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Project

Enhanced profitability of selected vegetable value chains in the Southern Philippines

Component 4: Analysis of selected value chains in Southern Philippines

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Lantipan Municipal Agriculturists Office

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- Kilapagan clusters 1 and 2
- Songo cluster
- Taguican clusters 1 and 2

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Pamuhatan Farmers Association (PAFA)

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Ned clusters 1 and 2

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2 Executive summary

Over the four year duration of this project:

A comprehensive market report has been published describing in detail, the institutional market for fresh vegetables in Metro Manila, Mindanao and the Visayas. Qualitative interviews with wholesalers and retailers in traditional vegetable markets, supermarkets, food caterers and restaurateurs revealed that both the supply and the demand for fresh vegetables was vastly different between islands and even within the one island. Given the many different ways in which fresh vegetables are used, the institutional market was segmented according to the role market intermediaries performed, where they were, what customers they served, the range of products required, the volume of product required and the quality specifications. Given the highly unpredictable nature of supply and demand, and significant variations in product quality, most institutional buyers transact with more than one supplier. While most institutional buyers associate one or more vegetables with a particular region or area of production, there is no evidence to suggest that institutional buyers are prepared to pay any more to procure fresh vegetables from their preferred source or origin.

In those areas of the Philippines with a Type IV climate, protected cropping becomes almost mandatory. However, almost without exception, institutional buyers do not differentiate between that product which has been produced outdoors and that which has been cultivated under protected structures.

Some 29 collaborative marketing groups in Bukidnon, Davao and South Cotabato were assisted to develop effective market linkages with institutional buyers in traditional and high value markets.

Clustering seldom reduced the length of the supply chain, for many of the activities that were performed by the displaced market intermediaries had to be undertaken by the cluster. However, clustering did facilitate the transfer of more timely market information, which enabled smallholder farmers to gain a better understanding of their downstream customers' requirements. As a result, farmers generally received a higher price from their focal buyer. However, as the focal buyers often had very specific quality requirements, the clusters needed to maintain their relationships with traditional or alternative buyers to dispose of that product which failed to meet specifications, was surplus to the focal buyer's requirements or where the focal buyer failed to honour their commitments.

An economic impact assessment revealed that after clustering, participating farmers had increased their income by an average of 47%. Moreover, the income of farmers in clusters was 18% higher than farmers who had not joined a cluster.

For clustering to be successful, the cluster must: (i) offer a comparative advantage; (ii) cluster members must have a common goal; (iii) have multiple buyers; (iv) strong leadership; (v) be transparent and have timely communication; (vi) have trust and social cohesion; and (vii) have strong institutional support.

In their transactions with focal buyers, the clusters encountered a number of constraints including: (i) extreme weather events; (ii) a lack of knowledge; (iii) a lack of capital; (iv) market impediments; (v) institutional impediments; and (vi) poor infrastructure. To improve the capacity of the cluster to transact with focal buyers, the project facilitated and delivered almost 70 training programs and technical visits.

To reach more smallholder farmers, the project developed a revised and improved exit strategy whereby the more mature clusters were encouraged to become more independent.

With the total investment in this project exceeding AUD 1 million, the internal rate of return over 20 years was estimated to exceed 48.6% with a benefit cost ratio of 2.47. When spillover effects were considered, with a 5% adoption rate, the IRR and BCR increased to 81.5% and 3.8, respectively.

3 Background

Marketing systems in the transitional economies are rapidly transforming. Traditional marketing channels, where prices are determined primarily by supply and demand, are gradually being replaced with coordinated linkages between farmers, food processors and retailers. For the downstream customers and market intermediaries, formal and informal market linkages provide a more reliable and regular supply of product and greater control over product quality and safety (Shepherd 2007).

While larger farmers can link directly to retailers, food processors and manufacturers, in most cases, it is necessary to organise smallholder farmers into groups, associations or cooperatives to supply the institutional market. For the purposes of this project, the institutional market was defined as the sale of fresh produce to market intermediaries, wholesalers and distributors, traditional and modern retailers, food processors and manufacturers, fast food chains, restaurants and resorts.

Through these collaborative marketing groups, smallholder producers are better able to supply the market in terms of the quality required and with the reliability of supply expected by the buyer. While collaboration offers higher returns by providing greater access to markets, it also requires the farmers to engage in various value-adding activities such as cleaning, grading, sorting and packing which considerably increases costs. This issue is manifested in ACIAR's agreed priorities for the Philippines, in particular to:

- improve alliances between fruit and vegetable suppliers, food processors, institutional buyers and retailers
- undertake an economic analysis of marketing chains and channels for fresh produce.

In the Philippines, more than 5.7 million households are currently believed to be involved in vegetable production (Aquino 2003). Since institutional customers are supplied mainly by wholesalers who consolidate vegetables from various sources, the linkage between the final customer and growers is often tenuous. Around 80% of the vegetables grown in Mindanao are still sold to wet markets in regional centres, and 20% to institutional markets in Manila, the Visayas and Mindanao (Concepcion et al. 2006). Opportunities exist for farmers to aggregate their supply into larger more marketable volumes and to sell directly to distributors, food processors and manufacturers, and restaurants. Furthermore, as the institutional market continues to fragment, opportunities will emerge to pursue higher value markets through differentiating the product on the basis of superior quality, product safety or the means of production.

Such collaborative marketing arrangements typically provide farmers with more market knowledge, more negotiating power and a higher price and may have a significant positive impact on farmers' income. The Northern Mindanao Vegetable Producers' Association (NORMIN Veggies) is one such organization based in Cagayan de Oro. It was organized by small independent farmers in a concerted effort to facilitate the development of the vegetable industry in Northern Mindanao. The organization aims to improve the competitiveness of the vegetable industry by producing high value, high quality and safe vegetables. NORMIN sources fresh produce for the domestic and inter-island trade (Concepcion, Digal and Uy 2006).

In order to meet the required market volume, NORMIN has facilitated the formation of marketing clusters. The members of each cluster are committed to a production plan to ensure that downstream customers receive the desired quantity of product at the required time. The members of each cluster follow a specified crop production protocol which outlines not only how the crop is to be produced, but how it is to be graded and packed. Each cluster has a cluster leader who is responsible for coordinating the cluster's activities.

This project applied a similar approach to smallholder vegetable farmers in South Cotabato who were endeavouring to sell their produce to fish canning factories and in the Davao region for those who were attempting to sell to supermarkets and other institutional buyers. Given that the majority of the fresh vegetables produced in Mindanao continue to be sold through the traditional wet market, this project explored alternative avenues to pursue higher value markets through product differentiation.

While much of the Philippine vegetable production occurs in the Luzon region, Mindanao's typhoon free climate gives the region a comparative advantage during the rainy season. Mindanao has a total land area of 14,033 km^2 with over 6,000 km^2 of agricultural land, 130 km^2 of which is estimated to be in vegetable production. It has a suitable climate and fertile volcanic soils for the year-round production of many vegetable crops, particularly high value temperate vegetables such as tomato, pepper, potato, lettuce and carrots.

This project was designed following a scoping study (ASEM/2005/062) in 2007, which had the following terms of reference:

- to review the current supply chain research activities being undertaken by the Government of the Philippines, industry and other donors
- to identify the major institutional markets for fresh vegetables in Metro Manila
    - identify consolidators in Metro Manila who supply these markets
    - identify private sector collaborators who will assist smallholder producer groups in selected production areas to establish commercial linkages with:
    - institutional customers (executive chefs, retailers, food processors)
    - consolidators (wholesalers) supplying Metro Manila
    - traders and market intermediaries
    - identify the volume and quality specifications of institutional customers in Metro Manila and for each market intermediary along the supply chain
- to identify major production and marketing constraints along the supply chain
- to identify potential market and technological interventions.

Given the large number of chains, the diversity of products and demands from institutional buyers, this project sought to identify potential gaps in the market and to explore the various means by which smallholder farmers could be linked to the market.

4 Objectives

Objective 1

- assess the institutional market for high quality vegetables in Metro Manila, Mindanao and the Visayas through:
    - surveying buyers of high quality vegetables regarding their current sources of supply and their projected requirements
    - examining the market for vegetable crops grown in the rainy season in a protected cropping environment

Objective 2

- describe and evaluate the performance of traditional and institutional vegetable value chains in Southern Mindanao in terms of:
    - product flows, losses and wastage
    - costs and margins
    - price setting
    - market information and communication
    - relationships with market intermediaries

Objective 3

- improve the capacity of smallholder vegetable farmers to better fulfil the needs of traditional and institutional buyers through
    - identifying the impediments and constraints to improving quality
    - assessing the incentives for improved quality along and across selected value chains
    - identifying alternative strategies to improve offer quality

Objective 4

- assist smallholder vegetable producers in Mindanao to adopt effective market linkage mechanisms via collaborative marketing arrangements and clusters through:
    - identifying the potential value of market clusters
    - assessing the benefits and costs of meeting the needs of different high value markets for stakeholders (especially smallholders) in the value chain
    - define the elements that support long-term trading relationships
    - pilot test smallholder marketing clusters

Objective 5

- identify and propose potential interventions at the farmer and market intermediary level to improve the performance of value chains in the southern Philippines vegetable industry.

5 Methodology

Linking smallholder farmers to institutional markets involves working with a complex system which requires input from a variety of research disciplines. This project utilised an agribusiness systems model developed under ASEM/2000/101 to integrate the various research methodologies and research disciplines. In that project, the vegetable industry in the Philippines was conceptualised as being comprised of two separate chains: one supplying low quality product to the traditional wet markets and the other supplying better quality product to supermarkets and other institutional buyers (Murray-Prior et al. 2004).

To involve the smallholder farmers in the research and development activities, the project used an action research process developed by CIAT (Lundy et al. 2005), which was being implemented and improved by the Catholic Relief Services with smallholder farmer groups throughout Mindanao. The clustering approach utilised by CRS is a sequential process involving eight steps that prepares farmers to link with the market; assists them to more effectively organize themselves into small groups or clusters; and guides them in engaging the market to provide more favourable outcomes, which improves their income and their livelihood (CRS 2007). The first five steps comprise the preparatory activities. These emphasize the need for farmers to learn new skills, access new information and adopt new innovative methods to identify and respond to market demands and opportunities. Adequate preparation during this critical business preparation and organizing stage ensures that a higher degree of success is attained when marketing actually starts to take place in Step 6 (Test Marketing). As shown in Figure 1, the process does not end with the development and strengthening of the cluster. The cluster may either return to cluster plan formulation (Step 5) and review its agro-enterprise plan, or initiate the formation of new and additional clusters (Step 4).

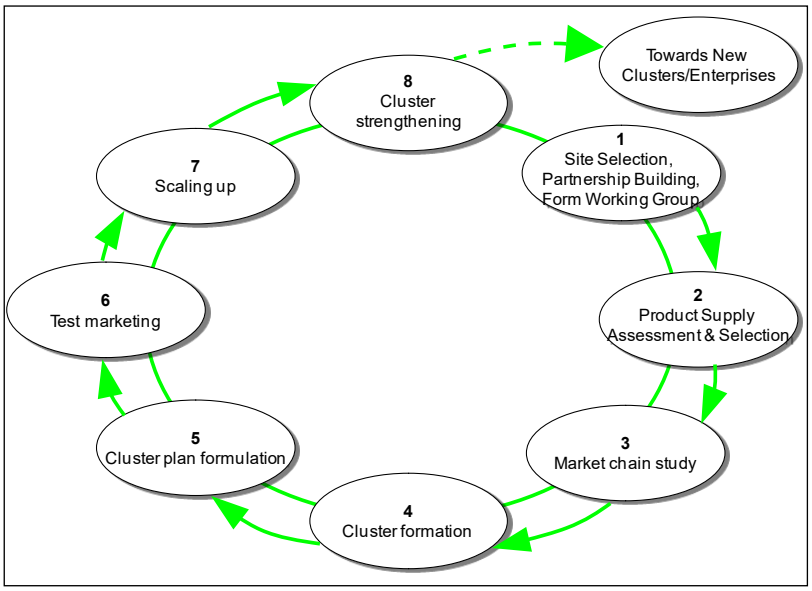

Figure 1: The CRS Eight-Step Agro-Enterprise Development Process

CRS development activities are guided by the six principles: (1) work with farmers as partners; (2) treat farming as a family business, acknowledging that rural communities are linked to markets and that farm families need income for off-farm products and services; (3) focus on farming systems that support diverse production; (4) promote agricultural practices that do not deplete or damage resources - link production to conservation; (5) use watershed approaches, fostering cross-community collaboration for resource

protection, natural disaster mitigation and upstream/downstream cooperation to meet competing water needs; and (6) ensure immediate benefits while investing in long-term outcomes.

Objective 1: To assess the institutional market for high quality vegetables in Metro Manila, Mindanao and the Visayas

In this first and most crucial phase of the project, institutional buyers in Metro Manila, Mindanao and the Visayas were interviewed with a view towards ascertaining the gaps in their current sources of supply and to identify potential new markets that have yet to be explored. While the previous scoping study met with many institutional buyers, it did not seek to identify the market for specific commodities, nor did it seek to identify niche markets for safe vegetables, organic, Fairtrade or hydroponic produce. Rather, the scoping study sought to identify the various means by which institutional buyers purchased their fresh fruit and vegetables and the extent to which they would be willing to assist emerging collaborative farmer groups. Furthermore, while the scoping study was focused primarily on Metro Manila, it became apparent that Metro Manila could not accommodate all the vegetables produced in Mindanao, even during the typhoon season (July to November). If the vegetable industry in Mindanao was to be sustainable, additional markets needed to be explored in the Visayas and indeed, in Mindanao itself.

Information was collected by key informant interviews that by necessity required highly experienced interviewers who were capable of probing respondents. This aspect of the project sought to:

- identify products that the respondent wanted but was unable to source in the Philippines;
- identify those products that consistently failed to meet the respondents specifications in terms of technical specifications and reliability of supply;
- identify new high value market segments (safe, organic, Fairtrade or hydroponic);
- identify the impact or influence that country-of-origin or region (including Mindanao) had on the customers decision to purchase; and
- explore such issues as variety, taste, colour, shape and size, packaging, freedom from chemicals, Fairtrade and equity and environmental sustainability.

Executive interviews were conducted face-to-face with buyers from the fast food industry, executive chefs, food service operators, purveyors, wholesalers and distributors, and retailers serving both the modern and traditional wet market.

This aspect of the project was undertaken by Curtin University and UP Mindanao. UP Mindanao subcontracted a component of the research in Metro Manila to the Professional Institute for Management Advancement, but undertook the study itself in Mindanao and the Visayas.

Objective 2: To describe and evaluate the performance of traditional and institutional vegetable value chains in Southern Mindanao

The project acknowledges the coexistence of two potentially competing value chains: those servicing the traditional wet market and those servicing the emerging institutional or high value market (Murray-Prior et al. 2004).

In the previous project ASEM/2000/101, UP Mindanao had sought to describe a single chain from the producer to the traditional wet market. However, such an approach ignored the fact that most farmers cultivated a range of vegetable crops and indeed, most farmers sold their produce to multiple customers. Even CRS acknowledge that in facilitating the formation of clusters, farmers are obliged to sell only 60% of the target crop through the cluster: they may choose to sell the remaining 40% to whoever they wish.

Describing and analysing the performance of the traditional and institutional value chains required all of the alternative value chains available to the selected clusters to be studied. Clusters were purposively selected to enable those servicing the fast food industry, institutional users (hotels and restaurants), food processors, retailers, purveyors and specialty markets to be studied.

Using a traditional pricing model, the purchase price and selling price was identified at each stage of the value chain (Batt 2003). Accompanying this was an activity schedule and an activity costing which identified the various activities undertaken by each actor (washing, grading and sorting) and the costs involved (materials, labour, rent). Recording the product flow and the losses and wastage at each step provided a surrogate model for evaluating both the costs and the rewards available to each actor.

The second component sought to explore the dyadic nature of the long-term relationships that existed between suppliers and their customers at each stage of the value chain. The key dimensions identified the partners' economic and non-economic satisfaction with the exchange transaction, the frequency and content of the market information exchanged, trust, the extent to which the partners were dependent upon their respective buyers and suppliers, their desire to maintain the relationship (commitment), and the extent to which either party was willing to make relationship specific investments. The final element explored both the source of and the use of power in the relationship.

Data for this aspect of the project was obtained from personal interviews with respondents using a structured questionnaire. UP Mindanao was primarily responsible for achieving this objective.

Objective 3: To improve the capacity of smallholder vegetable farmers to better fulfil the needs of traditional and institutional buyers

Concurrent with Objective Two, farmers and market intermediaries were interviewed to assess the extent to which upstream suppliers offer quality was able to match each customer's expectations (Parasuraman et al. 1985). Significant differences were expected to emerge with regard to the capacity of both farmers and the market intermediaries to meet the needs of the traditional and institutional market. An integral part of this analysis was concerned with the identification of the constraints that prevented upstream suppliers from fulfilling their customers' needs. Only after these constraints had been identified was it possible for the supplier to improve their performance.

In the Philippines, these constraints are numerous and multifaceted and include such variables as: the small farm size; the non-availability of quality seed; the high cost of inputs; limited access to credit; poor cultural practices; excessive insect and disease damage; limited knowledge of proper post-harvest handling methods; limited access to technical information; and limited access to market information (Lantican 2000; Manalili 2000; Panganiban 1976).

However, of more specific interest to this phase of the research was the extent to which the market was able to provide price incentives for quality. Given that prices are determined primarily by supply and demand, it is not unusual for farmers to realise higher prices for inferior quality produce. Furthermore, it is widely recognised that quality is at its peak in the main season, but as this most often coincides with peak production, prices are usually at their lowest. As chance events can often lead to a dramatic and sudden reduction in the quantity of produce available, prices will rise, irrespective of product quality. Market dynamics may thus lead many farmers to believe that there are few incentives for producing superior quality produce.

Furthermore, there is some evidence to suggest that many Filipinos consider vegetables as a "poor man's diet" and the consumption of vegetables may have some negative connotations (Digal and Concepcion 2004). This means that households who have the

capacity to buy will opt to purchase meat and meat-based products. While high socio-economic households are more aware of the health benefits of vegetables, fresh vegetables are seldom consumed because they require more preparation, they have a short shelf life and many members of the household, especially young children, do not like the taste of vegetables.

All three partners: Curtin, CRS and UP Mindanao participated in this aspect of the project. Strategies for improving quality were identified, discussed and where possible, implemented and evaluated.

Objective 4: To assist smallholder vegetable producers in Mindanao to adopt effective market linkage mechanisms via collaborative marketing arrangements and clusters

This component of the project could be best described as having two sub-components: a research phase and a parallel and concurrent development phase. The development phase was to be undertaken entirely by CRS with minimum intervention from the project. CRS already had a proven and accepted 8-step process based on the CIAT Territorial Approach to facilitate the formation of collaborative farmer groups or clusters. As the membership of these clusters grew, CRS had a mechanism in place by which entirely new clusters could be formed or spun out of existing clusters as they grew too big. At the commencement of the project, some of these clusters already existed, while others were in the process of being established. Some of these clusters were developed under the Philippine-Australia Landcare project, while others were formed with financial support from other donors including USAID (Growth with Equity in Mindanao), the Upland Development Program (UDP), the Kaanib Foundation and the Kasilak Development Foundation.

To facilitate the formation of new clusters and to build capacity within existing clusters, CRS employed three development officers: one in South Cotabato, Davao and Bukidnon. However, in April 2009, CRS advised that as a consequence of the global financial crisis, there had been a significant drop in the value of the donor funds CRS had received. With the Board having made a decision to reduce CRS activities in the Philippines, it soon became apparent that it would be necessary to engage another provider such as Kaanib, Kasilak, Landcare or Advocates of Philippine Fair Trade Incorporated (AAPFTI) or for UP Mindanao to employ the key CRS staff itself. In September 2009, having considered the alternatives, the three field staff were employed by the University of the Philippines Strategic Research and Management Foundation (UPSTREAM).

The research component, which was conducted by UP Mindanao and Curtin University, worked with the clusters established by CRS and UPSTREAM. This aspect of the project sought to identify the key determinants of sustainable collaborative marketing groups; to assess the benefits and costs of meeting the needs of different high value markets and to define the elements that supported long-term trading relationships.

This aspect of the research project commenced with a baseline study in conjunction with Objective 2. A subsequent survey of the cluster membership was undertaken to reveal the social and economic benefits that smallholder farmers had derived as a result of cluster membership. By participating in most of the capacity building activities in which the clusters were engaged, researchers were able to observe how the individual clusters operated. Trust and social capital, honest and transparent communication were expected to have a significant influence among the more successful cluster groups. Long-term linkages with preferred customers were facilitated during the proposed meetings under Objective 3.

Objective 5: To identify and propose potential interventions at the farmer and market intermediary level to improve the performance of value chains in the southern Philippines vegetable industry

This aspect of the project was on-going and continuous throughout the duration of the project. As impediments and constraints emerged, the clusters themselves took steps to address the problems. Regular meetings were conducted with buyers to evaluate what had been achieved and where necessary, to explore alternative approaches. By necessity this was a somewhat cyclical and iterative process, with ramifications along the chain (Figure 2).

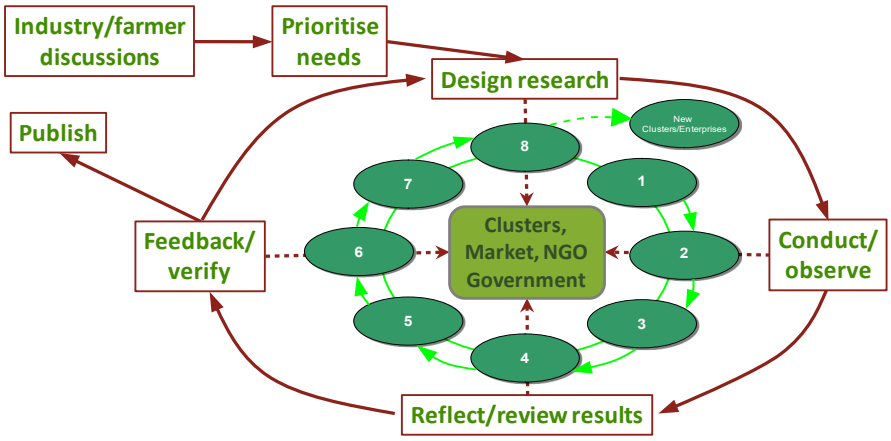

Figure 2: Participatory action research process integrated with action learning process for marketing clusters

Many of the issues and impediments that arose were directed towards the other components of the larger project ASEM/2007/066. Not unexpectedly, some of the impediments and constraints which emerged required intervention at the political level.

6 Achievements against activities and outputs/milestones

6.1 Objective 1: To assess the institutional market for higher quality vegetables in Mindanao and Visayas

no.	Activity	Outputs	Achievements
1.1	Survey buyers of high quality vegetables in Metro Manila, Mindanao and the Visayas regarding their current sources of supply and their projected requirements	Key purchasers of higher value vegetables identified; Gaps in supply (both by product and seasonality) identified; Alternative suppliers identified Likely prices, quantity and offer quality identified	Monograph published by UPSTREAM in 2012 [ISBN 978-971-95595-0-4] Copies distributed to project partners (NGOs, local government units, farmer clusters), ACIAR and project team members. Information derived from the market study has been utilised by the smallholder farmers in selecting appropriate crops. The key results of the market report have been presented at various seminars and farmers' fora in the Philippines and to an international conference in Malaysia.
1.2	Examine the market for vegetable crops grown in a protected cropping environment	Key purchasers of vegetables cultivated in a protected environment identified; Gaps in supply (both by product and seasonality) identified; Alternative suppliers, likely prices, quantity and offer quality identified	

This study of the institutional market for fresh vegetables in Mindanao and the Visayas was primarily undertaken to assist smallholder vegetable producers and the market intermediaries that they supply to identify new potential high value markets. In the past, vegetable producers in Mindanao have planted crops in the anticipation that during the typhoon season (June to November) the supply of fresh vegetables to Metro Manila from Baguio and Southern Luzon would be seriously compromised. For some products such as tomatoes, reliance on this window of opportunity continues to be profitable. However, for other fresh vegetables, relying on the typhoons is a risky proposition. When the typhoons fail to strike with their usual frequency and veracity, there is a marked increase in the volume of fresh vegetables available with a commensurate reduction in price.

For those smallholder farmers who draw the majority of their income from the sale of fresh vegetables, low prices threaten their very livelihoods. Furthermore, as the household needs a regular cash flow, vegetable crops must be cultivated all year round. So as to improve the financial situation for smallholder farmers, alternative markets which have an on-going need for fresh vegetables had to be explored.

The study identified a number of opportunities to supply non-traditional markets in Mindanao and the Visayas, including hotels and tourist resorts, fast food outlets and supermarkets, with a range of fresh vegetables. However, the report stopped short in making any specific recommendations. There were a number of reasons for doing this:

- few customers reported any real difficulties in sourcing the fresh vegetables that they require. With the exception of imports, this means that market share can only be gained at another growers expense;
- the market is volatile. Between the time that the research was undertaken and the research results were made available, other grower groups, distributors and consolidators may have already moved to take advantage of the market opportunities identified;
- as individual customers' needs are different, prices are highly variable and their terms of trade differ, cluster members or their appointed market intermediary will need to communicate directly with the intended buyer; and
- it was not the role of this project to be actively engaged in marketing the growers produce. Rather, this project, sought to strengthen the capacity of smallholder vegetable farmers to make better informed decisions. The market report was prepared primarily to give the smallholder farmers an enhanced marketing horizon, providing them with greater insights into the variety of alternative market outlets and the different quality standards that were required by various institutional buyers.

6.2 Objective 2: To describe and evaluate the performance of traditional and institutional vegetable value chains in Southern Mindanao

No.	Activity	Outputs	Achievements
2.1	Key value chains described, relationships and information flows identified, Constraints and potential improvements identified and documented	Product flows, losses and wastage; costs and margins; price setting arrangements; market information and communication; relationships with market intermediaries identified	Diagrams of key value chains completed Wastage and losses documented Farm gate prices and net margins identified Relationships with traders identified Preliminary reports made to industry Papers presented to international symposia

Prior to clustering, most smallholder vegetable farmers dealt with local traders who collected the farmers produce from the roadside or some predetermined collection point, or, they chose to deliver it, either directly or indirectly to the buyer. Farmers had a weak bargaining position and were usually price takers. Communication and financial flows were only between the trader and the farmer, and the farmer had little knowledge of the market beyond that (Figure 3).

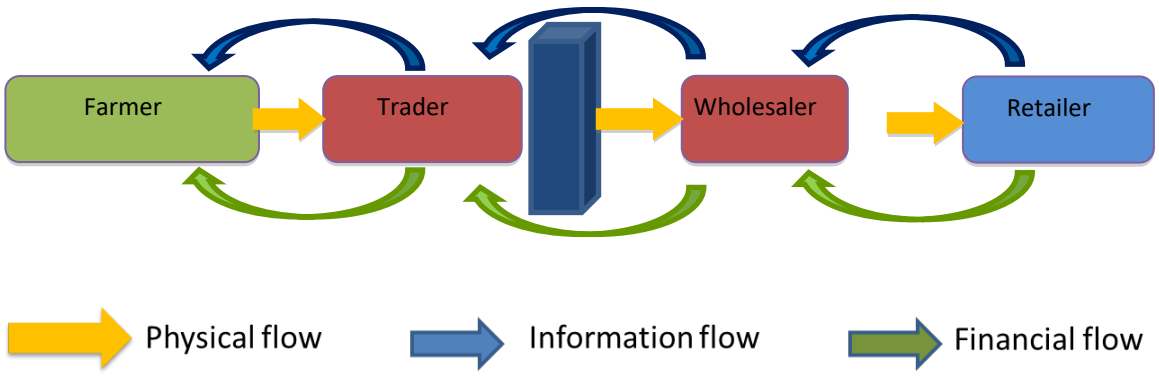

Figure 3: Generalized value chain prior to clustering

Post clustering, many of the functions that were traditionally performed by the traders were now undertaken by the cluster such as consolidation and aggregation, grading,

sorting and packing (Figure 4). However, the clusters were seldom involved in the transport of the product.

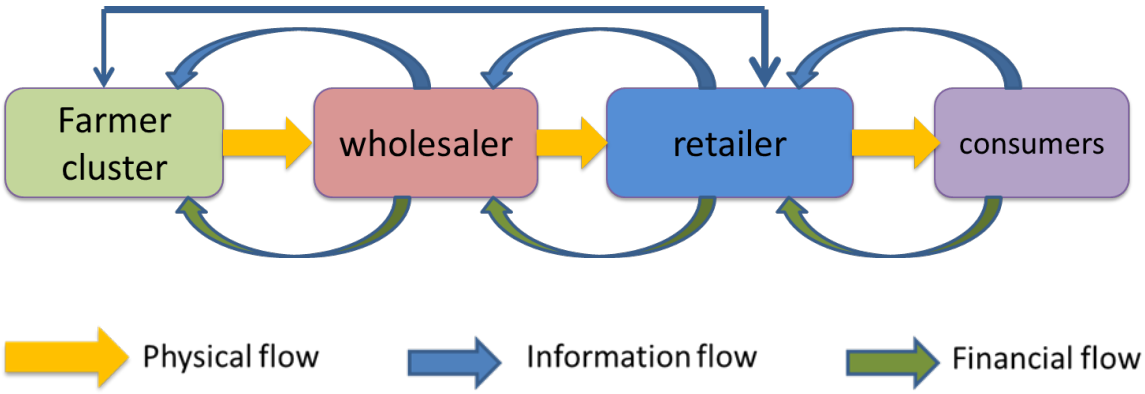

Figure 4: Generalised value chain post-clustering

While the chain was not any shorter, the major advantage of clustering was the improved flow of information and the opportunity for farmers to negotiate directly with the focal buyer. Being more aware of the buyer's needs, farmers were often able to receive a higher price for their produce as a result of grading and sorting, improved post-harvest handling and better negotiation skills.

While some of the clusters engaged with institutional buyers others continued to transact with preferred buyers in the wholesale market. In one case, the cluster decided to rent space and to establish itself as a trader in the wholesale market.

According to the production plans established by each cluster, cluster members were required to commit no less than 60% of their production to the cluster. The remaining 40% could be disposed of at the individual farmer's discretion. However, it soon became apparent that the institutional buyers were not always reliable, there were frequent price disagreements, often over quality, buyers often defaulted in making payment and in some instances where there was joint demand, institutional buyers could refuse at the last moment to accept the produce.

Irrespective of whether the cluster transacted with an institutional buyer or a traditional buyer, the focal buyer generally paid a higher price. However, when prices were high, presumably because of supply constraints, the price difference between the institutional market and the traditional market was minimal. However, when there was an abundance of product and prices were low in the traditional market, the institutional market generally paid significantly higher prices.

The price setting arrangements experienced were dependent upon the customers, the prevailing practices and the capacity of the cluster leaders to negotiate favourable terms of payment. For those clusters dealing with buyers in the traditional market, the terms of trade were primarily cash on delivery. However, in some instances, where the buyer was a regular customer, credit could be extended to the buyer for 1-2 days, whereupon payment was made on the next occasion that fresh produce was purchased.

In dealing with the modern retailers, the terms of trade seldom supported smallholder farmers. Prices had to be negotiated ten days in advance, there were significant penalties for late delivery, unsold product was returned to the buyer and payment was often made 10-14 days after the sale. Eliminating the market intermediaries did not reduce the price, for the clusters now had to undertake the marketing activities performed by collector agents and wholesalers.

At their inception, each of the clusters endeavoured to come to some arrangement as to how much members are willing to pay the marketing officer for facilitating the sales of the produce. The marketing officer must not only liaise with the intended customer to identify the desired volumes and to agree on a price, but also coordinate delivery among the contributing farmers and in some instances, to arrange transport, to accompany the produce to the buyer, to collect the funds and to then distribute the funds to the farmers on their return. On average, the marketing officer, who was also a member of the cluster, was paid 5% of the net proceeds of the sale.

The cluster members also had to collectively decide what proportion of their income they will contribute to a revolving cluster fund. Effectively, this is an informal line of credit which cluster members were able to access to borrow the funds to purchase inputs, to meet unforseen household expenses, or to meet the expenses associated with the formal incorporation and registration of the cluster. Where for example seeds and or fertilisers were provided by government, there was an expectation that farmers would repay the costs of these inputs into some collective fund, thereby enabling the cluster to become more sustainable.

Upon analysing the price margins along the chain, it soon became apparent that on many occasions market intermediaries failed to recover their costs. As vegetable prices in the Philippines were highly volatile as a result of dramatic shifts in the volume of product available for sale, between the time the buyer had purchased the fresh vegetables from farmers and when the product was delivered to the market, prices had often changed appreciably.

Farmers traditionally do not keep records of their costs, inputs or sales. Likewise, they seldom have any record of wastage or losses. During the analysis of the value chain, the amount of wastage and losses they experienced for the crops cultivated under the cluster plan was recorded. Field losses were very dependent on seasonal conditions and the incidence of pests and diseases, and ranged from just 1-2% to total crop failure.

For some clusters, the practice of *reseko*[1] among the traditional buyers was widespread. At the time of purchase, buyers deducted a predetermined amount of produce (by weight) to compensate for physical damage, moisture loss and product that failed to meet their specifications. Through grading and sorting prior to sale, cluster members were able to eliminate this cost.

With the rapid advance in cellular telephone technology, most of the clusters were able to communicate with their focal customers. The extent to which they needed to do so was largely dependent upon the frequency with which they transacted and the extent to which the products they had delivered met the customer's specifications. Not unexpectedly, when the supply was constrained, the frequency of communication increased as traders endeavoured to source sufficient product to meet their downstream customer's needs.

With respect to communication, two key problems often emerged. Even for those customers who may have defined quality specifications, these specifications were highly subjective, particularly for wet market wholesalers. When the supply of product was tight, the standards were relaxed, but when supplies were abundant, they were rigidly enforced. This often led to disagreements about what was and what was not acceptable.

The second issue related more to infrastructure and the limited coverage of the different cellular networks in the Philippines: in some barangays it is not possible to receive a signal. In other instances, it related to the prevailing practice in the Philippines whereby calls between phones on the same network are free, but between networks, call charges were often inordinately expensive.

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[1] *A term used to denote an automatic % deduction from the volume to account for shrinkage. The amount varies from 30% for leafy vegetables to 5% for other crops.*

Not unexpectedly, the cluster members chose to trade with the focal buyer because they generally offered a higher price. The focal buyers were perceived to be honest, reliable and trustworthy, and to keep their promises. There was very little evidence of the exercise of any coercive market power as the clusters could choose who they sold to.

6.3 Objective 3: To improve the capacity of smallholder vegetable farmers to better fulfil the needs of traditional and institutional buyers

No.	Activity	Outputs	Achievements
3.1	Quality constraints identified	Stakeholders capacity to meet the requirements of traditional and institutional markets identified	Paper identifying constraints to improving offer quality
3.2	Incentives assessed at the farmer and stakeholder levels for improved quality along the value chain	Quality incentives identified	Paper identifying quality incentives
3.3	Strategies for improving quality identified and analysed	Improved smallholder returns commensurate with the effort	Paper identifying alternative strategies for improving offer quality

Concurrent with Objective Two, cluster farmers and market intermediaries were interviewed to assess the extent to which upstream suppliers offer quality was able to meet customer's expectations. Significant differences were expected to emerge with regard to the capacity of both farmers and the market intermediaries to meet the needs of the traditional and institutional market.

These constraints, which are numerous and multifaceted, included such variables as: small farm size; the non-availability of quality seed; the high cost of inputs; limited access to credit; poor cultural practices; excessive insect and disease damage; limited knowledge of proper post-harvest handling methods; limited access to technical information; and limited access to market information.

Extreme weather events, where it was either too wet or too dry, had an adverse effect on plant growth, impacting on both productivity and the resultant quality of the harvest. Variations in the weather also impacted upon the incidence and the severity of pest and disease infestations. In turn, the extent to which farmers were able to control these outbreaks was somewhat dependent upon their working capital and their ability to access micro-finance.

However, the most significant group of constraints were related to infrastructure. This included the lack of electricity, no running water, the lack of transport and the poor condition of the roads. Some of the clusters were unable to communicate with focal buyers because of the lack of any signal for their mobile phones.

The high price that smallholder farmers received from the sale of the fresh produce they had grown provided the major incentive for them to continue to trade with their preferred buyer. Indirectly, the price that farmers received also impacted upon their on-going commitment to sell through the cluster. Where the cluster was unable to offer prices at

least commensurate with those the farmers could obtain from other buyers, the long-term sustainability of the cluster was questionable.

However, in making their decision to transact with a downstream buyer, the decision to sell was not made on price alone. In making their decision to sell, smallholder farmers considered what proportion of their output would meet the buyer's specifications. While there is some evidence to suggest that they received higher prices for superior quality that was contingent upon the quantity of product available. Irrespective, farmers then had to decide what to do with that product which was rejected. For this reason, some farmers preferred to sell the product ungraded, forgoing the cash incentives for superior quality product in the knowledge that they had made more money overall by selling all of the produce that they have grown.

Quality however does not relate only to the physical attributes of the product. The market report (Objective 1) identified a willingness among some segments of the market to pay a premium for organic vegetables. Indeed, one of the major supermarket chains in Davao was endeavouring to procure an increasing quantity of fresh vegetables from cluster members in the belief that the product had been grown in a more safe and sustainable manner.

Nevertheless, for smallholder farmers to access the institutional market, they had to first enter into some form of collaborative marketing arrangement whereby it became possible to consolidate a sufficient quantity of product of the desired quality to meet the buyers' specifications. However, without seed of the desired varieties, sufficient capital to purchase the necessary chemicals and fertilisers, sufficient agronomic skills and knowledge of the market's requirements, the quality of the product was unlikely to reach its potential.

The project sought to address these quality issues through; (1) the implementation of training programs, conducted through third party providers such as the Department of Agriculture, local government units and the City Agriculturist Office; (2) facilitating technical exchange visits between the clusters; (3) material support through the provision of weighing scales or plastic crates; (4) crop diversification; (5) facilitating agreements with ICTUS and BCB to arrange loans for the farmers; (6) communal farming; (7) a centralised consolidation point to which farmers brought their produce for sorting and grading; (8) supporting the formation of a confederation of clusters in the Davao area to meet the needs of a major supermarket chain; and (9) facilitating the adoption of protected cropping structures, most often as a grant from the Department of Agriculture, a local government unit or the City Agriculturist Office.

6.4 Objective 4: To assist smallholder vegetable producers to adopt effective market linkage mechanisms via collaborative marketing arrangements and clusters

No.	Activity	Outputs	Achievements
4.1	Identify the potential value of market clusters	Increased benefits for smallholders More effective links between smallholders and markets leading to improved market access and higher smallholder income	Benefits to smallholder farmers identified. Average monthly income increased by 47% (PhP 4,904 before: PhP 7,192 after). Cluster farmers' average income (PhP 7,192) was 18% higher than the farmers not in clusters (PhP 6,095). Links with institutional buyers sustained.
4.2	Assess the benefits and costs of meeting the needs of alternative markets for stakeholders (especially smallholders) in the value chain	Key benefits and costs identified and quantified for smallholders and stakeholders Report identifying appropriate interventions to enhance value chain performance	Continuous capacity building programs in marketing, leadership, record-keeping, financial reporting, pest and disease management Institutional linkages maintained with government agencies (DA, CAO, PAGRO), non-government organizations (Landcare), buyers (traditional and institutional). Continuous project monitoring through regular meetings and consultation sessions with the agro-enterprise coordinators

4.3	Define elements supportive of longer-term trading relationships	Effective linkage principles and mechanisms identified Demonstrate/measure the importance of trust and social capital as a driver of effective linkages Assess the importance of new technologies	Trust and relationship constructs identified and measured.
4.4	Pilot test smallholder marketing clusters	Functioning cluster groups in each value chain	Twenty-nine (29) clusters formed under the project. Several instances where cluster formation resulted in two or more subclusters. LGUs in project areas have adopted the clustering approach as a mechanism for improving production systems.

Over the duration of the project UPSTREAM worked with 29 clusters or 342 smallholder farmers. At the inception of the project, it was proposed that within each of the three research areas, six new clusters would be established by the project. Within Davao, all ten clusters were established under this project; in Bukidnon, four of the seven; and in South Cotabato, ten of the twelve. Collectively, over the duration of the project, the clusters were responsible for facilitating the sale of 570 tonnes of fresh vegetables.

The formation of these new clusters came about through two mechanisms: from within the clusters themselves and/or from referrals. As cluster membership expanded, so also did the diversity within the group. In order to resolve the philosophical differences that inevitably emerge, it was often easier for the cluster to split into two or more sub-groups.

The key benefits from clustering can be categorized as: (1) economic, (2) environmental and (3) social.

Economic benefits include higher prices for products, lower costs, higher income, improved market access, improved access to technical information and capacity building, greater access to production inputs (seeds and fertilisers), protective cropping structures and greater access to working capital. Monthly income of cluster farmers increased by 47% per cent on average, from PhP 4,904 per month before joining the cluster group to PhP 7,192 after clustering. On the average, the household income of cluster farmers was 18% higher compared to non-cluster farmers.

The adoption of natural farming technologies and the practice of contour farming have had a positive impact on the environment. Cluster members are maintaining the fertility and health of the soil through green manuring and crop rotations, the adoption of contour farming practices and using naturally produced insect repellents and attractants.

Having the capacity to negotiate with buyers and to establish market linkages enabled the clusters to diversify their markets and their product range. Through clustering, cluster farmers had a better understanding of the market dynamics, why prices increased or decreased, and the product specifications they had to meet to satisfy their downstream buyers' needs. A better understanding of the market enabled the farmers to develop improved linkages with downstream buyers, overcoming much of the distrust and apprehension that has been present in the traditional market. Moreover, cluster members felt more empowered as a result of the new skills and information they acquired through training workshops and seminars. Most of the clusters now have the capacity to make their own decisions, especially in dealing with buyers and in developing alternative markets. Their collective power for bargaining is not only useful in negotiating prices with buyers; it also enabled them to access farm inputs such as seeds, fertilizers and credit, technologies and external assistance through farm support programs. However, one of the most significant long-term social benefits cited by the farmers was the ability to send their children to school.

Beyond the cluster members, the increase in vegetable production has generated more employment opportunities in the community for planting, weeding, harvesting and sorting. It is estimated that, on average, each cluster member now requires an additional five man days per week to accommodate the activities associated with sweet pepper production. In addition, the need to transport the product to market has generated employment for many others in the community. Furthermore, in the absence of alternative sources of technical information, many of the cluster farmers provided training to other farmers who were not members of a cluster.

For clustering to be successful, the cluster members must have: (1) a common goal; (2) alternative markets; (3) strong leadership; (4) open communication; (5) trust and social cohesion; and (6) strong institutional support. Underpinning each of these pillars is the need to build capacity, thereby enhancing the capacity of each member of the cluster to make better informed decisions.

First and foremost, for the cluster to be successful, it must be able to offer some comparative advantage. In other words, the cluster must be able to deliver benefits to its members that are greater than those the members can obtain by acting independently. While farmers expect to receive a higher price, cluster membership can improve access to markets and market information, reduce costs through consolidation and provide greater access to production inputs including technical information, seeds, fertilisers, protected cropping structures and micro-finance.

The cluster members must have a common goal. The cluster must use democratic processes to make decisions so that every member feels they have participated. Cluster cohesion is enhanced by the social connections between the members such as belonging to the same family, the same ethnic group, living within the same community, belonging to the same church group or speaking the same language.

Having multiple markets for the produce enhanced the likelihood of success because it provided farmers with an alternative market when focal buyers default. Dependence on just one buyer potentially left the cluster vulnerable to exploitation. Furthermore, it is important to realise that; (i) not all the product available will meet the buyer's specifications; (ii) the quantity of product available may exceed the buyer's needs; and (iii) focal buyers do not always offer the highest price. Cluster members were encouraged to maintain good relationships with buyers in the traditional market.

