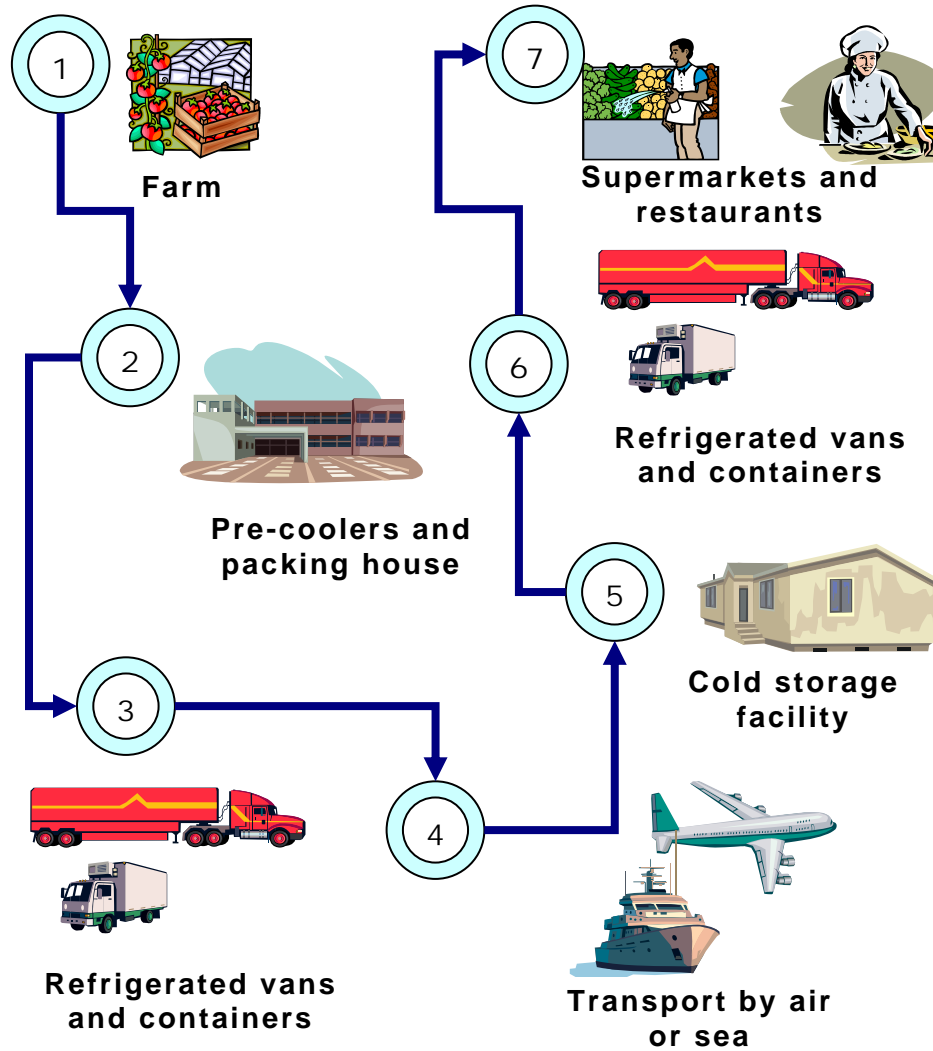
Of late, the Bureau implemented the Philippine National Cold Chain Programme which utilizes the traditional and alternative routes for fresh semi-temperate vegetables. But the implementation of the programme is still in its pilot stage. The programme covers the Mountain Province and Benguet-La Trinidad through the Halsema Highway. Vegetables brought from La Trinidad to Metro Manila and other provinces of Luzon traverse the La Trinidad-Manila line, passing through the provinces of Pangasinan, Tarlac and Pampanga before reaching the large city markets and supermarkets. Other traders also bring the produce directly to the municipal or city markets of Pangasinan, Tarlac and Pampanga. Some of the produce brought to Metro Manila even finds their way to other markets in the Southern Tagalog region to as far as the Visayas.

The Philippine National Cold Chain Programme was implemented to minimize post-harvest losses in vegetables, which is placed at 40-60 per cent. The main target of this programme is the Cordillera Administrative Region, as well as the plateaus of the provinces of Bukidnon and Misamis Oriental, where most of the highland vegetables in Mindanao are grown. This was conceived since private investment on refrigerated vans and reefer trucks are too prohibitive for the average farmer/grower to afford. Information about the benefits of the technology is limited, such that it is necessary to demonstrate to stakeholders how the cold chain technology works by piloting it in key transportation routes for fruits, vegetables, livestock, poultry and fishery products. The programme's main components and trade routes for temperate and semi-temperate vegetables cover pre-coolers, packing houses, cold storages, refrigerated trucks and refrigerated container vans. The different components minimize significantly the losses in vegetables right after harvest and during transit by

providing the favourable atmosphere and conditions necessary for preserving the freshness of the produce. The function of each component is demonstrated as follows:

- *Pre-coolers* - facilities used to remove field heat rapidly upon harvest to control the temperature of the vegetables to reach the desired conditions that extend its shelf life. This process is done to suppress respiration, inhibit water loss and growth of decay-producing micro-organisms and reduce the production of ethylene, which is considered a ripening agent. This process can be done prior to or after packing the vegetables. The process involves cooling the room where the produce is stored temporarily, in cases where the vegetables are stored for a short period of time. This requires the use of forced-air and high relative humidity technique. The schematic diagram on the processes involved in the Philippine National Cold Chain Programme is shown in Figure 4.4.
- *Packing houses* - where the produce is sorted according to size and/or colour, trimmed, cleaned and packed for transport directly to markets or cold storage facilities, before they are delivered to supermarkets or other retail outlets.
- *Cold storages* - depots used to store and maintain the temperature of transported vegetables that have been pre-cooled to extend shelf life and ensure freshness and preserve the quality of produce. The commodities are then transported to supermarkets where they once again stored in a cold storage facility until they are put on sale.
- *Refrigerated truck* - used to maintain the temperature of the produce while being transported from the pre-cooler and or packing facilities to the cold storage houses.
- *Refrigerated (container) van* - similar to refrigerated trucks only they are designed to transport larger volumes of vegetables by plane (in cargo hold) or ship (in container vans), in the case of transporting vegetables from Northern Mindanao to Manila, or trailer trucks.