One of the factors influencing the ability of the clusters to achieve their goals is good leadership. The focal person is the cluster leader who needs to have the skills to mobilize the members of the cluster. They are tasked with convening and facilitating cluster meetings and coordinating activities. To be successful, cluster leaders should ideally be elected through a democratic vote, rather than imposed on the group by some outside agency. In most cases, they were elected based on their previous experience as a leader

within the community. They were chosen based on their knowledge, skills and experience. A good leader must be good at managing people, be able to develop and implement plans, have experience in farming, be articulate, compassionate and be a good example. Furthermore, a good leader should be honest, outspoken, responsible and trustworthy. A good leader should have a good relationship with all members of the cluster, be transparent and above all else, treat the cluster members fairly and equitably. Trust is paramount, for in many instances, cluster members handed over the responsibility of consolidating, selling and negotiating a price for the vegetables to the cluster leader.

Trust between members is one of the important factors to strengthen group cohesion. Personal and process based trust is very important in a collaborative relationship. Any problems or issues that may potentially jeopardise the relationship must be dealt with and resolved expediently, which often means sanctioning members who have repeatedly failed to meet their obligations.

Institutional support organizations have been crucial to the success of the clusters. Aside from the assistance provided in linking the cluster to institutional buyers, support from other government and non-government agencies has been invaluable in providing crop inputs (seeds and fertiliser), micro-finance, technical advice, infrastructure (packing sheds and protected cropping structures) and in some instances, facilitating the transport of product to market.

Depending on the stage of cluster development, different capacity building activities have been provided to the clusters to equip them with the appropriate skills and knowledge to engage with different market outlets. These capability building activities included basic market training and market visits, enterprise planning, production scheduling, negotiating with buyers, field tours, crop protection training, bookkeeping and leadership training.

The main challenges that the clusters experienced were primarily external;

- adverse weather events often resulted in total crop failure, impacting adversely upon the ability of cluster members to meet their buyers needs and in other instances, to repay loans. However, membership of the cluster also provided the means by which cluster members were able to negotiate a mutually acceptable repayment schedule.
- the variability in price. The prices received often fell below the costs of production leaving cluster farmers both disillusioned and discouraged. One of the reasons contributing to the problem was the unrealistic price expectations used in the development of the cluster marketing plans and financial plans. These have subsequently been revised downwards and are much more conservative.

Internally, where the demand for the cluster's product declines or the quantity demanded is very small, cluster leaders have sometimes failed to adequately apportion the quantity among the cluster members, resulting in inequitable returns and accusations of unfair treatment.

Some farmers stopped planting vegetables altogether, deciding that they could make more money from planting other crops or engaging in off-farm activities, or to lease their land to corporate agribusiness enterprises. A lack of commitment among cluster members, poor leadership, conflict between cluster members and the lack of trust have been evident.

While the project had no difficulty in identifying and initiating new cluster groups, in order to take on more new clusters, the project had to identify a means by which it could amicably separate itself from the more mature clusters. Regrettably, there is some evidence to suggest that in some of the less mature clusters, an element of dependence has emerged, where the cluster itself was reluctant to severe its relationship with the project, for the members believed that doing so would limit access to additional resources. Similarly, there is evidence to suggest that many funding organisations are reluctant to withdraw their support from the more mature clusters, for their access to on-going funding is contingent upon their ability to demonstrate successful project outcomes.

Recognising this problem, the project proposed improvements to the CRS Eight Step Plan for Agro-enterprise Development through the incorporation of an exit strategy. The proposed steps in this phase include:

- a workshop to assess maturity for graduation or the exit of the donor agency;
- training in business planning and the development of business plans;
- strengthening links with support institutions;
- the formulation of business plans for the clusters after-life;
- a participatory evaluation of the clustering process, their involvement in the process and the donor agency's performance; and
- organising a graduation activity.

Graduation ceremonies were held in each of the three regions at which the farmers from each cluster developed their future business plans.

6.5 Objective 5: To identify and propose potential interventions at the farmer and market intermediary level to improve the performance of value chains in the southern Philippines vegetable industry

No.	Activity	Outputs	Achievements
5.1	Identify opportunities for intervention in the vegetable value chain	Annual reviews and progress reports	Potential interventions were identified and implemented.

To facilitate the process of cluster formation and in linking the clusters to institutional buyers the project made a number of interventions, both alone and in conjunction with other project partners. Without exception, these interventions were made only after the farmers had identified a need, rather than simply as a handout, both as a means of conserving resources and of discouraging dependence. In some instances, farmers were only able to access the benefits as a result of formally registering their clusters with the Department of Labour and Employment.

Having identified the need for a cluster and after taking a group of cluster farmers to visit the market, during the subsequent stage of cluster formation (Step 4), the lack of inputs often emerged as a major constraint. This included the lack of seed of the desired varieties, fertilisers and packing materials. Through the National, Provincial Agriculturists Office, the City Agriculturists Office or the Municipal Agriculturists Office, the project was able to source vegetable seeds.The project also purchased seeds for distribution. For the Davao and Bukidnon areas, these seeds were extended to the cluster members on the condition that the costs were to be recovered from the proceeds of the sale of fresh vegetables through flexible payment terms. The clusters also established a cluster fund, whereby farmers agreed to contribute 5 -10% of the sales revenue.

In some instances, the clusters were also provided with bags of compost to be used as fertilisers. In other instances, the clusters were taught how to prepare their own composts and other natural fertiliser supplements and insect repellents as a way of reducing their costs of production. While some reduction in the yield was inevitable, for many farmers, these natural alternatives were a significant risk reduction strategy, given the uncertainty in price and the risk of crop losses arising from climatic adversity. Other farmers were encouraged to adopt companion planting, contour planting and to practice crop rotation as a means of reducing the incidence of pests and disease and of maintaining soil fertility. The adoption of these sustainable farming practices was perceived very positively by one of the major supermarkets and several buyers from the food service industry.

To enable the cluster to maintain accurate records and indeed to ensure that they were not being deceived by institutional buyers, the project provided each of the clusters with a weighing scale. Where the institutional buyer required the produce to be packed in plastic crates, the project not only provided the crates but established with a buyer a reciprocal crate exchange scheme so that the produce did not have to be repacked. In some instances, the clusters were provided with building materials to facilitate the construction of packing and storage sheds. One cluster used recycled materials for their shed.

To meet the needs of the focal buyer, the majority of the clusters began to grade, sort and wash the produce before packing. These practices were adopted by the farmers with

minimal intervention from the project itself. In a similar manner, through facilitating exchange visits between the clusters, facilitating participation in national vegetable industry congress and through the delivery of the annual UP Mindanao Supply Chain Forum and the Farmers and Partners Learning Alliance, cluster members began to exchange ideas including the adoption of protected cropping. Where the clusters were registered with DOLE, they were able to take advantage of significant grants from the Department of Agriculture. In other instances, plastic sheeting was provided by the project and/or other project partners. As these grants were made to the clusters rather than to an individual, indirectly, they encouraged the development of communal farming, whereby each of the cluster members contributed either their time or some other input such as seeds, fertilisers or chemicals. The proceeds of the sale were then shared equitably between those who had contributed.

For many smallholder vegetable farmers, the lack of capital was a major constraint. As a member of a cluster it was significantly easier to obtain a loan from a lending institution on the basis that the cluster had developed a production plan, a marketing plan and a financial plan. However, it was also evident that the manner in which the loans had been distributed in the past was not only inappropriate but the amounts were excessive, with a significant proportion of the funds being redirected to the purchase of household goods rather than production inputs. When the clusters experienced crop failure, as a result of adverse weather conditions, collectively, the cluster was able to renegotiate a mutually acceptable repayment schedule.

From Component 1, several of the clusters were trained in the use of an innovative soil testing kit.

7 Key results and discussion

7.1 To assess the institutional market for higher quality vegetables in Metro Manila, Mindanao and Visayas

In the institutional market, fresh vegetables are purchased for resale, for processing or for subsequent incorporation in food service operations. Not unexpectedly, given the many different ways in which the product is used, the institutional market can be segmented on the basis of the role market intermediaries perform in the supply chain, where they are, what customers they serve, the range of products required, the volume of product required and the quality specifications required.

7.1.1 Segmenting the market for fresh vegetables in the Philippines

Given the diversity of climate types and topography, population and the distribution of household income, infrastructure development and food culture, each of the islands within the Philippines must be considered as a discrete market. On each island, the demand for fresh vegetables is different. For the temperate chopsuey vegetables, the source of supply will differ, contingent upon the availability and proximity of suitable highland areas, the frequency of shipping and road infrastructure.

In any analysis of fresh vegetable supply chains in the Philippines, it is essential to differentiate between the pakbet and chopsuey vegetables. The pakbet vegetables include those traditional, tropical lowland vegetables that are often intercropped with rice and maize and are an integral part of traditional Filipino diets. With the notable exception of tomato, the trade in these products occurs primarily between proximate rural and peri-urban areas and the immediately adjacent urban centres. There is very little inter-island trade because of the widespread availability of these products.

The production of the semi-temperate chopsuey vegetables occurs primarily in the highland regions. Given its close proximity to Metro Manila, the main area for the production of highland vegetables is the Cordillera Administrative Region (76%). Mindanao (19%) and the Visayas (4%) are the two other notable producers of temperate vegetable crops. Given that there is much variation in both the climate types and the availability of suitable highland areas across the archipelago, there is a significant inter-island trade in the temperate chopsuey vegetables.

Two other classifications must also be considered: the salad greens and lamas – the spices and condiments that are frequently used in cooking. The demand for these products is very much dependent upon the individual customer's needs.

In the fresh vegetable market, institutional buyers can be classified into one of four segments: Segment 1 is comprised of the five star hotels and tourist resorts, restaurants and the supermarkets catering to the wealthy AB consumers. These institutional buyers require the widest range of vegetables and are the most quality discerning. In most cases, formal product descriptions exist for each product. In addition, suppliers must operate under an approved food safety program, which may or may not be third party certified, and there is often a requirement for producers to adopt sustainable farming practices. Segment 1 purchase salad greens, culinary herbs and lamas and the temperate chopsuey vegetables. While some of them serve pakbet vegetables, these are provided to foreign tourists because they are traditional Filipino vegetables and may therefore be perceived as exotic.

Segment 2 is comprised of the business hotels and resorts who cater to business, government and non-government institutions who conduct seminars and conventions and provide special functions for the ABC1 households such as weddings, debuts and anniversaries. This segment also includes most of the mainstream supermarkets which

service mostly urban markets who value the convenience of purchasing all their household needs from one shopping centre. These institutions purchase similar types of vegetables as Segment 1, but they are far more price conscious. Most of the food service institutions in Segment 2 are very flexible with the menu they offer. If for any reason the product is not available, a substitute product is offered or customers simply advised at the time that they place their order that the product is not available. They rarely serve salad vegetables and herbs, but need a regular supply of chopsuey and pakbet vegetables.

Segment 3 includes the wholesalers, consolidators and distributors. Their customers include both traditional and modern retailers, food processing firms and hotels and restaurants. To service their different customers' needs, they require a wide range of fresh vegetables. The better quality produce is sold to Segments 1 and 2, while the lower quality produce is delivered to Segment 4.

Segment 4, the traditional wet market, accounts for 75 - 80% of the retail sales of fresh vegetables in the Philippines. In this segment, retailers cater to the needs of hotels, restaurants and households in the C2 and DE market segments. Quality requirements are not very strict and the range of products narrow. Generally only the traditional pakbet vegetables are purchased. In this segment, the demand for the temperate chopsuey vegetables is low and the demand for salad greens and herbs almost non-existent. For this segment, price is the most important variable in the decision to purchase.

7.1.2 Product availability

With the exception of a few specialist gourmet vegetables and culinary herbs which are required by only the most discerning buyers (Segment 1), most institutional buyers are readily able to procure the fresh vegetables that they require.

In sourcing the fresh vegetables that they require, the majority of institutional buyers rely upon preferred suppliers (suki) to provide them with the quantity and range of product that they require. However, given the highly unpredictable nature of supply and significant variations in product quality, most institutional buyers have more than one supplier. Such greatly extends their marketing reach, thereby increasing the possibility of securing the products required, whilst simultaneously providing a means by which the quality of the product offered and the price can be readily compared with alternative offers.

When supplying to the supermarkets, five star hotels and resorts, preferred suppliers must not only meet defined quality specifications, but the prices for that product which meets specifications is often established in advance. Given the unpredictable nature of supply in the Philippines, wholesalers and consolidators are free to purchase from wherever they can secure the best quality product at the most competitive price. However, significant penalties may also be imposed upon those suppliers who fail to deliver on time and to the quantities as specified.

As product shortages do inevitably arise, a significant amount of trade occurs between the different types of institutional market. Where preferred suppliers are unable to deliver what the restaurants want, they often source the product from supermarkets. For the five star hotels and tourist resorts, fast food companies and food processors, when the product is not available in the Philippines, they will import either directly or indirectly via Metro Manila.

So as to minimise their exposure to the financial risks associated with product losses arising from poor quality, poor post-harvest handling and product deterioration over time (shelf life), many of the supermarkets have invited concessionaires to manage and to operate the fresh produce department in-store. In accepting the offer, it is the concessionaires’ responsibility to stock the shelves, to wrap and to price the product, to prepare any pre-cut vegetable mixes, salad mixes etc., and to remove any unsold product. In return, the concessionaires pay a predetermined per cent of sales to the supermarket. As it is not uncommon for two or more concessionaires to operate within the one store, as

differences in both the quality and price are apparent, consumers may become easily confused.

7.1.3 Problematic products

The majority of the problems arise with the higher value, temperate chopsuey vegetables, leafy green vegetables and herbs. Despite the significant movement of fresh produce from the highland areas of production to the lowland areas of consumption, between different islands and different climatic zones, the supply is often insufficient to meet the demand and the quality highly variable.

Although such shortages are only temporary, the greater the distance and the more time the product is in transit, the greater the problem. This is a direct consequence of the lack of infrastructure, poor post-harvest handling and transport. In the absence of appropriate cool storage, leafy green vegetables will wilt very quickly. In a tropical climate, as high temperatures are often accompanied by high humidity, rots and moulds proliferate and the incidence of insect pests (grubs and worms) is high.

For those institutional markets that service the five star tourist hotels and resorts, the up-market restaurants and retailers, the non-availability and poor quality of the salad greens (lettuce), fresh herbs and lamas, present the greatest problems. As these products must be available, buyers often go to great lengths to assure supply through either purchasing from multiple suppliers or importing. For this market segment, other opportunities identified include baby or gourmet vegetables, mushrooms and specialty vegetables such as asparagus, celery and leeks, which are not always available in sufficient quantities.

At the other end of the market, few institutional buyers raised any issues with regard to either the sufficiency of supply or the quality of the traditional pakbet vegetables. As these products are widely available from the peri-urban regions that are adjacent to most urban centres, the product needs to be transported only a short distance. Furthermore, supplies can be renewed on almost a daily basis. In the traditional wholesale market, product which begins to deteriorate because it has not been sold or is infected with an insect pest, is often cut and incorporated into a variety of vegetable mixes, which other than cooking, require minimal to no preparation.

7.1.4 Product specifications

Most institutional buyers evaluate alternative suppliers of the basis of product quality, assortment, reliable delivery and price. Quality is evaluated by such criteria as freshness, firmness, colour and size, freedom from pests and diseases and physical injury, soil and chemical residues.

For those who wish to supply fresh vegetables to Segment 1, not only must the product meet prescribed standards, but there are often multiple specifications for each product, depending upon how it used. Furthermore, these standards are highly subjective and very much dependent on the quality of the fresh produce available. When there is a shortage, in order to secure a sufficient quantity of produce to meet the anticipated demand, the standards may be relaxed, but when supply is plentiful, the standards will be rigorously enforced. To reduce costs and preparation time in the kitchen, not only must the product be washed, trimmed and any external packaging removed, but for products such as garlic, ginger and onions, the product may need to be peeled.

Potentially, for those market intermediaries supplying this market, this creates an additional opportunity to add value. However, the quantities purchased are often small and delivery on a daily basis is expected to retain freshness.

7.1.5 Geographic indicators

Most institutional buyers associate one or more vegetables with a particular region or area of production. Baguio was primarily associated with the temperate chopsuey vegetables.

Most buyers preferred to purchase fresh vegetables from Baguio on the basis that they were of better quality, they looked better and in some instances, the product had a superior taste. Mindanao was most often recognised as an alternative source of supply for the chopsuey vegetables. However, product from Mindanao was preferred in the Visayas because of its lower price and more widespread availability. With the exception of Metro Manila, where the traditional pakbet vegetables were most often associated with the Ilocos region, most other institutional buyers failed to associate any of the tropical lowland vegetables with any particular region or area. However, most buyers preferred to purchase leafy green vegetables from "local" sources as these were perceived to be fresher.

In many instances, buyers did not associate the quality of the fresh vegetables with the region in which it was grown, but rather the place from which it had been shipped (Cebu) or despatched (Metro Manila). Product from Cebu was often perceived to be fresher because it was closer, but the product may have been sourced initially from Bacolod, Canlaon or Mindanao and even from Metro Manila.

There is no evidence to suggest that institutional buyers are prepared to pay any more to procure fresh vegetables from their preferred source or origin. In many instances, because of the seasonality of supply or infrequent delivery, buyers had no choice other than to purchase that product which was available.

7.1.6 Differentiating the product

In purchasing fresh vegetables, institutional buyers generally believe that the product is safe to eat. However, fresh vegetables are often contaminated with soil, heavy metals, chemical residues and pathogens (Shepherd and Tam 2008). While many buyers in Segment 1 require their suppliers to introduce quality assurance systems as a means of ensuring that they have taken "all reasonable steps" to assure consumers that the food is safe to eat, producers are unlikely to receive a price premium. If they wish to supply these institutional buyers, they must either operate under a third party certified quality assurance system or risk exclusion from the market.

In any discussion of organic produce in the Philippines, it is important to make the distinction between that product which is certified and that which is not. In much of the Philippines, organic refers to a low input method of production which uses natural inputs including animal manures, fermented plant juices, composts and vermiculture as a means of reducing the amount of chemical fertilisers and pesticides applied. However, this system of production does not preclude the use of chemical fertilisers or pesticides: farmers choose to sacrifice yields in the interests of reducing costs and thus their exposure to financial loss as a result of crop failure or inordinately low prices in the market.

Within the Philippines, even although organic produce is widely perceived to be more safe and healthy, the majority of institutional buyers are unwilling to pay any price premium to procure organic produce. For those businesses supplying the traditional wet market, local restaurants and carenderias, and even large, multinational food processors, as price is the key purchasing criteria, they are unable to pass on the additional costs to consumers. However, among the five star hotels, tourist resorts and those retailers who supply fresh vegetables to the wealthy AB consumer group, potential premiums of between 10% - 50% may be available for organic produce.

7.1.7 Protected cropping

Throughout much of the Philippines, vegetable producers are considering protected cropping as a means of improving the continuity of supply and the quality of the fresh vegetables produced. In those areas with a Type IV climate, where rain falls evenly throughout the year, protected cropping becomes almost mandatory, for otherwise, the

incessant rain accentuates the incidence of disease and may, during periods of heavy rain, completely wash out the crop.

From a producer's perspective, the primary benefit of protected cropping is to improve the marketable yield. However, almost without exception, institutional buyers do not differentiate between that product which has been produced outdoors and that which has been cultivated under protected structures. In the institutional market where continuity of supply is a key issue in determining whether a product will be placed on a restaurant menu, cultivating high value vegetable crops under protected structures is more likely to enhance market access and may possibly even elevate the supplier to "preferred" status.

7.2 To describe and evaluate the performance of traditional and institutional vegetable value chains in Southern Mindanao

7.2.1 Value chain maps

After participating in the CRS Eight Step Plan for Agro-enterprise Development, the clusters in Saloy and Quiropang collectively sold their produce directly to a wholesaler/retailer in the Bankerohan. Although this may seem to be only a modest improvement, prior to cluster formation, the farmers were selling as individuals to itinerant traders and beyond that, had no contact with the wholesalers operating in the Bankerohan. Since December 2010, the farmers in Pamuhatan (PAFA) have consolidated their product through the cluster to engage with one of the largest supermarket chains in Davao. It is only through clustering that the farmers have been able to provide sufficient product of the desired quality to retain the supermarket as a customer (Figure 5).

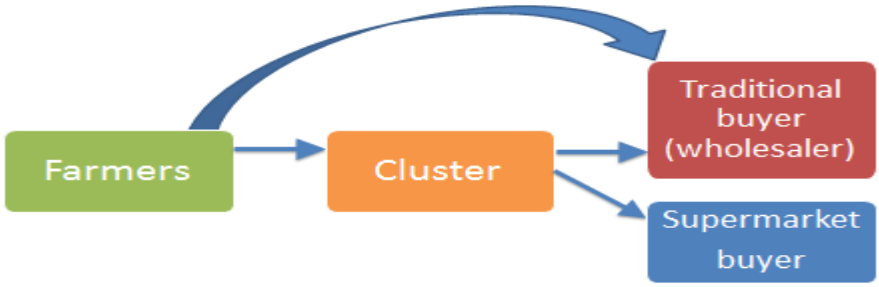


Figure 5: Fresh vegetable value chains in Davao

For the vegetable clusters in Bukidnon, chain mapping was conducted for the Songco and Kaatoan clusters, both of which were already well established. Results show that cluster farmers have engaged with various downstream buyers, including wholesalers and those acting as retailers, consolidators and a market facilitator. Products are mostly delivered to customers in either Bukidnon or Cagayan de Oro City.

Ampalaya (bitter gourd) cluster farmers in Impasugong, delivered their products to three main markets (Figure 6). Most of their produce was delivered to wholesaler-retailers in Kisolon, the nearby town of Sumilao and to Malaybalay City. In Impasugong, a small-scale food service institution, the Roadside Veggies Cafe, also provided an outlet, since bitter gourd is either cooked as part of the store's menu or sold fresh to walk-in customers.

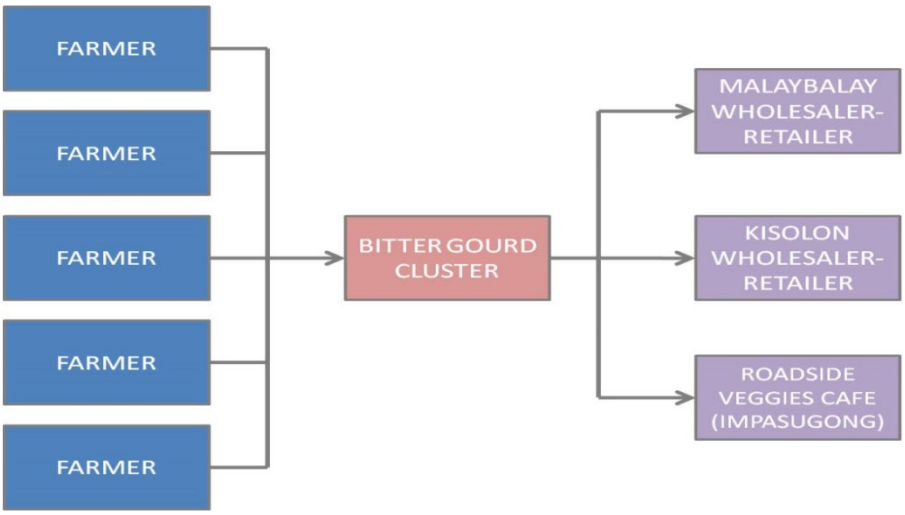


Figure 6: Bitter gourd cluster chain map

The main markets for the sweet pepper farmers in the Songco cluster include NORMIN Veggies and wholesalers, which are all located in the Agora Market in Cagayan de Oro. In addition, there was one wholesaler-retailer from Davao who came to pick up produce from the cluster's consolidation area. He also purchased from non-cluster sources in Songco and the neighbouring town of Lantapan (Figure 7)

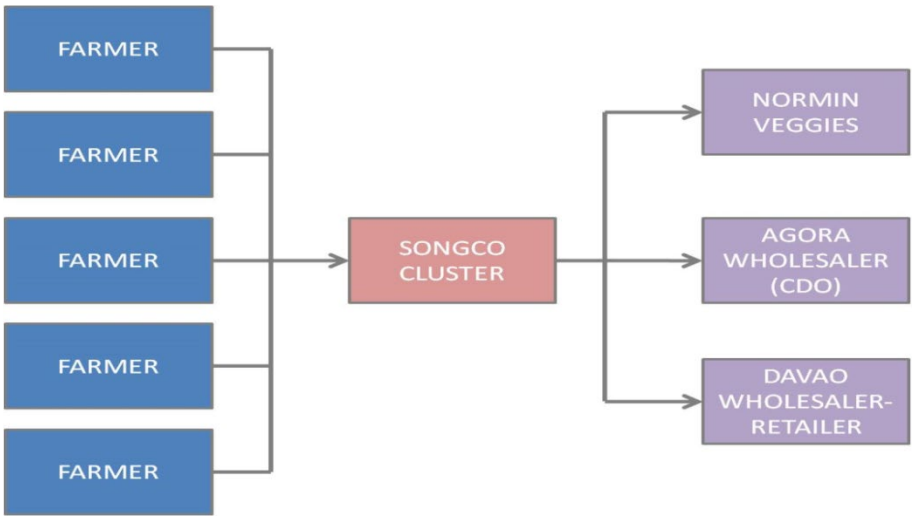


Figure 7: Songco cluster chain map

In South Cotabato, farmers in the Ned cluster go directly to consolidators and wholesalers. The consolidators pick up the produce from the municipality of Isulan and Sto Nino and deliver it to wholesalers in Koronadal and Davao, fish processors in General Santos and concessionaires for one of the supermarkets in General Santos (Figure 8). The wholesalers in Isulan and Sto Nino sell the produce to retailers in the area and to wholesalers in Koronadal and the municipality of Surallah.

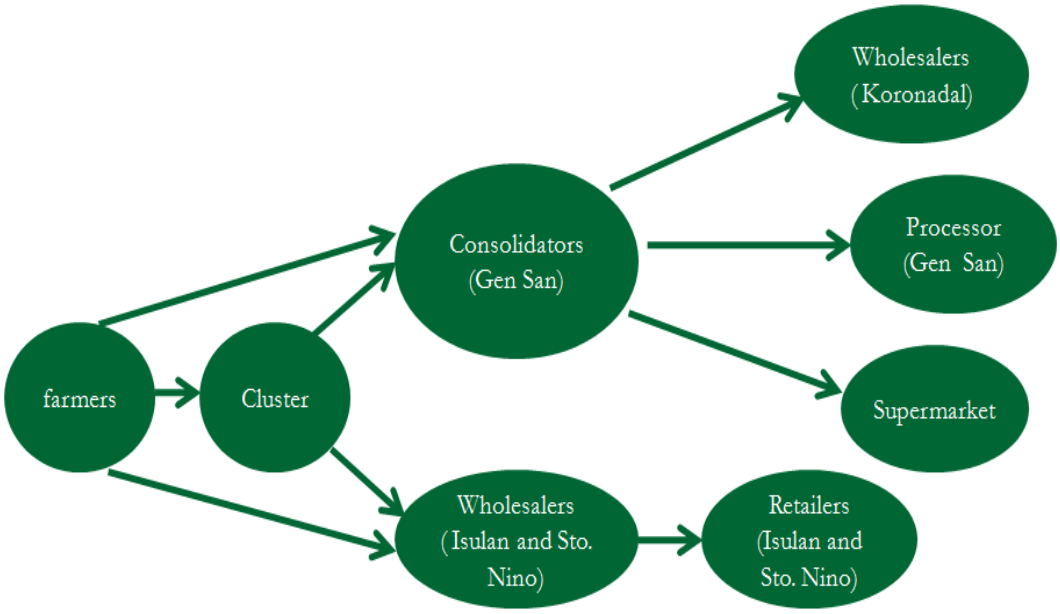


Figure 8: Chain map for Ned cluster

As these are very new clusters, farmers in the Kablon and Duengas clusters continue to sell their vegetables individually. Produce is sold to consolidators in General Santos who subsequently supply processors. Some farmers deliver to traders, whereas others sell to neighbouring farmers (bolantero) who consolidate the vegetables and subsequently sell to wholesalers in the wet market in Surallah.

Despite the potential benefits to be derived from clustering, it is important to acknowledge the coexistence of two potentially competing value chains: those servicing the traditional wet market and those servicing the focal buyer (Murray-Prior et al. 2004). At any point in time, smallholder vegetable producers have the option of supplying either one or both markets simultaneously. Where the farmers have been clustered to deliver to a focal buyer, product which fails to meet the prescribed quality standards can be redirected to the traditional market. In other instances, where the focal buyer defaults for any number of reasons, product can be redirected to the traditional market. Furthermore, given that the price in many institutional markets in fixed, whilst they remain highly volatile in the traditional market, when prices do suddenly increase, smallholder producers must be given the opportunity to participate in the market. For this reason, the CRS Eight Step Plan for Agro-enterprise Development requires smallholder farmers to commit no more than 60% of their product to the focal buyer.

7.2.2 Wastage and losses

Cluster farmers in Bukidnon reported that their field losses ranged from 1 - 18%, but their post-harvest losses ranged from just 0.1 - 3% (Table 1). Field losses were very dependent on seasonal conditions and the incidence of pests and diseases. For example, heavy rain in Bukidnon resulted in two successive crop losses.

Table 1: Losses and wastage at the farm level in Bukidnon

	Field losses		Post-harvest losses	
	Kg	%	Kg	%
Bitter gourd	12	0.8	2	0.1
Sweet pepper	1969	18.4	322	3.0

For the farmers in Impasugong, an inappropriate choice of bitter gourd variety resulted in very heavy losses as a result of fruit cracking and the susceptibility of the variety to a viral disease. In this instance, the problem was readily overcome by planting a more suitable variety.

In South Cotabato, infestation by fruit fly had a catastrophic impact on yields of sweet pepper both in the field and after sorting and grading (Table 2).

Table 2: Losses and wastage at the farm level in South Cotabato

	Field		Post-Harvest	
	Kg	%	Kg	%
Sweet pepper	11354	80.8	2772	19.4

For the clusters in Davao, a similar situation was evident (Table 3). Field losses ranged from as little as 1% to almost a complete crop loss depending upon the occurrence on heavy rain. By comparison, postharvest losses ranged from 1% to 40% depending upon the incidence of pest and disease infestation (eggplant) and physiological disorders such as cracking (for ampalaya).

Table 3: Field loss and postharvest losses among Davao clusters

	Percent							
	Sweet pepper		Bitter gourd		Squash		Eggplant	
Cluster	FL	PHL	FL	PHL	FL	PHL	FL	PHL
PAFA				2	8	1		
NABISALUM					20	4	20	12
SASVEFA			11	9			11	8
SFAQ			6	5	6		12	5
MIFA			6	6	71		78	39
	Percent							
	Chayote		Pechay		Tomato		Baguio bean	
	FL	PHL	FL	PHL	FL	PHL	FL	PHL
PAFA			20	2	4	6	0	0
NABISALUM	14	9	7	1	4	2	3	1
SASVEFA								
SFAQ								
MIFA								

where FL is field loss and PHL is postharvest loss

7.2.3 Farm gate prices and profit

For the Davao clusters, a comparison of the prices paid by different buyers for the same type of vegetables clearly demonstrated that the focal buyers generally paid a better price (Table 4).

These price comparisons were made by recording the prices offered by each buyer on the same day for a comparable quality product. Prices were calculated net farm gate after the subtraction of transport costs. However, price comparisons could not be made for all products as the three different types of buyer (traders, wholesalers and retailers) do not always purchase all the vegetables offered for sale. Where it was possible to make direct comparisons, institutional buyers were found to pay higher prices for both tomatoes and sweet pepper (Figure 9).

Table 4: Fresh vegetable prices by type of buyer (PHP/kg)

	Sweet pepper		Tomato	
	Traditional	Focal buyer	Traditional	Focal buyer
Volume sold (kg)	320	530	1,650	750
Farm price (PhP/kg)	71.25	87.50	12.00	40.00
Total production cost	17.24	22.12	1.77	5.83
Seeds	1.05	1.35	0.12	0.40
Fertilizer	4.33	5.56	0.29	0.95
Pesticide	6.77	8.69	0.30	1.00
Materials	0.82	1.06	0.27	0.88
Labour	4.26	5.46	0.79	2.60
Revenue less production cost (per kg)	54.01	65.38	10.23	34.17
Marketing Cost	0.11	0.12	0.32	1.06
Transport	1.27	1.37	0.40	1.32
Cluster Fee	3.56	4.38	0.60	2.00
Profit /kg	49.07	59.52	8.91	29.79

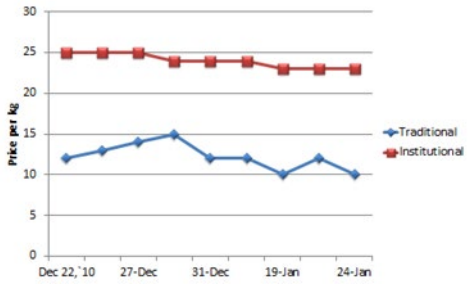
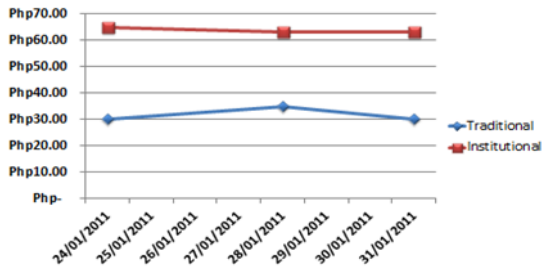
Tomatoes	Sweet pepper
	

Figure 9: Price differences between the institutional and traditional market

To ascertain the price margins along the chain, a sample of cluster farmers and their buyers were interviewed. For the Malamba Integrated Farmers Association (MIFA), five cluster members and four focal buyers were interviewed. At the time the interview was conducted, the MIFA cluster members were selling individually to their neighbours and local wholesalers/retailers in Calinan, Davao City.

For the MIFA cluster farmers, the calculation of profits is complicated by the knowledge that this is an area cluster rather than a product cluster: that is, the farmers grow a multiple number of vegetable crops (Table 5).

Farmers received an average price of PhP 9.00 per kg, which after deducting costs resulted in a profit of PhP 6.33 per kg. However, few farmers accounted for their own labour as part of the expenses incurred in producing and marketing fresh produce. Excluding labour, input expenses for fertilisers and pesticides accounted for 92.5% of the on-farm expenses.

Table 5: Costs and returns for MIFA cluster farmers (Davao)

PhP per kg	Farmers					Mean
	1	2	3	4	5	
Selling price	16.83	4.50	8.67	10.00	5.00	9.00
Inputs	0.39	0.47	0.09	9.00	2.40	2.47
Labour	0.03	0.00	0.00	0.00	0.00	0.01
Marketing	0.02	0.08	0.00	0.20	0.67	0.19
Total expenses	0.44	0.55	0.09	9.20	3.07	2.67
Profit	16.39	3.95	8.68	0.80	1.93	6.33

The major operating cost for the focal buyers was purchasing the smallholder farmers produce (75%) (Table 6). Like the farmers, most of the focal buyers did not account for the costs of their own labour as part of their expenses. With an average selling price of PhP 8.25 per kg, it was evident that most buyers were failing to recover their costs. In the Philippines, where vegetable prices are highly volatile as a result of dramatic shifts in the volume of product available for sale, between the time that a buyer purchases the fresh vegetables from farmers and when that product is available for sale in the wholesale market, prices may have changed. Furthermore, few buyers have knowledge about how much product is being grown where and when it will be available for harvest.

Table 6: Costs and returns for the MIFA buyers (Davao)

PhP per kg	Buyers				Mean
	1	2	3	4	
Selling price	17.00	6.00	5.00	5.00	8.25
Buying price	15.00	4.00	4.00	4.00	6.75
Labour	0.00	0.00	0.58	0.20	0.01
Inputs	0.00	0.00	0.02	0.03	0.20
Transport	0.00	0.00	0.50	0.00	0.13
MOOE	2.50	1.56	0.18	1.85	1.52
Wastage	1.46	0.00	0.00	0.20	0.42
Total expenses	18.96	5.56	5.28	6.28	9.02
Profit	-1.96	0.44	-0.28	-1.28	-0.77

A similar situation was evident for the farmers who belonged to the Nagkahiusang Bisaya ug Lumad sa Pamuhatan (NABISALUM) cluster (Table 7).

Table 7: Costs and returns for NABISALUM cluster farmers (Davao)

PhP per kg	Farmers					Mean
	1	2	3	4	5	
Price	7.50	5.00	12.00	5.50	22.50	10.25
Inputs	0.52	4.70	3.56	0.01	0.45	1.85
Labour	0.04	0.00	0.36	0.00	0.00	0.08
Marketing	0.01	0.40	0.05	0.00	0.14	0.12
Total expenses	0.57	5.10	3.97	0.01	0.59	2.05
Profit/ kg	6.93	-0.10	8.03	5.49	21.91	8.45

At the time of the interview, the cluster farmers in NABISALUM were selling individually to their buyers. The mean selling price was PhP 10.25 per kg, which after deducting costs left a profit of PhP 8.45 per kg. Input expenses accounted for 90.2% of expenses.

For the buyers, the cost of purchasing fresh vegetables was their major expense (94.2%). After deducting all expenses, the difference between the selling price to downstream buyers left an average profit of PhP 5.12 per kg (Table 8).

Table 8: Costs and returns for the NABISALUM buyers (Davao)

PhP per kg	Buyers			Mean
	1	2	3	
Selling price	86.00	53.50	8.10	49.20
Buying price	78.00	41.50	5.12	41.54
Labour	0.32	0.30	0.44	0.42
Inputs	0.00	0.00	1.25	0.35
Transport	0.12	0.27	0.20	0.20
MOOE	0.68	0.67	0.30	0.55
Wastage	2.04	0.00	1.02	1.02
Total expenses	81.16	42.74	8.33	44.08
Profit/ kg	4.84	10.76	-0.23	5.12

Between the different buyers, the variance was explained by the range of vegetables that they purchased and the different customers to whom they sold - again complicating the analysis, for most traders also purchase and distribute a range of fresh vegetable crops.

For the members of the Saloy Small Vegetable Farmers Association (SASVEFA), they had one regular buyer who was both a wholesaler and a retailer in the Bankerohan. The cluster delivered two times per week: on a Monday and Friday. Results suggest that cluster members received an average price of PhP 15.92 per kg, which after deducting expenses, generated a profit of PhP 10.18 per kg (Table 9).

Table 9: Costs and returns for SASVEFA cluster farmers (Davao)

PhP per kg	Farmers					Mean
	1	2	3	4	5	
Price	7.50	15.33	14.25	20.00	22.50	15.92
Inputs	1.23	0.74	1.55	4.79	0.84	1.83
Labour	0.00	0.00	0.15	0.00	0.52	0.13
Marketing	3.96	1.90	1.86	4.72	2.54	3.00
Cluster fee	0.26	0.84	0.87	1.00	0.91	0.78
Total expenses	5.45	3.48	4.43	10.51	4.81	5.74
Profit/ kg	2.05	11.85	9.82	9.49	17.69	10.18

For the buyer, after deducting the costs of purchasing the fresh produce (87.5%) and other marketing expenses, a profit of PhP 4.99 per kg remained (Table 10).

Table 10: Costs and returns for the SASVEFA buyer (Davao)

PhP per kg	Buyer
Selling price	15.56
Buying price	9.25
Labour	0.22
Inputs	0.15
MOOE	0.60
Wastage	0.35
Total expenses	10.57
Profit (per kg)	4.99
Gross margin	6.31

From Bukidnon, for cabbage, cauliflower and squash, there was evidence to show that institutional buyers consistently paid higher prices than the traditional buyers, although it is also evident that the difference in prices was diminishing (Figures 10, 11 and 12).

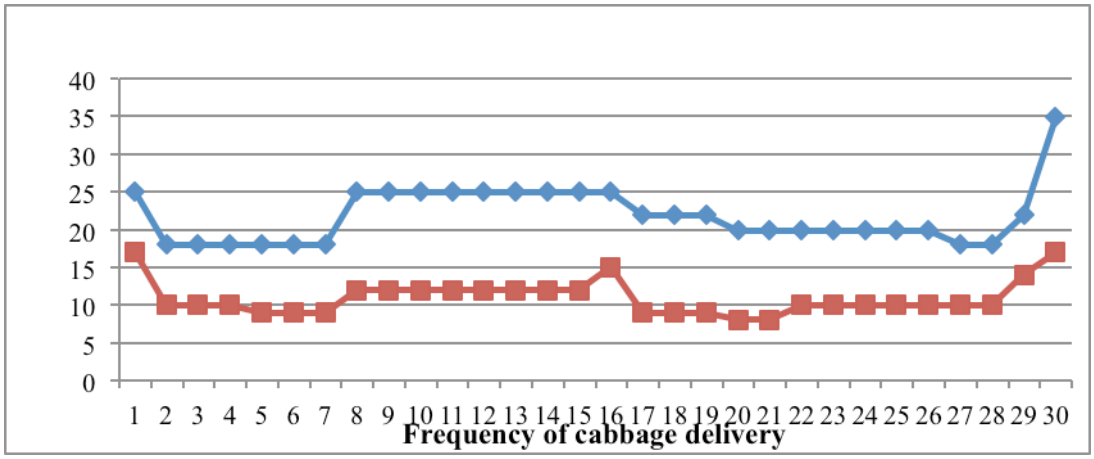


Figure 10: Price differences between the institutional market and traditional market for cabbages in Bukidnon (PhP per kg)

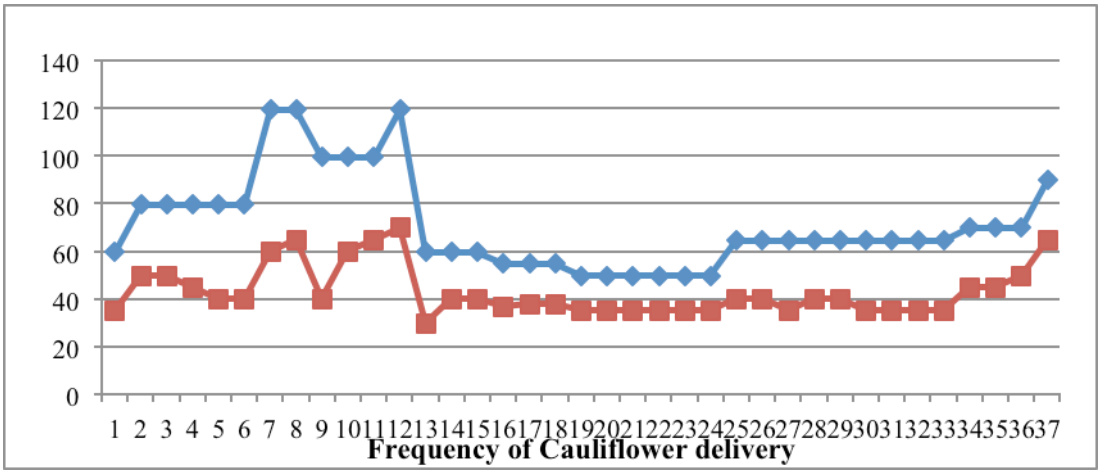


Figure 11: Price differences between the institutional market and traditional market for cauliflower in Bukidnon (PhP per kg)

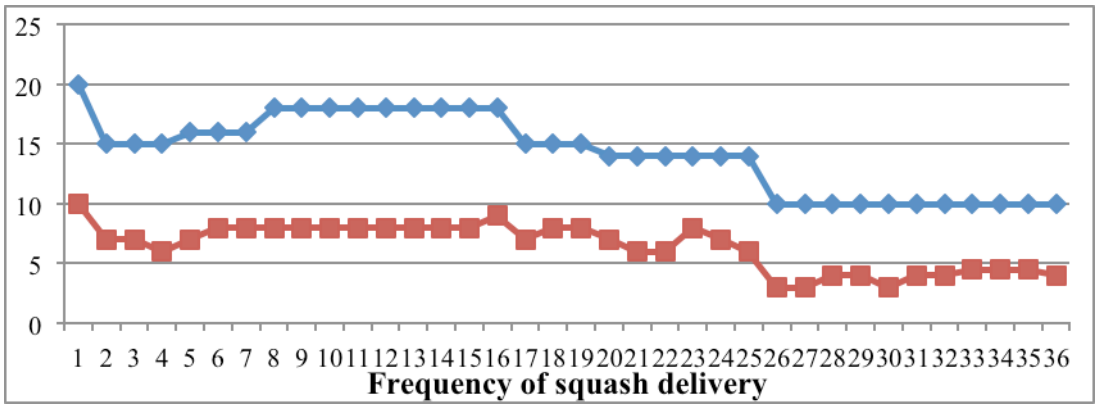


Figure 12: Price differences between the institutional market and traditional market for squash in Bukidnon (PhP per kg)

It was also apparent that when prices were highest, presumably because of supply constraints, the price difference between the institutional market and the traditional market was minimal. However, when there was an abundance of product and prices were low in the traditional market, the institutional market paid significantly higher prices.

In Bukidnon, a number of costs and returns analysis prepared at the farm level and the market intermediary level revealed that whereas the Songo cluster farmers were able to extract a net revenue or profit of PhP 14.34 per kg, the market intermediary's profit was just P 3.51 per kg (Table 11).

Table 11: Comparative returns for Songo sweet pepper farmers and their market intermediary in Bukidnon

Farm (Cluster)		Market facilitator	
Volume sold (kg)	3,913	Volume sold (kg)	600
Average farm price (PhP/kg)	32.00	Average selling price (PhP/kg)	50.00
Production cost	12.63	Total cost	46.49
Fertilizer	6.65	Storage and marketing fee	1.63
Pesticide	3.32	Labour - hauling	0.17
Materials	0.51	Electricity	0.03
Hired labour	1.58	Rent	0.17
Water	0.05	Wastage	12.50
Hired animal	0.52	Buying cost	32.00
Revenue less production cost	19.37		
Marketing	0.43	Profit (per kg)	3.51
Transportation	3.00		
Cluster fee	1.60		
Profit/ kg	14.34		

For the farmers, the most significant costs were fertiliser and pesticides, and the cost of transport. For the market facilitator, the most significant costs were the purchase price and the wastage.

For the cluster farmers in Kaatoan, a cost and returns analysis revealed that farmers gained a profit of PhP 7.10 per kg, with the market intermediary earning a profit margin of PhP 8.51 per kg (Table 12).

Table 12: Comparative returns (per kg) for Kaatoan sweet pepper farmers and their market intermediary in Bukidnon

Farm (Cluster)		Market facilitator	
Total volume sold (kg)	3,960	Total volume sold (kg)	600
Average farm price (PhP/kg)	27.00	Average selling price (PhP/kg)	50.00
Production cost	15.35	Total cost	41.49
Fertilizer	8.40	Storage and marketing fee	1.63
Pesticide	5.81	Labour - hauling	0.17
Materials	0.78	Electricity	0.03
Hired labour	0.21	Rent	0.17
Water	0.04	Wastage	12.50
Hired animal	0.13	Buying cost	27.00
Revenue less production cost	11.65		
Marketing	0.21	Profit/ kg	8.51
Transportation	3.00		
Cluster fee	1.35		
Profit/ kg	7.10		

In this instance, the market intermediary was able to extract a higher profit because they paid PhP 5.00 per kg less to purchase the sweet peppers from the farmers. However, for the farmer's, not only was their return lower because of the lower price, but their production costs were also appreciably higher than the Songco cluster, especially the costs of fertilisers and pesticides.

For the South Cotabato clusters, an analysis of the Ned supply chains provides the best comparison of the price differences between the focal institutional buyer and the traditional market (Figure 13).

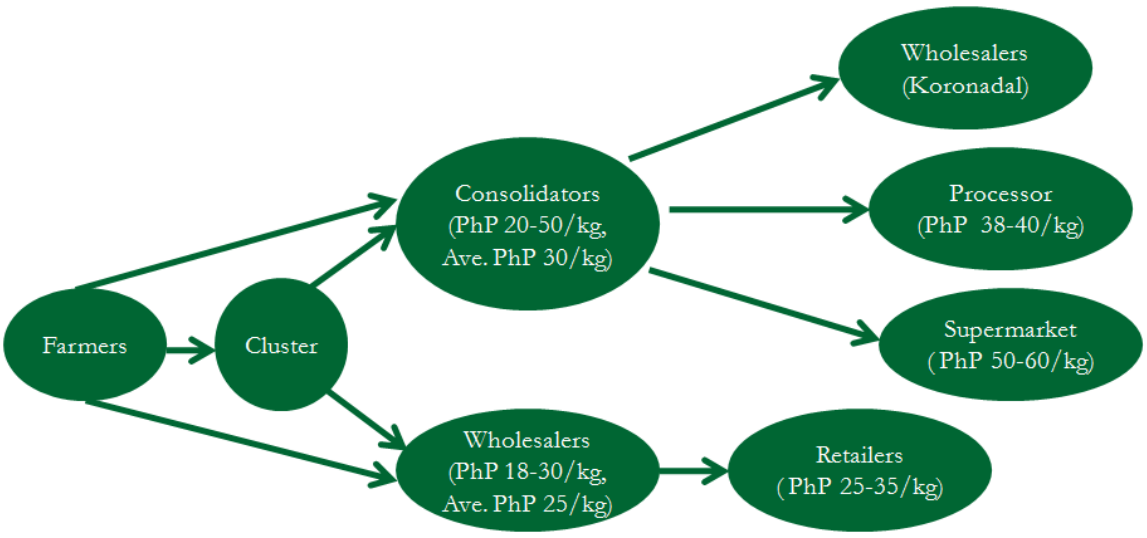


Figure 13: Prices differences in the Ned value chains

The prices received by the farmers from the consolidators varied from PhP 20 - 50 per kg. The consolidators then sold the produce to a fish processor for a fixed price of PhP 38 per kg for the off-size fruit (sweet pepper) and PhP 40 per kg for the desired sized fruit. The consolidators also supplied a concessionaire in a local supermarket with fruit at prices ranging from PhP 50 - 60 per kg.

For those farmers who chose to sell to the traditional market, the prices offered by the wholesalers ranged between PhP 18 - 30 per kg. The wholesalers on-sold the fruit to retailers who sold the fruit at prices ranging from Php 25 - 35 per kg.

At the farm level, the Ned cluster members were able to extract a profit of some PhP 14.86 per kg (Table 13).

Table 13: Profits for Ned sweet pepper cluster members

	Farmers					
	1	2	3	4	5	6
Kg	15	40	160	46	59	160
Price PHP	20.00	20.00	31.00	20.00	30.00	20.00
Production cost (kg)	0.51	0.46	2.07	0.98	0.12	0.61
Marketing cost (kg)	5.53	6.18	5.53	5.53	3.75	6.18
Labour (kg)	2.06	3.75	0.89	3.24	2.50	2.70
Profit per kg	11.86	9.61	22.51	10.26	23.63	10.51

	Farmers			Mean
	7	8	9	
Kg	80	480	27	118.55
Price	40.00	20.00	20.00	24.56
Production cost (kg)	0.93	1.48	0.94	0.91
Marketing cost (kg)	6.18	6.18	6.18	5.96
Labour (kg)	2.83	1.50	6.00	2.83
Profit per kg	30.06	10.84	6.88	14.86

7.2.4 Price setting arrangements

For those clusters dealing with buyers in the traditional market, the terms of trade were primarily cash on delivery. However, in some instances, where the buyer was a regular customer, credit could be extended to the buyer for 1-2 days, whereupon payment would be made on the next occasion that fresh produce was purchased.

Extending credit proved to be problematic for several of the clusters. For the Ned cluster in South Cotabato, one of the consolidators with whom they were trading offered post-dated cheques. When these cheques bounced the farmers were unable to meet their loan obligations to ICTUS.

For the farmers in the Songco and Kaatoan cluster in Bukidnon, in order to repay their loans to the BCB, an initial agreement was made whereby the consolidator (Normin) would deduct a pre-determined amount from the proceeds of the sale before remitting the balance to the farmers. However, as this reduced the cash price, the majority of farmers chose to circumvent the repayment mechanism. Inevitably, when farmers failed to repay the loan, BCB was forced to engage with the farmers directly through the cluster.

For some of the Davao clusters selling to one of the supermarkets, the price that the customer was willing to pay and the volume that they required was sent to the cluster as an SMS several days before collection. The cluster could then choose to accept or to reject the offer. Problems were experienced both by the supermarket and by the cluster farmers. For the supermarket, the cluster members often failed to indicate whether they could fulfil the customer's orders. Where the cluster was short, the quality of the produce offered for sale often fell below the agreed minimum standard.

Even although the price had already been agreed, the cluster members often haggled over the price, significantly increasing the amount of time required for the transaction to be concluded. For the farmers, having consolidated sufficient product to meet the customers need, the customer only selected the better quality produce. In this particular instance, these disagreements over price and the quality of the product offered for sale ultimately resulted in the dissolution of the relationship.

Another supermarket which was transacting directly with the clusters expected to be able to procure their produce at a lower price. Considerable discussion was necessary to convince them that such was not possible, because the activities performed by the traders to consolidate, sort and transport the produce would still need to be undertaken by the cluster farmers and as the volumes were small, no economies of scale could be achieved in the short run. Furthermore, as the product was "natural" - produced with minimal chemicals and inorganic fertilisers – the yields were lower and thus the breakeven prices were higher. For the supermarket, transacting directly with the clusters enabled them to source a safer, better quality product that had been subject to less handling. In this instance, prices were fixed for a week, based on the prevailing prices in the Bankerohan. However, the supermarket also had a policy whereby unsold product was returned to the supplier. For the clusters, since they do not deliver every day, it was impossible to comply with these terms. Fortuitously, the supermarket agreed to waive this requirement, for with leadership from their Board, it was their objective to source safe, sustainable fresh vegetables from local growers.

For the Ned cluster in South Cotabato, even although there was an agreement in place with the consolidator to supply a predetermined quantity of sweet pepper at a pre-agreed price, if the supply of one or more of the other products required by the fish canning plant were constrained (carrots and potatoes), the quantity of sweet pepper demanded would also decline (joint demand). That then left the cluster with a problem of how to dispose of the surplus product.

From their inception, each of the clusters has endeavoured to come to some arrangement as to how much members were willing to pay the marketing coordinator to facilitate the sale of their produce. The marketing coordinator must not only liaise with the intended customer to identify the desired volumes and to agree on a price, but to then coordinate delivery among the contributing farmers and in some instances, to arrange transport, to accompany the produce to the buyer, to collect the funds and to then distribute the funds to the farmers on their return. On average, the marketing coordinator was paid around 5% of the net proceeds of the sale.

The cluster members also had to collectively decide what proportion of their income they will contribute to a revolving cluster fund. Effectively, this was an informal line of credit which cluster members were able to access to borrow the funds to purchase inputs, to meet unforseen household expenses, or to meet the expenses associated with the formal incorporation and registration of the cluster. Where for example seeds and or fertilisers had been provided by government, the project or some other NGO, there was an expectation that farmers would repay the costs of these inputs into some collective fund, thereby enabling the cluster to become more sustainable.

7.2.5 Relationships with market intermediaries

For the cluster farmers, their relationship with their focal buyer was explored using a school-boy grading system where 75% was low and 100% was high.

For the three cluster groups in Davao, a high element of trust was evident in their exchange transactions with the focal buyer. The focal buyer was considered to be honest, trustworthy and to act in a way that considered the farmers best interest. The focal buyer generally provided correct information and could be relied upon to keep their promises (Table 14).

Table 14: School-boy grades for the relationship between cluster farmers and their focal buyers in Davao

	NABISALUM	PAFA	SASFEVA
Confidence	89.0	80.0	75.0
Correct information	94.8	85.0	80.0
Trustworthiness	92.0	85.0	90.0
Consider best interests	90.4	85.4	90.0
Honest	85.4	85.6	100.0
Keeps promises	87.5	94.0	90.0
Better offer	96.4	87.0	90.0
Power	94.4	88.0	100.0
Control of information	87.0	83.0	75.0
Freedom to adhere	91.4	91.0	90.0
Dependency	85.0	89.0	80.0
Provision of training	89.0	81.5	75.0
Open to suggestions	89.8	83.0	100.0
Frequency of information	78.8	88.8	75.0
Fairness of treatment	97.0	91.0	75.0
Quick to handle complaints	90.0	89.0	80.0
Provides adequate rewards	79.0	87.4	80.0
Expectations met	96.2	79.4	100.0

where 75 is low and 100 is high

The focal buyer was generally perceived to make the best offer relative to the alternatives. However, not unexpectedly and more so when prices were low, the farmers did not always believe that they had been adequately rewarded.

It was of significant interest to note that the focal buyer did not possess all the power, nor did they control all the information. Cluster farmers were able to make informed decisions about which market intermediaries they chose to transact with. In this respect, while the focal buyer was quick to handle complaints, information was seldom forthcoming unless the farmers asked for it. Furthermore, the focal buyer was unable to offer any training.

For the Bukidnon clusters, it was immediately evident that the relationship between the Impasugong (bitter gourd) cluster farmers and their focal buyer was stronger and more positive than that observed for the combined Songco and Kaatoan (Paglambu) clusters (Table 15).

The Paglambu cluster members reported that they were having difficulties with their sweet pepper buyer. The major problem related to the inconsistent application of quality specifications with a commensurate impact on price and the volume purchased. For this reason, the focal buyer was not perceived to have made the best offer nor had they appropriately rewarded the farmers.

Fortuitously, the Paglambu cluster members had not been forced to comply with the focal buyers requests. As the clusters were free to choose an alternative buyer, they were not subject to the use of coercive market power or any attempt by their focal buyer to attempt to withhold market information.

For the Kilapagan cluster members, their trust and satisfaction in their focal buyer was extraordinarily high. This should come as no surprise, for the cluster was relatively young. Having secured higher than anticipated prices from the sale of squash, their expectations had been exceeded. With only limited marketing experience, cluster members perceived that they were dependent upon their focal buyer and were willing to do whatever their focal buyer demanded.

Table 15: School-boy grades for the relationship between cluster farmers and their focal buyers in Bukidnon

	Impasugong	Paglambu	Kilapagan
Confidence	84.2	79.0	90.0
Correct information	85.0	78.2	92.5
Trustworthiness	84.2	79.2	92.5
Consider best interests	82.5	77.3	91.0
Honest	84.2	78.8	93.5
Keeps promises	87.5	77.3	93.5
Better offer	88.3	77.3	90.0
Power	75.8	77.1	90.0
Control of information	75.8	77.0	90.0
Freedom to adhere	85.0	77.3	90.0
Dependency	84.2	79.5	90.0
Provision of training	85.0	79.0	
Open to suggestions	85.0	81.8	
Frequency of information	85.0	80.8	
Fairness of treatment	82.5	84.0	93.5
Quick to handle complaints	82.5	78.5	93.5
Provides adequate rewards	82.5	77.3	90.0
Expectations met	80.0	77.5	93.5

where 75% is low and 100% is high

For the Kilapagan cluster farmers, a high degree of trust was evident between the cluster members. Cluster members believed that they had been treated fairly and equitably, but having contributed 10% of their gross returns to the cluster fund and an additional 5% to the marketing facilitator, several cluster members felt that they had not been adequately rewarded. Not unexpectedly, membership of the cluster provided access to technical and marketing information and capacity building (Table 16).

Table 16: School-boy grades for the relationship between cluster farmers and their cluster in Bukidnon

	Impasugong	Paglambu	Kilapagan
Confidence	83.0	86.0	96.0
Correct information	81.0	86.0	92.0
Trustworthiness	83.0	86.0	98.0
Consider best interests	83.0	87.5	92.0
Honest	83.0	87.0	98.0
Keeps promises	83.0	86.5	98.0
Better offer	85.0	87.0	92.0
Power	83.0	87.0	92.0
Control of information		87.5	92.0
Freedom to adhere	83.0	87.5	92.0
Dependency	83.0	86.0	92.0
Provision of training	86.0	86.0	97.0
Open to suggestions	86.0	87.0	97.0
Frequency of information	86.0	86.0	97.0
Fairness of treatment	86.0	88.0	89.0
Quick to handle complaints	86.0	87.0	87.0
Provides adequate rewards	86.0	84.0	82.0
Expectations met	86.0	86.5	83.0

where 75% is low and 100% is high

In comparison to the Kilapagan cluster, both the Impasugong and Paglambu clusters had been established under Landcare and could thus be considered mature. A high degree of trust was evident between the cluster members, suggesting that they could rely upon each other to fulfil their obligations. Cluster members believed that they had been treated fairly and equitably. The clusters were quick to handle complaints and to ensure that cluster members were adequately informed. However, cluster members had to comply with the quality standards established by the cluster and the various rules that governed their behaviour including the need to (i) commit no less than 60% of their product to the cluster; (ii) pay 10% of net proceeds to a cluster levy; and (iii) pay 5% of net proceeds to the marketing facilitator.

In South Cotabato, cluster farmers preferred to transact with their focal institutional buyer rather than to transact with wholesalers in the traditional market (Table 17).

Table 17: School-boy grades for the relationship between cluster farmers and their focal buyers in South Cotabato

	Institutional buyer	Traditional buyer
Confidence	86.0	79.0
Correct information	85.0	79.0
Trustworthiness	87.0	77.0
Consider best interests	89.0	76.0
Honest	88.0	77.0
Keeps promises	88.0	79.0
Better offer	89.0	76.0
Power	91.0	76.0
Control of information	86.0	78.0
Freedom to adhere	70.0	81.0
Dependency	85.0	77.0
Provision of training	77.0	76.0
Open to suggestions	81.0	80.0
Frequency of information	78.0	
Fairness of treatment	89.0	83.0
Quick to handle complaints	88.0	83.0
Provides adequate rewards	83.0	78.0
Expectations met	86.0	78.0

where 75% is low and 100% is high

The price that the consolidator paid was generally higher than that paid by wholesalers and payment was more prompt. Wholesalers would often agree on a price but then attempt to renegotiate the price after purchase. Whereas the consolidator provided clear guidelines as to the quality of the product required and generally purchased all of the fruit offered for sale, the wholesalers would only purchase some sizes.

Farmers believed that because they were Landcare members, the consolidators gave them a higher price. As farmers were not financially obligated to either consolidators or wholesalers, they were free to choose between alternative buyers. Consequently, neither buyer was able to exercise any coercive market power. Both consolidators and wholesalers had on occasion offered advice to the farmers on what to grow and how to grade and pack the fresh produce offered for sale. Market information on the other hand was less forthcoming, which farmers suggesting that the receipt of such information was infrequent.

7.3 To improve the capacity of smallholder vegetable farmers to better fulfil the needs of traditional and institutional buyers

7.3.1 Quality constraints

Quality, when combined with the ability to deliver a predetermined volume of product, is a necessary prerequisite in order to gain access to institutional buyers who subsequently resell the product with or without processing. For this reason, smallholder farmers acting independently are unlikely to be able to produce either sufficient product or the range of product that the buyer requires. To improve this situation, the most significant intervention that can be made is to encourage and facilitate the formation of collaborative marketing groups or clusters. However, the formation of these clusters cannot be imposed upon the farmers by external parties. They must evolve from within the communities themselves and they must be market driven. Furthermore, they must be adequately supported. Support relates not only to the provision of technical information and credit, but more to the long-term process of capacity building. Through this process, farmer's learning is directed towards finding cost effective resolutions to their problems which are embedded within an appropriate agro-ecological context.

In facilitating the process of rural market development, farmers must address a number of impediments. In the Philippines these constraints are numerous and multifaceted and include such variables as: the small farm size; the non-availability of high quality seed; the high cost of inputs; limited access to credit; poor cultural practices; insect and disease infestation; limited knowledge of proper post-harvest handling methods; limited access to technical information; and limited access to market information (Lantican 2000; Manalili 2000; Panganiban 1976).

Arising from this four-year study of vegetable supply chains in the Southern Philippines, the quality impediments identified fall into six groups, which to some extent, are all inter-related.

In the external environmental, extreme weather events, where it is either too wet or too dry, will have an adverse effect on plant growth, impacting on both productivity and the resultant quality of the harvest. Variations in the weather also impact upon the incidence and the severity of pest and disease infestation. The extent to which farmers are able to control these outbreaks is somewhat dependent upon their ability to access knowledge and working capital.

Indirectly, the lack of knowledge and capital may contribute to production constraints. The lack of good quality seed has been identified as a major constraint, especially for potato production in the Philippines (Batt 2003). While several attempts have been made to promote and establish a formal seed certification system in the Philippines, the limiting constraint appears to be the high rate of seed degeneration, for by the time any improved seed reaches the farmers', it is already contaminated with numerous tuber-borne diseases (Schmiediche 1995). Some of the reasons for the high rate of seed degeneration include the lack of appropriate crop rotations, the high incidence of pests and diseases, seed storage constraints and the lack of capital (Batt 2003).

Over the duration of this project, vegetable farmers in Bukidnon found that the variety of ampalaya that they were cultivating was very susceptible to a viral disease and cracking. In another instance, vegetable farmers in Davao were dismayed to find that the variety of squash they had cultivated was the wrong variety and there was very little demand for the product. For other farmers, the vegetable seeds they had been provided with by the City Agriculturists Office failed to germinate.

Often as a result of poor quality seed, farmers endeavour to increase productivity by increasing the use of inputs, especially fertilisers. Contrary to expectations, Rasco et al. (2005) found that the overuse of fertilisers was common practice among Filipino vegetable farmers.

For sweet pepper farmers in both Bukidnon and South Cotabato, inadequate crop rotations were found to have resulted in a marked increase in the incidence of soil borne disease, dramatically reducing productivity. Poor hygiene, particularly with regard to the disposal of rejected produce, may also have provided a potential source of contagion.

In Step 3 of the CRS Eight Step Plan for Agro-enterprise Development, farmers visit the wholesale market, engaging with their downstream customers for often the first time. During this process, farmers invariably encounter a number of marketing constraints, more often than not as a result of their lack of knowledge and their inability (if they continue to act independently) to provide downstream customers with a reliable supply of good quality product. Some of these initial learnings are very elementary: farmers learn that buyers pay different prices for different sizes, different stages of maturity (colour) and different quality (in terms of freshness, shape, cuts and bruises, and level of pest and disease infestation). This should come as no surprise, for the majority of smallholder farmers traditionally sell everything that they produce to traders for an all-in price, usually without any washing, grading or sorting.

However, even where the buyers may have some established quality standards, the extent to which these are enforced is largely governed by the amount of fresh produce available. Where, as a result of some extreme weather event there is a marked reduction in the quantity of produce available in the market, prices may suddenly escalate. In such situations, buyers will often pay high prices, irrespective of the quality to secure whatever produce is available. In many institutional markets where prices are negotiated in advance, highly volatile market prices have the potential to undermine the clusters' collective marketing effort. In other instances where the cluster is unable to consolidate sufficient product to meet the needs of the downstream buyer, the cluster may purposefully choose to introduce product which is outside the buyer's specifications.

Most smallholder farmers are financially constrained as a result of having insufficient collateral. Even then, the ability to access microfinance presents additional risks, since farmers opt to borrow on the basis of anticipated crop production. Highly exposed to climatic variations; a sudden decline in market prices; lower than expected yields; a lack of buyers; and losses arising from poor storage conditions, smallholder farmers often experience difficulties in meeting their obligations to repay loans. For those cluster farmers in Bukidnon who did take advantage of the opportunity to accept loans offered by the Bukidnon Cooperative Bank, after two successive crop failures, the level of indebtedness that they now face is itself a major constraint.

In other instances, the cluster may find that transacting with some institutional buyers is impossible because they are unable to issue official invoices or receipts. To comply, the cluster must be registered with the Department of Labour and Employment. Furthermore, the terms of trade under which many institutional buyers operate does not favour or support smallholder farmers. In some instances, rather than to pay cash on delivery, institutional buyers may pay from 14 days to 60 days later. For smallholder farmers who depend upon the cash to purchase household necessities, such terms are unacceptable. Furthermore, many retailers have mechanisms where after 2-3 days, any unsold product is returned to the supplier. Collectively, these impediments are described as institutional.

However, the most significant group of constraints are those which relate to the lack of infrastructure. These relate to the lack of electricity, no running water, the lack of transport and the poor condition of the roads. For some clusters, there is no public transport or in other instances, transport is too infrequent. Without adequate roads, produce must be manually hauled to the roadside or transported by motorcycle, *carabao* or horse. Invariably, this results in the produce being transported in sacks, whereupon it is exposed to considerable physical damage in transit. In Marilog, the farm to market road from Saloy has been a problem. Prior to the current dry season, constant landslides posed a major problem in transporting products.

7.3.2 Quality strategies

For smallholder farmers to access the institutional market, they must first enter into some form of collaborative marketing arrangement whereby it becomes possible to consolidate sufficient product of the desired quality to meet the downstream buyers' specifications. In one instance, with the support of this project and the Davao City Agriculturist Office, a confederation of clusters was formed to meet the needs of a major supermarket chain. This arose arose primarily because the range of vegetables required and the volume that was required greatly exceeded the capacity of any one cluster to deliver.

One of the major obstacles that smallholder farmers face in endeavouring to improve both productivity and quality is the lack of technical information. In the Philippines, just as in most other countries, increases in government expenditure for agricultural extension have failed to keep abreast with the increased cost of delivering these services. As one-on-one consultations are not cost effective, smallholder farmers have been encouraged to come together into collaborative groups.

Through the delivery of training programs conducted through third party providers such as the Department of Agriculture, local government units and the City Agriculturist Office, smallholder vegetable farmers have been able to improve productivity and quality through improved crop rotation, pest and disease recognition, integrated pest control and the judicious application of fertilisers. In Bukidnon, assistance was also received from East West Seeds who were able to identify and provide seed of a more suitable variety of ampalaya.

With almost 30 clusters participating in the project, facilitated in part through the annual supply chain symposium and the farmers forum organised by the University of the Philippines Mindanao and meetings conducted by the respective vegetable industry councils, the clusters have been encouraged to interact. As a consequence, technical exchange visits between the clusters have been facilitated with commensurate improvements in both productivity and product quality.

As a result of these technical visits between clusters, many of the clusters have elected to adopt protected cropping. Invariably, these structures have been provided as a grant from the Department of Agriculture, a local government unit or the City Agriculturist Office. In most cases, some co-funding arrangement has been necessary whereby the cluster has provided the materials for the framework (bamboo) and the labour, while the beneficiary has provided the plastic and in some instances, drip irrigation.

On average, the rain shelters have been quite modest in size and provided primarily for demonstration purposes. However, the Songco cluster, through the Department of Agriculture, was able to construct four protected cropping structures (9 x 40 m) and the Kaatoan cluster was able to secure two structures of similar dimensions. In both cases, it was possible to access these grants because the clusters were formally incorporated. While the clusters have enthusiastically embraced the opportunity to embark upon protected cropping, there are concerns about the long-term financial viability of protected cropping, for it is unlikely that the clusters will make sufficient provision to put aside the capital necessary to purchase the plastic to recover the structures.

One of the other initiatives that have been shared between the farmer groups is the increasing use of natural farming. For the majority of smallholder farmers, the adoption of high input farming systems exposes the farmers to a high element of risk. On the one hand, there is the very real risk of losing the entire crop at any stage as a result of heavy rain or persistent inclement weather. However, on the other hand, if all goes well and the supply is high, prices in the market may be so low that farmers are unable to recover the costs of production. While farmers seem willing to accept the lower yields from natural farming, the impact on quality has yet to be ascertained. Nevertheless, the adoption of such a farming system may very well provide an opportunity for smallholder vegetable farmers to enter into a new higher value market.

Food safety and quality is emerging as a key issue among the modern retailers, food processors and manufacturers. Concepcion et al. (2006) highlighted the concerns that consumers in the Philippines have about the potential presence of chemical residues. With several of the clusters pursuing natural farming, there is an opportunity with appropriate branding, to differentiate the product in the market and to potentially generate higher returns for farmers. However, such a proposition is unlikely to appeal to all markets, for unless the customer demonstrates a willingness to pay, the market will be more concerned about quality (freshness) and price. Nevertheless, the market study (Objective 1) indicates that farmers need not always pursue formal accreditation. While some are already involved, there is an emerging opportunity for the City Agriculturists Office and or the Municipal Agriculturists Office to become directly involved in the promotion of safe food and even in the development of regional identities.

In an effort to improve the quality of the fresh vegetables offered to focal buyers, many of the clusters now choose to wash, sort and grade the produce prior to packing. However, without any appropriate means of transport, selected product is still being packed into bags or sacks for hauling to the nearest roadside collection point. Here the product must be resorted to remove any damaged product and reweighed. In some instances, the product may be repacked into recyclable plastic crates to prevent any subsequent damage in transit. However, for the cluster farmers to participate in these schemes, they must first purchase a number of crates so that they can be readily exchanged at the point of delivery. Not unexpectedly, there is an element of trust involved in these transactions, for the cost of the crates is considerable and few smallholder farmers can afford to use them. Furthermore, unless the buyer is willing to collect the product or to pay a substantially higher price, there are few financial incentives to encourage their more widespread adoption. For this reason, sacks or bags remain the principal means of packing fresh produce.

With appropriate knowledge and technical support, farmers are introducing new crops in response to buyer's requests for a greater range of product. New crops have been introduced primarily in response to buyer's requests for a greater range of product. However, in other instances, new crops have been introduced because of the very high incidence of pests and diseases arising from inadequate crop rotations or adverse climatic events. However, without addressing the need for capital, farmers may be unable to take advantage of the opportunity.

One of the key benefits smallholder farmers have derived from the clustering process is the ability to access capital. Clustering provides the farmers with a more stable market, thereby providing the microfinance institutions with greater confidence in the farmer's ability to repay. As the clustering process requires the group to develop a gross margin, a planting schedule and a marketing plan, most of the information that the banks require can be readily made available. Microfinance institutions (MFI) are also becoming more involved in the preparation of business plans, marketing, agronomy and technology transfer as a way of ensuring that loans are repaid. For example, the Tinubdansa Kalamboan Foundation (TKSI) was established by the Bukidnon Cooperative Bank (BCB) to: (i) strengthen cooperatives through continuous education, gender advocacy, research-based policy making and entrepreneurship; (ii) promote and advocate resource-based financial management through savings, capital formation and financial literacy; (iii) facilitate the improvement of local products through technical assistance, micro-finance research and marketing; (iv) advocate the value of life and property through pro-poor insurance services; and (v) facilitate financial services for smallholder farmers and village entrepreneurs. However, climatic adversity and the high incidence of pests and disease can seriously reduce productivity, thereby preventing farmers from repaying their loans.

As a result of the improved social cohesion that develops among the cluster members, many of the cluster groups have embarked upon communal farming. This is a collective approach where farmers equally share the production expenses and the proceeds of the sale to repay their individual loans. One farmer might provide some of the fertiliser

required for the communal area, while others supply their labour for weeding, watering, trellising and harvesting. These communal farms provide a way for the cluster to collectively trial new crops, new varieties and where the cluster has been able to secure a greenhouse, the means by which all cluster members can benefit, rather than a single individual.

In other instances, the cluster members collectively decide what proportion of their income they will contribute to a revolving cluster fund. Effectively, this is an informal line of credit which cluster members are able to access the funds they require to purchase inputs, to meet unforseen household expenses, or to meet the expenses associated with the formal incorporation and registration of the cluster. Where for example seeds and or fertilisers have been provided by government or an NGO, there is an expectation that the farmers will repay the costs of these inputs into some collective fund, thereby enabling the cluster to become more sustainable.

7.4 To assist smallholder vegetable producers to adopt effective market linkage mechanisms via collaborative marketing arrangements and clusters

7.4.1 Market linkages

To facilitate this component of the project, the University of the Philippines Strategic Research and Management Foundation (UPSTREAM) employed three Agroenterprise Coordinators: one each in Bukidnon, Davao and South Cotabato.

In Bukidnon, the project worked with 7 clusters (Table 18).

Table 18: Cluster groups in Bukidnon

NAME OF CLUSTER	NUMBER OF MEMBERS			CROPS GROWN
	TOTAL	MALE	FEMALE	
Songco	13	12	1	sweet pepper and cabbage
Kaatoan	13	10	3	sweet pepper
Impasugong (ampalaya)	6	6	0	bitter gourd
Kilapagan Gardeners Association	13	7	6	squash, eggplant, sweet pepper
Taguican Valley Lumad and Dumagat Farmers Association	18	6	12	squash, eggplant, sweet pepper, bitter gourd
BUKIDNON	63	41	22	

The Songco and Kaatuan clusters (collectively known as Paglambu) were established by the CRS under a Landcare project and have been operating as a group for the past ten years. However, it was only in this project that they commenced to market vegetables as a cluster. Both groups sell to two consolidators in the Agora market in Cagayan de Oro, who in turn sell to a number of institutional buyers and households.

The Ampalaya cluster in Impasugong sell their product through a marketing arrangement facilitated by the Kaanib Foundation, whereby product is sold to consolidators in Cagayan de Oro and local buyers. The two Kilapagan and Taguican Valley clusters were both formed under this project. Their products are sold to local buyers in both Malabalay and Cagayan de Oro.

Over the duration of this project, the Bukidnon clusters have coordinated the production and marketing of more than 202 tonnes of fresh vegetables with a resale value in excess of PhP 5 million (Table 19).

Table 19: Volume and value of cluster sales in Bukidnon

Months	Volume (kg)	Value (PhP)
July 2009 – December 2009	15,073	376,825
January 2010 – June 2010	20,261	506,525
July 2010 – December 2010	7,395	184,875
January 2011 – June 2011	54,479	1,361,975
July 2011 – December 2011	90,467	2,261,675
January 2012 - June 2012	15,137	378,425
TOTAL	202,812	5,070,300

In Davao, UPSTREAM worked with 10 clusters (Table 20).

Table 20: Cluster groups in Davao

NAME OF CLUSTER	NUMBER OF MEMBERS			CROPS GROWN
	TOTAL	MALE	FEMALE	
Malamba Integrated Farmers Association (MIFA)	16	4	12	squash, eggplant, bitter gourd, beans
Nagkahiusang Bisaya ug Lumad sa Pamuhatan (NABISALUM)	16	14	2	tomato, squash, pechay, eggplant, beans, Malabar spinach, chayote
Pamuhatan Farmers Association (PAFA)	12	8	4	tomato, bell pepper, pechay, string beans, karlang, squash
Saloy Small Vegetable Farmers Association (SASVEFA)	17	10	7	eggplant, string beans, bitter gourd, sword pepper
Small Farmers Association of Quirogpang (SFAQ)	26	13	13	eggplant, Malabar spinach, bitter gourd, string beans, sword pepper, string beans, okra, squash, cucumber, mung beans
SASVEFA – Pag-Asa	11	5	6	ampalaya, squash, okra
SASVEFA – Lanzones	13	10	3	ampalaya, pole sitao, eggplant
Balite 1	14	5	9	squash, eggplant, sword pepper gabi
Balite 2	11	1	10	squash, eggplant, sword pepper, gabi
Maligaya Vegetable Growers Association	8	4	4	lettuce, sweet pea, sweet pepper, gabi
DAVAO	144	74	70	

To varying degrees, the ten clusters have been linked to traditional wholesale buyers in the Bankerohan. SFAQ entered into an agreement to supply one of the local retail stores. However, problems were experienced from both sides of the dyad. Growers complained that the buyer had not adhered to the quality specifications previously agreed. Furthermore, problems were experienced in coming to some consensus about the weight of the produce being sold. Conversely, the buyer complained that farmers often failed to provide sufficient product, the product was not available for collection at the agreed time and farmers seemed unwilling to accept the prices that had been previously agreed. Not unexpectedly, this relationship has been terminated.

One cluster from Maragusan withdrew from the project. Prior to their withdrawal, the field team facilitated an exit strategy workshop at which the remaining cluster members agreed that they no longer wished to operate as a cluster. The major reason was that the farmers were no longer relying upon farming as their main source of livelihood: mining is now the major form of employment in the Compostela Valley. Those who remain as farmers now earn the majority of their income from the sale of fermented plant concoctions which are used by one of the corporate organic farms in the area.

In South Cotabato, UPSTREAM worked with 12 clusters (Table 21).

Table 21: Cluster groups in South Cotabato

NAME OF CLUSTER	NUMBER OF MEMBERS			CROPS GROWN
	TOTAL	MALE	FEMALE	
Ned 1	15	13	2	sweet pepper
Ned 2	21	19	2	sweet pepper
Kablon 1, 2 & 3	25	25		cabbage, sweet pepper, carrots
Lamian	15	8	7	talong, squash & okra
Duengas 1 & 2	22	11	11	talong, ampalaya & kamatis
Assumption 1	11	7	4	ampalaya, talong & squash
Assumption 2	10	6	4	ampalaya, talong & squash
Cabuling 1	8	5	3	ampalaya, talong & squash
Cabuling 2	8	4	4	ampalaya, talong & squash
SOUTH COTABATO	135	98	37	

The Ned cluster was also initially established under Landcare. Under the Landcare project the members were primarily corn farmers but as the costs of cultivating corn increased and transport costs increased, they looked towards vegetable crops as a means of improving their household income. They primarily grew sweet pepper, which was sold through a number of consolidators to a fish canning operation and supermarkets in General Santos. Given some of the problems in selling to the fish cannery arising from the non-availability of other vegetable products, the clusters have extended their market reach to Davao using the skills learned under the CRS Eight Step Plan for Agro-enterprise Development.

Unlike the farmers in Ned, the municipality of Tupi (Kablon) is a well-established vegetable growing area. Traditionally, smallholder farmers sold their produce at the roadside to a number of traders who come to the area. As one of the major problems farmers experienced was the variability in price, a number of farmers came together to form Samahang Magsasaka ng Kablon (SAMAKA) in September 2007. Introduced to the project by the Tupi Municipal Agriculturist Office, three clusters were formed in 2009.

In Duengas, vegetable farmers in the barangay still depend on itinerant traders (bolantero) to consolidate and sell their vegetables to wholesalers in the wet market in Surallah. For their services, the bolantero receive a 20% commission derived from the gross selling price. Some farmers continue to sell directly to wholesalers in the Surallah wet market.

In Lamian, the cluster members were still not consolidating their produce: most preferred to sell their produce to the nearest wet market. Both the Cabuling and Assumption clusters in Koronadal experienced crop failure.

Despite these setbacks, cluster farmers in South Cotabato collectively produced and sold over 179 tonnes of fresh vegetables, valued at more than PhP 4.3 million (Table 22).

Table 22: Volume and value of cluster sales in South Cotabato

Period Covered	Volume (kg)	Sales (PhP)
July - Dec 2009	67,702	1,725,047
Jan - Jun 2010	13,000	331,240
July - Dec 2010	8,000	203,840
Jan - Jun 2011	30,000	764,400
July - Dec 2011	2,887	111,150
Jan - June 2012	58,078	1,182,456
TOTAL	179,667	4,318,133

7.4.2 Costs and benefits of cluster membership

To measure the impact of clustering on smallholder farmers, a quasi-experimental study was undertaken whereby cluster farms were compared before and after clustering as well as cluster farms and non-cluster farms.

The key benefits that farmers derived from clustering were economic, environmental and social. From a comparison of the production levels of farms before and after clustering, the volume of production increased for nine out of the eleven commodities (Figure 14).

Tomato production increased from 665 kg to over 4.3 tonnes; eggplant from 0.5 tonnes to almost 3.0 tonnes and chayote from 720 kg to 2.4 tonnes. However, the production of sword pepper declined as farmers shifted to other crops due to better relative profitability of other crops.

The increase in production also resulted in the increase in the output value, with the value of six commodities increasing significantly after clustering. The value of sweet pepper production increased from PhP 27,538 to PhP 39,697; eggplant from PhP 4,489 to PhP 41,259; chayote PhP 2880 to PhP 28,078; and tomato from PhP 8720 to PhP 41,686. As expected, the value of sword pepper production declined after clustering with the decrease in output (Figure 15).

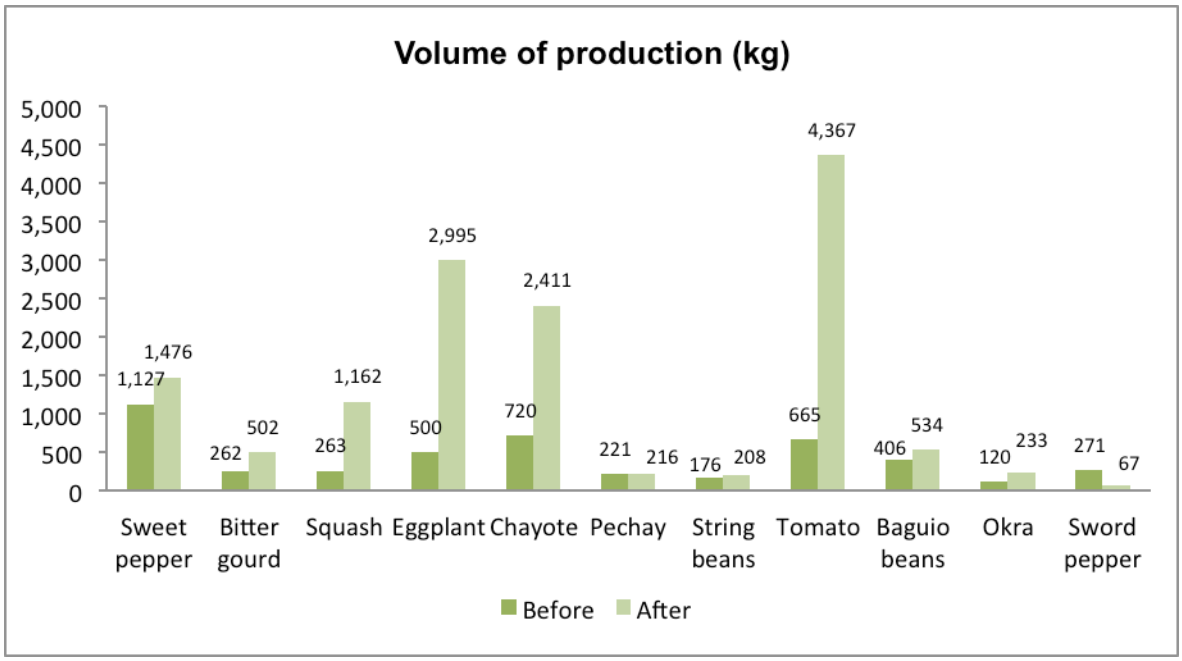


Figure 14: Volume of production before and after clustering

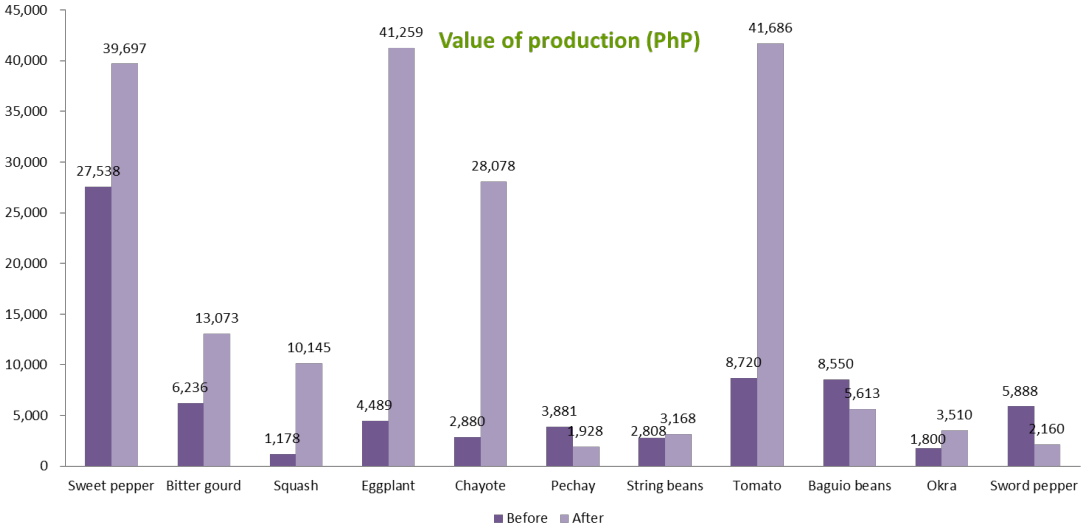


Figure 15: Value of vegetable production before and after clustering

Comparing the performance of cluster and non-cluster farms, the level of farm production was higher for cluster farmers rather than non-cluster farmers for all but one commodity. For most vegetables, there was a significant difference in the production levels between cluster farmers and non cluster farmers. Tomato production (over 4.3 tonnes) for cluster farmers was significantly higher than non-cluster farmers (1.6 tonnes)(Figure 16).