Figure 4.4 The Philippine National Cold Chain Programme



Source: Bureau of Postharvest Research and Extension, Department of Agriculture, Quezon City, Philippines.

Product certification

At present, no farmers' produce in Benguet, nor in any part of the country, is GAP certified, except in Cavite province, where one vegetable farmer was awarded a certification by the Bureau of Agriculture and Fisheries Product Standard. Whereas the produce in

Benguet is traditionally brought by the farmers to the trading post, there are emerging cases where a farmer is contacted by institutional consumers for the supply of certain produce at stipulated volume and price and quality specifications. As in other buying agreements, the quality of the produce involved is specified on the basis of internal arrangement agreed upon by the two parties and not necessarily on the basis of government certification. A case in point is the supply of lettuce by a farmer in Benguet to the largest fast food chain in the country.

As to organic vegetable growing, only one entity in Benguet is engaged in this kind of farming, the Benguet State University (BSU). But it has not attained the prescribed period of three years before it could be certified as organic by the government accredited certifying body. Its output, however, is not enough to meet the demands of the university staff and households in neighbouring areas, which signifies that organic produce has the potential to penetrate a bigger market.

Problems encountered

As aforementioned, the major problem in the Benguet vegetable industry is the high cost of transporting the production inputs from the roadside upward to the farm and bringing the produce downwards. This problem is compounded by high post-harvest losses due to poor handling, packaging, transport, and storage. Reducing losses by 20 per cent will have significant positive impact on farmers'/traders' incomes. Another problem is the inflow of cabbage, broccoli, bell pepper and other temperate and semi-temperate vegetables into the La Trinidad vegetable trading post coming from Region 1, Central Luzon and from Northern Mindanao. These are passed as grown in Benguet where vegetables have better eating quality. This ensues to oversupply of vegetables in La Trinidad, thus considerably decreasing the prices received by farmers. Not to be ignored is the chronic practice of paying low prices to most of the farmers by the traders.

Another major problem in the Benguet highland vegetable industry is the wide fluctuations in the volume of production caused by concentrated production during the cool and dry months and low production during off-season (The National Research, Development and Extension Agenda and Program for Vegetables, 2003). Adopting a strategy to stabilize supply all year round to a possible extent will minimize wide fluctuations in prices and will guide farmers in production planning to take advantage of favourable prices as warranted by farm conditions. Another is the excessive use of pesticides for the control of pest and diseases, which needs to be reduced by at least 50 per cent.

As small farmers do not have enough capital for the purchase of the required amounts of inputs, it has become their practice to obtain loans from vegetable traders for the purpose. As a result the farmers are obliged to sell vegetables to these traders at prices dictated by the latter. This buying scheme has become the tradition as brought about by the farmers' reluctance to borrow from banks due to too many requirements and paper work. Bigger landholders, however, borrow from banks at comparatively much lower interests or are self-financed.

4.5.2 Northern Mindanao

Post-harvest activities

Fresh vegetables in Bukidnon undergo cleaning, sorting, and packing prior to transport to the trading post. Most of the crucifers such as cabbage, broccoli and cauliflower are packed at the farmers home, while traders/buyers' trucks are parked for the loading of the produce. Other farmers rely on other truckers to transport their produce, which is paid based on weight, usually per sack, crate or box. Each sack would weigh between 75-90 kg, which is the requirement of the large buyers and traders from Cagayan de Oro and other buyers from the neighbouring cities like Davao City and Iligan City. At times, a truck would carry only certain types of vegetables owned by different farmers. These farmers usually travel with their produce to the market, usually up to the Agora Market in Cagayan de Oro. Stepping over the produce during transport is unavoidable, which causes damages, lowers the quality of the produce before it reaches its destination. At times, trucks are even flagged by highway patrol due to overloading, meaning too many people cram or hang at the back of the vehicle. In some instances, the farmers pay the public utility vehicle drivers to bring the produce to Agora market.

Cagayan De Oro is the marketing hub for highland vegetables in Mindanao where the major vegetable trading post, the Agora market, is located. Also located in the city is the Northern Mindanao Vegetable Growers Association Incorporated (NORMIN Veggies), a private trading post run by the association members. The city is the provincial capital of Misamis Oriental, with an estimated population of 553,996 (2007 Census figures).

The Agora market

Based on the survey conducted by the project team in October 2008, the average volume of vegetables that enters the Agora market was 18,828 kg per week (Table 4.9). The volume consisted of temperate and semi-temperate vegetables such as bell peppers, broccoli, cauliflower, celery, etc. This amounted to about PhP 361,550 weekly per stall, based on the

average prices of vegetables. With the Agora market facility having 100 stalls, it is estimated that the value of vegetables transaction would be in the vicinity of PhP 36,155,000 per week or PhP 1.88 billion annually (US\$ 39 million), which is a huge contribution to the local economy of Cagayan De Oro.

Table 4.9 Average volume and value of produce brought to the Cagayan de Oro trading post (Agora market)

Crop	Average quantity delivered per week (kg)	Average price per kg (PhP)	Value (PhP)
Bell pepper	1 916.67	60.00	101 166.67
Broccoli	200.00	37.50	5 000.00
Cabbage	4 333.33	6.33	25 666.67
Carrots	2 058.33	41.67	89 000.00
Cauliflower	106.67	21.67	3 666.67
Celery	50.00	15.00	2 250.00
Chayote	2 716.67	3.94	9 900.00
Cucumber	450.00	6.17	8 325.00
Leeks	66.67	8.33	1 666.67
<i>Pechay</i> -baguio	2 516.67	11.67	13 000.00
<i>Pechay</i> -native	33.33	6.67	666.67
Potato	1 383.33	44.17	67 541.67
Tomato	2 530.00	12.32	30 500.00
Chinese <i>pechay</i>	533.33	2.00	3 200.00
Total	18 828.33		361 550.00
for 100 stalls			36 154 999.58

Source: Based on survey conducted, 2008.

Buying scheme

Most of the stall owners in the Agora market hold on to the produce until a trader buy the stock. At times the produce is sold in matter of hours, and sometimes not sold at all and just left to rot. Farmers are paid only after the stall owners deduct the appropriate fees. A storage charge is collected, depending on the volume of the vegetables delivered. This depends on the volume of demand for vegetables. In times of high demand, storage fees go up and vice versa. Fees range from PhP 1 per kg to as high as PhP 3 per kg. These fees are deducted from the payments made to the farmers. Hence, a farmer delivering 10 kg of potatoes at the prevailing market price of PhP 50 per kg would get a total value of PhP 500, less PhP 10 (1 peso per kg), leaving the farmer with a sale of PhP 490.