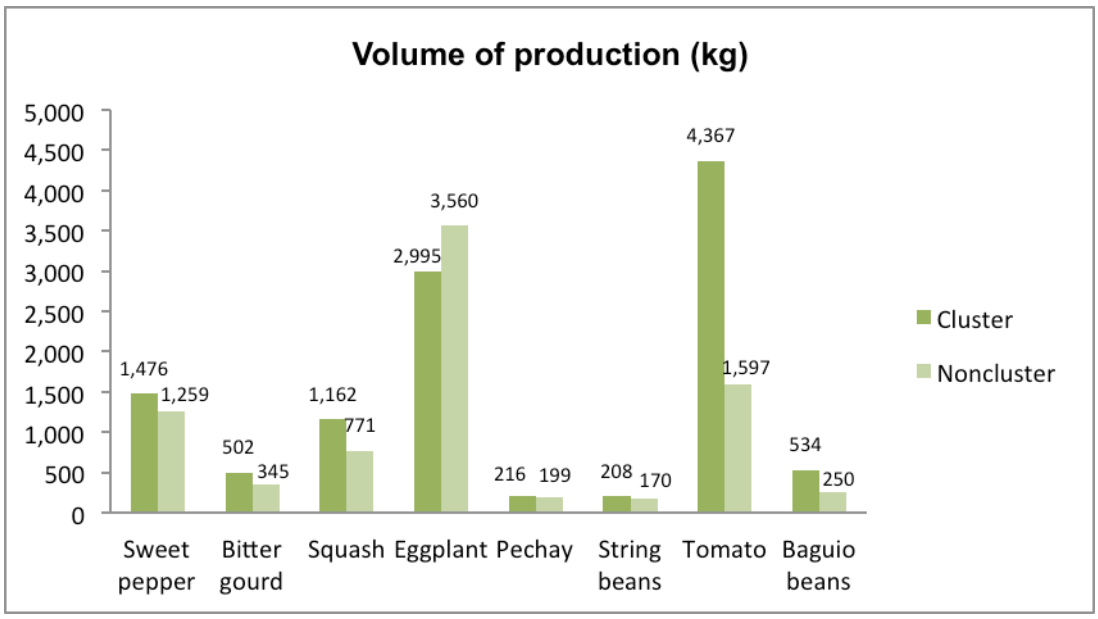


Figure 16: Vegetable production of cluster vs non-cluster farms

Not unexpectedly, after comparing the value of production between cluster farmers and non-cluster farmers, cluster farmers had a higher value of production for five out of eight commodities, For both pechay and string beans, non-cluster farmers had a higher level of production by value than cluster farmers (Figure 17).

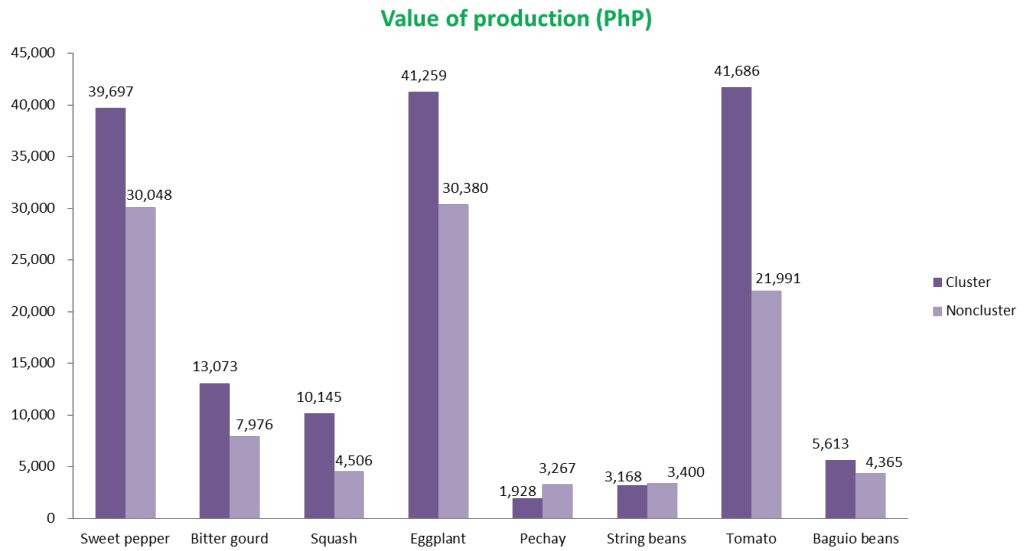


Figure 17: Value of vegetable production of cluster vs non-cluster farms

One of the benefits of clustering for smallholder farmers was their ability to access institutional markets which generally paid a higher price. On average, the prices paid by institutional buyers were PhP 10-25 per kg higher for most commodities (Figure 18).

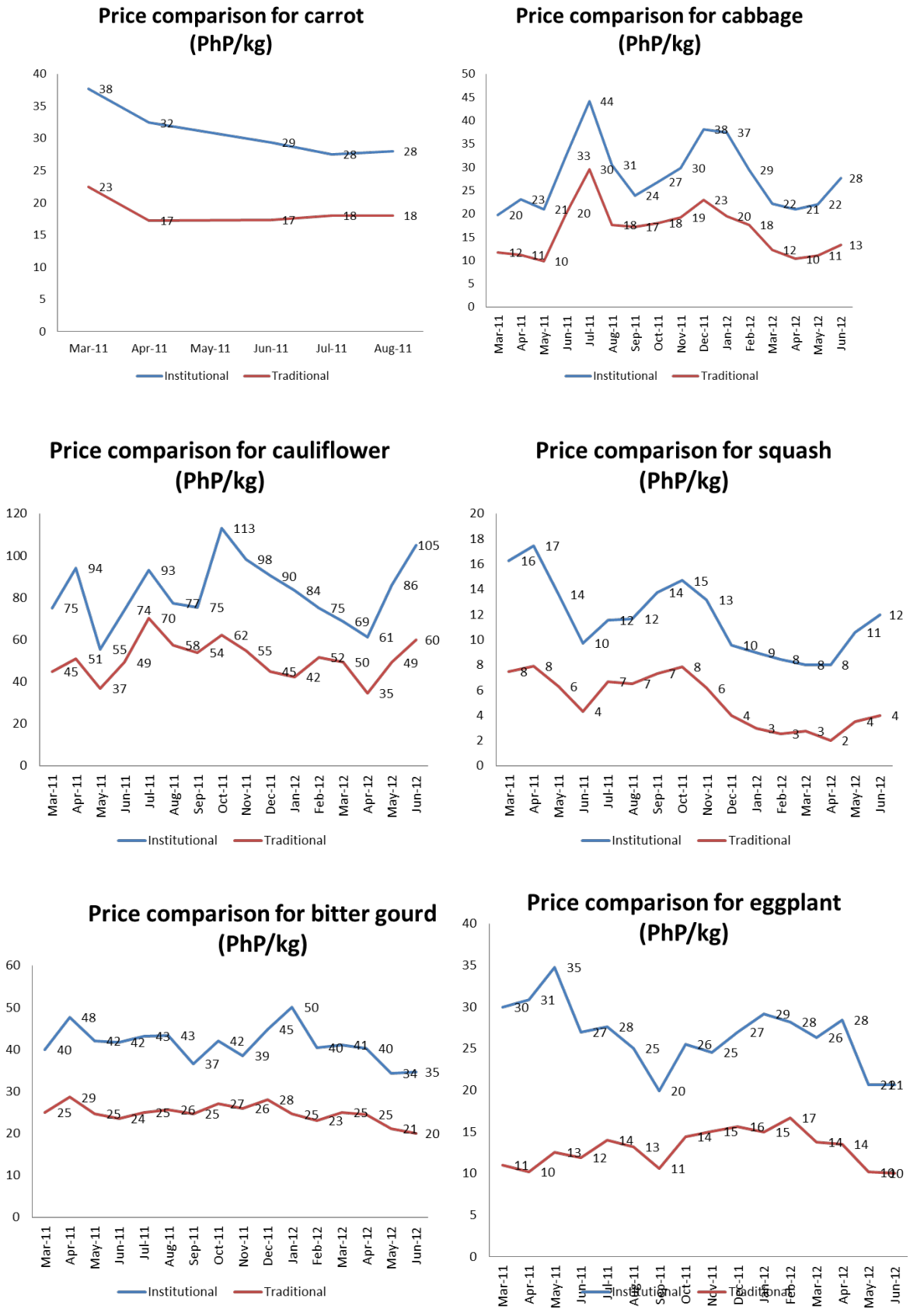


Figure 18: Price comparison for vegetables in institutional and traditional markets

On average, the net income from vegetable production increased for most vegetables after clustering. Significant increases in net income were recorded for sweet pepper, eggplant, chayote and tomato after clustering (Figure 19).

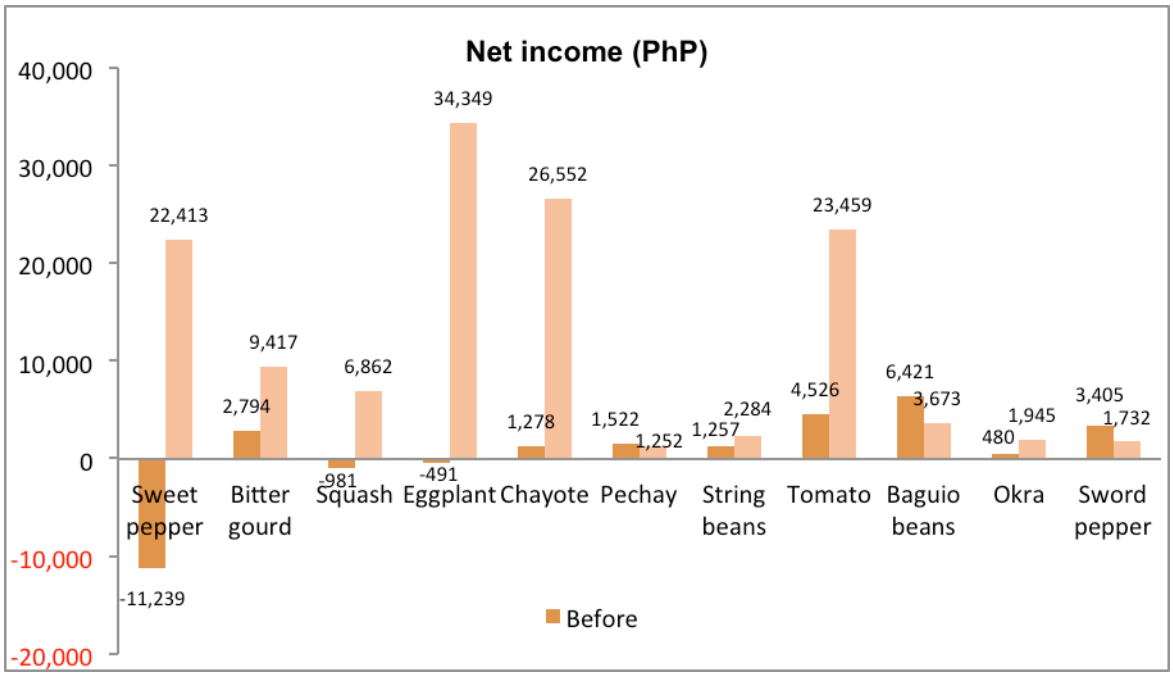


Figure 19: Net income from vegetables before & after clustering

Comparing cluster and non-cluster farms, the net income of cluster farmers for eggplant, tomato, sweet pepper and squash were significantly higher than non-cluster farms. It was only for pechay where non-cluster farms performed better than cluster farms (Figure 20).

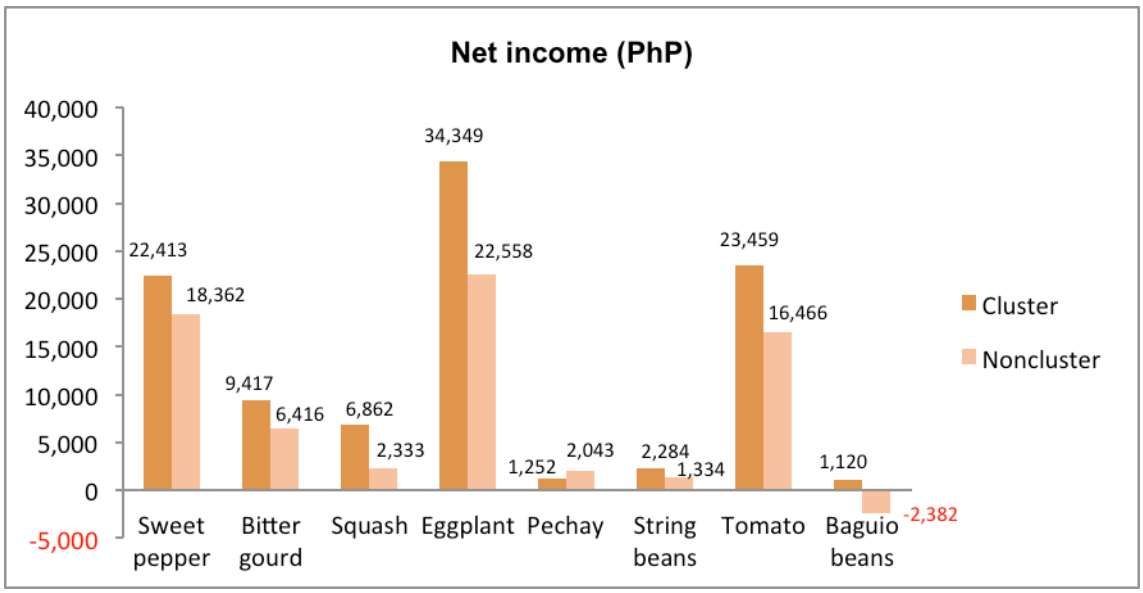


Figure 20: Net income from vegetables of cluster vs non-cluster farms

Looking at household income, the monthly income among participating cluster farmers increased by 47% from PhP 4,904 per month before the project to PhP 7,192 after the project. Furthermore, the average household income of cluster farmers was 18% higher compared to non-cluster farmers (Figure 21).

Figure 21: Farmers' household income before and after clustering and income of cluster vs non-cluster farms

For the Bukidnon clusters, having participated in the clustering process, there was unanimous agreement that clustering had not only improved the farmers' production and marketing skills, but also improved social relationships within the barangay (Table 23).

For the majority of cluster members (88%), clustering had improved access to markets, access to inputs and access to government support. However, particularly among the members of PAGLAMBU, clustering was perceived to have reduced the farmer's access to credit - no doubt as a result of the difficulties they were experiencing in repaying the loans advanced by BCB.

However, only 65% of farmers attributed any improvement in household income to clustering. While clustering provides access to technical inputs and technical information, in open fields, yields are determined primarily by seasonal weather events. In a similar manner, both production costs and prices will be influenced by adverse weather events. Prolonged heavy rain will require more pesticides and fungicides to be applied, increasing production costs. Not unexpectedly, yields will decline and quality will deteriorate. On the other hand, as supply is constrained, prices will rise. As each of these variables are controlled by external forces, clustering will have little influence. However, through the application of new knowledge, and in particular, the adoption of improved crop rotations, improved crop management and improved postharvest knowledge, clustering resulted in a significant reduction in the amount of waste product.

With an improved household income, 88% of participants reported a significant improvement in family health, with 71% indicating that more of their children were now able to attend school. At an environmental level, 94% of the Bukidnon farmers reported that they had adopted more sustainable farming practices. However, at the community level, the impact of clustering on employment was less evident.

Table 23: Benefits of clustering for the Bukidnon clusters

	Per cent		
	Increased	Decreased	No change
Understanding of markets	100		
Ability to negotiate	100		
Decision making skills	100		
Skills in horticultural production	100		
Skills in post-harvest practices	100		
Skills in pest & disease management	100		
Skills in marketing	100		
Relations with other farmers in the village	100		
Environment	94	6	
Leadership skills	88	12	
Access to markets	88	12	
Access to inputs	88	6	6
Access to farm-related government support	88	12	
Linkages with external partners	88	12	
Family health	88	12	
Skills in record-keeping	82	18	
Quality of vegetables produced	71	6	24
Number of children now going to school	71	29	
Total household income	65	12	24
Volume of vegetables produced	65	6	29
Volume of vegetables sold	65	12	24
Income from vegetable production	59	24	18
Cost of production	53	24	24
Price received for vegetables	35	24	41
Access to credit	24	71	
Production losses/ wastage	18	59	24
Number of people employed on the farm	18	47	35

For the cluster farmers in Davao, there was a unanimous agreement that clustering had improved their total household income. Not only had the income they received from vegetable production increased, but so also had the prices they received for the vegetables they had grown (Table 24).

For the majority of farmers (92%), their production and marketing skills were perceived to have improved, providing the farmers with greater access to more markets. Through clustering, the farmers now had a better understanding of the market dynamics, why prices increased or decreased, and the product specifications they had to meet to satisfy their downstream buyers' needs. A better understanding of the market enabled the farmers to develop improved linkages with downstream buyers, overcoming much of the distrust and apprehension that has been present before clustering. Moreover, cluster members felt more empowered with the skills and information acquired through trainings, workshops and seminars. They now had the capacity to make their own decisions, especially in dealing with buyers and in developing alternative markets for existing and new products.

However, among the Davao clusters, the benefits of clustering at the community level were less evident. Only 68% of farmers believed that leadership skills had improved and for 44% of farmers, relationships within the barangay had deteriorated. For 64% of farmers, linkages were external partners had declined rather than improved.

Table 24: Benefits of clustering for the Davao clusters

Aspect	Per cent		
	Increased	Decreased	No change
Total household income	100		
Income from vegetable production	96		4
Price received for vegetables	96		4
Skills in horticultural production	92		8
Skills in post-harvest practices	92		8
Skills in pest & disease management	92		8
Skills in marketing	92		8
Access to markets	92		8
Decision making skills	88		12
Volume of vegetables sold	84	4	12
Ability to negotiate	84		16
Volume of vegetables produced	80	12	8
Understanding of markets	80		20
Skills in record-keeping	80		20
Leadership skills	68		32
Access to farm-related government support	64		36
Family health	64		36
Environment	64		36
Quality of vegetables produced	56	4	40
Relations with other farmers in the village	56		44
Cost of production	48	28	24
Access to inputs	36		64
Linkages with external partners	36		64
Number of people employed on the farm	32	8	60
Access to credit	24		76
Production losses/ wastage	12	48	40

In South Cotabato, the improvements in production and marketing skills were much more modest (Table 25). For many farmers, clustering was perceived to have resulted in less access to inputs, credit and government support. Prices were perceived to have fallen and in contrast to both the Bukidnon and Davao clusters, production losses and wastage had actually increased.

However, few of these issues could be attributed to clustering itself, for the farmers in South Cotabato had experienced a major infestation by fruit fly, which not only reduced the amount of produce they had available for sale, but also appreciably increased the costs of production to control the outbreak.

For the Ned farmers, as one of the more mature groups, many of the cluster members had already seen their household income increase by as much as 200% as a result of shifting from corn to sweet pepper. This has enabled them to purchase a number of production inputs (back pack sprayers), household items and in one instance, to finish building a new house. Five cluster members had purchased mobile phones and were now using SMS to communicate and negotiate with buyers regarding the price prior to delivery. Six members of the cluster said that the income they had received from sweet peppers production had facilitated the education of their children, while several others were able to pay-off long standing debts with relatives.

Cluster members had also provided training to other farmers who were not currently part of a cluster. Fourteen NLCA members and 17 non-members had asked for technical assistance from the cluster members.

Table 25: Benefits of clustering for the South Cotabato clusters

Aspect	Per cent		
	Increased	Decreased	No change
Skills in horticultural production	88		12
Relations with other farmers in the village	88		12
Skills in post harvest practices	84		16
Skills in pest and disease management	84		16
Cost of production	72	4	24
Understanding of markets	72		28
Linkages with external partners	72		28
Volume of vegetables sold	68		32
Skills in marketing	68		32
Total household income	64	4	32
Volume of vegetables produced	64	4	32
Skills in record-keeping	64		36
Income from vegetable production	60		40
Ability to negotiate	60		40
Decision making skills	60		40
Access to markets	60		40
Production losses/wastage	52	20	28
Quality of vegetable produced	44	16	40
Number of people employed in the farm	44		56
Leadership skills	40		60
Number of children going to school	40		60
Price received for vegetable	36	4	60
Access to credit	36		64
Environment	36		64
Access to farm related government support	32		68
Access to inputs	28		72
Family health	28		72

7.4.3 Pilot testing

Over the duration of this project, various improvements were made to the CRS Eight Step Plan for Agro-enterprise Development to address problem issues including: input finance arrangements; risks associated with production failure and pest and disease problems; maintaining relationships with buyers; and building group resilience and independence so that donor agencies have an exit strategy.

Smallholder farmers in the Philippines have limited or no access to the formal lending sector. Consequently, they have to rely on informal moneylenders including local traders, landlords, commodity wholesalers and other village money lenders. These loans are often available at rates well above those charged by commercial finance institutions. When smallholder farmers collaboratively market their produce through a cluster, they often by-pass the traditional marketing system, thereby excluding farmers from accessing these loans, for generally under such arrangements, lenders advance the loan in the expectation that they will be able to purchase the product at prices that are advantageous to them.

For the financial institutions, lending to farmers who are connected to an integrated supply chain is more feasible. Indeed, some of the cluster groups in Bukidnon and South Cotabato were able to access finance through microfinance institutions, because they were organised into clusters and had prepared production, marketing and financial plans.

However, when production failed as a result of adverse weather or disease problems, the farmers who had formal loans faced additional burdens, which affected both the viability of the cluster and its marketing arrangements.

In Bukidnon, when the crops failed due to disease and weather related problems, the members of the PAGLAMBU and Impasugong clusters found themselves unable to meet their contractual obligations. In the first instance, as the microfinance institution had advanced the loans to farmers because they were members of a cluster, some farmers withdrew from the cluster so that they would not have to repay their loans or those incurred by other cluster members. However, although the advancement of the loans was facilitated through cluster membership, each member remained individually responsible for the repayment of their own loan. Having sought initially to avoid the problem, after approaching the bank, the cluster was able to negotiate a mutually acceptable agreement to facilitate the repayment of the loans at no additional interest. Furthermore, having secured six protected cropping structures from the Department of Agriculture Region 10, again as a result of being a registered farmer group, the remaining members of the PAGLAMBU cluster embarked upon a communal farming enterprise. Collectively, the cluster members shared the costs of production and the profits generated from the sale of the produce, which they individually used to repay their loans.

Vegetable farming in the Philippines is a risky business, with production quantity and quality varying widely due to climatic conditions and pest and disease outbreaks. Dry periods can lead to poor crop emergence and growth, while wet periods can dramatically affect seedling survival, flowering, product quality and yield. An extended period of wet weather also intensifies fungal diseases, which increase the costs of control and reduce yields. These variations in yield and quality not only reduce farmers' returns, but also make it more difficult for clusters to be consistent suppliers to institutional markets.

One strategy adopted by farmers to manage the risk is to adopt lower input production systems that require lower financial outlays and reduce yield variability. Many clusters are in relatively remote areas, so imported fertilisers and pesticides are expensive and difficult to obtain. Accordingly, farmers have been investigating the use of natural farming systems. These systems use local inputs, such as organic fertilisers, composts and homemade pesticides.

Another strategy is for the cluster to commit only a portion of their expected yield to the focal buyer, particularly if this is an institutional buyer who wants consistent supply. The figure that is widely used is 60%, although this varies depending on the crop and the number of buyers. This strategy is advantageous in that it enables farmers to sell their surplus product to other buyers, particularly where prices increase unexpectedly. It may also enable farmers to maintain their relationships with traditional buyers who provide other services such as credit and it spreads the risk if their focal buyer defaults or refuses to accept product.

Smallholder vegetable farmers in the Philippines have little understanding of modern institutional markets because they have traditionally only dealt with local traders and rarely visit the wet markets where the majority of their product is sold. The clustering process tries to overcome this deficiency by training farmers to conduct their own market chain studies, including talking to buyers at different stages of the chain and in different markets. Farmers are also taught negotiating skills, which improves their confidence and ability to negotiate prices, volume and quality with buyers. Nevertheless, some time is required for smallholder farmers to develop their knowledge of market operations and requirements and this can create misunderstandings and conflict between the cluster and their focal buyers. Conversely, institutional buyers often have a limited understanding of the constraints smallholder farmers' face, which exacerbates misunderstandings and conflicts. This has led to numerous breakdowns in the relationship between buyers and clusters.

Under the existing CRS Eight Step Plan for Agro-enterprise Development, these issues are overcome through conducting a number of test marketing activities (Step 6). After each shipment, the cluster members meet to evaluate the performance of the trial product deliveries in terms of the quantity and quality of the product that was delivered versus that which was planned. Sometimes the problem is with the farmers, but sometimes the problem can be with the buyer. This is a learning process for both parties and it appears that in some cases it requires a couple of years, including periods when the cluster sold to other buyers. In other situations, a sustainable relationship may not be possible due to a whole range of reasons. The donor agency that is facilitating this process needs to have patience and to act as an honest broker by not taking sides and attempting to identify the root causes of the problem. It is important for farmers to be involved in discussions and negotiations with the institutional buyers as this is the only way in which understanding and mutual respect can be gained and sustained.

Enhancements to the CRS clustering process

Cooperatives and cooperative marketing arrangements have a poor record in the Philippines. Many of these cooperatives were set up for political reasons such as agricultural development, pacification of revolutionary activities and distribution of subsidised inputs. Most failed when government removed institutional supports. While outside support can enhance the chances of success, ~~but~~ it can also encourage dependency, which means that the cluster is not sustainable once external support has been withdrawn. If cluster marketing is to be a successful, processes are required that develop resilience in the groups so that they can survive with minimal external support. This also implies building in an exit strategy as a component of the clustering approach. To achieve this, amendments were suggested to the CRS Eight Step Plan for Agro-enterprise Development. The revised framework incorporates three discrete phases: Phase 1 - Establishment; Phase 2 - Building Resilience; and Phase 3 – Implementing an Exit Strategy (Figure 22).

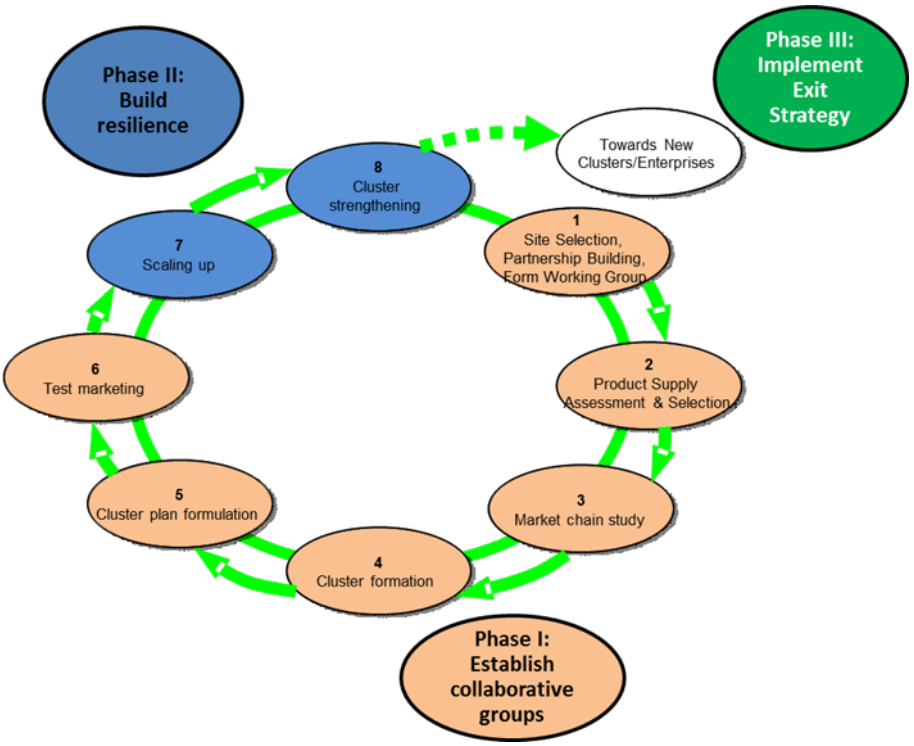


Figure 22: Revised Agro-enterprise Development Process

Phase 1: Establishment

This phase largely follows the first six steps of the current CRS model with only minor modifications. In Step 1 (site selection, partnership building and formation of the working group), greater emphasis must be placed on investigating input financing arrangements. Some knowledge on savings, loans and finance alternatives must be provided.

In Step 2 (product supply assessment and product selection), potential crops and products should be considered rather than decided on.

The choice of products is then re-evaluated in Step 3 (market chain study) which must be expanded to include an investigation of the input requirements for particular crops, potential sources and costs of those inputs, and the ability of farmers to finance those inputs.

In Step 4 (cluster formation), the normal process of orientation on marketing basics and clustering needs to be broadened to include production issues, sources of inputs and the financial implications of particular crops.

Step 5 (cluster plan formulation) would then proceed essentially as normal. Under this step, the emerging cluster develops; (i) a production plan, which involves the development of a planting and harvesting schedule for the products to be produced by the cluster; (ii) a marketing plan, which identifies who the product will be sold to, quality specifications (if any), when and how the product will be consolidated, washing, grading, sorting and packaging (as applicable) and the anticipated price; (iii) a financial plan, which in reality is an extended gross margin for each crop, which outlines the anticipated returns (expected yields x expected prices), the anticipated costs of seed, fertilisers, chemicals and transport, and the anticipated collection of cluster funds (10%) and the cluster marketing fee (5%). The final plan is a management plan, which identifies the cluster office bearers (president, vice president, secretary, treasurer and marketing coordinator) and establishes the cluster rules and sanctions (such as the volume of product cluster members must commit to the cluster, the cluster levy, the cluster marketing fee and regular attendance at cluster meetings).

The test marketing step (Step 6) involves a number of stages including: (i) assessing cluster commitment and capability of members; (ii) identifying information and training needs; (iii) conducting training to overcome deficiencies; (iv) evaluating buyers and establishing a good working relationship; and (v) refining the agro-enterprise plans.

Generally, this first phase lasts for 1 to 2 years.

Phase 2: Building resilience

The focus of Phase 2 is essentially cluster strengthening and capacity building – an expansion of Step 8 (cluster strengthening). The clusters often go through periods of decline in activity, often caused by production or marketing problems. Problems like these have the potential to cause the cluster to collapse, but if the donor agency is able to support the cluster in developing strategies to deal with these issues, the clusters develop confidence in their own abilities and are in a better position to deal with future issues with minimal assistance.

During this ‘repair and maintenance’ phase, support from donor agencies may be necessary in this process of developing resilience. Clusters have overcome production problems by establishing links with seed companies to procure better quality seed and changed production practices with the assistance of local government advisers. Clusters have overcome marketing problems by utilising the skills they have learnt to identify new buyers and markets and to subsequently diversify their markets.

In this phase, the role of the donor agency is to provide assistance when the cluster is struggling, to help enhance their networks and to build capacity. The donor agency is encouraged to provide less direct assistance and to encourage the group to draw upon

their own resources. Some of the activities in this phase include: (i) revisiting the product supply assessment step and reassessing the need for agronomic support; (ii) undertaking additional market chain studies with a view to re-assessing the clusters performance in meeting the customers' needs, identifying additional markets and selecting focal market chains. By necessity, this activity requires existing customers to be directly involved in the process; (iii) reviewing cluster membership and structure; (iv) identifying information, training and support needs, which are addressed through training and capacity building activities; (v) revising cluster and operational plans; and (vi) conducting and reviewing marketing activities.

Phase 3: Implementing an exit strategy

The sustainability of cluster marketing arrangements is problematic as most groups fail when the donor agency withdraws. Some of the reasons for this arise from the donor agencies desire to take control of the marketing thereby replacing traditional market intermediaries; donor agencies providing too much advice and providing too many material inputs, thereby creating a 'handout mentality'; competition between donor agencies; donor agencies focussing on 'favourite' groups who have a 'reputation' for success; and the failure of donor agencies to develop exit strategies.

The CRS clustering process already includes a number of criteria for assessing cluster maturity, so the focus here is on how to incorporate these into a process to implement an exit strategy. The specific steps in this phase could include: (i) a workshop to assess maturity for graduation or exit of the donor agency; (ii) training in business planning and the development of business plans; (iii) strengthening links with support institutions; (iv) the formulation of business plans for the cluster's after-life; (v) a participatory evaluation of the clustering process, the farmers involvement in the process and the donor agency's performance; and (iv) organising a graduation activity.

From the graduation workshops conducted in Bukidnon, the PAGLAMBU cluster members reported that clustering had enabled them to: (i) implement a unified and synchronized planting schedule; (ii) establish additional market linkages with a supermarket chain in Davao and a restaurant in Boracay; (iii) delegate a marketing officer to negotiate with potential buyers; (iv) implement collaborative marketing; and (v) to improve discipline within the cluster members.

Going forward, in the absence of any support from the C4 project, the cluster members from both Kaatoan and Songco indicated how it was their desire to continue to plant and collectively market as a cluster (Table 26).

For the Impasugong bitter gourd cluster, the results were not dissimilar. Through cluster formation, the farmers had been able to: (i) sustain market outlets; (ii) negotiate with a number of buyers; (iii) gain the confidence necessary to negotiate with potential buyers; (iv) learned to communicate with buyers using SMS; (v) to be recognized by many; (vi) to become a unified, strengthened cluster; (vii) to purchase vehicles and farm animals; and (viii) to be able to repossess personal and household items that they had offered as collateral (pawn) in order to secure finance.

It was also their intention to continue to follow the planting schedules they had developed and to continue to sell their produce to existing customers (Table 27).

For the smallholder farmers in Kilapagan, cluster marketing had brought them together, which enabled them to market their products collectively. The cluster was now providing financial support to the members and the members themselves had developed empathy towards each other and proactively offered advice and suggestions. The adoption of communal farming had enabled the cluster to generate additional income which was then made available to the cluster members to borrow. Through the cluster, farmers had gained knowledge of soil acidity and the kind of fertilizers they should be using on their farms.

Table 26: Future cluster plans for PAGLAMBU

Future plans	Who will accomplish	Key person(s) or agency to tap	Time frame
Kaatoan cluster			
Installment of irrigation	Cluster to make a request to Barangay Council; to ask for assistance through village's leader	Barangay Council; Kasilak Foundation, LGU Lantapan (Mayor's office and MAO)	May – June 2012
Implementation of planting schedule	All cluster members	LGU Lantapan for seed assistance	May – June 2012
To continue cluster meeting	Cluster officials and all members	Cluster officials and all members	Starting May 2012
Songco Cluster			
To continue cluster meeting	Cluster officials and all members	Cluster officials and all members	Starting May 2012
Implementation of planting schedule under rain shelters	All cluster members and officials	All cluster members and officials	Starting May 2012
Sustaining market linkages and tapping additional outlet	Arnold Cesar	Arnold Cesar or Recto Canda (Songco cluster officials)	May – December 2012

Table 27: Future plans for the Impasugong cluster

Future plans	Who will accomplish	Key person(s) or agency to tap	Time frame
Sustaining cluster activities through regular meetings planning planting schedule	All cluster members	Partner institutions (Kaanib, CRS, UP Mindanao and LGU)	Every month
Sustaining product deliveries to various market outlets, especially with newly established buyers.	All cluster members; cluster leader monitors	KKP (*Kristohanong Katilingban sa Pagpakabana*), a religion-based organization	Weekly

In the absence of C4, the cluster member anticipated that they would seek seed support and technical assistance from the DA Malaybalay and endeavour to gain one or more protected cropping structures from the City Agriculturists Office in Malaybalay.

For the Taguican vegetable farmers, cluster marketing had enabled them to identify a buyer and thus it was much easier to dispose of the products they had cultivated. Through cluster marketing, the costs of marketing had decreased because there was no need for the farmers to individually go to market. The farmers had gained valuable agronomic information, in particular, the more appropriate use and application of fertilisers. As a group, the farmers were more disciplined and actively participated in cluster activities.

To enable the group to continue, the cluster leaders indicated that it was their intention to seek technical and financial support from the Malaybalay City Agriculturists Office. However, the Marketing Officer would retain responsibility for marketing the group's product and of negotiating prices with potential buyers.

In Davao, the Saloy Small Vegetable Farmers Association (SASVEFA) indicated how clustering had enabled them to know what vegetables to grow, where to sell, who to sell to and how to negotiate with buyers. Perhaps most importantly, farmers had learned to appreciate the linkage between vegetable production and marketing, and the need to actively engage with the buyers and other cluster members. Through cluster marketing, the farmers were united, more willing to help each other and had learned to respect each other. Over the duration of the project, farmers had learned how to grow vegetables, what fertilizers to apply and many had adopted more sustainable farming practices, including the use of contour planting.

At a community level, the cluster encouraged those farmers who were not members to sell through the cluster and for those who were not yet members, to join a cluster or to establish a new cluster.

At the conclusion of the C4 project, the SASVEFA cluster indicated that it was their desire to continue to strengthen the cluster through facilitating farm visits to other clusters, establishing a communal farm and encouraging the adoption of sustainable (natural) farming practices to reduce input costs and to better fulfil the needs of downstream customers (Table 28).

Table 28: Future plans for the SASVEFA clusters

Plans	**Person in-charge**	**Target date**
Farm visit	Members	
Communal farm	Members	3rd quarter of 2012
Use of organic fertilizer	Members, NGO	
Encourage cluster members	Members	
Pursue alternative livelihoods (pig & poultry) for additional income	Members, DA, NGO, barangay council	Next year (2013)
Buy our cluster vehicle	Members, NGO, UP Mindanao, barangay council	
Farm to market road	Barangay council, LGU, NGO	
DOLE registration	Members, UP Mindanao	This year (2012)

However, the cluster members also recognised the importance of pursuing alternative livelihood strategies, including the raising of both pigs and chickens, rather than to rely entirely on vegetable production. To overcome the major constraint – transport – the cluster intended to buy its own vehicle and to approach the barangay council and local government to improve the farm to market roads. To take advantage of the grant opportunities presented by the Department of Agriculture, the cluster leaders intend to formally register the cluster with the Department of Labour and Employment.

For the Malamba Vegetable Farmers Association, clustering had provided the members with a regular weekly income. It was not only easier for the cluster members to sell the vegetables they had grown, but they could now contact their buyers at any time as many had purchased mobile phones. Through some of the training delivered, farmers could now calculate their anticipated farm income and farm expenses.

Even in the absence of the C4 project, the farmers anticipated that they would continue to trade as a cluster, to hold regular monthly meetings and maintain their production schedule.

For the Pamuhatan Farmers Association (PAFA), through clustering, the area planted in vegetables had expanded dramatically. The farmers had learned many new production and marketing skills and were now transacting with one of the major supermarket chains in Davao. In part, through their transactions with the supermarket, the farmers were more aware of the need to take care of the environment. They were planting fruit trees and practising contour farming to avoid soil erosion.

For the Small Farmers Association of Quirogpang, the most valuable experience they had gained from clustering was their participation in the various training programs and seminars organised by UPMin. Through clustering the farmers had gained the confidence to talk to other farmers and to negotiate with buyers. As SFAQ was an active member of the confederation of clusters, the group had established relationships with other clusters which, in part, had enabled them to learn from the collective experience of others.

SFAQ anticipated that in the absence of any further support from this project, they would maintain their relationship with the other clusters through reciprocal farm visits and to engage with local government and other NGOs for support (Table 29).

Table 29: Future plans for SFAQ

Plans	**Person in-charge**	**Target date**
Farm visits	Cluster members and officers	Every 2nd Tuesday of the month
Establish connection with government and NGOs	Cluster officers	This year
Build a nursery	Cluster members and officers	This year
Continue communal farm	Cluster members and officers	This year

For the smallholder farmers in the Ned cluster in South Cotabato, as this project drew to its conclusion, the cluster members indicated that: (i) they would use the skills they had learned in other agro-enterprise activities; (ii) they would adopt more sustainable farming practices including vermicomposting; (iii) they would seek to reduce postharvest losses and to improve product handling; (iv) they would formally register the Ned Landcare Farmers Association with DOLE; and (v) they would maintain regular cluster meetings.

For the Kablon clusters, while the members also intended to continue to operate as a cluster, collectively, they intended to approach the Governor's Office for technical support and financial assistance.

In a similar manner, as the majority of the other clusters in South Cotabato were relatively young, cluster members indicated that in the absence of C4, they would endeavour to seek technical and financial support from local government institutions including the Municipal Agriculturists Office and other NGOs.

8 Impacts

8.1 Scientific impacts – now and in 5 years

Under HORT/2007/066, this component of the project has developed a revised three phase process to improve the CRS Eight Step Plan for Agro-enterprise Development. Part of the proposed exit strategy was tested and evaluated during the three graduation ceremonies held in Bukidnon, Davao and South Cotabato. This improvement will enable future development projects to more readily replicate, to extend their reach, and for the more mature clusters to become more independent.

8.2 Capacity impacts – now and in 5 years

As an integral part of the clustering process, several capacity building activities were introduced. Between 2008 and 2011, 69 capacity building activities were conducted which involved 14 different training modules. The total number of participants was 1242, which was made up of 755 males and 487 females. The interventions included:

- market visits by farmers
- cluster enterprise planning
- buyer interviews and negotiation
- record keeping and Minute taking
- economics and accounting
- leadership
- financial management
- post-harvest training
- the transfer of technology (protected cropping structures)
- pest and disease training
- soil testing

While the market visits allowed farmers to meet downstream buyers and to see, first hand, what the market required, the technical training enabled the participating farmers to improve their production and post-harvest practices to better meet the requirements of their downstream buyers.

The benefits of these training programs were demonstrated on numerous occasions over the duration of the project. When the focal buyer in South Cotabato defaulted, the farmers in the Ned cluster utilised the skills they had learned to identify alternative buyers in the Davao wholesale market. For the farmers in the Kablon cluster, they decided to use the skills they had learned to establish their own vegetable trading operation in the wholesale market. Even though the cluster farmers in Maragusan decided that they no longer wished to trade as a vegetable cluster, the skills they had learned in making fermented plant concoctions and vermicompost were utilised in the manufacture of organic inputs for one of the large multinational corporations operating in the Compostela Valley.

Facilitated in part by the establishment of the UPMin Farmers and Partners Learning Alliance, the desire to reduce risk arising primarily from some unfavourable experiences resulting from the procurement of loans from formal lending institutions, and the desire by one of the major supermarkets to procure fresh vegetables that had been produced in a more sustainable manner, the majority of the clusters were adopting low input natural farming techniques. These systems rely heavily upon the use of companion planting, crop rotations and the extensive use of locally produced organic fertilisers and insect repellents. Others were constructing rain shelters as a way of protecting vegetable crops

from the adverse effects of heavy rain. In both instances, these interventions were driven by the farmers themselves and their desire to improve their wellbeing.

To the maximum extent possible, the project endeavoured to minimise the use of 'handouts'. However, in those instances where the cluster had no financial resources, seed of the desired vegetables were donated in the expectation that the cost of these would be repaid at harvest through the establishment of a cluster fund. To ensure cluster farmers were appropriately paid for their contributions and to check that the cluster had not been cheated by the downstream buyer, each of the clusters was provided with a set of weighing scales. In those instances where the institutional buyer required the product to be packed in plastic crates, as few cluster could afford to purchase these, the project not only provided crates, but in conjunction with the institutional buyer, established a crate exchange program so that the produce did not need to be repacked.

Project staff training

Mr Rodel Real participated in the workshop on Economic Analysis Techniques for Evaluation of Farm Fruit and Vegetable Systems, held at VSU, Leyte in November 2012.