In addition to the storage fee, some stall owners deduct 25 per cent from the total value of the produce to cover the cleaning/trimming costs incurred by the stall owners/buyers. Most of the products brought to the stalls are mostly packed tightly in sacks, each weighing an average of 50 to 80 kg, depending on the requirement of the buyer/trader. For each type of vegetables, there is a corresponding deduction to defray cleaning/packing

costs. Other traders deduct 2-3 kg from the value of the produce (e.g. 20 kg of cabbage at PhP 5 per kg, which is equivalent to PhP 100-PhP 20 if they deduct 2 kg from the total value), leaving the farmer with only PhP 80. This arrangement is common among traders and farmers in the Agora market. Traders, on the other hand, have to pay around PhP 100 per day for hired labour to clean and package the vegetables prior to transport.

Northern Mindanao Vegetable Growers Association, Inc. (NORMIN Veggies)

The Department of Agriculture, in its efforts to create a competitive vegetable industry for the local and world markets organized the Northern Mindanao Vegetable Growers Association, Inc or NORMIN Veggies. The aim for the establishment of NORMIN Veggies is to give better opportunities to farmers/growers in accessing the latest technology and become more productive. The DA, likewise, intends to provide assistance in marketing their produce. NORMIN Veggies runs the operation of its stall within the Agora complex. Unlike the other stalls, farmers/growers must first become members before they can bring their produce to the NORMIN Veggies trading stall. To become a member, the association has first to visit the farm of an applicant to verify if the said grower indeed owned a tract of land cultivated for vegetable production. Once a farmer’s application has been approved, the farmer can bring his produce to the stall ready to be marketed. The advantage of joining the association is that 50 per cent of the total value of fresh produce is paid upon delivery and the balance is paid as soon as the farmer’s stock is totally sold. In addition to this, the proportional fees collected to defray cleaning/packing are lower at fixed rates depending on the value or price per kg of the produce as the following table shows:

Table 4.10 NORMIN Veggies rates to defray cleaning, trimming, packing and storage of members’ produce

Value per kg	% deduction from overall value of produce for cleaning/packing
Up to 10.00	5% of gross value
10.05 to 20.00	4% of gross value
20.05 to 50.00	3% of gross value
More than 50.00	2% of gross value

Source: Based on the result of survey conducted by the project team, October 2008.

This scheme is more reasonable compared to the exorbitant rates charged by other traders and buyers in the Agora market.

Other services provided by the association is the conducting of trainings for interested farmers as well as making contacts with major companies selling farm inputs

such as seeds, fertilizers, etc. to take advantage of lower prices when purchased in bulks. The members are also provided with reefer vans and refrigerated trucks under the Philippine National Cold Chain Programme of the Department of Agriculture to aid in the transport of highly perishable crops. According to one of the officials of NORMIN Veggies, the Department has yet to provide a cold storage facility to accommodate larger volumes of fresh produce. The association is governed by a board of directors and the operations are overseen by its president. One of the ongoing plans and programmes of the association is the strengthening of farm quality management systems leading to good agricultural practices.

Destination of produce from the trading post

Vegetables produced in Bukidnon and Misamis Oriental are mostly transported to the major cities in Mindanao (Davao City, Iligan City, Zamboanga City, Dipolog City, etc.), Visayas (Cebu City, Tacloban City, and Iloilo City) and Luzon (Metro Manila). Agora is located just inside the port area of Cagayan De Oro and the produce is mostly freighted on large container and passenger sea vessels.

Bukidnon, a top producer of tomatoes, also supplies a significant volume of produce to Manila during the typhoon season, when the production in Northern Luzon is low. Tomatoes intended for shipment to Manila, as well as for trading within the Cagayan de Oro trading posts, are packed in wooden crates. Aside from tomatoes, significant volumes of lettuce grown in Misamis Oriental are shipped to Manila. Aside from bringing the produce to Cagayan de Oro trading post, some of the lettuce growers opt to sell to a company based in Cagayan de Oro for Manila shipment. Other growers, formed into clusters, also ship directly to buyers in Manila. Shipment is done through the use of cold chain facilities like refrigerated vans. Other produce, like sweet pepper, is also shipped by a grower to a Manila institutional consumer based on a buying agreement. According to the UNDP study, shipping tomatoes from Cagayan de Oro to Manila involved a total logistic cost of PhP 5.59/kg, consisting of transportation cost and cost of packaging materials and labour (which amounted to PhP 0.80/kg at the farm level). Transportation cost amounted to PhP 0.54/kg.

Lettuce for shipment to Manila is cleaned after harvest which is done by wiping it to remove the soil and dirt particles at the farm level. Lettuce is sorted according to weight, colour, and appearance. The produce is individually wrapped in newspapers and then packed in rented crates lined with brown papers to prevent spoilage prior to shipment. Other lettuce growers prepare the produce for shipment by packing it in bamboo baskets. Others prefer to ship it in plastic containers although they cost more compared to using

bamboo crates. But in the long run, plastic containers are cheaper to use as they are more durable than bamboo crates which are disposable after each use. Some farmers do not clean the produce and just load it in *jeepneys* or multi-cabs without packing properly.

The cost of marketing lettuce from the time it left Bukidnon until it reached Manila amounted to PhP 24.37/kg. Of this amount, shipping with the use of refrigerated vans cost about PhP 9.71/kg, or more than 40 per cent of the total marketing cost. Agent's commission went as high as P 10/kg or 41 per cent of the total marketing cost, which under normal circumstances should not be more than 10 per cent of the value of the produce sold.

The Philippine National Cold Chain Programme in Northern Mindanao

Mindanao, one of the major island groups of the Philippines, is considered to have the largest area suited for growing crops, including temperate and semi-temperate vegetables. Bukidnon and Misamis Oriental are the second largest suppliers of fresh highland vegetables in the Philippines. These two provinces are the major suppliers of highland vegetables in Mindanao or even in Metro Manila and the Visayas region during the monsoon months in the Philippines. This is the season when the Cordillera region is unable to produce semi-temperate vegetables due to heavy downpours and constant flooding. This situation induces the Cordillera farmers to shift to other crops resistant to water logging.