Mr Recarde Bacus, the Agro-Enterprise Coordinator in Davao, was awarded a six week training scholarship under the Crawford Fund to work with farmer groups in Western Australia to improve the marketing of fresh vegetables.

8.3 Community impacts – now and in 5 years

Under HORT/2007/066, this component of the project has been instrumental in:

- identifying the different needs of institutional buyers in Metro Manila, Mindanao and the Visayas. This is the most recent and the most comprehensive analysis of the inter-island trade for fresh vegetables in the Philippines and as such, is likely to be utilised as a reference for many subsequent studies. The results have already been utilised by the clusters in their transactions with institutional buyers in both Mindanao and the Visayas, and by Normin Corporation;
- describing and evaluating the performance of traditional and institutional vegetable value chains in Mindanao. From the outset, this project recognised and promoted the need for smallholder farmers to transact with two parallel and complementary value chains. While the project sought to link smallholder farmers to higher value institutional markets, institutional buyers; (i) do not always pay the highest price; (ii) they take only what they need of the farmers product; (iii) their quality standards vary with the amount of product available; (iv) they do not always pay on time; and (v) they seldom provide finance or technical assistance. These findings have been subsequently incorporated into the clustering process where; (i) the cluster transacts with more than one focal buyer; (ii) cluster members are generally required to commit only 60% of their product to the cluster; and (iii) the cluster is encouraged to establish relationships with external parties including the Department of Agriculture, Municipal and City Agriculturist Offices and micro-finance providers;
- improving the capacity of smallholder vegetable farmers to better fulfil the needs of traditional and institutional buyers. For smallholder farmers to supply a sufficient quantity of good quality product cost effectively to both traditional and institutional buyers, the establishment of a collaborative marketing group (cluster) is essential. Clustering also facilitates access to a range of service providers including seed companies, the Department of Agriculture, Municipal and City Agriculturist Offices and micro-finance providers. Indirectly, through a participatory action learning process, which is fundamental to building capacity within the clusters, to improve the quality of the product and to reduce risk, cluster farmers have adopted low input natural farming systems and protected cropping. The clusters participating in this project have also provided an avenue for testing the adoption of the soil testing kits

developed by Component One and the field multiplication of improved seed potatoes produced under Component Three;

- the clustering process itself has been adopted by the Davao City Agriculturists Office to facilitate the process of technology transfer and the adoption of Good Agricultural Practices (GAP) to reduce the high incidence of chemical residues on fresh vegetables and environmental contamination arising from the inappropriate application of chemicals in intensive vegetable production;

8.3.1 Economic impacts

The results of this study have shown that significant benefits arise from clustering for both individual farmers and the community. For smallholder farmers, the adoption of the CRS Eight Step Plan for Agro-enterprise Development has facilitated farmers understanding of the market, thus enabling them to identify and to better meet institutional buyers' needs. Through the formation of cluster marketing groups, smallholder farmers have been able to access market information and to gain some bargaining power with institutional buyers. Clustering has enabled smallholder farmers to achieve higher market prices, increase productivity and improve their profitability. Their collective bargaining power has also enabled them to more cost effectively access farm inputs such as seeds, fertilizers and credit, technologies and external assistance.

A better understanding of what the market wants has enabled the farmers to make more informed decisions about what crops to grow. Farmers' awareness of market specifications and standards has improved and collectively, farmers have embarked upon more value adding activities such as sorting, grading and packaging. Improved production and post-harvest practices have resulted in less farm and post-harvest losses and less reject product, thus improving returns to smallholders.

The benefits of clustering, however, go beyond the farm gate. Farmers are not the only beneficiaries of the clustering process. Clustering also delivers benefits to the buyers, for they can communicate directly with the farmers, rather than through market intermediaries. Product consolidation is easier and they can obtain quality and quantity assurances.

The increase in vegetables production has also expanded the demand for labour in the community. In the absence of mechanisation, especially among smallholder farmers in the highland regions, vegetable crops are very labour intensive at every stage of production. Many cluster farmers have found it necessary to employ additional labour to assist with cultivation, planting, weeding, harvesting and sorting. Furthermore, to get the product to market, the demand for transport services has increased, providing greater employment opportunities for a multitude of different logistics providers.

Benefits to partner agencies were also noted. Partnering with organized groups like clusters made it more cost effective for development organisations to deliver programs and services to farmers.

The evidence from this project demonstrates that the economic impact of clustering is generally positive. However, success cannot be attributed to a single variable, but rather to a multitude of factors inherent in the Eight Step clustering process. The collective power of the farmer's, coupled with their improved production and marketing capacity, has enabled cluster farmers to achieve higher market prices for their produce and to ultimately improve their household income.

To establish the benefit-cost of clustering, four scenarios were modelled: (i) farm level impacts only with no adoption (Model 1); (ii) inclusion of spillover effects with no adoption (Model 2); (iii) farm level impacts with adoption (Model 3); and (iv) inclusion of spillover effects with adoption (Model 4).

The total investment in this project exceeded AUD 1 million, with ACIAR contributing $799,990); Curtin University ($193,035) and project partners ($31,522). For Model 1, with an assumed planning period of 20 years and a discount rate of 8% per annum, the net present value (NPV) of the project was PhP 35.3 million. The internal rate of return (IRR) was 48.6% and the benefit cost ratio (BCR) was 2.47 (Table 30).

Table 30: Economic analysis of the project

Indicator	No adoption		With Adoption	
	Farm-Level	Spillover	Farm-Level	Spillover
Net Present Value (PhP million)	35.3	46.5	106.9	134.1
Internal Rate of Return (%)	48.6	77.8	81.5	144.3
Benefit Cost Ratio	2.47	2.93	3.80	4.51

In the second scenario (Model 2), it was assumed that there would be some spillover effects to the community brought about by additional employment opportunities as a result of the increased production. As farmers increased their production, they were able to hire other people to help with either farm activities or in marketing. When spillover effects were taken into consideration, the NPV increased to PhP 46.5 million; the IRR increased to 77.8% and the BCR increased to 2.93.

Most technologies or interventions, particularly those that are successful, are likely to be adopted. In Models 3 and 4, it was assumed that there would be a modest 5% adoption rate. For Model 3, the NPV under this scenario was PhP 106.9 million, the IRR was 81.5% and the BCR is 3.8. For Model 4, the NPV was PhP 134.1 million; the IRR was 144.3% and the BCR was 4.51.

8.3.2 Social impacts

At both an individual and community level, the social impacts of clustering saw a marked improvement in social capital, improved relationships among farmers and more confident empowered farmers.

At the cluster graduation ceremony held in Bukidnon, cluster members spoke at length about the unity of purpose that now pervaded their communities. With a greater empathy and better understanding among individual members, cluster members were able to work together to collaboratively market their produce with confidence. Cluster members were more disciplined and faithfully maintained the agreed planting schedule. Consistent quality and reliable delivery had enabled the clusters to maintain their relationships with existing customers and in some instances to develop new markets. Collectively, several of the clusters had embarked upon communal farming as a means of enabling resources such as protected cropping structures to be shared equitably among the cluster members and of reducing the risks associated with the production of new crops. For at least one group, although the cluster had yet to register with DOLE, they had been recognised by local government as a legitimate group and as such were now able to access production inputs (seeds) and technical advice.

For the clusters farmers in Davao, the clustering process had resulted in similar social impacts. With more respect and greater confidence in one another, cluster farmers were more united. As their social networks had expanded, so did the opportunities to engage with new buyers and development agencies. As a direct consequence of the clustering process, cluster farmers were now able to access material and technical support. For at least one cluster, funding had been received to establish a consolidation centre in the barangay. Although this was used primarily for grading, sorting and weighing the produce, it also served as the community meeting point. For another group, cluster formation had

resulted in the establishment of a community water system. One group described the key benefit of clustering as continuous community improvement. Through clustering, farmers and the community could now look forward to a bright future.

In South Cotabato, the social impacts arising from clustering were even more dramatic. Through clustering, farmers were able to consolidate sufficient produce to make it economically viable to organise a means of transport to deliver their product to markets. The increase in production subsequently enabled cluster farmers to offer employment to their neighbours. For others, it enabled them to send their children to school. For other farmers, engaging in cluster farming had opened their minds and dramatically expanded their horizon. Through their participation in cluster farming, farmers had been able to visit many different places and to meet many different people. Not only had their personal networks expanded outside the community but also within the community. With greater trust, there was more social cohesion. With greater access to technical information and financial support and the commensurate increase in household income, communities were being revived and reborn.

8.3.3 Environmental impacts

Vegetable production in the Southern Philippines is a very risky proposition. In the absence of protected cropping structures, incessant rain will reduce both productivity and quality and may even result in total crop failure. Conversely, in a good season when all goes well, prices may be so low that farmers are unable to recover the costs of production. In such an uncertain environment and with little collateral, one of the strategies that cluster farmers have adopted is a low input natural farming system. This system relies primarily upon the use of bio-dynamic fertilisers and insect repellents, integrated pest control, companion planting and improved crop rotations. As several of the cluster groups are derived from Landcare groups, contour farming practices have been widely adopted as a means of minimising soil erosion. Several of the species utilised have the potential to earn additional income in the short term from the sale of fruit and in the longer term from the sale of timber.

Recognising that such systems use fewer chemicals, and thus there is less likelihood of product being contaminated with chemical residues, one of the major supermarkets in Davao has indicated its desire to purchase and promote the products derived from these low input systems. Furthermore, in an effort to minimise the impact of intensive vegetable production on the environment, these low input systems are being actively promoted by local government units and the City Agriculturists Office.

8.4 Communication and dissemination activities

Over the duration of this project, 12 peer refereed papers have been presented at three international conferences, with a further four submitted for inclusion in the joint ACIAR/PCAARRD end of project publication.

Peer refereed conference papers

Axalan, J.T., Israel, F.T., Concepcion, S.B., Batt, P.J., Murray-Prior, R.B. and Loma, L. 2011. Socio-economic impact of cluster marketing: the case of Ned Landcare Association Sweet Pepper Cluster. In Batt, P.J. (ed) Proceedings of the Third International Symposium on Improving the Performance of Supply Chains in the Transitional Economies. Acta Hort 895: 37-44.

Axalan, J.T., Concepcion, S.B., Montiflor, M.O., Lamban, R.J.G., Real, R.R., Batt, P.J., Murray-Prior, R.B., Rola-Rubzen, M.F., Israel, F.T., Apara, D.I. and Bacus, R.H. 2013. Social capital and trust in collaborative marketing groups: the case of vegetable cluster marketing in the Southern Philippines. In Batt, P.J. (ed) Proceedings of the Fourth International Symposium on Improving the Performance of Supply Chains in the Transitional Economies. Acta Hort *** [in press]

Batt, P.J., Concepcion, S.B., Lopez, M.T., Axalan, J.T., Hualda L.A.T. and Montiflor, M.O. 2011. Exploring the institutional market for fresh vegetables in the Southern Philippines. In Batt, P.J. (ed) Proceedings of the Third International Symposium on Improving the Performance of Supply Chains in the Transitional Economies. Acta Hort 895: 59-68.

Batt, P.J., Concepcion, S.B., Axalan, J.T., Hualda, L.A.T. and Montiflor, M.O. 2013. Exploiting opportunities in the institutional market for fresh vegetables in Mindanao and the Visayas. ACIAR/PCAARRD. Fruit and Vegetable Technical Workshop. Cebu. July 2012. [in press]

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Rola-Rubzen, M.F., Batt, P.J., Murray-Prior, R.B., Concepcion, S.B., Montiflor, M.O., Real, R.R., Axalan, J.T. and Lamban, R.J.G. 2013. Does clustering matter? Impact of clustering on vegetable farmers in the Philippines In Batt, P.J. (ed) Proceedings of the Fourth International Symposium on Improving the Performance of Supply Chains in the Transitional Economies. Acta Hort *** [in press]

Rola-Rubzen, M.F., Murray-Prior, R.B., Batt, P.J., Concepcion, S.B., Real, R.R., Lamban, R.J.G., Axalan, J.T., Montiflor, M.O., Israel, F.T., Apara, D.I. and Bacus, R.H. 2013. Impact of clustering on vegetable farmers in the Philippines. ACIAR/PCAARRD. Fruit and Vegetable Technical Workshop. Cebu. July 2012. [in press]

In addition, the experiences gained from the project have been incorporated into two book chapters:

Murray-Prior, R.B., Batt, P.J., Hualda, L.A.T., Concepcion, S.B. and Rola-Rubzen, M.F. Chapter 31. Increasing the role for smallholder farmers in the world market for horticultural food. ISHS [in press]

Murray-Prior, R.B. and Batt, P.J. 2013. Collaborative marketing groups in developing economies: strategies and factors contributing to success. In Mazzarol, T. and E. Mamouni Limnios (ed). Cooperatives in the Fourth Sector: The Role of Member-Owned Businesses in the Global Economy. Tilde University Press: 113-128.

Furthermore, the results of the institutional market study (Objective One) were published in a monograph by UPSTREAM and widely circulated among the cluster groups, the three Mindanao vegetable associations, project partners and industry.

Concepcion, S.B., Batt, P.J., Lopez, M.T., Axalan, J.T., Hualda, L.A.T. and Montiflor, M.O. 2012. Institutional Market Study Report. UPSTREAM. ISBN 978-971-95595-0-4.

Other papers presented to conferences include:

4th Agribusiness Economics Conference - Globalizing Food Chains and the Emerging Economies: Agribusiness Potentials and Issues, Davao City, July 10-11.

Axalan, J.T., Concepcion, S.B., Montiflor, M.O., Lamban, R.J.G., Real, R.R., Batt, P.J., Murray-Prior, R.B., Rola-Rubzen, M.F., Israel, F.T., Apara, D.I. and Bacus, R.H. 2012. Factors affecting the level of trust of vegetable farmers in Southern Philippines.

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48th Philippine Agricultural Economics and Development Association (PAEDA) Biennial Convention, Mariano Marcos State University, Batac City. October 20-21.

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Proceedings 12th International Conference of the Society for Global Business and Economic Development. Singapore. July 21-23.

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Axalan, J.T. Concepcion, S.B., Batt, P.J., Hualda, L.A.T., Montiflor, M.O. and Lopez, M.L. 2009. Institutional buyers criteria for choice of vegetable suppliers

Second South Cotabato Vegetable Production and Marketing Forum. November 24.

Montiflor, M.O. 2009. Overview of the Vegetable Market

Under an initiative commenced during the earlier ACIAR project ASEM/2000/101, the project team have delivered 27 papers under the UP Mindanao Supply Chain Management Forum. These one day seminars are widely publicised among the academic community, development agencies and the vegetable industry. A nominal fee, to cover the costs of the lunch and refreshments, was usually required.

7th UP Mindanao Supply Chain Management Forum: January 26, 2012.

S.B. Concepcion	Overview of the project
F.T. Israel	Linking farmers to market: South Cotabato experience
D.I. Apara	Bukidnon experience on market linkage
R.H. Bacus	Working with clusters: Davao City experience
M.O. Montiflor	Beyond research: cluster support from 2009-2011
R.R. Real	Challenges, strategies and success factors of clustering: the case of Kilapagan cluster
J.T. Axalan	Strategies to reduce post-harvest losses: Southern Philippines cluster experience
R.J.G. Lamban	Marketing improvements of Davao city clusters
M.F. Rola-Rubzen	Does clustering matter: the economic and social impacts of clustering
R.B. Murray-Prior	A participatory market-driven approach to research, development and extension
P.J. Batt	Going organic: pros and cons

6th UP Mindanao Supply Chain Management Forum: February 7, 2011.

S.B. Concepcion	Institutional markets in the Philippines
R.B. Murray-Prior	Participatory action research
J.T. Axalan	Cluster chain analysis: South Cotabato Clusters
R.R. Real	Cluster chain analysis: Bukidnon Clusters
R.J.G. Lamban	Cluster chain analysis: Davao Clusters
F.T. Israel	Linking farmers to markets: South Cotabato
D.I. Apara	Linking farmers to markets: Bukidnon
R.H. Bacus	Linking farmers to markets: Davao
M.F. Rola-Rubzen	Measuring impact

5th UP Mindanao Supply Chain Management Forum: February 5, 2010

S.B. Concepcion	Overview of the project
P.J. Batt	Initial results of the marketing survey
R.B. Murray-Prior	Collaborative marketing groups: concepts and theories

F.T. Israel	Introduction to the 8-step clustering approach
J.T. Axalan	Importance of social capital in cluster farming: the case of bell pepper cluster in Barangay Ned, Lake Sebu
R.R. Real	Exploring market linkage of cluster farmers in Lantapan and Impasug-ong, Bukidnon: a case study
M.O. Montiflor	The tie that binds: case of Smallholder Farmer's Association of Sitio Quirogpang

To share their collective experiences of the clustering process, UPMin established in 2010 the UP Mindanao Farmers and Partners Learning Alliance. These meetings were generally attended by the cluster leaders with perhaps one or two other members of the cluster management committee. In this instance, the costs associated with their participation in the forum (bus fares, accommodation and meals) were covered by the project.

2nd UP Mindanao Farmers and Partners Learning Alliance: July 7-8, 2011

S.B. Concepcion	Overview of the project
F.T. Israel	Objectives of the forum
A. Cesar	Institutional marketing experiences in Bukidnon clusters
E.Y. Ibanez	Agro-enterprise development experiences of Kablon clusters
R.E. Suguihan	Marketing experiences of Kilapagan clusters
S.R. Divinagracia	NCLA experiences of agro-enterprise development
A. Estrera	Pamahutan Farmers Association marketing experience
Z. Aparecio	Saloy Small Vegetable Farmers Association marketing experience
P.J. Batt	Standardising quality: practices, processes and implications
R.B. Murray-Prior	What lessons have we learned about the CRS 8 step clustering approach
M.F. Rola-Rubzen	Impacts of clustering on farm households
E. Salcedo	LTS supermarkets: quality, volume and supplier preferences
Z.C. Gonzaga	Development of a cost effective protected vegetable cropping system in the Philippines
L. Arbes	Agroforestry practices: Landcare experience
V. Justo	Bacterial wilt management in solanaceous vegetables
A. Tulin	Soil nutrients

First UP Mindanao Farmers and Partners Learning Alliance: July 19-20, 2010

F.T. Israel	Overview of the learning alliance
J. Villanueva	Ned, Lake Sebu, South Cotabato cluster
J. Tugap	Quirogpang, Davao City cluster
A.D. Cesar	Lantapan, Bukidnon cluster
J.B. Horio	Saloy, Davao City cluster
E. Ibañez	Kablon, Tupi, South Cotabato cluster
E. Quimado	Bukidnon cluster
P.J. Batt	Challenges in marketing in ASEAN countries

R.B. Murray-Prior	Collaborative marketing initiatives in ASEAN countries
L.A. Avila	Climate change and mitigating measures
J.Y. Gaisano	Institutional market requirements
S.B. Concepcion	Institutional market segments

There were also several farmers' fora and vegetable congresses where the research results were disseminated to the industry stakeholders:

Concepcion, S.B. 2012. Institutional market situationer: emerging vegetable value chains. Presented during the 8th Mindanao Vegetable Congress, Grand Men Seng Hotel, Davao City.

Concepcion, S.B. 2011. Institutional market for fresh vegetables. Presented during the Davao Trade Exposition, Oct. 21.

Montiflor, M.O. 2011. Overview of the vegetable market. Presented during the VICSMIN Farmers Forum and Organizational Meeting of Davao del Sur farmers, Digos City, Sept. 14.

Montiflor, M.O. 2010. Markets for Mindanao vegetables. Presented during the VICSMIN Farmer's Forum, Brokenshire College, Davao City, Sept. 29.

Montiflor, M.O. 2010. Overview of the vegetable market. Presented during the Farmers' Forum and Davao del Norte Vegetable Industry Development Association, Provincial Agriculturist's Office, Tagum City, May 18.

9 Conclusions and recommendations

9.1 Conclusions

Qualitative interviews with wholesalers and retailers in traditional vegetable markets, supermarkets, food caterers and restaurateurs in Metro Manila, Mindanao and the Visayas reveal that the institutional market for fresh vegetables vastly different between islands and even within the one island. While the traditional lowland *pakbet* vegetables are readily available in most markets, the demand for the temperate *chopsuey* vegetables, *salad greens* and *lamas* differs between market segments.

With the exception of a few specialist gourmet vegetables and culinary herbs which are required by only the most discerning buyers, most institutional buyers are readily able to procure the fresh vegetables that they require from preferred suppliers (suki). Moreover, given the highly unpredictable nature of supply and significant variations in product quality, most institutional buyers have more than one supplier. As product shortages do inevitably arise, a significant amount of trade occurs between the different types of institutional market.

In the institutional market, the majority of the problems arise with the higher value, temperate *chopsuey* vegetables, leafy green vegetables and herbs. Despite the significant movement of fresh produce from the highland areas of production to the lowland areas of consumption, between different islands and different climatic zones, the supply is often insufficient to meet the demand and the quality highly variable. Although such shortages are only temporary, the greater the distance and the more time the product is in transit, the greater the problem. This is a direct consequence of the lack of infrastructure, poor post-harvest handling and transport.

Most institutional buyers evaluate alternative suppliers of the basis of product quality, assortment, reliable delivery and price. While most institutional buyers associate one or more vegetables with a particular region or area of production, there is no evidence to suggest that institutional buyers are prepared to pay any more to procure fresh vegetables from their preferred source or origin.

For smallholder farmers to participate in both the traditional and high value institutional market in a more equitable manner, farmers must be encouraged to form collaborative marketing groups or clusters. However, the formation of these clusters cannot be imposed upon the farmers: they must develop organically from the bottom up. The farmers must take ownership of the process and be active participants in the development of their cluster marketing groups.

Too often it seems, development agencies and NGOs are misguided in their approach that the best way to improve the performance of supply chains is to remove market intermediaries. The results from this study do not generally support this approach, for it is apparent that the market intermediaries are often the major financiers and risk takers who do perform a number of value-added activities. If they are to be removed, these activities must be performed by another actor; either the cluster itself or the NGO. Where the NGO performs these activities itself, while it may generate desired results, it is not sustainable. If the clusters are to perform these activities, as they often lack the capacity, a significant investment in training is required.

Training is required in a multitude of different areas. Under the CRS Eight Step Plan for Agro-enterprise Development, in Step 3, farmers are introduced to their downstream buyers often for the first time. They must learn how to assess the market, to evaluate the needs of their institutional buyer and learn how to negotiate advantageous prices. In the subsequent steps, a planting schedule is developed, a marketing plan, a financial plan

and a cluster management plan. Basic skills in record keeping, accounting and financial management are required.

Going forward, the cluster will only survive if it has some comparative advantage and some core elements such as trust, social cohesion, transparency, equity and effective leadership.

Clustering is advantageous not only for the farmers but also for the buyers, since they are able to procure a reliable supply of product that meets their specifications. However, the focal buyer does not always pay the highest price and as they often have some quality specifications, the cluster must continue to transact with multiple buyers to dispose of that product which fails to meet the buyer's specifications or is surplus to requirements.

For the farmers, the benefits of clustering extend well beyond access to markets. Clustering also facilitates the farmers' access to agronomic and postharvest information and material support such as seeds, fertilisers and credit. Upon becoming a registered farmers' organisation, it may also provide access to a range of grants from the Department of Agriculture and indeed, as a registered business, facilitate their subsequent transactions with institutional buyers such as supermarkets and food corporations. However, clustering cannot eliminate the risk of unseasonal climatic events nor can it guarantee price.

For smallholder farmers, clustering offers a number of economic, environmental and social benefits. From this study, there is empirical evidence to demonstrate that cluster farmers benefit from increased productivity, higher prices, lower costs and higher net income. Environmentally, as more cluster farmers are adopting low input natural farming systems which rely upon the greater use of organic fertilisers and biodynamic insect repellents, integrated pest control, companion planting and crop rotations, less chemicals are applied. As many cluster farmers are also members of Landcare groups, with the adoption of contour farming practices, soil erosion is greatly reduced. Socially, cluster marketing has brought many of the rural communities closer together. Over time, with greater understanding, empathy and respect, cluster farmers are more disciplined and are more likely to treat farming as a business. The additional income not only provides additional employment, but is revitalising rural communities, giving them renewed hope for the future. In those instances where the cluster has been successful in securing a major grant from government to establish one or more protected structures, and in part as a risk mitigation strategy associated with the production of new crops, many of the clusters have embarked upon communal farming where the farmers share the proceeds commensurate with their inputs. Furthermore, so as to meet the needs of a major supermarket chain in Davao, there is evidence to demonstrate how the clusters themselves are collaborating to determine which clusters will grow what crops when and in what quantity.

For development agencies, with limited financial resources, the problem is not to attract new clusters but rather of being willing to get some of the more established clusters to depart. From the development agencies perspective, their future funding is often tied to their capacity to demonstrate tangible results, and it is often they who are reluctant to severe their ties to the more success groups. However, the clusters themselves may also be reluctant to depart fearing that they will no longer be able to access resources. As this project has shown, provided that the clusters have received the appropriate training, most are capable of making their own decisions and of taking responsibility for their own actions. Nevertheless, even the most mature clusters may still benefit from the collective experience of others. The Farmers Forum and Partners Learning Alliance established by UPMin has the potential to provide such a vehicle. Furthermore, few of the clusters have survived without strong institutional support from a multiplicity of stakeholders. Indeed, very few of the clusters would progress beyond Step 3 were it not for the willingness of focal buyers to offer their support to the emerging clusters.

9.2 Recommendations

1. There is a growing demand for organic (natural) vegetables from many institutional buyers. As these products have been cultivated using minimal inputs, the products are perceived to be safer for the consumer as they are less likely to contain chemical residues. Such systems also utilise a broad range of organic composts (including vermicompost) and bio-dynamic pesticides (including fermented plant juice), integrated pest management (ipm), contour planting and companion planting, and crop rotations. It is recommended that research be undertaken to explore:
   - what impact these low input systems have on yield, profitability and risk?
   - what impact these low input systems have on the quality of the resultant products?
   - what impact these low input systems have on the shelf life of the products?
   - what impact these low input systems have on the nutritional quality of the fresh vegetables?
   - what impact these low input systems have on the soil environment?
   - how effective are these low input systems in controlling the incidence and severity of pest and disease attacks?
   - what impact these low input systems have on the health of farm households?
   - who is driving the demand for these low input production systems?

2. Associated with this, there is an immediate need in the market to differentiate the vegetables produced under these low input farming systems from the mainstream vegetables produced by other farmers. To develop an appropriate and flexible group certification scheme, research is required to identify:
   - the current low input farming practices used by smallholder farmers in the Davao region?
   - what chemical fertilisers, fungicides, herbicides, insecticides and pesticides are currently used?
   - how are they applied?
   - how often are they applied and at what rate?

3. Concurrent with the development of an appropriate quality assurance program, there is a need to identify:
   - what price premium smallholder farmers will obtain from the use of a sustainable label?
   - which buyers are willing to pay a price premium for organic (natural) produce under a sustainable label?
   - at the farm level, what processes are necessary to facilitate the adoption of a sustainable label?
   - what barriers or constraints will prevent or restrict the uptake of a sustainable label at the farm level, a chain level and the retail level?
   - how can these barriers or constraints be overcome?

4. In order to achieve group certification, to facilitate the transfer of appropriate technologies and to collectively market their produce, it is necessary to facilitate the formation of cluster marketing groups. This project has identified both quantitatively and qualitatively the value of promoting sustainable clusters at the farm level. While numerous improvements to the CRS Eight Step Agro-enterprise clustering approach have become evident, these improvements have yet to be tested and refined. The research questions arising from this component include:
   - investigate and propose appropriate cluster sustainability and resilience strategies and exit strategies for donor agencies
   - develop and test processes for incorporating microfinance as part of the cluster development process

- develop and test a revised process for the formation, expansion and graduation of smallholder farmer marketing clusters.

5. One of the initiatives to arise from the study was the emergence of a confederation of clusters. In order to meet the needs of institutional buyers, the clusters meet regularly to decide which clusters will grow what products and in what quantities. Research is required to explore an alternative means to encourage the formation of a sustainable confederation of clusters. Research is required to identify:
   - what is the most appropriate way to structure the confederation so that it is self supporting and competitive with alternative marketing systems?
   - how will it be possible for clusters to enter and exit the confederation?
   - how will the products be best allocated between the clusters?
   - how will quality be controlled to ensure that clusters deliver product that is comparable?

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11 Appendix One

11.1 Impasugong cluster

11.1.1 Site description and group formation

Impasugong is one of 22 municipalities in Bukidnon Province, Northern Mindanao. It is situated in the north eastern part of the province and is approximately 75 km from Cagayan de Oro and 30 km from the capital city, Malaybalay. It consists of 13 barangays.

The name Impasugong is a Higaonon term, which means “to make the current come upstream”. It was named after a spring located in the north west of the municipality, where it is said that the water coming from this spring flows and returns to its source when it meets another body of water from a creek that runs alongside the spring.

The municipality is characterized by steep mountains, deep canyons and gorges and numerous rivers and creeks which flow from the mountain ranges. The principal water channels include the Atugan, Dila, Dumalaguing, Kalabugao, Kinapuntan and Tagoloan rivers. These are utilized as a source of irrigation and the generation of hydro-electricity.

Impasugong has a Type III climate, which is characterized as having no pronounced wet season and a short dry season, which usually lasts from February to April.

The municipality has a total land area of 107,167 ha. Some 83% of the land is classified as timberland and 17% as alienable and disposable lands.

The majority of the people in Impasugong depend on farming as their primary source of livelihood. A large number of the indigenous people are still dependent on forest products. Smallholder farmers, land owners and peasants are engaged in the production of traditional crops like corn, coffee, abaca, rice and others. However, a growing number of farmers are now planting vegetables on a regular basis. Much of the land is planted with plantation crops (pineapple and banana) for Del Monte Philippines and Dole Philippines, and sugar cane is cultivated by some of the larger land owners.

In 2008, a group of farmers in Barangay Poblacion were brought together to form a vegetable marketing cluster focused on the production of bitter gourd (*Momordica charantia*), locally known as *ampalaya*. The Catholic Relief Services (CRS) introduced the farmers to the Eight Step Plan for Agro-enterprise Development, which is a sequential process that prepares the farmers to link with the market, assists them in becoming an organized group and guides them to engage with the market under more favorable terms of trade that improve their incomes and livelihood (CRS, 2007).

The formation of the Impasugong cluster was made possible through a partnership between the farmers’ group, non-government organizations like the Kaanib Foundation Inc. (KFI) and CRS. Local Government Units (LGU), such as the Department of Trade and Industry (DTI) and the Department of Agrarian Reform (DAR), also collaborated in the establishment of the cluster. In 2009, cluster facilitation was transferred to the UP Strategic Research and Management Foundation Inc. (UPSTREAM).

11.1.2 Product supply assessment and product selection

Membership profile

The Impasugong cluster is composed of six farmers, who are all male and reside in Barangay Poblacion, Impasugong. The mean age of the farmer-members is 39 years old. All are married with an average of 3 children. On average, 6 people reside in the household. In terms of education, the range of education is from elementary level to high school graduate, with most farmers having spent 9 years at school. Most of the farmer-members are Catholic.

Farming is the main source of income in the barangay, but some farmers have other means of supporting their household including being a trader, carpenter, farm labourer or water tender. Through this, the farmers earned an average monthly income of PhP 5,333. Aside from being a member of the cluster, most farmers were also a member of some other political, civic, or church-based organisation.

Cluster members had been farming for an average of 14 years. Most had at least one area for crop production, which ranged from 0.25 – 3.0 ha. The terrain ranged from flat to rolling and steep. Most farmers cultivated a wide array of crops including fruit, vegetables, root crops and corn. Farmers used a variety of tools including a plough, shovel and bolo, but most only had a cow or carabao to help them cultivate their farms.

Farm production

Farmers were using a variety of both conventional and natural fertilizers including complete (14-14-14), urea (46-0-0), mono-ammonium phosphate (16-20-0), di-ammonium phosphate (18-46-0), sulphate of ammonium (21-0-0), full/compound (16-16-16), potash (0-0-60) and Multicote (17-17-17). In addition, farmers were applying organic fertilizers such as chicken dung (manure) and vermin-compost. These were applied at least once during the cropping season as either a basal dressing or regular side dressing on a weekly or monthly basis. Farmers were also applying foliar fertilizers made from various plant concoctions, fruit juices and indigenous microorganisms.

Cluster farmers applied a variety of chemicals for the control and prevention of pests and diseases such as cutworm, fruit fly and blight. These include various fungicides and insecticides such as Karate, Lannate, Selecron, Manzate and Magnum. Several farmers were also applying a range of organic concoction to deter insects.

Most of the cluster farmers were also practicing crop rotation and contour farming.

Financing

Most of the cluster farmers had borrowed from PhP 2,000 - 50,000 from either an NGO or a local cooperative bank. The loans were generally repayable at the end of the cropping season. The funds were borrowed to purchase production inputs such as seed, fertilizers, and pesticides.

Marketing

Four buyers were identified to whom the farmers sold their produce. These included processors, wholesalers, retailers and a market facilitator. The primary reason for choosing to deal with these buyers was that the farmers had already transacted with them at some time in the past. These preferred buyers, locally called “suki”, generally gave the farmers a higher price and could easily dispose of their products. Farmers brought their product to the different markets in boxes, sacks, wooden crates, baskets and plastic bags.

11.1.3 Market chain assessment

Rapid market appraisal

The cluster farmers in Impasugong were fortunate because their products already had identified buyers. The proposed marketing system for the ampalaya was for the farmers to bring their fruit to Kaanib’s production supervisor who would make sure that the produce met the buyer’s specification, particularly for the market facilitator (Figure 1).

The prevailing farm gate price was in the region of PhP 18 - 20 per kg.

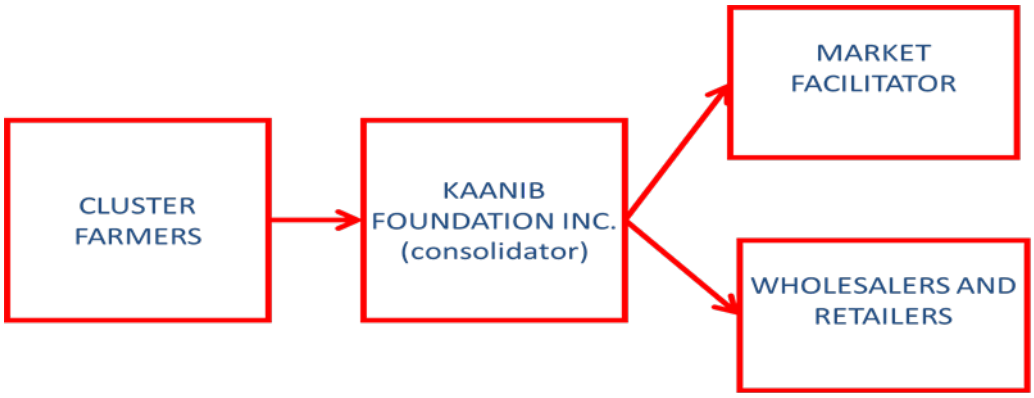


Figure 1: Bitter gourd cluster supply chain

However, this system could not be maintained as the farmers experienced a massive crop failure due to a viral disease locally known as *pamamarako*, which is similar to cucurbit aphid-borne yellow virus (CABYV) that causes curling, thickening and yellowing of leaves, a decreased numbers of female flowers and consequently a marked reduction in yield. This lowered their expected harvest and ultimately their anticipated income. As a result, they were not able to sustain the delivery of bitter gourd to the market facilitator. Some farmers shifted to other types of vegetables while others withdrew from the cluster.

Chain maps

Although the farmers tried to maintain their linkage with the market facilitator, the traditional market was the recipient of the majority of the fruit produced. After consolidation, the cluster farmers delivered their produce to three wholesale-retailers in Kisolon, Sumilao and Malaybalay. In Impasugong, a food institution known as Roadside Veggies Café also provided an outlet, selling fresh fruit to walk in customers or selling the cooked product as an integral part of the menu (Figure 2).

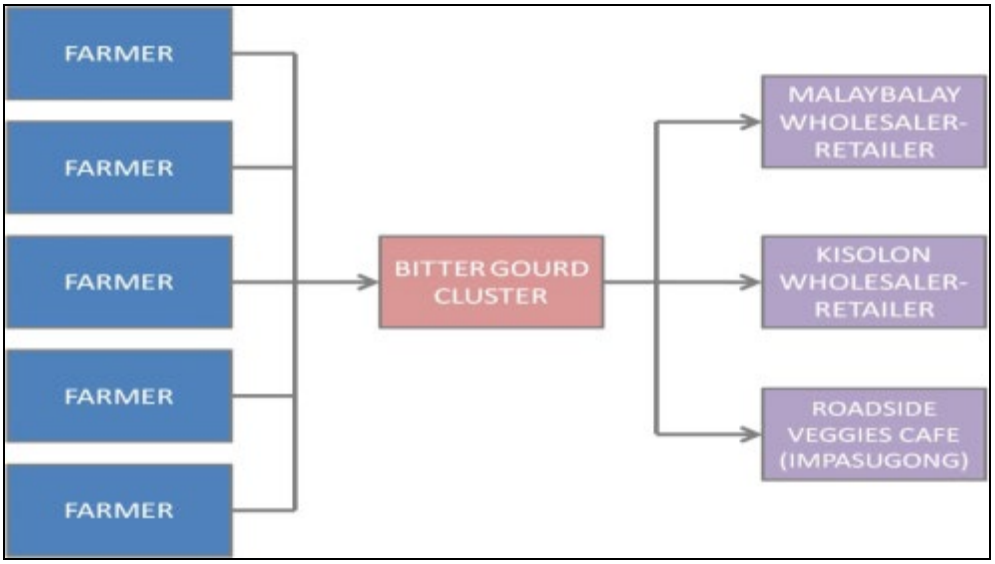
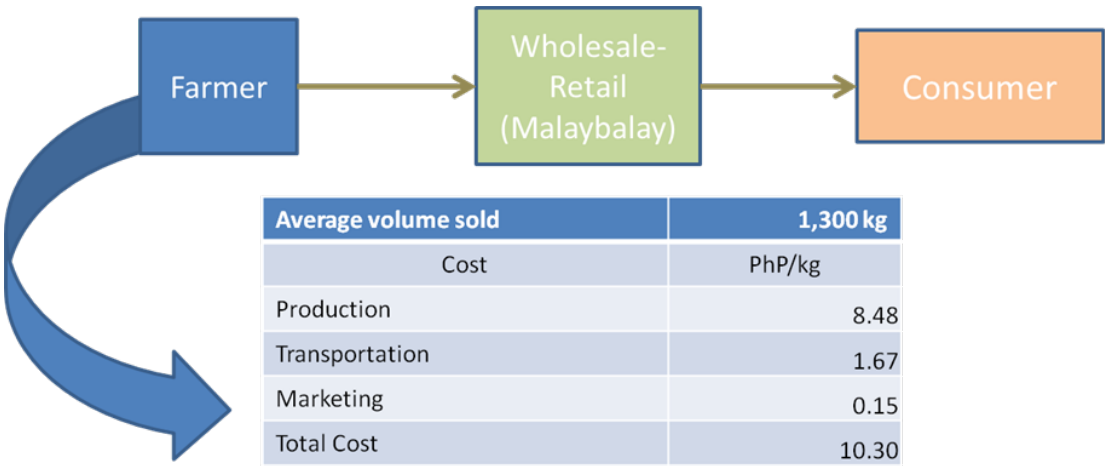


Figure 2: Bitter gourd (Impasugong) cluster chain map

Costs and margins

For the farmers, fertilizers and pesticides are the major cost components in the production of bitter gourd. This is followed by the cost of transport, for the product must be carried from the farm to markets in Malaybalay, Kisolon or Impasugong (Figure 3).



Average volume sold	1,300 kg
Cost	PhP/kg
Production	8.48
Transportation	1.67
Marketing	0.15
Total Cost	10.30
Average buying price	25.00
Net Margin	**14.70**

Figure 3: Costs and returns of bitter gourd. (Net margin should read be gross margin)

Marketing costs, on the other hand, involves the use of cardboard cartons to protect the fruit while in transit. On average, each farmer spent PhP 10.30 to produce and market 1 kg of bitter gourd. With an average farm gate price of PhP 25/kg, farmer's were able to earn a net revenue or profit of PhP 14.7/kg.

11.1.4 Cluster formation and planning

In an agro-enterprise plan, the farmers collectively developed four basic components. A market plan assisted the farmers in identifying what quality specifications were required by the buyers. Price estimates were included since this enabled the farmers to determine if it was viable to produce the product. For bitter gourd, they were able to achieve a minimum price of around PhP 20 per kg, providing that the fruit met the buyer's specifications (Table 1).

A supply plan was developed to provide an estimate of the required volume that should be attained by each farmer. An operational flow was also constructed to show what activities were involved in the harvesting and marketing of the crop. For bitter gourd, the delivery was scheduled every four days. Having secured two markets, farmers could choose whether they would deliver to NORMIN Veggies (700 kg) or RVC (200 kg).

A management plan was prepared which identified the roles of the cluster officials and the rules that farmers had to follow.

A financial plan identified the external support that was available from microfinance institutions such as the Kaanib Foundation, who were able to assist the cluster members by advancing the equivalent of PhP 10 per hill (plant) to assist in the purchase of production inputs such as seeds, fertilizers and pesticides. Each farmer was able to borrow PhP 2,000-7,000. The financial arrangement was that the cluster members

collectively would be responsible for repaying the total amount provided to the members after one cropping season.

Table 1: Agro-enterprise plan for the Impasugong cluster

	Details
Marketing plan	Target market: NORMIN Veggies Roadside Veggies Café (RVC) Quality specifications: 4-5 pieces per kg 25 cm long No insect damage and cracking Straight and smooth Target sales: 200-700 kg PhP 20 per kg Gross sales: PhP 4,000-14,000 Mode of payment: Cash payment thru Kaanib
Production/supply plan	Source: Farmers from Poblacion, Impasugong 500 kg every four days Operational flow: Farmers deliver products to Kaanib every four days Consolidated products are placed in a sack or box Products are then delivered to NORMIN or RVC Materials needed: Sack or *bukag* (rarely)
Management plan	Operations: Consolidator – Kaanib Foundation production supervisor Buyer(s) – RVC and NORMIN Veggies The cluster leader should be present during delivery.
Financial plan	Source of Capital: Kaanib's cash assistance worth PhP10 per hill (no interest rate) Terms of repayment – after one cropping period

11.1.5 Test marketing

Conduct of trial delivery

In 2009, the Impasugong cluster farmers were not able to harvest the required volume of bitter gourd. The cropping season was unfavourable and much produce was damaged due to infection by a viral disease. Nevertheless, there were some cluster farmers who succeeded in producing bitter gourd even when the viral disease was affecting other farmers in the area. It was found that these farmers had purchased a disease-resistant variety of bitter gourd known as *Galactica*. Farmers found that when they planted this variety, their production dramatically improved. However, the new variety was significantly

more expensive and most farmers did not have the financial resources. Consequently, the project facilitators provided a number of seeds for these farmers so that they can start their production using the superior variety.

In June 2010, the cluster farmers commenced production using the superior variety. Harvesting continued until December 2010, by which time the Impasugong cluster farmers had produced 1,690 kg of bitter gourd (Figure 4).