Aside from its operational focus, which is on the Mountain Province-Benguet-Manila route, the Philippine National Cold Chain Programme intends to cover the Mindanao-Cebu-Manila route through which big volumes of highland vegetables in Northern Mindanao are transported to major destinations. From Bukidnon and Misamis Oriental, the produce finds its way to the Agora Market or Agora Trading post which is strategically located at the Cagayan de Oro City port area, ready to be shipped to Cebu and Manila. Some buyers and traders transport the produce to Zamboanga, General Santos city, Iligan City, Dipolog city and Davao city and other major cities of the Mindanao island group. Transport to Cebu or Manila are normally done by loading produce on large container vans or manually loading on transport trucks such as reefer trucks and refrigerated vans carried on the ship via the roll-on-roll-off system or RORO. The RO-RO system is a major programme implemented by the government to make the transport of major agriculture products throughout the Philippines more efficient and effective.

With the programme (National Cold Chain), the produce can reach the consumers at a shorter time and kept at ideal conditions. The programme is a new facility such that farmers and traders are barely aware of its existence. This system had been introduced and demonstrated by BPRE to the stakeholders and to hasten adoption, the government

provides technical assistance to the private sector and co-operatives or associations. The NORMIN Veggies has been a recipient of the technology and has been using it for few years now. According to one of the interviewees, the government through the Department of Agriculture's Regional Field Unit 10 is in the process of establishing a large cold storage facility in front of the NORMIN Veggies stall in the Agora market to accommodate larger volumes of produce being brought in by its members.

Product certification

Some of the respondents interviewed in Bukidnon and Cagayan de Oro were aware of the certification scheme of the Department of Agriculture implemented through the Bureau of Agriculture and Fisheries Product Standards. No farms in Northern Mindanao, at present, are certified and only a very small number of the farmers interviewed grew organic vegetables, but not certified by the government certifying body. As in Benguet, most of the interviewees used the internal guarantee system, where they would ensure their buyers that their produce is organic. But the number of pure organic farmers is insignificant as most of the farmers declaring as such still use the traditional methods of farming, i.e. using a combination of inorganic and organic fertilizers. Organic fertilizer is in the form of chicken dung, which is mixed with soil. A sack costs PhP 6, and a sack weighs around 50-60 kg, which shows the lower price of organic fertilizer compared to inorganic fertilizer. But the preparation of organic fertilizer is shown to be labour-intensive, which explains the reason why organic vegetables cost higher than those produced conventionally. Another technology used is the agro-forestry process where vermin-compost is used to hasten the decomposition of organic matter into fertilizer.

Despite the lack of awareness of GAPs and organic certification, most of the farmers are open to the possibility of being certified or undergo relevant training. The average age of the farmers interviewed in Bukidnon was 39 years and the average number of years involved in farming was 21 years. These farmers are prone to adopt product certification as previous studies have shown that younger farmers are more open to new technologies and innovations.

Problems in vegetable marketing

The farm gate prices of fresh produce as dictated by the buyers or traders have been a prevalent practice obtaining in Cagayan de Oro City, as well as, throughout the country. A number of farmers incurred debt with the buyers and traders in the form of loans for the purchase of inputs such as seeds, fertilizer, and pesticide. Like in Benguet, many farmers

are obliged to sell the produce to the traders who provide them loans. For some farmers who are not able to pay the whole amount of the loan, the unpaid amount would be carried over until the next harvest. The borrowed amount would keep on increasing, thus, the farmers are stuck in a rut, where they are unable to make decent profits from their farming activities to pay their debts. Thus a number of farmers have gone into looking for other sources of income. Some serve as officials of the local governments, while others work for other farmers. Despite the effort of government to provide assistance and other sources of income, farmers are still unable to do away with borrowing from large traders and buyers.

Larger farmers mostly borrow from banks or self-finance their own trucks to transport their produce to the trading post. The average transport cost per kg is based on the type of crop being transported and the price depends on the supply and demand for the produce. At the market, farmers are mostly paid once their produce is totally sold out. Between 10-25 per cent from the total value of the produce is deducted from the payment, as well, to cover cleaning and trimming costs incurred in the warehouse. The rate deducted depends on the demand for vegetables, but some warehouse owners are lenient and only deduct lower amounts. Aside from the cleaning/trimming fee, some warehouses deduct a fee of between PHP 1-2 per kg of the produce brought to the warehouse. These fees add to the transport cost of the farmer and at times of oversupply, some of the produce rarely lasts more than a day at the warehouse and worst, some just go to waste if not sold at all. The farmer cannot dictate the price of the produce as their only intention is to sell their produce at once. It has been a constant problem that many farmers produce vegetables without knowing what type of vegetable is in demand in the market. Many a farmer just follows what other farmers are planting or what they think would sell. According to one farmer, this is what they call as 'casino' farming, or hoping that whatever crop they plant and market will earn them high profits.

4.6 Pricing scheme

Every trader sets the buying prices in the trading post. A farmer, on the other hand, has his own target selling price, but the traders usually prevail in the bargaining process. At the farm gate level, traders oftentimes have more information about the existing prices in the wholesale and retail markets. This gives them a commanding power in price negotiations. Most of the farmers are receptive towards the pricing information relayed by traders. This is because they usually lack information on the prevailing vegetable prices. Some farmers, who know the existing prices in retail markets, are able to bargain for better prices compared to those who just depend entirely on traders' information.

In addition to the monetary and product exchange between farmers and traders, the latter usually impose additional requirements when buying produce at the farm gate level. Most want certain types of vegetables cleaned, sorted and packed. Vegetables like carrots and potatoes are packed unclean and sorted by size. Leafy vegetables like broccoli, cabbage and Chinese cabbage are sold untrimmed for the outer leaves serve as protection against physical damages sustained during product transport. Tomatoes are packed in wooden crates, while most of the produces are packed using sacks which are prone to damage.

Most of the transactions between the farmers and traders happen at the trading post, where vegetables are bought and priced per kilogram. Tomatoes are priced per crate, while chayote is set per sack. Untrimmed leafy vegetables are priced differently. Untrimmed broccoli, cabbage and Chinese cabbage are weighted first, and then a determined percentage is deducted from the gross weight in computing for the total value of the commodity. In Agora, 25 per cent is deducted from the gross weight of cabbage and Chinese cabbage, while 10 per cent is being taken off from broccoli.

Some traders no longer transact in public trading posts but go directly to the farms and purchase vegetables from farmers. Through this modality, they are able to buy vegetables at lower prices. In some cases like in Lantapan, Bukidnon, canvassers exist and serve as agents to look for vegetables that are ready for harvest for traders to buy at lower prices. In such cases, canvassers set the prices.

Traders who purchase vegetables in the trading posts in CAR and Northern Mindanao transport the produce to other provinces and cities, where they sell to wholesalers and retailers. The markups from farm gate to wholesale prices range from 27 percent (string beans) up to 619 per cent (asparagus) in 2007. On the other hand, the markups from farm gate to retail prices range from 114 per cent (string beans) up to 314 per cent (*chayote*) as shown in Table 4.11.

Table 4.11 Farm gate, wholesale and retail price of highland vegetables in the Philippines, 2007

Crop	Farm gate	Wholesale	Retail
Asparagus	14.46	104.00	n.a.
Bell pepper	33.22	70.54	n.a.
Broccoli	22.77	38.58	n.a.
Cabbage	9.47	17.9	33.27
Carrots	15.87	30.86	49.84
Cauliflower	16.24	41.38	n.a.
Celery	19.37	32.69	n.a.
Chayote	4.05	10.41	16.77
Cucumber	12.67	18.78	n.a.
Onion (leeks)	20.48	28.93	n.a.
Chinese cabbage	6.32	17.81	n.a.
Pechay (native)	13.08	19.46	32.33
Potato	19.73	29.69	43.81
String beans (sitaw)	16.44	20.96	34.87
Tomato	11.5	19.74	31.89

Source: Department of Agriculture-Bureau of Agricultural Research.

Note: n.a. – no available data.

4.7 Instability of vegetable prices

Prices of vegetables in the Philippines are unstable, constantly changing with the fluctuations in supply and demand. This situation obtains in every marketplace. Like many other agricultural products, vegetables prices are not regulated by the government but allowed to change as dictated by market forces. Vegetable prices change more rapidly as compared to the prices of other agricultural produce. The demand for vegetables in the country is not as stable compared to other agricultural products. Vegetable prices fluctuate with a slight change in prices of other commodities due to their high price elasticity. Since they are comparatively cheaper, the demand for vegetables increases when prices of other food commodities rise. Conversely, when vegetable prices increase, the consumption pattern easily shifts in favour of the much cheaper alternative. This price instability makes farmers vulnerable to the negative effects of falling market prices.

Moreover, the supply of vegetables in the country easily changes in response to the prevailing prices in the market. The inability of farmers to predict the market demand and lack of information on what type of vegetables other farmers grow often lead to oversupply or undersupply of specific vegetables in the market. Moreover, natural phenomenon, specifically, typhoons, play a major role in destabilizing the country's supply of vegetables. Once typhoons make a direct path over the country's primary sources of vegetables, the supply available for trade in the market are abruptly reduced, thus distorting the prevailing vegetable prices.

4.8 Product certification in the Philippines

Product certification for vegetable products is not a common practice in the country. Neither has certification served as a requirement for a Filipino household when buying vegetables for consumption. Very few vegetable farmers engage in third party certification. This is due to the disincentives brought about by the costs incurred during the certification process and the small portion of the market that demands for certified products. Certification entails a large financial cost, from preparation of the farm up to the actual process of conducting checkups for the certification. Preparing the farm for certification means adhering to the requirements of the certifying body, which needs a big amount of financial outlay and additional labour costs. Expensive certification makes it hard for small farmers to undergo the process. Farming conglomerates, on the other hand, have great potential but they seem to express less interest in it due to the negligible incentives in undergoing the process.

Good Agricultural Practices (GAPs) National Level

Good Agricultural Practices certification in the country was initiated in 2006. To ensure the safety and quality of horticultural produce that is consumed fresh, the Philippine government has developed and enforced the Code of Good Agricultural Practices. Today, certification is still in the process of being popularized in which stakeholders are being informed on the certification guidelines. Certification aims to encourage farmers to adopt sustainable agricultural practices and to increase accessibility of horticultural products to both local and foreign markets. Through certification, consumers' welfare is enhanced by enabling them to exercise their option to buy quality produce from traceable and certified sources.

To review and approve applications for certification, the Certification Committee was formed. The committee is composed of government officials and representatives from the private sector, non-government organization/people's organization and academe. The Bureau of Agriculture and Fisheries Product Standards (BAFPS) acts as the secretariat of the committee. The committee endorses the issuance of certificate to the Secretary of the Department of Agriculture. They also review and approve changes in fees, attend to appeals, annually review complaints and determine penalties for the abuse of standard or mark. They also negotiate satisfactory settlement for complaints and reimbursement for investigation. National and regional inspectors are as well designated by the committee. The regional inspectors that are recommended by their agency head replicate the composition of the national inspectors.

DA Certification Scheme is differentiated into three according to the applicant type, which can be an individual grower, produce marketing organization (PMO) or a company/corporation. For PMOs, they are required to establish 100 per cent control of the registered growers of the group.

After the application is evaluated, the Certification Committee notifies the applicant within 30 days on the exact date of the farm audit to be conducted. For on farm inspection, the inspector takes samples of water, soil, plant tissue and other important matters for testing. And for these, a receipt is given to the producer. All the materials are tested and the results of the analyses are given back to the producer. The cost of the testing is borne by the producer which amounts to PhP 5,250 per item. An ordinary inspection usually requires a minimum of three items to be tested. Aside from the laboratory testing, an exit interview with the applicant or authorized representative is being conducted by an inspector to discuss all the potential problems indicated in the inspection form.

All applicants must comply with the Code of Good Agricultural Practices in order to qualify for certification. They must implement a transparent and traceable system to keep track of the production from sowing to harvesting/packaging. All farm management activities should be well documented to help trace the history of the farm produce. All farm records should be kept for two years. For new applicants, three months of farm records are required. After the inspection, the Certification Committee reviews the inspection report to decide whether to approve, deny or put the application in pending. If the application was denied or put in pending, the committee chairperson notifies the applicant within 15 days. Once approved, the certification committee endorses the issuance of the certification to the Office of the Secretary of the Department of Agriculture. Once the Secretary of Agriculture approved the issuance of certification, the Programme Certification Committee assigns a permanent registration number and issues certificate to the applicant.