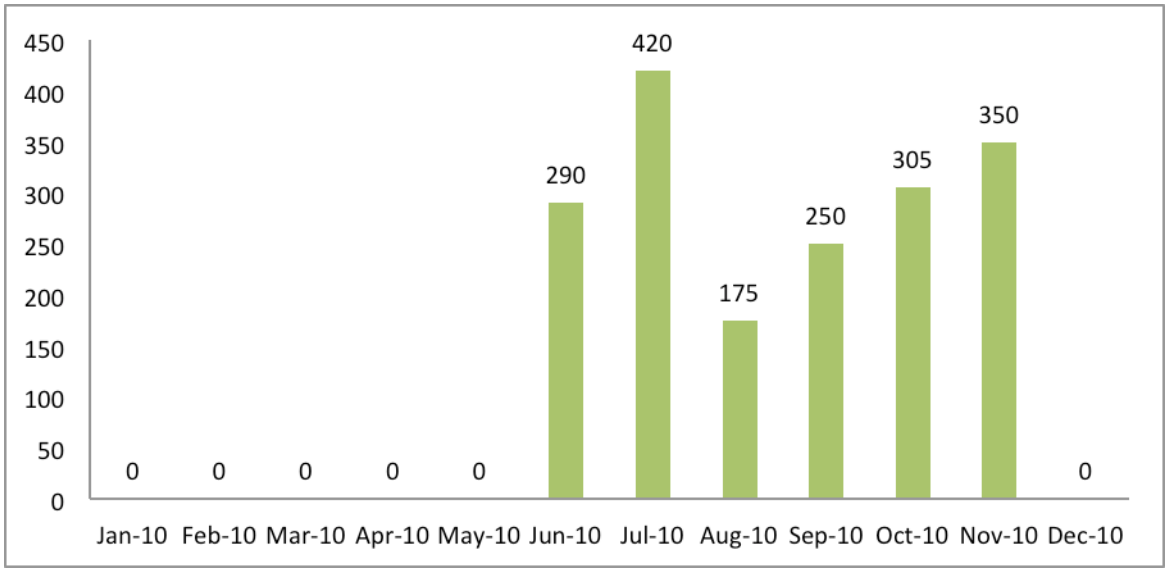


Figure 4: Production of bitter gourd 2010 (kg)

Evaluation of trial delivery

For the trial delivery period (2009 – 2010), the Impasugon cluster farmers produced 3,300 kg of bitter gourd. With an average buying price of PhP 27/kg, gross sales amounted to PhP 93,055 (Table 2). With this level of income, farmers were able to recover from the losses they incurred during the first months of their initial delivery. This was largely the result of having selected a superior variety.

Table 2: Volume and sales of bitter gourd, 2009-2010

Year	Volume (kg)	Sales (PhP)
2009	1,610	48,300
2010	1,790	44,755
Total	3,400	93,055

11.1.6 Scaling up

Entry to institutional market

With the improvement in the supply of bitter gourd, the Impasugong cluster farmers managed to identify additional buyers for their produce. Together with other clusters in Bukidnon and Davao, they were able to penetrate two Davao-based supermarkets. While one supermarket transacted with the cluster, the other supermarket purchased through a consolidator. Another buyer, a market facilitator, was based in Cagayan de Oro and had multiple buyers from the local market and some processing companies (Figure 5).

Continuous supply

In the succeeding years, bitter gourd production has been favourable for the Impasugong cluster farmers. The use of the resistant variety not only improved the yield but also the marketable qualities of the fruit. In 2011, the volume of production increased to 10,250 kg (10.2 tons), a 200% increase from the previous period (Figure 6).

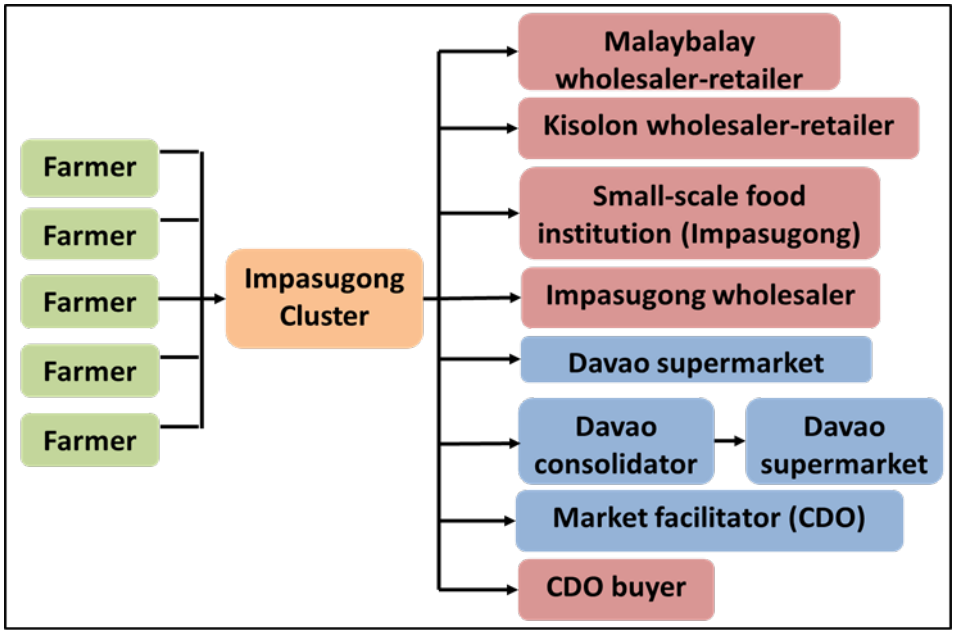


Figure 5: New Impasugong cluster chain map, 2012

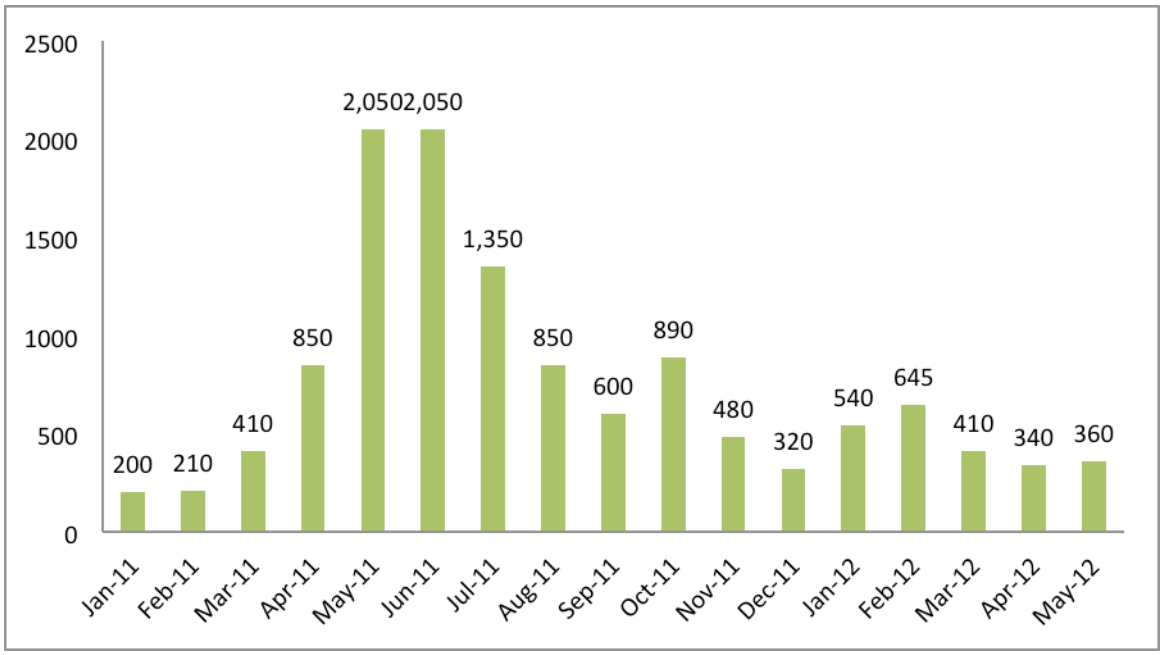


Figure 6: Volume of production of bitter gourd, kg (January 2011-May 2012)

Not only did the marketable yield increase, but the value of production increased by more than 300%. This was due to the improvement in prices received by the farmers after

entering the institutional market, which generally paid premium prices. Gross sales increased from PhP 93,055 in 2009/2010 to PhP 418,120 in 2011.

Membership changes

The improved productivity and new institutional market linkages encouraged other farmers in Impasugong to join the cluster. From the six initial cluster farmers, membership increased to 13 farmers. All of these farmers have participated in a number of cluster capacity building programs including soil test analysis, a cluster maturity workshop and the project closing program held in Malaybalay City.

Cross-site visit

One of the major activities for the bitter gourd cluster was a cross-site visit to a farm in Malaybalay in May 2009. This farm was considered to be the best producer of bitter gourd. This exposure trip was very helpful, especially as the cluster had experienced production failures. The farmers realized the importance of:

- soil, leaf, pest and disease analyses
- identifying the best methods for preventing pest and disease outbreaks but also for proper fertilizer and insecticide application
- having plastic mulch, drip-line irrigation systems, and appropriate postharvest handling and packaging
- proper cultural management, which included multiple and diversified cropping and the use of insect attractant.

During this visit, the farmers learned that the main cause of fruit cracking in bitter gourd was a boron deficiency.

Seed support

In addressing the problems associated with crop failure due to *pamamarako*, the farmers received seed of an improved variety that was resistant to the disease. As a result, production has increased and product losses have declined.

Participation in various symposia

The Impasugong cluster leader was invited to be part of the UP Mindanao delegation, along with other cluster leaders from Bukidnon, Davao and Maragusan, to attend the Second South Cotabato Vegetable Production and Marketing Forum in November 2009.

For two consecutive years, the cluster farmers attended the Farmers and Partners Learning Alliance Forum organized by UP Mindanao. This provided an avenue for the cluster farmers, partner organizations and project staff to come together to discuss effective measures in controlling pests and diseases, to share marketing experiences, and to recommend ways of strengthening the bonds between cluster farmers.

In addition, the Impasugong cluster farmers attended various events in their own municipality, particularly during the celebration of Impasugong Day. On these occasions, the farmers were invited to display their produce in an Open Market activity, where they were able to sell their produce directly to consumers.

11.1.7 Cluster maturity assessment

The Impasugong cluster was formed in 2008. Collectively, the cluster farmers were asked to evaluate how mature their group was against five criteria on a scale from 1-5, where 1 was the worst and 5 was the best.

In the area of organizational development, the cluster farmers gave a grade of 3/5, which implied that the cluster was functioning independently. Membership has also increased from 6 to 13, as the benefits of clustering had encouraged other farmers to join the group. However, the cluster farmers admitted that although they attended the cluster meetings, the cluster did not meet regularly (Table 3).

Table 3: Maturity assessment of Impasugong cluster

Maturity indicator	Average	Description
Organizational Development	3/5	Cluster has a meeting but not regular called by its cluster leader. Cluster functioning independently, able to implement enterprise plan (Marketing and production) Conduct membership expansion due to production demand in the market
Market Position	3/5	Market is developing with more buyers who can offer stable arrangements More buyers tapped Market entered into are for longer term agreements Special negotiation done Market is diversified a. New products b. Cluster pursue market research for high value markets
Supply Capacity	3/5	Cluster members can supplement each other supply in terms of deficit. Production technologies are in place for reliable quality and quantity. Regular product supply coming out based on the enterprise supply plan.
Financial Resources	3/5	Financial system is not yet proper implementation Financial reporting during meeting ,etc. loan sharing system are in place during marketing
Management Capacity	2/5	Enterprise plan enhanced to address new opportunities. Business operating system in place. Management looks forward to other market opportunities. Members expansion
TOTAL	**3/5**	

In terms of market position, a grade of 3/5 signified that the cluster has increased market linkages, especially with the addition of institutional buyers from Davao and one market facilitator based in Cagayan de Oro. They had also conducted negotiations with the institutional buyers and received special arrangements. They were starting to diversify their product range so that they could attract more buyers.

For the supply capacity area, the cluster farmers gave a grade of 3/5, which implied that they had implemented an appropriate production management protocol. This is essential

in sustaining their production. As a result, they were able to regularly supply their produce every week to their anticipated buyers.

In terms of financial resources, a grade of 3/5 meant that the cluster had implemented a price pooling system. A detailed financial report was presented to every cluster meeting.

Lastly, the management capacity was graded 2/5. This implied that the cluster had established a business-type environment where farmers should think and act not only as growers but also as businessmen. Although membership had expanded, it was always necessary to prioritize the market outlets.

11.1.8 Assessment of value chains associated with the cluster

Challenges and strategies faced due to crop failures

During the initial year of cluster implementation, many of the Impasugong cluster farmers found themselves unable to repay the loans they had taken up to purchase the inputs they required to commence production. As a result, several farmers were discouraged and withdrew from the cluster and the membership declined from nine to six active members.

To address the problems associated with bitter gourd, the cluster farmers diversified into bulb onion (*Allium cepa* L.) production, which was made possible through the efforts of CRS and a food service company that offered to buy the onions from the cluster. Those farmers who showed an interest in producing bulb onion were provided with at least one rain shelter. However, Kaanib insisted that the rain shelters were provided as a loan to the farmers. At a cost ranging from PhP 7,500-10,000 per unit, the amount to be deducted from the farmers' returns was equivalent to the depreciation rate in one year, which ranged from PhP 625-833.

Most farmers were cultivating multiple crops including bulb onion and leafy vegetables such as pechay (*Brassica rapa* L.), so that they would have a continuous flow of income. They have also executed strategies to reduce their costs of production through the application of organic fertilizers and insect repellants. Through these, the farmers could save on input costs and thus redirect the excess funds to meet their financial obligations.

The farmers were also able to access a superior variety of bitter gourd that was resistant to the disease. This not only increased the marketable yield but also the quality of the harvested fruit.

Relationships and trust measures

For the Impasugong cluster, an assessment of the farmer's relationship with their buyers and with their fellow cluster members was conducted. A school-boy grading system was used for the assessment, which ranged from 75-100%, where 75% was the lowest grade and 100% was the highest.

Cluster farmers to buyers

The farmers regarded their buyers as good business partners. Except for power and the control of information, farmers awarded their buyers with a grade of at least 80%. This implied that there was a good working relationship between farmers and buyers (Table 4).

More specifically, the farmers indicated that they had a high degree of confidence and trust in their buyers. Although some buyers only purchased small quantities, the deals were generally well arranged, open and transparent, and honest. Buyers seldom took advantage of the farmers especially during difficult times, like sudden decreases in prices or crop failure. Buyers always considered the best interest of the farmers since their concerns were always addressed.

Farmers revealed that they continued to transact with their preferred buyers because they made the best offer. Farmers were free to transact with other buyers, and indeed they often did if the preferred buyer could not take all of the produce they had available. Moreover, buyers were very generous in giving suggestions and advice to the farmers, particularly on production techniques.

Table 4: School-boy grades for the relationship between Impasugong cluster farmers and their focal buyers

Dimensions		Grade
Trust	Confidence	84
	Correct information	85
	Trustworthiness	84
	Consider my best interests	83
	Honesty	84
	Keep the promises	88
Power-dependence	Better offer	88
	Ease to transfer	85
	Power	76
	Control of information	76
	Freedom to adhere demands	85
	Dependency	84
Relationship-specific investments	Provision of education	85
	Openness to suggest	85
	Openness to advice	85
	Frequency of information	85
Satisfaction	Fairness of treatment	83
	Quickness to handle complaints	83
	Provision to adequate rewards	83
	Expectations met	80

Farmers to cluster

For the trust measures, farmers provided an average grade of 83%, which implied a high degree of trust was present among the cluster members. The farmers were confident that the cluster was working in their best interests. The others farmers could be relied upon to keep their promises (Table 5).

In terms of the power-dependence dimension, an average grade of 84% signified that the cluster members felt that they have the freedom to make their own decisions. There was little evidence of the exercise of any coercive power or the abusive use of power for personal gain. The group acted cohesively for the benefit of the entire group.

With regard to the relationship-specific investments, cluster membership provided access to the technical and marketing training that the farmers felt they required. Within the cluster, information was freely exchanged and group members felt that even as individuals, they had an opportunity to contribute.

With an average grade of 86%, the farmers believed that they had been treated fairly and equitably. Collectively, the cluster responded quickly to their complaints. Having received higher prices from the preferred buyers, the farmer's expectations had been met.

Chain analysis and gaps

Costs and returns at the farm level

During the initial period of cluster formation, disease infestation had a significant negative impact on productivity. On average, yields were reduced by as much as 90%. Whereas farmers expected to harvest 500-700 kg, one cluster farmer was able to harvest only 58 kg. Not unexpectedly, the costs of production and marketing (PhP 31.60/kg) were very high in relation to the anticipated returns (PhP 40.00/kg)(Table 6).

Table 5: School-boy grades for the relationship between Impasugong farmers and their cluster

Dimensions		Grade
Trust	Confidence	83
	Correct information	81
	Trustworthiness	83
	Consider my best interests	83
	Honesty	83
	Keep the promises	83
Power-dependence	Better offer	85
	Power	83
	Freedom to adhere demands	83
	Dependency	83
Relationship-specific investments	Provision of education	86
	Openness to suggest	86
	Frequency of information	86
Satisfaction	Fairness of treatment	86
	Quickness to handle complaints	86
	Provision to adequate rewards	86
	Expectations met	86

Table 6: Costs and returns during crop failure

Cost Component	**Amount (PhP/kg)**
Fertilizer	19.66
Pesticide	9.66
Materials	1.80
Marketing	0.15
Transportation	0.34
Total cost	**31.60**
Farm gate price/kg	**40.00**
Profit/ kg	**8.40**

Although the farmer still had a positive profit, with such a small quantity of fruit, the cluster lost its intended market. Farmers were forced to transact with buyers in a nearby public market where the prices were lower. Fortunately, one cluster farmer purchased seed of a superior variety of bitter gourd, which was found to be resistant to the disease. With support from the project, seed was distributed to the other farmers and production soon recovered. By the end of 2010, the cluster had harvested 1,790 kg of ampalaya at an average price of PhP25 per kg.

With the larger volume of production, cluster members were able to reduce costs of production and marketing. Despite the lower prices, the farmer's profit increased from PhP 8.40/kg to PhP 20.65/kg (Table 7).

Table 7: Cost and return of the cluster farmers using the superior variety

Cost Component	Amount (PhP/kg)
Fertilizer	0.84
Pesticide	0.85
Materials	1.22
Water	0.14
Marketing	0.09
Transportation	1.21
Total cost	**4.35**
Farm gate price/kg	**25.00**
Profit	**20.65**

Margins received by chain actors

Identifying the margins received by every chain actor is important to determine the effectiveness of clustering in the distribution of benefits. By looking at the transfer of margins through individual marketing, it could be said that the margins have been reasonable for both farmer and the buyer. At the farm-level, a margin of PhP 14.7 per kg was received, while at the wholesale-retail level, the margin was PhP 8.7 per kg (Figure 7).

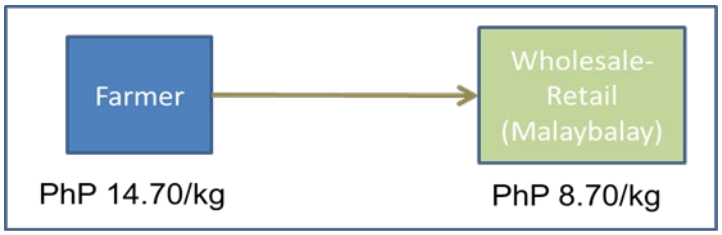


Figure 7: Profit margins received through individual marketing

With the implementation of cluster marketing, profit margins received by every chain actor have increased remarkably. At the farm level, the margin improved to PhP 19.4 per kg, while at the wholesale-retail level, a margin of PhP 9.16 per kg was received (Figure 8).

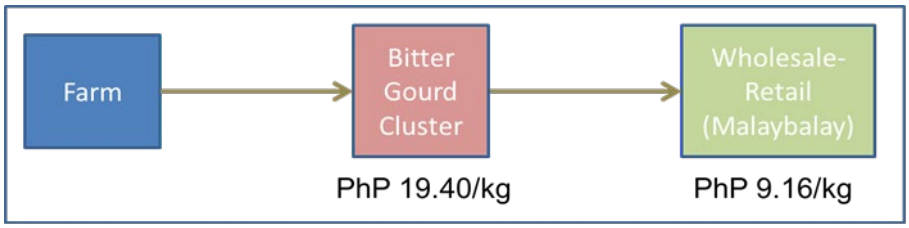


Figure 8: Profit margins received through cluster marketing

The increase in margin can be attributed to the better harvest of the farmers since they were able to increase their marketable yield using a superior variety. With the economies of size, production costs were spread across the greater quantity of fruit, thus improving the margins received by cluster farmers.

Losses along the chain

In 2009, the Impasugong cluster farmers experienced a massive crop failure. For this reason, farmers did not record the losses they incurred during the period. In 2010, only a few farmers were still producing bitter gourd. In 2011, having introduced the new variety, there was a marked reduction in the amount of losses at the farm level (Table 8).

Table 8: Losses at the farm level

Year	Field		Post-harvest	
	Kg	%	Kg	%
2010	12	0.8	2	0.1
2011	0	0	0	0

In the downstream marketing of the product, the losses were insignificant. According to the buyers, ampalaya is one of the most frequently purchased vegetables and thus the buyers could easily dispose of the product. However, losses did increase during the rainy season, primarily as a result of fruit cracking and discoloration (Table 9).

Table 9: Losses at the downstream level

Type of buyer	Location	Kg	%
Wholesale-retail	Malaybalay	0	0
Eatery	Impasugong	1	10
Wholesale-retail	Kisolon	5	6

11.1.9 Impact of clustering

Farmer evaluation of the clustering process

To evaluate the impact of clustering on the Impasugong cluster farmers, a survey was conducted in 2011. Farmers were asked to respond to each of the questions by indicating whether the variable had increased, decreased or stayed the same. According to the farmers, both their costs of production and the amount of waste or reject product had decreased as a result of their membership to the cluster (Table 10).

Production costs has declined as a result of improved production methods including the use of organic inputs which were less expensive and the use of superior varieties which had resulted in both an increase in production and the quality of the marketable yield.

There had been little if any improvement in the prices farmers received or in the number of people employed on the farm. Perhaps as a result of the market training, farmers understood that prices were determined by supply and demand, factors over which they had little control. Despite the increase in production, farmers were employing family labour which, in the absence of few alternatives, had a minimal opportunity cost. Presumably because the farmers had already built a strong relationship with their local government, cluster formation had little if any impact in improving the farmers access to government support.

However, there were a number of positive impacts attributed to clustering. These included an increase in income, yield, quality of vegetables, production and marketing skills, and social capital. More farmers were able to send their children to school from the extra income they received from cluster marketing.

Table 10: Clustering evaluation by Impasugong cluster farmers

Impact	Response
Income from vegetable production	Increase
Cost of production	Decrease
Total household income	Increase
Volume of vegetables produced	Increase
Volume of vegetables sold	Increase
Price received for vegetables	No change
Production losses/ wastage	Decrease
Quality of vegetables produced	Increase
Number of people employed on the farm	No change
Understanding of markets	Increase
Ability to negotiate	Increase
Decision making skills	Increase
Skills in horticultural production	Increase
Skills in post-harvest practices	Increase
Skills in pest & disease management	Increase
Skills in marketing	Increase
Skills in record-keeping	Increase
Leadership skills	Increase
Access to markets	Increase
Access to credit	Increase
Access to inputs	Increase
Relations with other farmers in the village	Increase
Access to farm-related government support	No change
Linkages with external partners	Increase
Number of school-aged children who could not afford to go to school before but are now able to go to school	Increase
Family health	Increase
Environment	Increase

Changes in farmer knowledge

One of the many impacts of clustering that could not be measured in monetary terms was the increase in knowledge. Before clustering, these farmers were producing and

marketing their produce individually. With the implementation of clustering, the notion of collaborative marketing was successfully introduced to the farmers which improved their skills in negotiation and bargaining. The farmers were more confident in dealing with potential buyers, but were more aggressive in taking advantage of opportunity to expand their market.

The concept of cooperation has been firmly instilled in the minds of the farmers. Collectively, they developed a number of strategic plans that to ensure the cluster would succeed beyond the duration of the project.

Changes in farmer practices

Cluster farmers had adopted a number of cost-effective measures as one way of managing their expenses. With the continuous rise in the cost of conventional fertilizers, farmers were able to supplement these with the application of organic fertilizers. The Kaanib Foundation taught the farmers how to make various concoctions derived from different plants and other local products, and how to use chicken dung and vermi-compost as part of their crop nutrient management protocols.

Changes in marketing practices

The cluster has been successful, together with other Bukidnon clusters, in negotiating an agreement with an institutional market in Davao. The cluster was tasked with the responsibility of delivering the bitter gourd.

Economic changes

Cluster farmers in Impasugong significantly increased their monetary benefits after joining the cluster. On average, the monthly income from 2010 to 2011 improved by 38%. This was mainly due to the increase in production as a result of the use of a superior variety. Having planted *Galatica*, the marketable yield of bitter gourd increased by 101% while the value of production increased by 119%. With the improvement in their income, the farmers were able to purchase additional farm animals and vehicles. Others had the capacity to repay outstanding loans to relatives and other farmers.

11.1.10 Conclusions

The clustering process has proven effective among the cluster farmers in Impasugong. Diverse benefits have been identified as a result of the implementation of clustering. Farmers were able to access different marketing channels, which gave them different price levels, and at the same time, they were able to negotiate with potential buyers. This allowed them to put into practice the learning they obtained from the various training programs they attended.

In terms of production, the farmers were able to access a superior variety of seed that enabled them to continuously produce bitter gourd and to attain a vastly better quality product for distribution to different market outlets. They had also been trained in a variety of different cost-effective measures, such as organic inputs and plant concoctions, so that they will be able to reduce their production expenses.

Cooperation between the cluster farmers and the project facilitators was a contributing factor to the success of the clustering process. It is very important that whenever development strategies are being implemented, active participation between the recipient and the facilitator is sought. By doing so, success is assured to go to those who most need it.

11.2 Samahang Magsasaka ng Kablon (SAMAKA)

11.2.1 Site description and group formation

Barangay Kablon is populated by more than 4,880 inhabitants, most of who are indigenous people belonging to the *B'laan* tribe (66%)(NSO, 2007). Kablon has a total land area of 1,004 hectares of which 700 hectares are devoted to agriculture (Kablon Barangay Profile). Some 65% of the households are engaged in farming.

Before the existence of the Kablon cluster, vegetable trading occurred on the roadside where itinerant traders would come to collect products. These would be brought to the wholesale market in General Santos, Koronadal or Davao.

One of the major problems encountered by the farmers was the instability in price, especially when prices suddenly declined. Generally, with few alternatives, farmers chose to sell their vegetables at whatever price they could get to avoid product spoilage. However, in September 2007, a group of passionate vegetable farmers wanted to change this trading arrangement and organized themselves into a group *Samahang Magsasaka ng Kablon* (SAMAKA).

Physical resources

Barangay Kablon, one of South Cotabato's main vegetable production areas, is situated on the western slopes of Mt. Matutum. Kablon has approximately 4,754 hectares of land area divided into eight *sitio*s at an elevation ranging from 140 – 1,000 m above sea level. Kablon is one of the 15 *barangays* of the Municipality of Tupi, South Cotabato.

The soil type ranges from sandy loam to rocky and the topography is characterized as flat to rolling terrain. Temperatures are generally cool, with no distinct wet or dry season. The average farm size of households is 2- 3 hectares.

Infrastructure and services

Farm sites in Kablon are mostly located away from barangay roads. From General Santos City, Kablon Crossing can be reached by bus in 30 minutes. From Kablon Crossing, it takes 10 - 15 minutes to reach Kablon proper by motorcycle. The transportation cost for vegetables is PhP 30-50 per ride.

Business activities

Vegetable farming is the primary source of livelihood for most households in Kablon. The most common vegetables produced include carrots, radish, Kentucky beans, cabbage, tomato, *chicharo*, bell pepper, potato, squash and *chayote*. Vegetables are planted either in patches or in 1 to 3 hectare lots. The area cultivated varies from season to season depending on the farmer's financial capacity. The vegetables are planted in rain-fed, open field areas. Production methods are still traditional and cropping decisions are based on market trends. Inputs such as fertilizers, seeds, pesticides and other products are bought in Tupi and General Santos City.

The barangay produces vegetables all year round with marketing as the main consideration for the timing of planting and harvesting. Kablon is capable of producing more varieties of vegetables because of the favourable temperate climate and low transportation cost from the farm to the market.

Partnerships

In 2009, Brgy Kablon was chosen as a research site for the ACIAR funded vegetable project Component 4. An orientation to the project was done in Poblacion, Tupi, South Cotabato, to identify potential partners. The Landcare Foundation of the Philippines Inc. (LFPI) was tapped to assist with capacity building, the implementation of the agro-enterprise plan, based on their experience with the Ned clusters, and the promotion and integration of the Landcare principles into the prevailing farming system. The Integrated Cooperative Towards Unified Services Inc. (ICTUS), a micro finance institution, was tapped to provide a source of finance to procure the production inputs needed by the farmers and to establish a financial recording and management system. The Tupi Municipal Agriculturist Office was tapped to assist with the provision of a venue for the training programs, production technology, capability building, and monitoring and evaluation. The Provincial Agriculture Office provided material support in terms of vegetable seeds, production technology and capability building. The East West Seed Company provided support for the establishment of a demonstration farm in Kablon. CEMIARC assisted in the establishment of the demonstration farm, production technology and marketing assistance through AMAD. The Barangay Council of Kablon assisted with the selection of farmers and the Tupi Municipal Agriculturist Office (TMAO) recommended the SAMAKA group to the project.

Initial farmer working group

Three clusters were formed and organized during the first 3 months of the project intervention. Some 27 farmer-members of SAMAKA joined the collective marketing activities with carrots, sweet pepper and cabbage as their chosen vegetables.

11.2.2 Product supply assessment and selection

Membership profile

Seventeen respondents were interviewed in three clusters: 5 respondents for the cabbage cluster, 6 respondents for sweet pepper, and 6 respondents for carrots. All respondents were male. Most respondents (88%) were married with an average of 3 children in each household. The average age of the respondents was 42 years and the average length of residency in the barangay was 21 years. Some 23% of the respondents had reached an elementary level of education and a further 23% had graduated from elementary school. Most of the respondents (71%) were Catholic.

Farming was the major source of household income. Other source of income included hauling, land rental from fresh produce exporters and honorariums as a barangay official. The average monthly household income was PhP 6,970. On average, respondents had been farming for 22 years.

Farm production

The respondents grow cabbages, tomatoes, cauliflower, spring onion, chayote, carrots, potatoes, squash, Chinese pechay, radish and eggplant. Other crops include bananas, coconut, durian, jackfruit, coffee, pineapple and avocado.

The common farm tools used by the farmers include: a *lagaraw* - single-edged flexible long sword with a bent tip (83%), a *sadol* (hoe) (76%), a sprayer (76%), *arado* – (plough)(58%), daro (35%), *guna* – knife for digging out roots and weeding (12%), a rake (18%) and a *karas* - scythe for cutting grass (18%). Some 59% of the farmers owned one or more horses and 41% owned a carabao.

The common fertilizers used in the area included: Complete (100%), urea (65%), sulphate of ammonia (41%) and potash (29%). Some were using chicken dung (29%), compost (24%), guano and vermicast, particularly as a basal application.

The most commonly used pesticides included Pribaton (65%) for worms and insects, followed by Selecron (53%) for fruits flies, Dices (29%) for diamond-back moth, Lannate (29%) for cutworms, Bushwhack (18%) for aphids, worms and butterflies, and malathion (18%) for bugs and worms. Dithane (24%), Daconel (18%), and Ridomil (18%) were the fungicides most often applied. Some farmers were using detergent bars, chilli juice, gasoline, and *ipil-ipil* extracts to discourage pests and insects.

Some 47% of the farmers practiced contour farming to prevent soil erosion.

The major problems farmers experienced included pests and diseases (71%), hot weather (18%), the lack of finance to purchase farm inputs and the low buying price.

Marketing practices

Most of the respondents (65%) were using their own money to finance their vegetable production. The remainder sourced finance from informal institutions, neighbours and traders. Product was sold to the traders and *jambolero* in *Sitio Glandang* and Brgy Kablon proper and direct to wholesalers and retailers located in the General Santos public market (Figure 1).

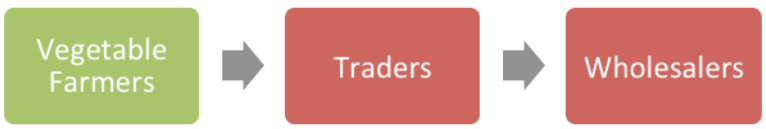


Figure 1: Traditional market chain

The mode of transportation was by truck (88%), with the produce packed in sacks (76%) for cabbage and sweet pepper, wooden crates for tomatoes, and cartons for cauliflower. The mode of payment was primarily cash.

11.2.3 Market assessment

Rapid market appraisal results

Part of the clustering approach is to provide knowledge and skills among farmers on the basic concepts of marketing through market visits. In Barangay Kablon, 21 farmers were given some basic training on how to conduct a market chain study and interview potential buyers to obtain information regarding their requirements. Role players were used for the members to practice their interview skills before visiting the markets. Farmers visited the public markets and supermarkets in General Santos and Koronadal, interviewing wholesalers and institutional buyers such as supermarkets and restaurants.

Buyer comparison

After returning from the market study the participating farmers presented the results of their market intelligence back to the larger group. Members of the cluster were able to gain information about a number of products (Table 1).

Table 1: Market survey with institutional and wet market buyer

	Institutional Buyer	Wet Market
Buyer	Canning processor	Wholesalers
Crop	Carrots, cabbage, sweet pepper	Carrots, cabbage, sweet pepper
Month when in high Demand	All year round	All year round
Price/kg	Cabbage - PhP 30/kg Carrots - PhP 65/kg Sweet pepper - PhP 60/kg	Cabbage - PhP 15/kg Carrots - PhP 50/kg Sweet pepper - PhP 45/g
Quality Required	Good quality, no physical damage	Good quality
Packing Requirements	Sacks	Sacks
Frequency of Purchase	Once a week	Everyday

11.2.4 Cluster formation and planning

During the briefing and orientation in the project area, 21 vegetable growers signalled their interest in participating in the formation of 2 clusters.

Initial marketing plan

Based on their agro-enterprise plan, the Kablon clusters planned to sell their vegetables to the consolidators for processing and to wholesalers in the General Santos public market (Table 2).

Table 2: Agro-enterprise plan 2009

	Carrot Cluster	Cabbage Cluster	Sweet Pepper Cluster
Target market	Consolidator and wholesaler	Wholesaler	Consolidator and wholesaler
Sales Volume	3 tonnes per week	0.50 -1 tonnes per week	0.60 tonnes per week- good quality 0.15 tonne per week - reject
Price/kg	PhP 15.00	PhP 8.00	PhP 45- 60.00

Payment Arrangement	Cash	Cash	Cash
Promotion	Give sample to buyer	Give sample to buyer and meet them	Bring samples during negotiation, share to other partners

Cluster farmers identified potatoes, carrots, sweet pepper and cabbage as the products for agro-enterprise development following the clustering approach. In order to know the capacity that individual growers could provide, an enterprise planning workshop was conducted for the cluster members.

Initial production/supply plan

During the initial agro-enterprise plan, 8 farmers agreed to plant cabbage, 9 farmers to plant carrots and 8 farmers agreed to plant sweet pepper. The estimated production for one cycle was 1.5 tonnes for carrots, 10 tonnes of cabbage and 18 tonnes of sweet pepper.

Operational flow

In Kablon cluster, the following flow of activities was prescribed from planting to marketing their vegetables (Figure 2).

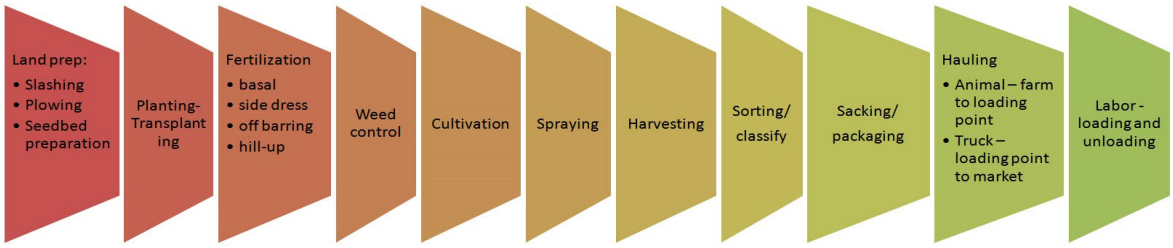


Figure 2: Operational flow

Initial management plan

The Kablon cluster had a very simple organisational structure. SAMAKA, through its cluster leader, was in charge of the operation of the cluster. The marketing officers were farmers who were responsible for consolidating the harvest of other farmers (Figure 3).

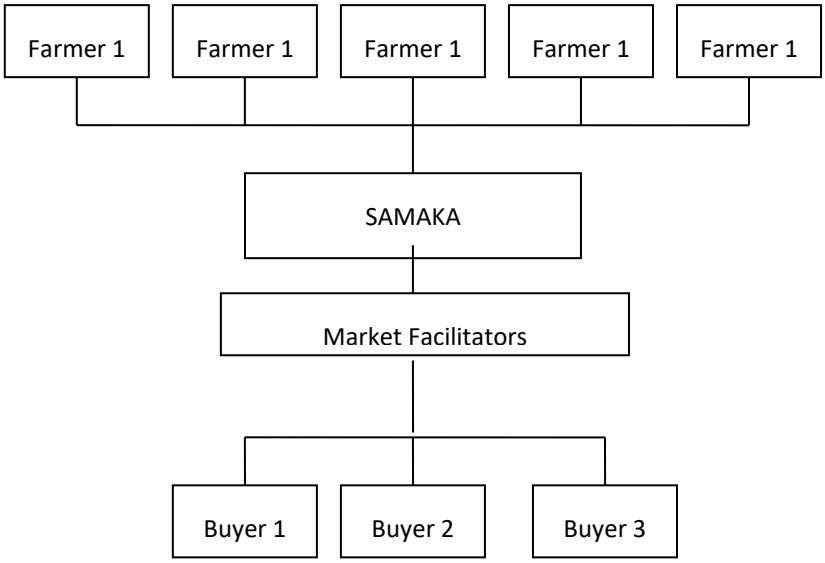


Figure 3: Organisational structure

The responsibilities of the market facilitator included the collection of payment for the produce. In return, the market facilitators receive a 5% commission on the gross value of the sales as compensation.

To ensure the efficient operation of the cluster, a number of rules were established:

Farmer's shoulder all expenses during marketing

Obliged to give 10% of the net sales revenue for their product: 5% goes to market facilitators and 5% to a cluster fund

Product labelling and coding

Regular assessment after delivery

Records to be regularly updated and open to all members

Finances must be deposited in a bank account

Initial financial plan

Based on their financial plan, the Kablon clusters expected to earn from PhP 10,000 to as much as PhP 251,000 (Table 3).

Table 3: Financial Plan

	Carrots	Cabbage	Sweet Pepper
Target Volume	1,500 kg	90,000 kg	14,400 kg
Good quality			3,600 kg
Reject			
Resiko (30% of the total volume)	-	27,000 kg	
Total Volume- Resiko	-	63,000 kg	
Target Price	15.00/kg	8.00/kg	
Good quality			20/kg
Reject			12/kg
Expected Total Gross	22,500	504,000	339,840
Cost			
Fertilizers, chemicals and seeds	5910	63,810	79,133

Labor (planting to harvesting)	5,500	13,900	167,733
Other inputs	-	125,100	-
5% SAMAKA share	1,125	25,200	16,992
5% market facilitator	1, 125	25,200	16,992
Total Cost	12,535	253,210	280,850
Total Income	9,965.00	250,790	58,990

Initial product quality management plan

To protect the products, farmers planned to prevent pest infestation and to utilize sacks and cartons as packaging to protect the produce from bruising. Product was to be graded after harvest to ensure it met the buyers specifications.

11.2.5 Test marketing

In January 2010, carrot, cabbage and sweet pepper seed were distributed to 25 farmers of SAMAKA with an understanding that all cluster members were to pay back to SAMAKA, the corresponding amount of seeds they received. However, due to heavy rains, 60% of the seedlings failed to germinate.

Evaluation of trial delivery

With only a small volume of vegetables available to the cluster, most of the farmers sold their produce directly to wholesalers, bypassing the market facilitators to avoid being charged the 5% marketing levy and the 5% contribution to the cluster fund. As the distance from the farm to the market was so close, farmers had no difficulty in selling their vegetables by themselves (Figure 4).

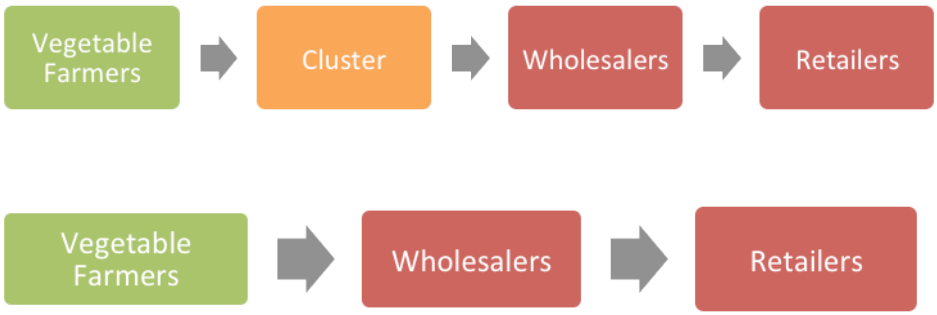


Figure 4: Initial cluster chains

From 2009 to 2011, the Kablon clusters delivered 4,470 kg of cabbage, 308 kg of sweet pepper, and 1,089 kg of carrots, to generate sales worth PhP 114,940. Only a small volume of produce was consolidated by the cluster and sold to wholesalers due to several problems. These problems included crop failure due to pest and diseases infestation, drought, difficulties experienced in timing production schedules, instability of market price, inability to maintain good quality and inconsistent delivery volumes.

Table 4: Actual vs planned deliveries 2010

Crop	Total kg		Ave. price/ kg		Gross sales	
	Plan	Actual	Plan	Actual	Plan	Actual

Cabbage	90,000	4,470	8	15	504,000	67,050
Carrots	1,500	1,089	15	31	22,500	33,759
Sweet pepper	18,000	308	20	29	339,840	8,932

One of the initial problems the SAMAKA cluster faced was the refusal by ICTUS to extend loans to farmers on the basis of slow repayments among other farmer groups in the province. In response, MAO Tupi introduced the Enterprise Bank – a micro financial institution servicing South Cotabato that could provide lending services to organized farmers, but this too failed to materialize.

However, in October, MAO Tupi were able to provide 8,000 tuberlets of clean potato seed to SAMAKA from NOMIARC in Bukidnon. Through a series of farmer field schools, cluster members were equipped with the knowledge and skills to reduce the incidence of pests and diseases in their production area.

Establishment of a bagsakan area

General Santos City is one of the major market outlets in Region XII. In 1996, the City Government of General Santos established a bagsakan centre to provide a space for those farmers who wanted to sell their products to the public. The City Government leased the bagsakan area to the City Food Terminal Multi-Purpose Cooperative (CFTMPC). Where an individual or organized group wants to acquire a space in the bagsakan, their application must be approved by CFTMPC and they must follow all the terms and conditions. The idea of establishing a vegetable trading centre was seen as providing unbiased price information, a sufficient volume of supply and establishing good rapport with wholesale consolidators and other walk-in buyers in the bagsakan area. Direct marketing can also give the individual farmer a greater share of the consumer peso and possibly a higher return on each unit sold.

Of the 27 cluster members, 9 decided to participate in the operation of a trading centre. The trading centre not only sold vegetables from the cluster, but also purchased products from other farmers within the barangay.