The certification is being renewed every three years through submission of new application a month before the third year ends. Inspection and issuance of new certificate is done within 30 days after the receipt of the renewal request. The renewal is preferred to be done on growing or packing season.

Once certified, farms are enabled to use the Good Agricultural Practice for Fruits and Vegetable Farming mark on their produce. The farms are allowed to use the mark in advertising and to put it in their letterheads. All materials with the mark are submitted to the Certification Committee for approval.

Certification Guidelines are being observed with strictness. Certified farms should continuously comply with the Code of Good Agricultural Practices. Non-compliance with the code results to revocation of the certification. Non-compliance, depending on the degree, may also result in fines, suspension or withdrawal of award, which are publicly announced.

Organic agriculture (national scope)

Organic agriculture in the country is currently promoted and developed by the government in order to attain an agricultural system that is environmentally, socially and economically sound. The Executive Order 481 titled "Promotion and Development of Organic Agriculture in the Philippines", which was approved last December 2005, further strengthened the government's drive towards extensively promoting agricultural farming in the country.

There are two ways of organic products' guarantee system currently used in the country, the producer's personal guarantee and the third party certification. Producer's guarantee is being used by organic producers that have established integrity in producing organic products. This is commonly used in small markets wherein the consumers have some personal knowledge about the producers. Personal guarantee also suffices in cases wherein there are a mutual understanding between the producer and the consumer.

Third party certification is commonly used in cases where the producer's reputation on organic production is still unknown to many. This type of certification is also being used to increase the trust on the product's quality, and to access markets that have stricter guidelines on organic products. Certification is commonly done by an established certifying body. In some cases, a third party with good reputation guarantees organic farming. This happens in the case of Benguet State University (BSU) as it guarantees the product of some farmers in Benguet. Some organic farmers in Benguet are able to sell their produce as organic with the help of BSU.

Organic Certification Center of the Philippines (OCCP) is the only accredited certifying body for organic agricultural products in the country. The certifying body is independent, private and composed of 19 non-government organizations. They set standards for organic production of various agricultural commodities. They started certifying farms in 2004. In certifying organic produce, it is the method of production that is being certified as organic and not the product itself. As such, the standards created by OCCP focused on the cultivation of land, growing of plants and processing of produce.

Land conversion is an important element in organic certification. A farm used for conventional farming is given a span of time to convert the land into organic farming. It

commonly takes three years of land conversion for cases where the use of synthetic fertilizers has been intensive. This period of time is still being decided upon application, basing it on the soil condition of the farm and on the type of crops to be cultivated. In the case of clearing new land or virgin land for organic agriculture, the conversion requirement is waived.

In the production of crops like vegetables, there are minimum requirements set in the standard for organic agriculture. In order to enhance sustainability, self-reliance, and biodiversity value of farms; a wide range of crops and varieties are encouraged to be grown. High priority is given to the use of certified organic seeds and plant materials. But in the absence of supply of organic seeds, conventional planting materials are allowed to be used only in some given conditions and requirements. To retain the natural method of reproduction, plant varieties are allowed to be bred through conventional method.

For soil management, documentation of crop rotation patterns is required. There is a minimum of one legume crop in rotation within three years for farms with intensive vegetable cultivation. Tillage and cultivation implements should be used to maintain or improve the physical and biological quality of soil and to minimize erosion. There must be an establishment of appropriate conservation measures which include best management practices that would prevent wind and water erosion. For fertilization programme, high priority is given to the use of biodegradable materials of microbial, plant or animal origin produced on organic farms. But when the amount of biodegradable materials from organic farms is not sufficient, materials from the non-organic farms may be used but should not be greater in proportion. Supplementary application of fertilizers must be organic or adhere to the set requirements. Raw manure should be applied properly to avoid contaminations.

There is a strict prohibition with the use of synthetic pesticides in management of weeds, pests and diseases. Products prepared at the farm from local plants, animals and microorganisms are allowed for application. Thermic weed control and physical methods for pest, weeds and disease management are allowed. Spraying equipment must be exclusive for the use of organic farms application. The use of synthetic products like growth regulators and dyes is not permitted.

Processing and handling of organic produce must be done separately from processing of non-organic products. When not labelled, organic produce should not be stored and transported together with non-organic products. Storage facilities should be well maintained and used appropriately to preserve the good quality of the produce. It must be assured that there are no contaminants in the storage facilities that would affect the

produce. Pesticides and other chemical treatments should be avoided in controlling pests in the storage facilities. The packaging materials to be used must not contaminate the produce and maintain its aseptic condition.

When the qualifications have been met and requirements have been fulfilled by the farms, OCCP entitles them to use organic farming certification labels. But there are still some requirements and guidelines in labelling that farms are compelled to adhere to.

Pros and cons of certification (national scope)

Certification comes with significant amount of costs and accompanying benefits. Farmers who grow vegetables using conventional means normally experience changes in their farming costs and in the quality of their produce once they have undergone the process of certification. The financial cost of adhering to the standards of the certifying body is the most apparent cost of undergoing certification. Application for certification requires fees that are sunk in nature. Aside from the fees, putting up the facilities required at the farm, like comfort rooms and cleaning area, would definitely require a large financial outlay. Maintenance of cleanliness and orderliness in the farm and keeping an updated record of farm activities may require not only outright financial outlays but additional labour costs and diligence.

With organic certification, the transition period for conversion incurs great cost in the form of financial outlays. Significant decrease in the amount of harvest and smaller produce becomes apparent. Since pest management in organic farming is not as easy and effective as the one practiced in conventional farming, most of the harvests in the transition stage often times have physical flaws. Since the quality and quantity of produce decline during the stage of transition, farmers oftentimes experience sudden substantial decrease in their incomes.

Although certification requires a large financial outlay, it is still worth taking for some farmers as it creates benefits in many forms. Market capturing is much easier with certified products. Vegetables certified organic by a third party are easier to market than those that are self-guaranteed. Once a specific market is captured, higher and more stable prices for the produce could be expected.

Complying with the standards set by the certifying body improves greatly the condition of the farm, quality of produce and welfare of the farmers. Right choice and proper application of fertilizers, pesticides and other farming inputs which certification promotes will help in improving the condition of the soil and increasing the productivity of the farm. It will as well help lessen the wastage incurred in the improper application of farm inputs.

With certification, vegetable producers will be able to distinguish their produce from those that are not certified. Signaling of quality will be much easier when certification is involved. When good quality vegetables can be differentiated from the bad, farmers growing good quality produce will be able to demand for higher prices. Certification then makes it easier for farmers to assure their customers of the good quality of their produce. Adoption of good agricultural practices and production of organic produce do not just benefit the farmers, but the consumers as well. When more certified products are made available to the market, consumers will then have the option of buying quality produce from a certified source.

4.9 Conclusion and recommendations

The importance of consuming certified good quality vegetable products should be made known to the public in order to create sufficient demand that would create incentive for farmers to undergo certification. The benefits of consuming certified products should be popularized. Making the certification accredited in the foreign market will also help in widening the market that can be accessed by certified products, thus creating much larger incentive for certification.

Lowering the cost of certification will as well help in encouraging more farmers to undergo certification. Subsidizing the entire cost of certification for some farmers is an option the government may use in promoting production using good agricultural practices or organic farming. Selected farmers would serve as actual demonstration of the benefits that could be extracted from the system.

Many of the highland farmers, especially the small landholders, are not given a fair share of the benefits derived from the vegetable marketing industry. This is attributed to the absence of value-added activities which they could undertake to improve the quality of their produce. In most cases, the farmers ignore this activity in their desire to bring their harvests as fast as possible to the market outlets in view of the high perishable nature of the produce and to take hold of the much needed cash. They do partial trimming and cleaning of vegetables, such that they cannot command better prices in the market. Most of the cleaning and trimming are done by the wholesaler who gets bigger profits than the farmer due to aggregate volume of sales.

Most often, they are not aware of the added benefits that could be derived from selling the standard quality desired by the consumers. This could be due, partly, to the absence of reliable and timely information. But the biggest hindrance to engage in these activities, more so in getting product certified, is the lack of capital for the acquisition of the

needed infrastructure and facilities and for the payment of wages to workers. The farmers, together with the national and local governments, should be able to strategically plan workable and sustainable projects that would give them higher incomes from vegetable growing.

Being certified, the farmers would be able take advantage of the rising income and preference for safe food and concern for environment protection among urban consumers. Metro Manila alone could absorb a significant portion of the vegetable production. In 2004, it was estimated that the metropolis consumed 155,716 metric tons of semi-temperate vegetables. Consumption is seen to increase significantly with the geometric increase in population, which in the Philippines grows at 2.3 per cent per annum.

To take advantage of the economic gains from value-added activities, the highland farmers could group themselves, similar to what the Benguet farmers had done to empower the members. They should adopt strategies that would further their interests with the support of the local governments, the Department of Agriculture (DA) and non-governmental organizations. A good number of projects and programmes had been put in place by the DA to support the farmers in agricultural production, facilitating access to credit, and marketing. A big stride had been done by the Department with the passage of Republic Act 7900, which aims to provide smallholder farmers with the opportunity to compete in both domestic and international markets. The Act, known as the High Value Commercial Crops Law promotes the production and marketing of high value crops by providing PhP 1 billion fund for the allocation of credit.

The Ginintuang Masaganang Ani-High Value Commercial Crops Programme (GMA-HVCC) could provide support in the marketing of highland vegetables to the farmers. Aside from policy advocacy and technology development, the programme undertakes market development and promotion, infrastructure support, investment and financing and information education communication (IEC) in collaboration with the relevant staff bureaus/unit of the DA and state colleges and universities. It provides post-harvest facilities such as cold chain system and cableways. But the tramlines in Benguet need to be rehabilitated and upgraded at once. It also provides timely information, facilitation and linkages, better regulatory services, including certification, pest and food safety and analysis in collaboration with the DA's relevant agencies. Moreover, the programme established the RO-RO (roll-on-roll-out) Strong Republic Nautical Highways which facilitate the transport of agricultural products within the three major islands of the country, namely Luzon, Visayas, and Mindanao.

Further, the Department's relevant staff bureaus/units could be tapped by the farmers in CAR and in Northern Mindanao, as well as in other regions, to give them support in strengthening the vegetable marketing system as well as improve yields. One example is the Agribusiness and Marketing Assistance Division (AMAD) which is mandated to facilitate and co-ordinate programmes related to agribusiness development and marketing. Its responsibility includes market intelligence/assessment, dissemination of market-related information, and giving support to market linkages. The Bureau of Agriculture and Fisheries Product Standard, which has the responsibility to set and implement standards for fresh and secondary processed products, conducts trainings on certification in all regions of the country. Its mission encompasses: 1) total confidence in Philippine products; 2) protection of consumers against unsafe and defective agricultural and fishery products; and 3) promotion of competitiveness of all local produce through implementation of quality assurance standards.

The negative effects of unstable demand and vegetable prices can be mitigated by improving the flow of price information from the actual market to the farmers. If farmers will be informed of the prices existing in the market, negotiating for better prices would be much easier for them. The information flow can be improved using the current technologies available. Cell phone technology is a good tool government can utilize to reach the farmers and relay to them relevant price information. Farmers, who mostly have technological know-how with the use of cell phones, can be trained on using them to get price information. In the trading posts, posting of prices in major vegetable destinations like Manila, Cebu and Davao will be a great venue to help relay information to the farmers in marketing their produce.

Finally, the establishment of associations or co-operatives should be encouraged by the government in order for highland farmers to gain leverage in the marketing of their produce, rather than acting individually. It is important that these farmers be provided with effective training and extension programmes aimed at addressing the constraints to productivity and efficient marketing. Aside from trainings on the production and marketing aspects, values formation should be an integral part of the programme in order to instill in them commitment and discipline necessary for the successful and sustainable operation of their respective associations/co-operatives. This is imperative to avoid the collapse of associations/co-operatives which was experienced by many agricultural co-operatives in the country, accruing from inefficiency, lack of discipline, and corruption among those at the management level.

5. Concluding Remarks

As was mentioned in the introduction, the results of both studies were presented in two workshops, conducted in the Philippines and in Indonesia involving stakeholders, including farmers and farmers' associations, government representatives, policymakers, traders, supermarket representatives, NGOs, researchers, and certification authorities both private and government. Therefore, it is only proper to end this report by presenting the conclusions and policy recommendations put forward by both workshops.

5.1 Indonesia

5.1.1 General conclusions

- Certification is an assurance for agricultural produce in terms of quality and consumers protection. It should be conducted by an institution, formally accredited by the National Accreditation Committee;
- It was agreed that product certification is required by consumers, with added value; and
- Agricultural Produce Certification Authority has been formed, both in central and regional level.