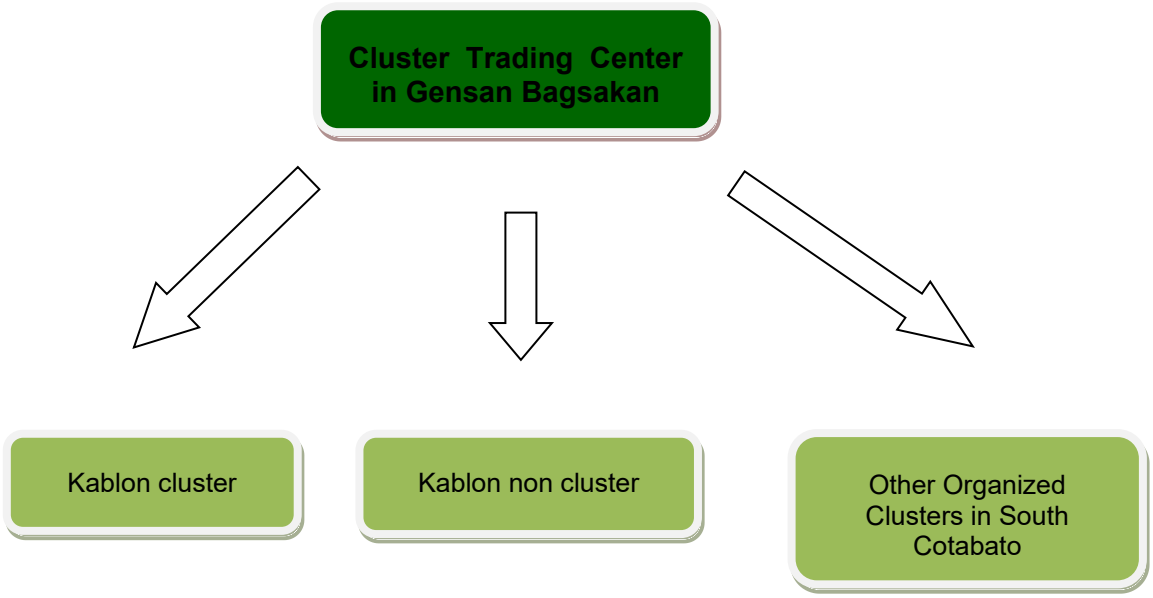


Figure 5: Sources of supply for bagsakan area

The trading center was managed by: an operations manager, treasurer, bookkeeper, purchaser, sales clerk and auditor. Operating the bagsakan centre helped the cluster members become more aware of the reasons for the price variation in the market, because they had experience in both buying and selling vegetables to wholesalers and retailers. Cluster members also established relationships with other buyers and consolidators since staff acted as traders in the trading centre. However, late in 2011, the cluster stopped trading vegetables because of the shortage of capital. The lack of capital prevented management staff from purchasing all the products they needed within the barangay, because non-cluster members demanded cash on receipt of their products. Another challenge was the continuous heavy rain that caused crop failure and poor quality vegetables.

11.2.6 Scaling up or scaling down

Despite these problems, the cluster remained strong as a farmer group. The cluster realized that these problems could be solved if they were to have a vegetable consolidation and trading centre where they could source produce from other clusters and farmers and they explored other crops such as potatoes.

Originally, Kablon was to have three clusters, but by 2011 it had reduced to only two with 18 members. The decline in numbers was the result of a crop failure during the first production cycle.

Despite the absence of an agro-enterprise plan the SAMAKA clusters were able to sell fresh vegetables individually to wholesalers and retailers in General Santos (Table 5).

Table 5: Actual against plan

Crop	Total kg		Ave. price/kg		Gross sales	
	Plan	Actual	Plan	Actual	Plan	Actual
Potatoes	21,000	12,541	25	33	525,000	413,853
Cabbage	-	15,250	-	15	-	228,750
Lettuce	-	77	-	55	-	4,235
Radish	-	7,840	-	16	--	125,440
Tomato	-	7,375	-	11	-	81,125

11.2.7 Cluster assessment

Organisation development

A rating of 3.0 suggests that the Kablon cluster can function adequately and that they have regular monthly meetings. However, they failed to function to consolidate their product as a group and failed to develop market plans. There was no regular assessment of activities against objectives.

Market position

A rating of 3 suggests that the market is developed. Cluster members were able to access more institutional buyers who could offer them a better deal, but the group had failed to establish any long-term arrangement. They had also introduced new crops – potatoes – to capture capture an emerging opportunity. Having operated the bagsakan centre, farmers now had a better understanding of market dynamics and the manner in which prices were determined.

Supply capacity

Initially after one year, production protocols were in place to maintain a reliable supply of good quality products. However, the farmers failed to meet their objectives because of technical production problems.

Financial resources

Before clustering, the farmers depended upon their own capital to purchase the inputs they required to grow their intended crop. Collectively, through their limited transactions with the bagsakan centre, basic record keeping skills had improved and financially, the cluster had established a consolidated account through charging a service fee.

Management capacity

There was a cluster leader and management team with assigned duties and tasks to perform.

Activities conducted to strengthen the cluster

Different capacity building activities were provided to the Kablon cluster to equip the farmers with the appropriate skills and knowledge to ensure the long-term sustainability of the cluster, even after the project had concluded. The capacity building activities were supported by other partners including the Landcare Foundation of the Philippines Inc and the Tupi Municipal Agriculture Office. These activities included basic market training, market visits, cluster enterprise planning, buyer negotiation, field tours, crop protection training and leadership training.

As a result of clustering, farmers reported that:

- it was more easy to access support from different agencies including local government units, Office of Municipal/Provincial Agriculture Office and non-government organizations
- the group had bargaining power to negotiate with buyers. Before clustering they were individual farmers who relied heavily on what the traders dictated in terms of pricing.
- know how to produce and market quality products. Before they try to deceive the buyer by not delivering good quality products, but now they see the importance of maintaining long-term relationships
- management skills have been enhanced
- changes in the farming system such as the use of a planting calendar. This was not widely practiced before clustering. The use of a planting calendar enabled the farmers to anticipate income better, for they planted the crops in anticipation of the market needs. With appropriate technology given by Landcare and the LGUs, they were also able to implement improved soil erosion measures
- they know more traders and consolidators and have more alternative markets
- they know more suppliers of farm inputs
- farmers were more aware about the prices and buyers requirements

11.2.8 Conclusions

The cluster marketing approach adopted in Kablon was successful because of the farmers' flexibility in facing obstacles like crop failure. Another key success factor was the strong support of local government units. Farmers had increased their technical and marketing knowledge and improved their farming and marketing practices because of clustering. The benefits of clustering had significantly improved income, especially after the farmers had engaged in potato production.

The failure of the cluster to sustain collective marketing was attributed to geographic proximity to the market. As suggested by Murray-Prior (2007), collaborative marketing groups will only be successful where they have some comparative advantage. As it was relatively easy and inexpensive for the farmers to individually send their produce to market, there was little need for the cluster to consolidate the product. In this instance, the greatest benefits arising from clustering where in the provision of technical advice and access to inputs such as improved potato seed.

11.3 Kilapagan Gardeners Association

11.3.1 Site description and group formation

Sitio Kilapagan is one of seven sitios of Barangay Can-ayan, Malaybalay, the capital city of Bukidnon Province, in Mindanao, the Southern Philippines. The barangay, which is composed of five *purok*, has a total land area of 13,090 ha of which 10,189 ha is forest land while the remaining 2,284 ha are classified as alienable and disposable. In terms of land use, approximately 88% (502 ha) is devoted to agriculture, while the remaining 12% is allocated to commercial, residential and recreational uses. The barangay also manages two watersheds, the Samwinit and Kilaogawan.

In 2008, the population of Barangay Can-ayan had reached to 4,995 of which 19% resided in Sitio Kilapagan. Can-ayan is 7 km from Malaybalay and is readily accessible by motorcycle, locally termed as *habal-habal*.

Farming is the main source of livelihood among households in Barangay Can-ayan. The agricultural products grown in the area include corn, rice, sugarcane, and assorted fruits and vegetables, specifically *lanzones*, banana, durian, mango, rambutan, squash, tomato and sweet pepper. Other than this, some residents own commercial establishments such as sari-sari store, while others are employed in mat weaving, soft broom making and the making of wooden products.

In March 2010, ACIAR-Component 4, headed by Mr. Dante Apara, presented a proposal to the Barangay Can-ayan Council to conduct a clustering orientation among residents in Sitio Kilapagan and to formally introduce the purpose of the project. Selecting the current site was initially recommended by the Bukidnon Cooperative Bank (BCB), as some residents in the area were clients of the bank. After a positive response from the barangay council, a clustering orientation was undertaken in April, which was attended by more than 30 residents in Sitio Kilapagan and neighbouring puroks.

During the orientation, Mr. Apara explained what the clustering approach was and how farmers could benefit from it. He then discussed the CRS Eight Steps clustering approach for agro-enterprise development. After the cluster orientation, those farmers who wished to become part of the cluster were trained in the basic concepts of marketing. They were exposed to the wholesale market in Agora, Cagayan de Oro City. Afterwards, farmers selected prospective buyers for the products they intended to grow. From the humble beginnings, the Kilapagan Gardeners Association was formed.

At present, the Kilapagan Gardeners Association is comprised of two clusters in Purok 6 and 7. Thirteen (13) farmers have pledged their support to the cluster and collectively, they have also elected officers for the association.

11.3.2 Product supply assessment and product selection

Membership profile

The Kilapagan Gardeners Association is located in Barangay Can-ayan, Malaybalay City, at an elevation of 830 m above sea level.

The mean age of farmers is 37 years old. On average, cluster members have been living in Kilapagan for more than 20 years. The average number of household members is 4, which includes 2 children. In terms of educational attainment, most farmers have at least 7 years of formal education. Most of them are Baptists. Aside from the cluster, farmers are also members of other organizations like church-based affiliations and civic groups.

Farming is the main source of livelihood. The average monthly household income is PhP 4,000.

Farm production

Most farmers have two areas devoted for crop production. The average farm size is 3 ha where the dominant terrain is described as rolling. Most farmers own their land, allowing them to diversify their production: vegetables, root crops, corn and fruits.

Farmers use a variety of hand tools including a scythe, plough, wedge, bolo and spade. Both cows and water buffalo are utilized in preparing the soil for planting. Farmers use complete fertiliser, sulphate of ammonium, urea and chicken dung. These are applied at least one time per cropping period as a basal and side-dressing. The most frequently used pesticides include mancozeb and lambdacyhalothrin. Application is done at least one time per week from transplanting until the start of harvest. To prevent soil erosion, farmers have already implemented contour farming and crop rotation as a means of disease mitigation.

Financing

The Kilapagan cluster farmers use a variety of means to finance their production. Aside from self-financing, one had previously gone to a financier while other farmers went to the BCB and other banks.

Marketing

The majority of buyers prefer products to be delivered to their selling area. In most cases, the produce is either brought by animal or manually hauled to a consolidation area before loading the produce into a jeepney. The most common packaging materials in the area include sacks, boxes and baskets. Payment is either made cash-on-delivery (COD) or in subsequent installments after the product has been sold.

Product selection

During the product supply assessment, farmers in Sitio Kilapagan were asked what vegetables were most commonly grown in the area. They cited 12 vegetables, with the corresponding price range and average volume harvested in a cropping season (Table 1).

Table 1: Crops grown in Sitio Kilapagan (one cropping period)

Crops	Average Volume Harvested (kg)	Average Farmgate Price (PhP/kg)
Tomato	75,000	15
Cabbage	20,500	13
Squash	20,000	6
Chinese cabbage	20,000	13
Sweet pepper	15,000	45
Eggplant	10,000	14
Cucumber	10,000	10
Baguio beans	10,000	13
Bitter gourd	5,000	18
Pechay	1,000	13
Spring onion	1,000	20

Most of these vegetables were classified as lowland types, but there were some high-value crops such as cabbage and tomato.

11.3.3 Market chain assessment

Rapid market appraisal

In May 2010, the Kilapagan farmers were exposed to potential buyers in the Agora wholesale market in Cagayan de Oro City. After splitting into two groups, farmers were asked to interview prospective buyers using a structured questionnaire developed by the CRS. During the market visit, farmers were able to interview 11 buyers, most of whom sourced their product from Bukidnon and Misamis Oriental. Products were delivered to their warehouses where the suppliers were paid on-the-spot pricing at the prevailing market price. Most buyers had no specific quality standards for the vegetables they purchased, while others classified the product into three classes: Class A, B and C. To maintain the desired quality, farmers had to pack the produce as directed by the buyer. For example, each broccoli head should be wrapped in clean paper before placing it in a box.

Prices were not fixed, even on an hourly basis. Changes in supply and demand could occur at any time. From this reason, buyers found it difficult to tell the farmers in advance of the prices they were prepared to pay.

For most of the farmers, this was the first time that they had conducted this kind of activity. Interviewing a number of buyers in the Agora market was helpful for it provided the farmers with an idea about the dynamics of the market and how to deal with people. The activity has provided an opportunity for the farmers to build their rapport with prospective buyers for they would meet many of these people again during test marketing.

Initial chain map

Before clustering, farmers in Sitio Kilapagan relied heavily on three buyers from Malaybalay (Figure 1). One was a warehouse operator who usually offered them a higher price for their vegetables. There were also wholesalers and consolidators who have been their *suki* or frequent buyers not only for their vegetables, but also for other crops like corn and rice.

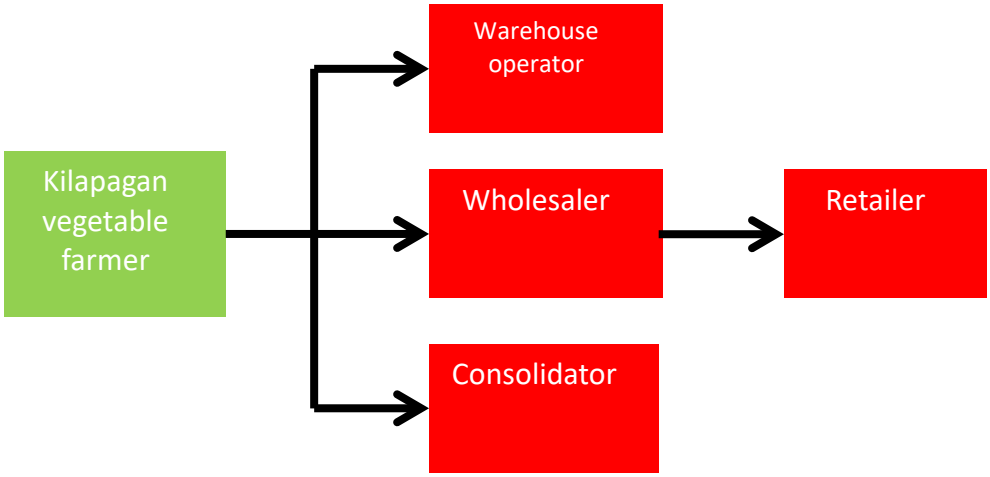


Figure 1: Pre-cluster chain map

Buyer comparison assessment by farmers

According to the farmers, all buyers they met had preferred suppliers or *suki*. At no time where vegetables scarce, nor did they stop trading, even for a day, because their stalls in the Agora market were always open.

When using a sack to pack the vegetables, the buyers required their suppliers to put banana leaves inside the sack to help retain the moisture levels. They also advised their suppliers to wait for their produce to be sold, rather than to take payment immediately after delivery since prices could change from time to time and they might get a higher price if they were willing to wait. There was no particular time of the day when the farmers should deliver: the only requirement was that they continue to deliver good quality product. Suppliers could arrange for their produce to be picked up from their consolidation area or some place that was feasible for both parties. Where farmers did require cash-on-delivery (COD), buyers would deduct PhP 3 per kg as a rental. However, farmers could wait to be paid after the produce had been sold.

Farmers enquired about the different prices paid for selected vegetables in the Agora market. Not only would this help the farmers to decide what kind of vegetables to grow, but it also identified any seasonal variation in price and the demand. The vegetables that offered the highest prices were potato, sweet pepper, carrot and onion.

The farmers also noticed that all buyers were using the same telecommunications carrier, thereby making it more convenient and less expensive to talk.

Support needed

Vegetable seeds were provided to the Kilapagan cluster to enable to start cultivating squash, eggplant and sweet pepper. These three vegetables were familiar to the farmers and in terms of production skills, the farmers felt they were proficient. The farmers specific varieties for each crop; Suprema for squash, Casino 901 for eggplant, and Smooth Cayene for sweet pepper.

In addition, the cluster was also given material support in the form of a knapsack sprayer and a calibrated weighing scale to make sure that they had an accurate measure of the quantity of vegetables produced.

11.3.4 Cluster formation and planning

The Kilapagan Gardeners Association is composed of two sub-clusters. However, they only have one set of officers who govern the management of the cluster, implement the rules and policies, and provide services and assistance to the members.

Cluster's set of officers

The establishment of the cluster would be incomplete without electing a set of officers who will govern the affairs of the cluster (Table 2).

Table 2: Kilpagan cluster officers (2010-2011)

Cluster Leader	Eddie Suguihan
Asst. Cluster Leader	Pastor Rudy Yandong
Marketing Officer	Roel Suguihan
Asst. Marketing Officer	Danilo Datu
Secretary	Dante Suguihan
Treasurer	Editha Ratunil
Auditor	Elvira Suguihan
PIO (Purok 6)	Rolando Lambon
PIO (Purok 7)	Alita del Rosario

Cluster policies

The Kilapagan farmers developed a set of rules and regulations that were to be followed by all members:

- Regular meeting every first Monday of the month at 3:00 pm.
- Seeds will only be distributed to the members who have already tilled their farmlands. The cluster leader and the assistant cluster leader will inspect farms prior to the distribution of seed.
- Harvesting should be done in a coordinated manner.
- From the net income received by each cluster member, 10% will be deducted to establish a cluster fund.
- The marketing officer will be given PhP 1 per kg for every product delivered to him.
- Products should be sold collectively, not individually

Members can avail loan services from the cluster, only if the service will be used for production purposes. 5% interest will be applied for all loans.

Agro-enterprise plan

For the Kilapagan cluster farmers, the agro-enterprise plan they developed included a market, supply, financial and management plan.

Market plan

Based on the results derived from the market survey activity, the farmers identified three prospective buyers. Farmers were asked about the estimated harvest one could achieve by focusing at least one crop identified (Table 3).

Table 3: Initial market plan (July 2010)

Target Market	Agora Market, particularly Ike Ladra (Ike Vegetable), Sarah Enoc (Sarah Vegetable) and Winlove Lastimoza Test deliveries will start on August or September (assuming that production will start on June)
Product	Product form: sweet pepper, squash and eggplant Quality specs: classified Packaging: sack (with banana leaves), carton/box, wooden crate
Target Sales	Estimated harvest to be consolidated (kg): Squash – 3,000 Eggplant – 2,000 Sweet pepper – 2,500 Buying price (PhP) per kg (lowest): Squash – 3.00 Eggplant – 8.00 Sweet pepper – 15.00 Projected sales: PhP 9,000 for squash PhP 16,000 for eggplant PhP 37,500 for sweet pepper

Financial plan

Each farmer was asked to estimate the costs incurred in producing the three identified crops. The production expenses included fertilizers, insecticides and labor (Table 4).

Table 4: Initial financial plan (July 2010)

	Squash	Eggplant	Sweet Pepper
Target volume (kg)	3,000	2,000	2,500
Buying price (PhP/kg)	3	8	15
Expected total gross returns (PhP)	9,000	16,000	37,500
Production costs (PhP)			
Seeds	1,800	940	650
Fertilizer 14-14-14 21-0-0 46-0-0 0-0-60	 1,100 500 930	 375	 2,200 1,000 950
Insecticide Karate Manzate Lannate Selecron Ratkill	 325 420	 1,680 2,800	 1,260 1,400 664 40
Labour	720		
Total expenses (PhP)	5,795	5,795	8,665
Gross margin (PhP)	3,205	10,205	28,835

For squash production, farmers were applying 50 kg of complete fertilizer (14-14-14), urea (46-0-0) and ammonium sulphate (21-0-0). To control pests and diseases, farmers used both Karate and Manzate. During harvest, farmers employed two farm workers. Collectively, the estimated production cost was PhP 5,795. If farmers were to harvest 3,000 kg of squash at PhP 3 per kg, they would earn PhP 9,000. After costs, the gross margin was PhP 3,205.

For eggplant, the production protocol included 25 kg of ammonium sulphate and 6 kg of Manzate and Lannate. Farmers chose not to hire any farm workers since the harvesting of eggplant could be facilitated by themselves or other family members. The estimated production cost was PhP 5,795. If 2,000 kg were harvested at PhP 8 per kg, the gross revenue were PhP 16,000. After costs, farmers could earn a gross margin of PhP 10,205.

For sweet pepper, farmers applied 200 kg of complete fertilizer and ammonium sulphate and 25 kg of potash. Since sweet pepper is a host for more pests and diseases, three chemical brands were used: Manzate, Lannate and Selecron. Sweet pepper had the largest production cost of PhP 8,665. However, if farmers could harvest 2,500 kg at an average price of PhP 15 per kg, they could expect to earn a gross revenue of PhP 37,500. After costs, the farmers expected to earn a gross margin of PhP 28,835.

Supply plan

A supply plan was formulated to estimate the volume that each farmer would harvest for each crop (Table 5).

A total of 12 farmers indicated their willingness to commit to the production of 36 tonnes of squash; 9 farmers volunteered to plant and harvest 18 tonnes of eggplant; and 5 farmers committed themselves to the production of 12.5 tonnes.

Table 5: Initial supply plan (July 2010)

Cluster member	Crops to be grown		
	Squash	Eggplant	Sweet Pepper
Purok 6			
Editha Ratunil	Y	Y	
Eddie Suguihan	Y	Y	
Elvira Suguihan	Y	Y	
Pastor Rudy Yandong	Y	Y	
Manuel Yandong	Y	Y	
Dante Suguihan	Y		
Jessa Lambon	Y	Y	
Roel Suguihan	Y	Y	
Rolando Lambon	Y		
Dante Quinal	Y		
Eddie Boy Suguihan		Y	
Marlon Oging		Y	
Purok 7			
Danilo Datu			Y
Benroy Datu Sr.			Y
Judy Docinos			Y
Alita del Rosario	Y		Y
Carmen Lindaban	Y		Y
Total number of suppliers	12	9	5

11.3.5 Test marketing

Trial delivery

When the Kilapagan cluster farmers delivered their squash for the first time in October 2010, they experienced a buying price of just PhP 1 per kg. The reason for the low price was a significant over supply. However, in the succeeding deliveries, the price did manage to reach PhP 2 per kg, which was very timely as more squash were being harvested at that time. For eggplant, the price settled at an average of PhP 8 per kg. By the end of October 2010, the first month of the trial delivery period, the cluster has harvested 2,021 kg of squash and 87 kg of eggplant.

For sweet pepper, production was less favourable as the farmers experienced fewer harvests than expected. The reduction in yields was due to some external factors such as disease and mismanagement. By the end of April 2011, they had harvested only 90 kg of sweet pepper.

Second cycle of production

The succeeding months proved very favourable for the farmers, as the prices went up as high as PhP 18 per kg for squash and PhP 15 per kg for eggplant. By that time, farmers were harvesting a large volume of the two crops.

Since farmers had already recognized the importance of continuity of supply, most farmers had already started their second cycle of production. Others were even preparing for their third cycle. This scenario was made possible since farmers now had the means to purchase their own seeds.

Evaluation of trial delivery

During the first year of trial marketing, the Kilapagan cluster farmers produced 7,157 kg of squash (PhP 15,950) and 828 kg of eggplant (PhP 6,624). In the subsequent harvest period, the production of squash increased to 19,187 kg (PhP 129,630) and 3,993 kg (PhP 38,617 of eggplant.

The Kilapagan cluster chose to transact with three buyers (Figure 2). The Malaybalay wholesaler-retailer became the cluster's most frequent buyer as they both resided in the same city. Farmers had to transport their products for at least 20 minutes either by a jeepney or motorcycle. If they had an ample supply of products, the cluster would sell to a retailer in Cagayan de Oro. On occasions, a consolidator would arrive from Tacloban (Leyte) who would travel to the farmer's area to purchase squash. Usually, this buyer offered the highest price but he would come only when there was a shortage of product in the Visayas.

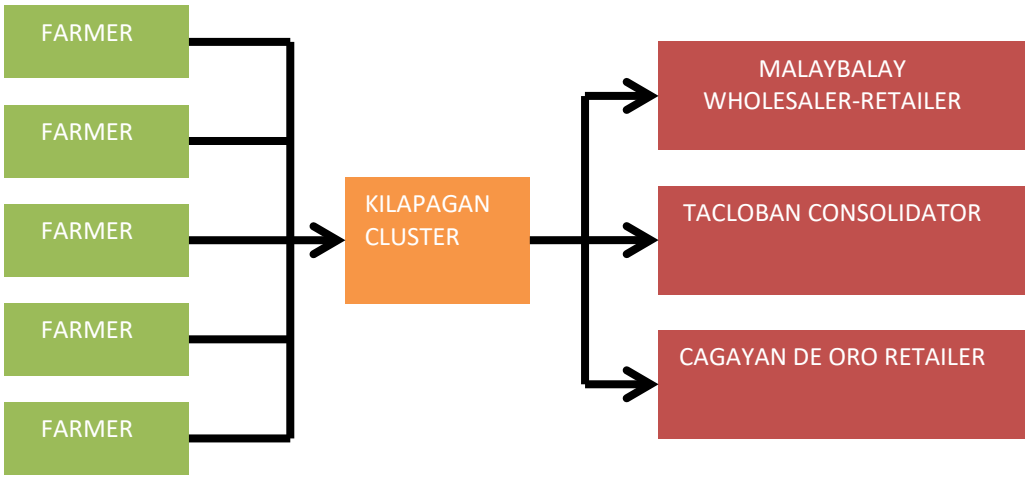


Figure 2: Kilapagan cluster chain map

When the Kilapagan cluster farmers developed their supply plan, they anticipated that they would produce 36,000 kg of squash, 18,000 kg of eggplant and 12,500 kg of sweet pepper. However, as they executed their production protocols, they experienced numerous challenges. One of these was crop failure, due to disease, especially for sweet pepper, so they decided not to produce this vegetable. Farmers suspected that due to some uncontrollable weather events, they were not able to achieve their target production. Many said that they used to harvest more vegetables than what they were currently producing. However, they did not discount the fact that some of them were producing at a slower pace. With more experience, some would choose to plant at a different time in anticipation of higher prices. Nonetheless, all of the farmers agreed that only through continuous production could they hope to reach production target. Having reached their production target, the cluster farmers decided to focus more on producing squash and eggplant since they already have an established market for these two vegetables. Nevertheless, the cluster included cucumber as a priority crop.

11.3.6 Scaling up

Membership changes

After one year of operation, the Kilapagan cluster has achieved continuous production and increasing sales. However, the low buying price led some farmers to withdraw from the cluster after just one cropping season. They revealed that they had been unable to recover the money they had spent. However, most farmers recognized that the prices were affected by supply and demand. Through continuous production, they recognized that the time would come when prices would improve.

Supply changes

With the cluster's bad experience with sweet pepper, they decided not to plant sweet pepper but to concentrate on the production of squash and eggplant for the succeeding delivery periods. By January 2012, the Kilapagan farmers had harvested over 2 tonnes of squash. For cucumber, while the results were encouraging, in the following months the prices eased. Production peaked in March 2012, when farmers sold 402 kg of cucumber (Figure 3).

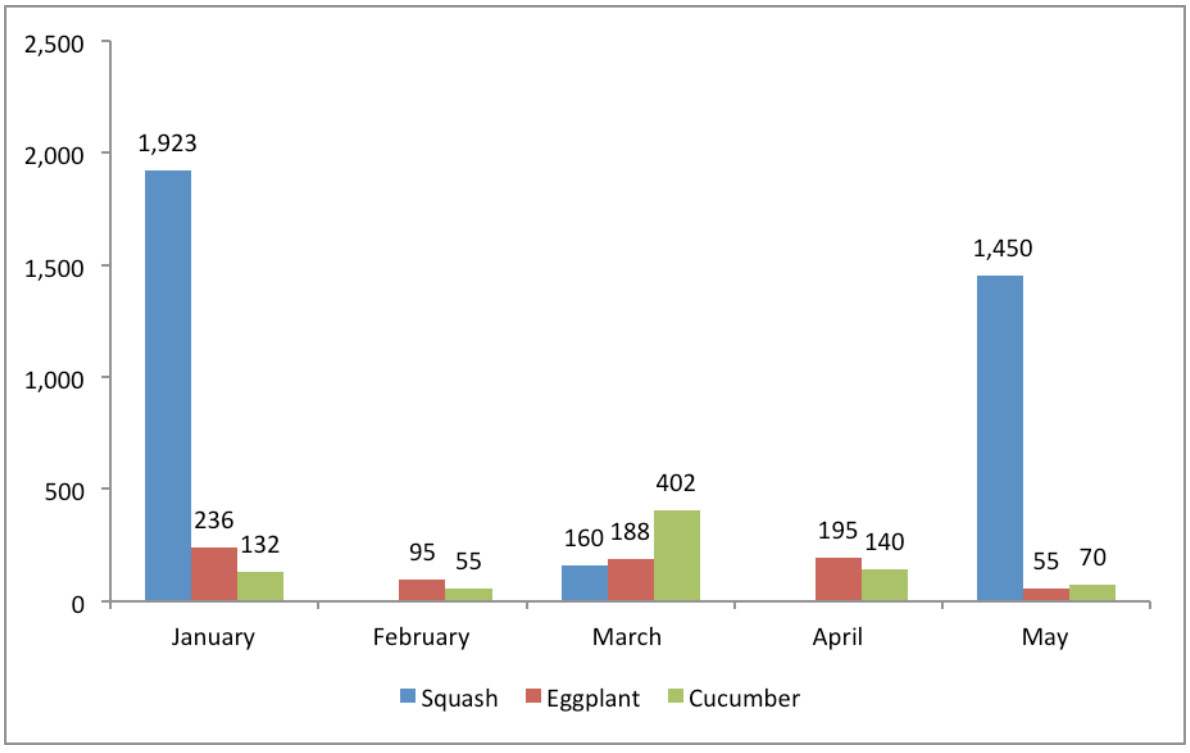


Figure 3: Volume of production by Kilapagan cluster, kg (January-May 2012)

Establishment of communal farming

In addition, the Kilapagan farmers implemented communal farming as a strategy to increase not only their production, but also their farm sizes. Through communal farming, the cluster members could work together in a farm area operated by the cluster, where

production expenses and proceeds were shared among all those members who contributed.

Increasing cluster fund

With continuous production, farmers anticipated that their cluster fund would also increase. By May 2012, they had accumulated PhP 23,000. From this account, the cluster had purchased additional seeds and fertilizers, which cluster farmers could access through a soft loan arrangement. No interest was payable, but the loan was to be repaid after the harvest period.

Participation to various capacity building activities

The Kilapagan cluster farmers were eager to attend those workshops and symposia that would help them increase their knowledge and production skills. On two occasions they participated in the Farmers and Partners Learning Alliance Forum, which provided an opportunity for all the cluster farmers from Bukidnon, South Cotabato and Davao City to come together to share their experiences. In addition, numerous production and post-harvest experts shared their knowledge on soil nutrition, pest and disease control and packaging. Some farmers participated in the National Vegetable Congress.

Access to material support

Various material supports were provided to the Kilapagan farmers to assist with their establishment. After the establishment of the cluster in 2010, the cluster was provided with seeds, a weighing scale and a knapsack sprayer from UPSTREAM.

The Agriculture Office of Malaybalay City benevolently provided the Kilapagan cluster farmers with additional seeds and water buffalo to assist farmers prepare their land. The farmers were also provided with plastic sheets to build their own protected cropping structures.

11.3.7 Cluster maturity assessment

Maturity assessment is a way of determining the progress a cluster has made based towards being self-sufficient in five key areas: organizational development, market position, supply capacity, financial resources and management capacity. For the Kilapagan cluster, the farmers rated their cluster 3/5 (Table 6).

In the area of organizational development, the cluster had established a specific schedule for cluster meetings and conducted other activities that helped to unify the members. The cluster was also able to implement their enterprise plans effectively.

The cluster was a recognized supplier for squash and eggplant, given that they have recurring buyers for the two vegetables, which included a Tacloban consolidator and a wholesaler in Malaybalay.

The cluster had been able to sustain their vegetable production. By the end of 2011, the Kilapagan cluster had produced and delivered 26 tonnes of squash and 4.8 tonnes of eggplant to various market outlets. Through this, the cluster has generated sales worth PhP 190,821 and established from the 10% levy on sales, a cluster fund of PhP 19,000. This meant that the cluster farmers now had the capacity from their own accumulated resources to purchase the farm inputs they required. The cluster treasurer had been

judicious in recording the cash flows thereby ensuring that the cluster members were appropriately paid.

The Kilapagan cluster could be considered to be a well-managed group, given that all officers had been effectively performing their roles in the cluster. They had established a set of policies which were being observed by all members. They had sought new markets and even established a relationship with a Davao-based supermarket.

Table 6: Kilapagan cluster maturity level

Maturity indicator	Grade	Description
Organizational development	3/5	Cluster has a regular meeting called by its cluster leader. Cluster functioning independently, able to implement enterprise plan (Marketing and production) Conduct activities for the unity of members
Market position	3/5	Market is developed with more buyers who can offer stable arrangements More buyers tapped Market entered into are for longer term agreements Special negotiation done Markets are diversified a. New products b. Cluster pursue market research for high value
Supply capacity	3/5	Cluster members can supplement each other supply in terms of deficit. Production technologies are in place for reliable quality and quantity. Regular product supply coming out based on the enterprise supply plan. Volume plan vs actual plan not yet met.
Financial resources	3/5	Financial system are in place Financial reports are done and discussed during meeting. Cluster savings are in place Sharing system is in place Communal farm is a strategy to generate funds
Management capacity	3/5	Enterprise plan enhanced to address new opportunities. Business operating system in place. Management looks forward to other market opportunities. Conduct election for new set of officers
Average	3/5	

11.3.8 Assessment of value chains associated with the cluster

Price trends

The market linkages established by the Kilapagan cluster have proven effective in accessing better prices. For instance, the Tacloban consolidator offered PhP 18 per kg for squash which was very high compared to the average price of PhP 5 per kg in the local market. In addition, after experiencing the low prices in October-November 2010, the cluster farmers have been receiving better prices for squash (Figure 4).

When the price peaked at PhP 14 per kg in January 2011, farmers were able to recover. However, the price suddenly declined in February and continued to fall through to June

2011 after which it increased from July to September 2011. In general, the farmers have received a higher price for squash than that which was initially budgeted (PhP 3 per kg).

For eggplant, the prices that farmers experienced were relatively stable. The average price received was PhP 8-9 per kg, but prices could rise to as much as PhP 12 per kg. Since farmers are producing eggplant in a whole-year cycle, they can expect to receive stable prices (Figure 5).

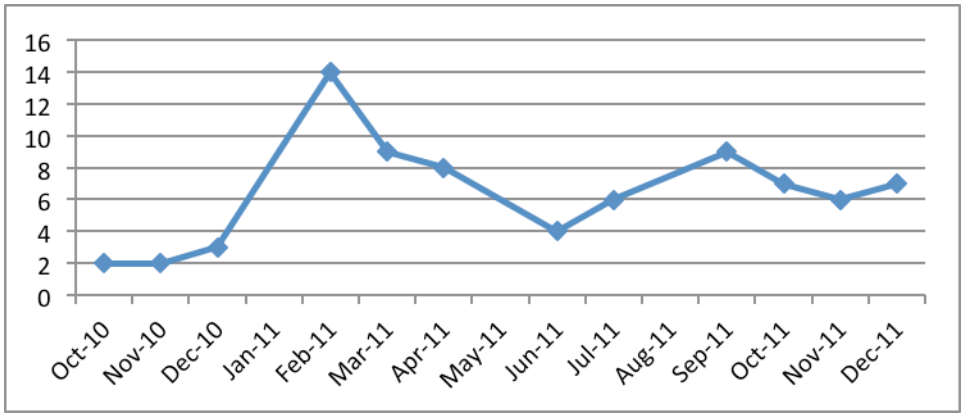


Figure 4: Price schedule for squash, PhP/kg (October 2010-December 2011)

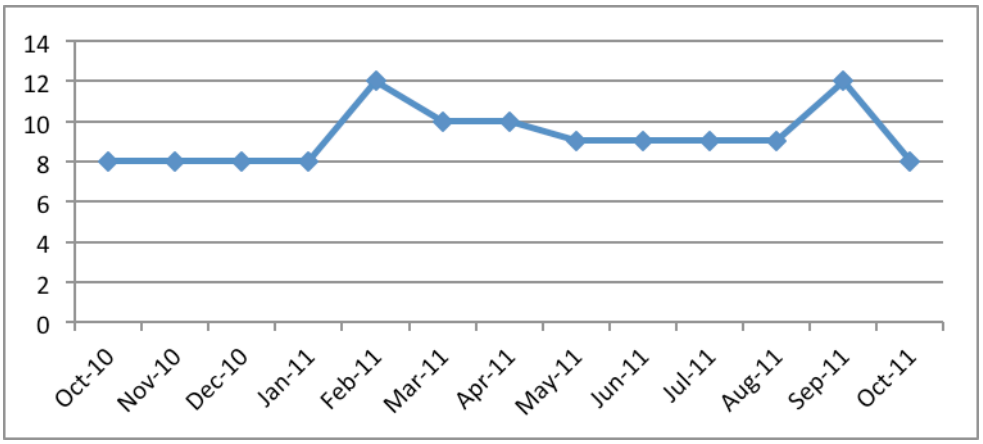


Figure 5: Price schedule for eggplant, PhP/kg (October 2010-October 2011)

The price for cucumber has been very volatile from January-May 2012. For the first two deliveries the average price was PhP 5 per kg, then suddenly it peaked at PhP 25 per kg before stabilizing again for the four succeeding deliveries (Figure 6).

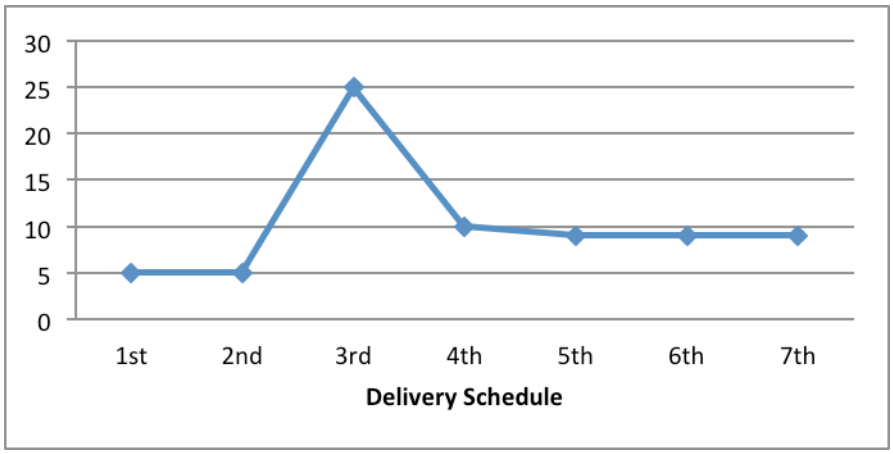


Figure 6: Price schedule for cucumber, PhP/kg (January-May 2012)

Chain analysis and gaps

Cost and return

For squash, the average production a farmer can expect to harvest was 8,400 kg. With a buying price of PhP 5.3 per kg, a gross income of PhP 44,486 was received. Production expenses, on the other hand, include fertilizer and pesticide. Hired labour was important especially during the harvest period. In terms of the marketing cost, hauling is the largest component, since farmers must hire additional labourers to carry the sacks of squash from the farm to the consolidation area. A cluster fee of 10% is deducted from the gross sales of each farmer. The farmer must also pay for the cost of transportation since produce must reach the buyer on-time. After deducting all the associated costs, the farmer received a net income of PhP 29, 102 (Table 7).

Table 7: Cost and return for squash

Total volume sold (kg)		8,400
Gross income (PhP)		44,486
Average price (PhP/kg)		5.30
Production cost (PhP)		
Fertilizer	2,350	
Pesticide	107.5	
Labour	360	
Total production cost		2,817.5
Marketing cost (PhP)		
Transportation	2,558	
Hauling	5,560	
Cluster fee (10%)	4,448.6	
Total marketing cost (PhP)		12,566.6
Net income (PhP)		29,101.9

For eggplant, in an average year, a farmer could produce 961 kg in one cropping period. With a farmgate price of PhP 10 per kg, a gross income of PhP 9,610 was anticipated. Costs, on the other hand, include both production and marketing expenses. Pesticide is the largest cost component, followed by transportation and fertilizer. Similarly, a cluster fee of 10% was deducted from the gross income received by each farmer. After deducting all the costs, a net income of PhP 5,169 was received by each farmer (Table 8).

Trust and relationship measures

In general, the Kilapagan farmers demonstrated a positive response towards their focal buyers. They gave the three identified buyers outstanding ratings in terms of trust, power-dependence and satisfaction. For the relationship-specific investments, farmers did not give any grade on these dimensions because they did not have any experience or opportunity to ask their buyers for any production-related training and technical assistance (Table 9).

Table 8: Cost and return for eggplant

Total volume sold (kg)		961
Gross income (PhP)		9,610
Average price (PhP/kg)		10
Production cost		
Fertilizer	PhP 530	
Pesticide	1,620	
Total production cost		PhP 2,150
Marketing cost		
Transportation	PhP 855	
Hauling	95	
Sorting	380	
Cluster fee (10%)	961	
Total marketing cost		PhP 2,291
Net income		PhP 5,169

Table 9: School-boy grades for the relationship between Kilapagan cluster farmers and their focal buyers

		Wholesaler	Consolidator	Retailer
Trust	Confidence	85	95	100
	Correct information	90	95	100
	Trustworthiness	90	95	100
	Consider my best interest	87	95	100
	Honesty	92	95	100
	Keep the promise	92	95	100
Power-dependence	Better offer	85	95	100
	Ease to transfer other buyers	90	95	100
	Power in relationships	85	95	100
	Control of information	85	95	100
	Must adhere to demands	85	95	100
	Dependency	85	95	100
Relationship-specific investments	Provision of education and training programs	N/A	N/A	N/A

	Coordinate production schedules	N/A	N/A	N/A
	Advice on what crops to grow	N/A	N/A	N/A
	Frequency of information	N/A	N/A	N/A
Satisfaction	Treated fairly	92	95	100
	Quick to handle complaints	92	95	100
	Adequate rewards	85	95	100
	Expectations met	92	95	100

Nonetheless, the ratings that the farmers gave for the trust dimensions indicated that they did have confidence in their buyers. Over the two year period that farmers had been dealing with these buyers, the buyers had demonstrated that they could be trusted for they gave the farmers correct price information and they kept their promises.

In addition, farmers said that the kind of "power" that their buyers had was not to undermine them but rather to make every transaction as transparent as possible. The high score in "control of information" indicated that their buyers did not hide any important information from the farmers. When prices fell, they informed the farmers so that they could understand how dynamic the market was.

The scores for satisfaction were high, which implied that there was a good working relationship between the cluster farmers and their focal buyers. This enabled the Kilapagan farmers to sustain an on-going linkage with the three buyers.

In terms of the relationships that cluster members had towards their colleagues and their cluster, a high level of trust was evident in the exchange (Table 10).

Table 10: School-boy grades for the relationship between Kilapagan farmers and their cluster

Dimensions		Rating
Trust	Confidence	96
	Correct information	92
	Trustworthiness	98
	Consider my best interest	92
	Honesty	98
	Keep the promise	98
Power-dependence	Better offer	92
	Power in relationships	92
	Control of information	92
	Freedom to adhere demands	92
	Dependence with the cluster	92
Relationship-specific investments	Provision and frequency of education and trainings	97
	Openness to suggest in coordinating production schedules	97
	Frequency of information	97
Satisfaction	Fairness to treatment	89
	Quickness to handle complaints	87
	Provision of adequate rewards	82
	Expectation met	83

The farmers also gave an average score of 92% to the power-dependence dimension, which implies that the elected cluster officers seldom used their power to their own advantage or to harm the members in any way. Since most of the cluster members had participated in one or more training programs provided by various organizations including UPSTREAM, they awarded an outstanding score of 97% to the relationship-specific investment dimensions. Although they gave a score of only 85% to the satisfaction dimension, the majority of farmers were very positive about their cluster.

11.3.9 Impact of clustering

One of the most important aspects of clustering was the training on negotiation with buyers. Through this, cluster farmers were able to access market information such as quality and volume requirements, prices and to better understand the distribution process. This enabled the farmers to engage with various market outlets and to negotiate better prices and modes of payment.

Through clustering, the farmer's dependence on the financier was eliminated. Farmers were able to access inputs from several organizations to provide the start-up capital for their activities. The cluster subsequently provided capital for farmer members through their own cluster fund.