5.1.2 Specific conclusions

A. *Institutional aspects*

1. In the context of decentralization, institution of certification at provincial/district level is needed.
2. To conduct certification effectively, supervision by an independent body is required.
3. Simple procedures and implementation, as well as minimum cost for farmers in obtaining certification, are needed.
4. Strengthening farmers' institutions, agricultural and rural economies are required.
5. There is a need for 'Pesticides-free Certification'.
6. Certification covering all national and regional major commodities is compulsory, including necessary standardization.

B. Socialization of certification

1. The information on farmers' success stories can be used as a model for other farmers.
2. Intensive socialization on procedures and benefits of certifications to all related stakeholders.
3. Extensive information on the definition, implementation and trade of organic produce is needed.
4. Improve co-ordination and consolidation of related parties in the planning and implementation of certification.
5. It is necessary to have a database on farmers who succeeded in obtaining certification and have it uploaded in the internet for public access.

C. Certification implementation procedures

1. The implementation of certification to all regions has to be done immediately with minimum cost.
2. It is essential to have implementation and technical guidance and distribute these to regions.
3. There is a need for a simplified procedure.
4. Good co-ordination between central-regional governments; among farmers-private sectors-government.
5. Conduct pilot projects as models for farmers in different regions.
6. Consistency and honesty are mandatory in the implementation of certification.
7. Improve the role of main wholesale markets as marketing infrastructure in certification.

D. User's perspective

1. It is necessary to have systematic education on certification for producers and consumers to harmonize perception on certification.
2. It requires socialization for all related parties, especially in relation to standard, procedure and the importance of certification.
3. Improve farmers' institutions in the region/provinces/ districts.
4. Provide government support to farmers in terms of regulations and law enforcement.
5. There must be a gradual transitional process in regulating certification to avoid any misleading information.
6. Government needs to support the cost and subsidies for small farmers

7. The role of multi-stakeholders in the certification process is important for better communications.
8. Government needs to support continuous improvement of sustainable organic produce.

5.2 The Philippines

Below are the six major issues/concerns and the recommendations which came out during the discussions.

5.2.1 Tedious and expensive product/process certification

Recommendations:

- Establish a protocol on alternative guarantee system (AGS) wherein BAFPS (for GAP) will provide full subsidy towards certification for three years and two years for OA, the last years will be shouldered by the farmer/s wanting the certification.
- Provision of a continuous capability building on GAP and OA stakeholders and institute an advocacy on AGS to consumers.

5.2.2 Lack of information campaign on Good Agricultural Practices (GAP) and Organic Agriculture (OA), their costs and benefits both to the producers and consumers, and agencies involved in the certification

Recommendations:

- Allot funds specific for IEC programme and activities in the promotion of GAP and OA to the public.
- Massive information campaign on healthy and safe food to educate both policymakers and consumers.
- Enhance assistance on the effective promotion of organic farming in the region/province specifically to create a focal person on organic farming and assist farmers on establishing proper linkages.
- Government to provide a complete listing of all the laws and policies on certification through a booklet or manual that contains all the necessary and specific information distinguishing each of them including the agencies/institutions responsible.
- Develop and prepare IEC materials in different dialects to cater to the local people particularly the farmers in the rural areas. This may come in the form of broadcast media to promote GAP/OA and a booklet that is specific on the certification fees and the duration of the process.

5.2.3 Inadequate incentive package on the part of the government to support DA's (Dept. of Agriculture) programmes on GAP and OA

Recommendations:

- Revisit the strategic plan of DA specific on GAP and OA programmes and reinforce and strengthen these.
- There must be a separate funds for R&D, E&T, and regulatory.
- Provision of capability building for farmers who are into GAP/OA.

5.2.4 Certification is a demand driven issue. Scale is important with average of less than one hectare, how this can be resolved (setting a business- oriented and farmer- responsive conglomerates sensitive to the demand of the world market)

Recommendations:

- Create co-operatives/Organized groups (clustering of farmers) especially those engaged and practicing GAP and are into OA.
- Develop a mindset of 'real farmer' – professionalizing farming responsive to the global demand given the proper technologies and support at hand.

5.2.5 Low participation in the certification programme of the government (since its inception in 2005 only one farm has been GAP certified)

Recommendations:

- Create a model farm that has been successful in organic farming.
- Promote the use of GAP and OA through the provision of incentives for farmers engaged in the appropriate farming activity.
- Emphasize “there is money in going organic and certified” including low costs, domestic and international demand, new livelihoods for support services/inputs, and employment.
- Strengthen programme on organic agriculture down to the *barangay* level (in strong partnership with LGUs and Regional DA units).

5.2.6 Private monopoly of a certifying agency for organic agriculture

Recommendations:

- Create other validating and evaluating agencies that follow the protocol and procedure of GAP and OA certification.
- Rationalize and lower the certification fees for more participation.

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Appendix

Appendix 1. Number of established and value of gross output of large/medium food and beverages industries in Indonesia 1975-2005

Year	Number of large/medium establishments	Value of gross output (billion IDR)		Average gross output (million IDR/establishment)
		Nominal price	Constant price (1983=100)	
1975	2 012	397	1 195	594
1979	2 057	1 179	1 666	810
1986	3 294	5 483	4 149	1 260
1988	3 697	8 050	4 883	1 321
1989	3 621	10 816	6 093	1 683
1990	3 924	12 175	6 511	1 659
1991	3 790	13 454	7 285	1 922
1992	3 988	17 913	8 261	2 071
1993	4 094	24 163	10 731	2 621
1994	4 102	23 434	9 546	2 327
1995	4 536	29 332	10 576	2 332
1996	4 767	35 185	12 849	2 695
1997	4 856	38 897	12 325	2 538
1998	4 856	67 503	13 207	2 720
1999	4 666	72 852	10 888	2 333
2000	4 661	92 399	13 160	2 823
2001	4 681	104 067	13 087	2 796
2002	4 551	133 515	15 625	3 433
2003	4 414	162 388	16 532	3 745
2004	4 638	171 317	19 292	4 159
2005	4 648	197 015	18 555	3 992
Increase/ decrease				
1975-1985	39%	93%	71%	82%
1986-1996	45%	542%	210%	109%
1996-2005	-2%	460%	44%	48%