Concurrently, there have been significant changes at the community level. Prior to the formation of the cluster, farmers grew and marketed their vegetables individually. The cluster has kept them united which enabled them to market their products collaboratively. Furthermore, the cluster is now providing financial support to its members. Each cluster member has developed empathy towards one another by giving advice and suggestions. In terms of resource generation, communal farming is generating additional income for the cluster. The farmers have gained knowledge on soil acidity through capacity building activities and are more aware on what fertilizers should be used on their farms.

11.3.10 Conclusions

For the Kilapagan cluster, the clustering process has been very successful due to a number of factors. Firstly, the cluster farmers were very eager to learn and adapt the process even during the orientation stage. Their willingness to participate in different capacity building activities has resulted in many benefits which have been significant enough to sustain the cluster.

Even although the cluster was formed in the latter half of 2010, the farmers proved that they could achieve what other clusters had accomplished in a much shorter period of time. This suggests that cluster maturity is not so much a function of time, but rather the way in which the members interact to achieve the goals they have set.

Through the cluster fund, the Kilapagan cluster has been able to support its members. The cluster has become self-sustaining in terms of purchasing inputs for the members and in providing short-term financial assistance. In turn, this has enabled the cluster to increase their production and their product portfolio so that collectively they can all earn more income and further increase their contribution to the cluster fund.

Clustering has had a significant and positive impact on capacity building. Farmers have used the knowledge and skills they learned from the different training and capacity building activities to develop their activity plans even after the termination of the project.

Vignette

Lessons learned on clustering: case of Kilapagan cluster

The Kilapagan cluster, also known as the Kilapagan Gardeners Association, was formed on June 2010. A series of training and capacity building activities were conducted that led to the establishment of two sub-clusters under the association. These included clustering orientation, market training, a market visit, negotiation with buyers and enterprise planning. Thirteen (13) farmers have pledged their allegiance to the cluster.

At the start-up of the cluster, farmers received three kinds of vegetable seeds: squash, eggplant and sweet pepper. These vegetables, according to the farmers, were best suited to their land and climatic conditions. After three months of cultivation, farmers started to market their produce to buyers in Malaybalay and Cagayan de Oro. A *viajedor* also came from Leyte to procure products needed for the Tacloban City market. By May 2012, the cluster's gross income had exceeded PhP 229,400.

Lessons learned

After two years of being part of the cluster, farmers have learned some valuable lessons that have kept the cluster strong. Four key lessons are highlighted.

Planting calendar should be followed. When the cluster decided to plant the three vegetables, a planting calendar was established that required farmers to follow a staggered schedule of seeding. This was to ensure that produce would not all be harvested at the same time. Maintaining a continuous supply is the main reason farmers decided to plant in this manner. As a result, they were able to harvest a larger volume of squash ranging from 300 kg to 3,695 kg per month. For eggplant, farmers were able to harvest from 87 kg to 650 kg per month. Most farmers are now in their second cycle of production.

Effective leaders are very important. The success of the group is attributed to a strong and effective leader. Within this cluster, three leaders stand out: the cluster leader, the marketing officer and the cluster treasurer. The cluster leader strictly monitors the members. He often visits the members on their farms to get an update on his/her production. He is able to manage the affairs of the cluster very well. The marketing officer is well-equipped with the skills of dealing with buyers. He always makes sure that their produce will get a reasonable price. The cluster treasurer judiciously keeps her financial records updated. She made it clear to the members that she is transparent and can be trusted. However, she emphasized that the cluster savings will only be used for cluster activities.

No one is above the cluster rules and policies. Being effective leaders means that they must set a good example for everyone. These policies were made not to restrict the farmers but to instill in the farmers' mind that for the cluster to work, all of them must abide by the rules. For example, every cluster member must give 10% of the gross value of the vegetables sold to the cluster fund. Any loan that a member wishes to acquire from the cluster fund that is unrelated to agricultural purposes will not be granted. Cluster members must learn to live within their means and not to rely on credit. Each member must prepare the land before they can have the seeds.

Social connection creates an atmosphere of cooperation. Cluster farmers value the relationship that they have with each other. They treat each member as a "family member" and they continue to communicate even with the few inactive members, knowing that someday, they will realize the importance of being part of a functioning group. Since the members have been neighbours for more than 20 years, it is easy for them to hold meetings and to conduct other cluster-related activities, like working on their communal farm. Through this, the cluster can expect full participation from the members. All of these make them work hand-in-hand. For as long as members are socially bound with each other, they will cooperate in the attainment of their goals.

11.4 Malamba Vegetable Farmers Association

11.4.1 Site description and group formation

Barangay Malamba is located in Marilog District, Davao City.

Vegetables are not the main product of the area, as vegetable farming provides employment primarily for women where it is intended to supplement household income. Farmers sell their products within the *Barangay* while the surpluses are delivered to Calinan and Bankerohan Public Markets.

The Malamba Cluster was organized by the Catholic Relief Services (CRS) in partnership with the Davao City Agriculturist's Office in 2008. The organization was named Malamba Integrated Farmers Association. During their collaboration with the project, CRS conducted training on vermiculture and vermicast production. It was claimed that farmers were able to lower the cost of production by using vermicast. Aside from this, the farmers also earned additional income by selling the worms at PhP 300.00/kg. Other training was given on the production of fermented plant juice (FPJ), fermented fruit juice (FFJ) and insect attractants and repellents.

The Malamba cluster started with 16 members: an equal number of men and women farmers. The crops identified were corn, banana, cacao, coffee, sweet potato, peanut, mango, lanzones and cassava.

11.4.2 Product supply assessment and product selection

During a farmers' planning workshop conducted in February 2009, the Malamba cluster identified various products for their target buyers in the Bankerohan. Tropical vegetables such as bitter gourd, squash, string beans, eggplant, Malabar spinach and sweet pepper were the identified products of Malamba.

The organic fertilizers used by the respondents included fermented fruit juice (FFJ), fermented plant juice (FPJ), Oriental Herbal Nutrient (OHN) and vermicast. These organic concoctions were also utilised as insect attractants and repellents. However, when necessary, chemicals such as Dithane, Karate and Malathion were applied.

Several of the Malamba farmers practiced contour farming as a means of reducing erosion.

Marketing practices

The Malamba farmers identified retailers and wholesalers as their buyers. Mostly these buyers came from the Bankerohan Public Market, Calinan and in the village. Most of the produce was delivered to the Bankerohan.

The farmers' problems in marketing were labour from the farm, transportation, low prices, the poor condition of the road and the distance to the loading point. Many of the farmers had experienced low yields, poor quality and pest and disease infection. The farmer's string beans curled and the bitter gourd rotted easily.

11.4.3 Market chain assessment

As part of the Agro-Enterprise planning workshop conducted in 2009, the Malamba farmers were exposed to other potential markets. They were able to interview institutional buyers and wet market buyers. Aside from exchanging contact numbers, the farmers were able to gather important information regarding the quantity and quality of the vegetables preferred by buyers, the price and seasonality. The farmers were also able to get an appreciation of the mode of payment and packaging specifications. Two supermarkets and two Bankerohan wholesalers were among the buyers interviewed.

In the Bankerohan, the highest volume needed by interviewed wholesalers was squash (Table 1). The demand month for this vegetable was June to October. The crops that were in demand all year round were sweet potato and bitter gourd.

Table 1: Rapid Market Research: Bankerohan Public Market

Products	Volume	Price	Demand Month	Sources
Squash	400 kg	5-10/kg	June to Oct	Maragusan, Davao City (Marahan, Marilog, Quirogpang, Malamba, Namnam, Paquibato), Digos, Kapatagan
Sweet potato	300 kg	9/kg	All seasons	
Pechay	200 kg	20/kg	Nov to Feb	
Eggplant	200 kg	20/kg	Nov to Feb June to July	
Ginger	200 kg	25/kg	Nov to Feb	
Malabar Spinach	200 kg	25-40/kg	Nov to Feb June to July	
Karlang	200 kg	5-6/kg	June to August	
Radish	150 kg	15/kg	July to Oct	
Sponge gourd	100 kg	15/kg	Nov to Feb	
String beans	100 kg	20-25/kg	Nov to Feb June to July	
Okra	100 kg	25-37/kg	Nov to Feb June to July	
Bitter gourd	150 kg	25-30/kg	All year	

Tomato	100 kg	25-30/kg	Nov to Feb June to July	
Baguio Beans	100 kg	35/kg	Nov to Feb	
Sword pepper	100 kg	40-60/kg	Nov to Feb June to July	
Chayote	25 sacks	2.50/piece	June to Feb	
Chilli (Halang)	30 kg	100-180/kg	Nov to Feb June to July	
Sweet pepper	Any	80/kg	June to July	
Camote tops	Any	3/bangan	June to July	
Lemongrass	Any	8/bangan	June to July	
Cucumber	Any	22-25/kg	June to July	
Bottle gourd	Any	18/kg	June to July	

The leafy vegetables in demand were pechay, Malabar spinach, camote tops and lemongrass. Aside from sweet potato, the other rootcrop in demand was karlang.

Most of the vegetables mentioned were tropical vegetables such as eggplant, ginger, radish, sponge gourd, bottle gourd, string beans and okra. The semi-temperate vegetables included Baguio beans, tomato, cucumber, sweet pepper, chayote, sword pepper and chilli.

The usual sources of vegetables were the Compostela Valley Province (Maragusan), Davao City (Marahan, Marilog, Quirogpang, Malamba, Namnam, Paquibato) and Digos City (Kapatagan).

Rapid market appraisal results

The result of the rapid market appraisal showed that there was a big difference in the price of the vegetables. The farmers shared this information, among other observations during their discussions, with other cluster members in the barangay.

Prices were at their highest in December. The price of chilli for example was PhP 180/kg and sword pepper was PhP 110/kg.

The rapid market appraisal was an interesting experience for the farmers. In one instance, security guards in one of the institutional markets did not permit the farmers to enter and roam around the store. This caused embarrassment, especially to those farmers who rarely go to shopping malls. There was also some hesitation from the buyers in giving their names and contact numbers.

Initial (pre clustering) chain map(s)

The vegetable products from Malamba were usually sold in the local market, particularly within the Barangay (Figure 1).

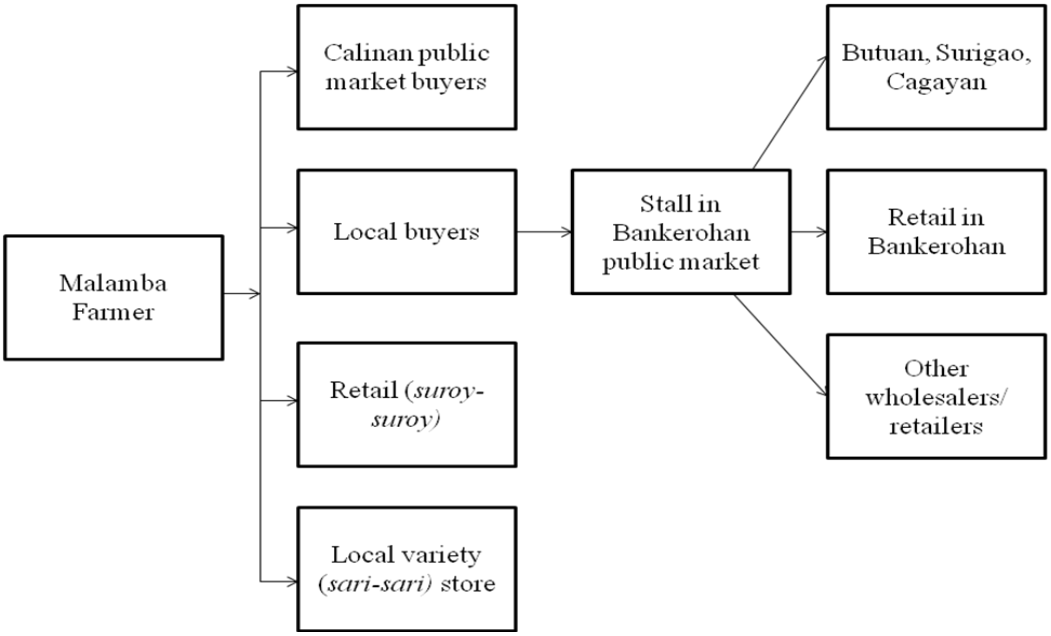


Figure 1: Malamba Supply Chain

There were also retailers who carried and sold the vegetables on their heads and roamed around the village. Other buyers included the variety stores who sold dry goods and grocery items.

Some buyers come from the nearby Calinan public market. However, there were also instances when local buyers (residents of the village) purchased the vegetables and brought these products to their stalls or delivered them to their preferred buyers in the Bankerohan public market. In the Bankerohan, there were many buyers who transported the vegetables to areas as far away as Butuan, Surigao and Cagayan.

Support needed

The majority of the support needed by the farmers was equipment for their organic fertilizer production. As a result, the City Agriculturist Office provided them with a shredding machine.

11.4.4 Cluster formation and planning

The farmers jointly formulated an enterprise plan with the Quirogpang cluster in February 2009, which contained details such as the variety, volume and the desired quality. The products identified were squash, eggplant and okra. Their quality management plan was to try to produce good quality products Class A products.

Initially, farmers intended to harvest one time per week. The group decided to gather at the village gymnasium. Harvest would be on Thursdays. The cluster leader would contact a buyer or buyers from Bankerohan and on Fridays the vegetables would be delivered. The material and equipment needed included cellophane, baskets, sacks and knife. The other significant cost was the cost and hauling and transport from the farm to the gymnasium.

The production plan was to be done twice a year (during March and August).

11.4.5 Test marketing

Nang Fely, a vegetable buyer from Bankerohan wet market was selected from those met during the market survey. However, because of the financial support received by some

farmers from their *suki*, some farmers only sold 40% of their harvest through the cluster with the following considerations:

- the vegetables were classified into two sizes A & B and priced according to the prevailing market price
- previously, vegetables had been weighed in the Bankerohan display area, but the buyer recommended that all vegetables be weighed before delivery to save time
- stocks were delivered every Thursday morning in a weekly basis
- the mode of payment was cash

However, the cluster only delivered once after the February 2009 agro-enterprise planning session.

Revisions made to plan

In January, 2010, due to the increasing number of members but no cluster deliveries, the project decided to hold a reorientation program for the Malamba cluster. The farmers were asked if they sincerely wanted to continue with the cluster. All 16 members present during the meeting answered in the affirmative.

Because of increasing number of members (more than 30), the farmers chose to form two clusters. To ensure close monitoring, leaders were chosen for each of the clusters: (1) Ms. Shirley Amoy and (2) Ms. Lorna Sali. The responsibilities of the cluster leaders included: (1) calling the meeting; (2) developing the planting schedule in consultation with the members; and (3) following up the payment status of the members. Collectively, the cluster added sweet pepper and bitter gourd to the list of selected vegetable crops.

In addition to the cluster leaders, the cluster elected a president, Mr. Romy Arenas, who was to spearhead the activities of the 2 clusters.

11.4.6 Scaling up or down activities

Scaling up activities are on-going. Simultaneous with the scaling-up is the strengthening and re-orientation of the agro-enterprise plans.

Capacity building activities, training and exposure

One Malamba cluster farmer attended the First National Vegetable Marketing Summit in Davao City in 2009. The objective was to acquire additional knowledge on the latest vegetable production technologies, post-harvest practices, packaging and logistics, and potential markets with specific volume and quality requirements.

One cluster member travelled with the UP Mindanao project team to Lake Sebu and Koronadal City in South Cotabato to participate in the Second South Cotabato Vegetable Production and Marketing Forum.

In December 2009, the Davao City Agriculturist's Office, together with other government and non-government organizations, celebrated Organic Day at the Rizal Park in Davao City. The three day activity included a number of different symposia on climate change, vermiculture, composting, organic fertilizers and the making of plant concoctions, a display of products, lectures on technology, the announcement of the *Gulayan sa Barangay*[2] award winners, and an opportunity to sell fresh produce. Two farmers from Malamba attended and were able to sell all the cluster's vegetables during the first day. The cluster was also able to secure some free plastic crates and seed trays distributed by

[2] Gulayan sa Barangay (GSB) *is a project of the Davao City Agriculturist's Office to encourage each* Barangay *to cultivate vegetables for local consumption. The implementation of the project, piloted by the Vegetable Industry Council of Southern Mindanao (VICSMIN), Inc. in 2004, was turned over to Davao City in 2005.*

the City Agriculturists' Office through the High Value Commercial Crops program of the Department of Agriculture (DA-HVCC).

Prior to this, the cluster received 36 sacks of organic fertilizer, 5 kg of squash seeds and 9 cans of bitter gourd seeds from CAO and DA-HVCC. Although these were free of charge, the cluster was expected to collect a payment from the farmers after harvest to establish a future fund.

Because of their participation in these capacity building activities, the members of the Malamba cluster were able to avoid a dole out mentality and were more resourceful in their endeavours.

Changes and current challenges of Malamba Cluster

In January 2010, the cluster held another reorientation. Aside from identifying both inactive members and interested new members, the agro-enterprise plan was revised.

The main problems facing the cluster included the lack of technical and theoretical knowledge regarding modern and effective ways of managing their crops, limited resources and the uncertainty of possible markets. Another problem was the sustainability of members.

11.4.7 Level of maturity

In 2011, the group did their cluster maturity workshop (Table 2).

Table 2: Level of maturity

Cluster Maturity	Organizational Development	Market Position	Supply Capacity	Business Management Capacity	Financial Resources
Number	3	3	3	4	3

For organizational development, they rated themselves 3, which meant that the cluster had regular meetings called by their cluster leaders and they had written agreements and written policies in place. Market position was also rated 3. This meant that the cluster had developed a number of markets who could offer a stable arrangement. They had also identified a number of buyers and were able to forge long-term agreements and to negotiate special pricing arrangements. A ranking of 3 for supply capacity meant production technologies were in place for reliable quantity and quality standards for at least 80% of the cluster members. The highest rate of 4 was given for business management capacity. This was due to the reorientation and revision of the enterprise plan which had identified new opportunities for the cluster. The Malamba farmers rated their financial resources with a score of 3. This suggested that market earnings were more predictable, financial reports were done and discussed at the cluster meetings, and that at least some of the farmers had paid their proportion of the marketing and management costs.

11.4.8 Chain analysis and gaps

Losses along the chain

The farmers indicated that the cluster incurred 8% losses for sweet pepper and string beans. However, the sweet pepper buyer did not incur any wastage while the string bean buyer experienced additional losses of 13%. For bitter gourd and squash, the cluster incurred a 3% loss while their buyers did not incur any loss.

11.4.9 Impact of clustering

For the five members of the Malamba cluster who participated in the post cluster impact study, all agreed that as a result of clustering, their income from vegetable production had increased with a commensurate improvement in household income (Table 3).

Table 3: Impacts of clustering

Aspect	Increase (%)	Decrease (%)	No change (%)
Income from vegetable production	100	0	0
Cost of production	40	40	20
Total household income	100	0	0
Volume of vegetables produced	100	0	0
Volume of vegetables sold	100	0	0
Price received for vegetables	100	0	0
Production losses/ wastage	0	100	0
Quality of vegetables produced	100	0	0
Number of people employed in the farm (both for production and marketing)	40	0	60
Understanding of markets	80	0	20
Ability to negotiate	100	0	0
Decision making skills	100	0	0
Skills in horticultural production	100	0	0
Skills in post-harvest practices	100	0	0
Skills in pest & disease management	100	0	0
Skills in marketing	100	0	0
Skills in record-keeping	80	0	20
Leadership skills	60	0	40
Access to markets	100	0	0
Access to credit	80	0	20
Access to inputs	60	0	40
Relations with other farmers in the village	80	0	20
Access to farm-related government support	100	0	0
Linkages with external partners	100	0	0
Number of school-aged children who could not afford to go to school before but are now able to go to school	60	0	40
Family health	80	0	20
Environment	60	0	40

Both the volume of vegetables produced and the prices at which they had been sold increased. However, production losses had also increased as a greater quantity of product failed to meet the buyer's specifications. Farmers had a much better appreciation of the market dynamics and of their capacity to negotiate with buyers.

11.5 Maligaya Vegetable Growers Association (MAVEGA)

11.5.1 Site description and group formation

The Maligaya Vegetable Growers Association (MAVEGA) is one of the youngest Davao clusters. In June 2010, a project orientation meeting was conducted that was attended by 8 female and 12 male farmers.

Barangay officials in Marilog helped identify possible areas where farmer clusters could be formed. Aside from them, the Davao City Agriculturist's Office pledged to assist the farmers.

Although the farmers live near the highway, their farms are located approximately 1-2 km further up the mountain. Aside from the concrete road to the highway and the presence of electricity, no other infrastructure is present in the area. However, several *sari-sari* (variety) stores are present.

Most of the farmers had been farming for the majority of their lives. The area that they were cultivating ranged from 0.25 ha up to 7 ha, with the topography ranging from rolling to steep slopes. The majority of land was held under stewardship.

The common vegetables planted were lettuce, sweet peas, sweet pepper and taro. These vegetables were also the priority crops chosen by the cluster for their agro-enterprise plan.

The main problems farmers were experiencing was the lack of finance to purchase seed, fertilizers and pesticides, disease in lettuce and sweet pepper, infestation by pests and the hot weather.

Marketing practices – farmers' & buyers'

Usually, local buyers from nearby Marahan purchased their vegetables (Table 1).

Table 1: Buyers for the MAVEGA cluster

Name of buyer	Address	Place of delivery	Type of buyer	Reasons for choosing the buyer
various buyers	Marahan	Marahan	Retailer	Because we only have few vegetables
various buyers	Bankerohan	Bankerohan		Canvass
various buyers	Marahan	Marahan	Retailer	Few vegetables and near the area
CASEDO	Marahan	Marahan	Cooperative	Because I'm a member of the coop
various buyers	Bankerohan	Bankerohan	Retailer	It depends on who gives higher price
own retail: wife	Bankerohan	Bankerohan	Retailer	It is better because other buyers buy at a lower price.

Depending on the individual buyer, the vegetable and the relationship the farmer had established with the buyer, the terms for pick up and delivery were flexible.

CASEDO, an NGO, also purchased vegetables from the farmers.

The deliver produce to the Bankerohan, farmers used boxes, baskets (*bukag)*, sacks and plastic crate. The mode of transport from the farm was hired motorcycles and jeepneys.

The main problem in marketing was the unstable price of the vegetables. Other problems experienced by the respondents were crop failure, brought about by frequent rain and pest infestation. Most of the damage was to leafy vegetables such as pechay and lettuce. However, some were able to harvest at least 50% of their planted vegetables.

The farmers primarily sold their products to local traders and viajedors who eventually sold the products to Davao City, Bukidnon and in Marahan/Buda.

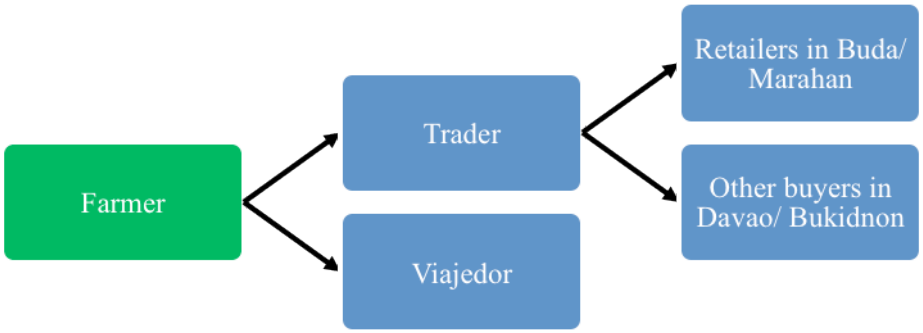


Figure 1: Initial supply chain map

They also delivered vegetables to the Bankerohan. The farmers choose to sell to the Bankerohan because the buyers purchased their vegetables all-in, irrespective of quality on a cash basis. However, the buyers determined the prices.

The farmers were very dependent on these buyers. One of the main reasons they were interested in joining the cluster was an expectation of higher prices.

11.5.2 Cluster formation and planning

In October 2010, the Maligaya cluster undertook its agro-enterprise planning and cluster formation facilitated by the agro-enterprise coordinator.

Initial marketing plan

The identified buyer was Liting Arbanilla from the Bankerohan (Table 2).

Table 2: Marketing plan

Buyers: Liting Arbanilla Products: lettuce, sweet pea, red pepper, gabi Quality: lettuce – All in sweet pea & red pepper – Classify gabi – all in Price: Prevailing Sales target: (gross) ▪ lettuce PhP 115,000 ▪ sweet pea PhP 56,000 ▪ atsal PhP 100,000 ▪ gabi PhP 14,100 Payment term: Cash on delivery/following day

Deliveries: Monday and Friday

The target products were lettuce, sweet pea, taro *(gabi)* and sweet pepper. With little opportunity to dictate or to influence the price, the cluster accepted the prevailing market price.

Although the cluster preferred cash on delivery, they were also amenable to payment the next day, which was the practice they were most used to.

Assuming that they were able to produce and to sell all the vegetables they had grown, their estimated gross income was PhP 285,350 (Table 3). The highest income was expected to come from lettuce

Table 3: Estimated gross income

	# of hills	**Expected harvest (kg)**	**Least price (PhP)**	**Gross income (PhP)**
Lettuce	23,000	5,750	20.00/kg	115,000
Sitsaro (sweet pea)	7,500	1,875	30.00/kg	56,250
Atsal (sweet pepper)	10,000	5,000	20.00/kg	100,000
Gabi (Taro)	4,700	4,700	3.00/kg	14,100
Total				**285, 350**

In November 2010, the MAVEGA cluster leader, together with other cluster leaders from Davao City, held a meeting with an institutional buyer from one of the major supermarkets in Davao. The objective of the meeting was to showcase the products produced by each cluster, identify the frequency of delivery and the required volume, quality and price. MAVEGA offered to supply lettuce, but the institutional buyer already had a stable supplier.

Initial production/supply plan

Lettuce was the primary vegetable to be supplied by the cluster with 5.7 tons (Table 4).

Table 4: Supply plan for the MAVEGA cluster

Estimated Supply Volume:

- lettuce 5.7 tonnes
- sweet pea 1.8 tonnes
- atsal 5.0 tonnes
- gabi 4.7 tonnes

Operational flow:

Consolidation area: Purok Center @ Sitio Maligaya

- harvest time; 5:00 – 7:00 in the afternoon
- classify on the farm
- bring to the consolidation area at (purok centre) at 8:00 am
- check and reclassify
- load into the jeepney at 10.00 am
- marketing officer to accompany the product

Materials needed:

- weighing scale
- sako/bukag
- tie/straw

The other important crops were sweet pepper (atsal) with 5 tons and taro (gabi) with 4.7 tonnes. They were also planning to supply 1.8 tons of sweet pea.

During their agroenterprise planning, five farmers agreed to plant the four crops (lettuce, sweet pea, sweet pepper and taro)(Table 5).

Table 5: Production Plan (based on agreed vegetables and hills per farmer)

	Number of Hills			
	Lettuce	Sweet pea	Sweet pepper	Gabi
1. Reynaldo trozo	4,000	1,000	2,000	1,000
2. Gloria	3,000	1,000	500	500
3. Arlene Obis	3,000	1,000	500	500
4. Jemboy	5,000	1,000	2,000	200
5. Mabini	1,000	500	1,000	1,000
TOTAL # OF HILLS	**16,000**	**4,500**	**6,000**	**3,200**

In November 2010, the cluster was given seeds by UP Mindanao, based on their production plan. However, taro, which is a common commodity, is readily available and cheap (often free) was not provided.

Initial management plan

The management plan included arrangements and compensation for the marketing officers. For the MAVEGA cluster, there were 2 marketing officers identified: Ms Arlene Obis and Ms Gloria Largo. It was agreed that the marketing officers would be paid PhP 0.5 per kg, while the marketing/cluster fee was 5% of the gross proceeds.

Monthly meetings would be on the first Wednesday of each month. Financial reports were to be presented at every meeting and a monitoring team would be established to ensure all plans were implemented. All members were to attend all meetings.

Initial financial plan

The initial financial plan for the cluster was very simple: the cluster needed seeds which they would obtain from UP Mindanao and the Davao City Agriculturist's Office.

11.5.3 Test marketing

Conduct and evaluation of trial delivery

A trial delivery was made in April 2011 to a buyer in the Bankerohan. The vegetables sold were sweet peas, pechay and sweet pepper. After three deliveries MAVEGA stopped selling because the products were not of good quality. This was due to the frequency of rain which damaged the lettuce and sweet pepper and made them look unappealing. These were the same problems they had encountered prior to clustering. Consequently, the farmers went back to selling individually.

Activities conducted to strengthen the cluster

For personal reasons, the cluster leader became inactive in the cluster and as a result, very few of the cluster plans were implemented.

MAVEGA elected a new cluster leader in June 2011. The new cluster leader continued to attend and participate in the federation meetings, learning alliances, market visits and training conducted by the project. The cluster attended a total of 15 capacity building activities including basic market training, post-harvest training, buyer negotiation and federation meetings.

11.5.4 Conclusions

In this instance, it is believed that the cluster was exposed to a new institutional market too soon. The cluster had not been fully trained or provided with the training in production and marketing as a group. There were no established champions or leaders among the members. The MAVEGA cluster was used to trading in the spot market, where buyers purchased their product all-in (without quality control) for cash. Moreover, their products, mostly leafy vegetables were not needed by the institutional buyer since they already had a reliable supplier.

Being one of the youngest clusters, MAVEGA are currently looking into producing semi-temperate vegetables for wholesalers in Davao City. The previous problem of weak leadership has been rectified by the election of a new cluster leader.

As a result of crop failure, the cluster farmers decided to sell individually. They did not have enough volume to consolidate as they only had a few members.

11.6 Nagkahiusang Bisaya ug Lumad sa Pamuhatan

11.6.1 Site description and group formation

Sitio Kibantao, Pamuhatan is part of Barangay Marilog, Davao City, Southern Philippines. The *barangay* has a total land area of 17,833 has with a population of 14,255 as of August 2007 (National Statistics Office 2007). The distance from Davao City to the sitio is approximately 65 km. The population of Sitio Pamuhatan, as of December 2009, was only 483, which was composed of 100 households.

Sitio Kibantao, Pamuhatan, can be accessed using jeepneys. However, the farm to the highway road is only passable by foot, water buffalos or horses. During the wet season the farm road is slippery, which makes it difficult for farmers to transport their products to the highway. The cost of transporting the vegetables is PhP 1/kg. Vegetable farming is the main source of income in the area.

Sitio Pamuhatan and Brgy. Saloy were the two areas chosen by the project to establish two new clusters. In August 2009, project staff from University of the Philippines Mindanao conducted a project orientation among the vegetable farmers in Sitio Pamuhatan and nearby *sitios*. The project orientation was attended by 31 vegetable farmers, *barangay* officials and *purok* leaders.

During the orientation, attendees were introduced to the ACIAR Mega Horticulture program particularly Component 4. The objectives of the project were presented to the farmers, *barangay* and *sitio* officials. Moreover, the CRS 8-step clustering approach was also introduced to them. The project sites were also introduced to the people who attended the orientation.

It was clarified during the orientation that vegetable farmers were not obliged to join the cluster, only those who wished to. Clarifications were made regarding the support to be extended by the project so farmers knew what to expect if they decided to join the cluster.

The farmers showed interest in participating in a cluster when they learned that the primary objective of the project was to link smallholder farmers to the market/s that should result in a better price for their produce. Out of the 31 farmers that were present at the project orientation in August, 25 farmers indicated that they were willing to join the cluster. These farmers were grouped into clusters based on the location of their residence. The first cluster was the Pamuhatan Farmers Association (PAFA) with 15 farmers residing in Sitio Pamuhatan and the Nagkahiusang Bisaya ug Lumad (NABISALUM) with 10 farmers residing in Sitio Kibantao.

Together, these two newly formed clusters underwent the basic concepts of marketing training and workshop. The workshop aimed to provide farmers with the knowledge and skills to produce and market their vegetables. A training workshop was conducted in November 2009. Part of the training was to expose the farmers to both the traditional markets and modern institutional markets. Going to the market and having the chance to interview market players will aid the farmers in their future collaborative marketing activities. After the training and workshop, the two clusters operated separately.

11.6.2 Product supply assessment and product selection

Membership profile

During the baseline survey conducted in the second quarter of 2010, the NABISALUM cluster had 16 members of which 88% were male and 12% were female. Of the 16 members, 69% are members of the Matigsalog tribe. Members had an average age of 35 years old. Of the 16 members, 81% were married, 13% were single and the remaining 6% were living together. The average household size of the members was 5, although the

household size ranged from 2 to 10 persons. Members had been living in Sitio Kibantao, Pamuhatan for an average of 25 years.

Twenty five percent (25%) of the members had attended elementary school, 31% had graduated from elementary school, 13% had attended high school, 19% had graduated from high school and 6% had attended college. Fifty percent (50%) of the members belonged to the Apostolic church, 31% were Roman Catholic, 13% were Baptist, and 6% were Christian. Sixty percent (60%) of the members' main source of income was vegetable farming. Other sources of livelihood include cultivating fruit trees, banana, coffee, corn, livestock farming, hired labour and selling vegetables. The average monthly household income of members was PhP 2,925. Cluster members were also involved in other organizations such as the church and ancestral tribal association.

Farm production

Farmers of Sitio Kibantao had been involved in farming for an average of 15 years. The average size of the farm cultivated by farmers was 1.4 ha. Most of the land was rolling (48%), steep (42%) or flat (10%). Sixty seven percent (67%) of the land was owned by the farmers, 13% was under a stewardship grant, 10% was ancestral domain land and 10% was rented.

The most common vegetables grown by farmers were squash, eggplant, Malabar spinach, tomato, karlang, sweet pepper and chayote. Tools used by farmers included a scythe, bolo and sickle. Some farmers also owned horses and water buffaloes. Sulphate of ammonia, urea and complete fertilizers were frequently applied by the farmers. The frequency of use varied from once a week to one time per month. Pesticides used by the farmers included lannate, bushwack, dithane, tamaron, malathion, magnum and sniper. Farmers applied pesticides on a weekly to monthly basis. They also used foliar fertilizer on a weekly basis.

Some farmers practice contour farming and mulching to prevent soil erosion, others plant root crops and fruit trees. The production problems farmers experienced included attacks by pests and insects such as stem borers, erratic weather conditions, difficulties in accessing water, and the lack of finance to start production. Most farmers fund their own production, while some borrow seeds from their neighbours. Other farmers borrow money from their buyer. Farmers repay their loan after harvest.

Marketing practices

Based on the baseline survey, 44% of the farmers sold their vegetables to wholesalers and retailers in the Bankerohan wholesale market, 37% sold to retailers in the nearby area in Marahan, and the remaining 19% sold their vegetables to retailers in the neighboring *sitio* of Upian. One cluster member, who was also a vegetable retailer, sometimes consolidated the products from farmers in the area and sold them to the Bankerohan. In deciding to whom they would sell, most farmers chose to sell to their usual buyer or *suki*. The other reason for selling to this person was the small volume of vegetables they had available.

During delivery, farmers usually used either sacks or rattan baskets to pack their vegetables. Others utilized wooden crates. All farmers delivered their vegetables to their respective buyer, thus paying the transportation cost. To be able to reach the Bankerohan wholesale market, farmers ride a jeepney. To go to Marahan, farmers used a motor cycle and to deliver their products to Sitio Upian, a horse. For buyers from Marahan and Sitio Upian, the farmers were paid after delivery. Buyers from the Bankerohan either paid cash after delivery or paid the farmers after several deliveries. Some of the farmer's experiences during marketing included unstable prices, low profits, wastage and damage, and the lack of regular buyers.

11.6.3 Market chain assessment

Rapid market appraisal results

Farmers used to sell their vegetables to wholesalers and/or retailers in the Bankerohan, Marahan and Sitio Upian. In all instances, farmers paid the transportation cost. The costs incurred were on a per unit of packaged vegetables, rather than the volume. Farmers usually paid PhP 50 for a wooden crate and/or sack and PhP 60 for a rattan basket. The traditional buyers accepted all kinds of vegetables. They did not require the farmers to sort the vegetables according to any quality specifications. However, for some vegetables like tomato, buyers wanted it to be sorted by size: the bigger the tomato, the higher the price. For other vegetables, buyers gave the same price for all vegetables since they purchased the vegetables in a *kuridas* (all in) system. Buyers could purchase any quantity of vegetables as they supplied many *viajedors* and vegetable consolidators.

Initial chain map

In 2009, before the cluster was formed, the farmers in Sitio Kibantao sold their vegetables to wholesalers and/or retailers in the Bankerohan and nearby areas (Figure 1).

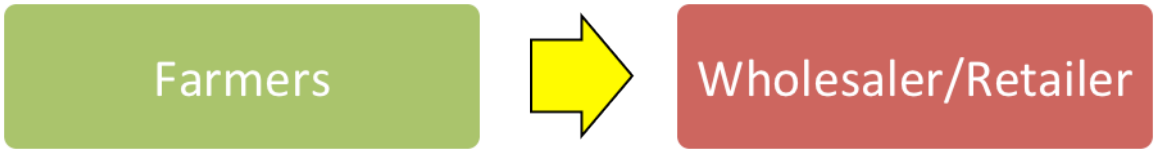


Figure 1: Pre-clustering chain map of Sitio Kibantao farmers, 2009

Before clustering, farmers individually delivered their produce to wholesaler/retailer buyers in the Bankerohan, Marahan and Sitio Upian. Farmers selling to the buyers in the Bankerohan communicated with their buyer through text messaging. The jeepney driver delivered the product directly to the buyer and accepted the payment (in cash) for and on behalf of the farmer. The jeepney driver then deducted the cost of transport and any other expenses incurred during the delivery and paid the residual amount to the farmer. In many instances, the buyer made one consolidated payment after several deliveries. For farmers selling to buyers in Marahan and Sitio Upian, they delivered the vegetables personally and generally receive payment (in cash) at the time their vegetables were delivered. Prices were based on the prevailing market price.

Buyer comparison assessment by farmers

The majority of the buyers chose to purchase whatever quantity and whatever kind of vegetables were offered. However, some chose only to buy some vegetables such as tomato, bitter gourd, squash, carrots, Baguio beans, radish, cucumber, sweet pepper and chayote (Table 1).

11.6.4 Cluster formation and planning

Initial cluster agreement

Initially, the cluster agreed to contribute 5% of their net sales as a marketing fee. The marketing fee was used to establish a cluster fund for the group. Moreover, seeds were given by the project to the cluster. By the time the cluster was collaboratively marketing, several of the members had failed to repay the cost of the seeds, so the cluster members chose to deduct another 5% from the net sales as seed repayment.

Aside from these cluster policies, the cluster members created four plans which will aid them in operating the cluster.

Table 1: Buyer comparison summarized by farmers after market visit, 2009

Buyer	Vegetables	Volume
Jimboy Dizon	Assorted vegetables	No limit
Neriza Lim	Assorted vegetables	No limit
Torina Ayo	Assorted vegetables	No limit
Jenefe Bangot	Assorted vegetables	1,000 kg/day vegetables
Alot Bagacay	Tomato, bell pepper	No limit
Dodong Nene	Carrots, bell pepper, ginger, pipino	5 sacks/day/vegetable
Narcisa Lopez	Squash	No limit
Fe Seniza	Bitter gourd	No limit
Aldy Neroja	Pipino, sayote, karlang	No limit
Frankling Kamansi	Assorted vegetables	*40-50 sacks (2 x/week) *squash – no limit
Daning Camacho	Raddish, pipino, pechay, eggplant, ginger	Small volume
Analyn Manlanay	Sibuyas dahon	No limit
Neneng Balagulan	Bitter gourd, eggplant, upo	No limit
Mary Jane Latayada	Squash, pechay, sayote	Small volume
Epi Micalso	Squash, carrots, baguio beans, bell pepper, onion	No limit
Rey Ranario	Assorted vegetables	No limit
Elith Antes	Pipino, bell pepper, ampalaya, tomato	Depends on the capital available
Doydoy Arbanilla	Tomato, radish, baguio beans, pechay	No limit
Anastacia Lopez	Squash	No limit

Initial marketing plan

Cluster members chose squash and tomato as their two main products. The cluster chose to supply their vegetables to buyers from the Bankerohan wholesale market (Table 2). The figures in this table reflect the sales target and gross income for both clusters. The two clusters aimed to plant 24,000 hills of squash and 28,000 hills of tomato, earning a potential profit of PhP 633,815 and PhP 204,750, respectively.

Table 2: NABISALUM's initial marketing plan, 2009

	Squash	Tomato
Buyers	Bankerohan buyers	Bankerohan buyers
Sales Target	24,000 hills = 90, 545 kg	28,000 hills: 585 boxes
Gross Income Pamuhatan Bankerohan	@ 5/kg = PhP 452,725 @ 7/kg = PhP 633,815	@ 250/box = PhP 146,250 @ 350/box = PhP 204,750

Initial production/supply plan

The NABISALUM cluster planned to cultivate 4,500 hills of tomato and 8,000 hills of squash. Members of the cluster considered to care for and maintain the vegetables from the preparation of the seed beds to transplanting until harvesting. The product flow will be from the farm of each member to the consolidation centre of the cluster (Table 3).

Table 3: NABISALUM's initial supply plan, 2009

	Squash (hills)	Tomato (hills)
Odo	4,000	1,000
Rudy	1,000	500
Bernard	1,000	500
Ekoy	1,000	500
Merlyn	1,000	2,000
Total	**8,000**	**4,500**

Initial management plan

The cluster elected Nong Odo to be their cluster leader. They also appointed two members to be in charge of monitoring the production of all cluster members, and one member as their marketing officer and treasurer. The marketing officer was to be responsible for the product delivery and record-keeping for every delivery. This person would also record each member's contribution to the cluster fund and seed repayment (Table 4).

Table 4: NABISALUM's initial management plan, 2009

Cluster Leader	Odo
Production/ Monitoring In-charge	Bernard, Rudy
Marketing In-charge	Merlyn
Treasurer	Merlyn
Marketing fee	5%

Initial financial plan

The cluster's target cost per kg in producing and marketing tomato was PhP 7.40 and PhP 1.50 per kg for squash (Table 5).

Table 5: NABISALUM's initial financial plan, 2009

Production costs	**Tomato**	**Squash**
Seeds	200	2,000
Fertilizer	4,000	3,000
Chemicals		850
Land Preparation hagbas daro	500	1,000
Planting	800	120
Care and Maintenance - sticking	6,000 500	600
Harvesting	1,000	1,000
Hauling/Loading	2,250	1,000
Transportation	2,250	5,000
Boxes	1,100	
Total Expenses	16,600	14,770
Yield	90 boxes[3]	10,000 kg

[3] *1 box = 25 kg*

11.6.5 Test marketing

Conduct of trial delivery

In August 2010, the cluster started consolidating and collectively marketing their products. The cluster's first buyer was a wholesaler/retailer in the Bankerohan. The product initially consolidated by the cluster was squash (Figure 2).

Figure 2: Initial cluster chain map of NABISALUM cluster, 2010

During their trial delivery, the members of the cluster consolidated their vegetables and delivered it to the house of their marketing officer. Cluster members helped in packing the squash in sacks. As the cluster member delivered the vegetables he/she was to contribute, one member helped in weighing the vegetables while the marketing officer recorded the weight for every member.

Once the weighing and packing was done, the sacks were labelled with the cluster's name and the name of the buyer. They then waited for the jeepney to pass by the area and loaded the vegetables. The marketing officer instructed the jeepney driver to unload the products in the Bankerohan where the buyer was waiting.

Table 6 illustrates the volume and value of squash for the cluster's series of trial deliveries for the month of August 2010.

Table 6: Trial delivery record of NABISALUM, 2010

Date	Volume	Value
August 11, 2010	712	3,204
August 19, 2010	769	3,460
August 24, 2010	953	3,812
August 26, 2010	596	2,384
August 31, 2010	1,228	4,267

The cluster delivered one to two times a week. The average price received by the cluster for their squash ranged from PhP 4.00 to PhP 4.50 per kg.

11.6.6 Scaling up or down activities

Decisions of cluster as a result of test marketing

The cluster continued delivering to the wholesaler/retailer in the Bankerohan after their trial delivery until December 2011 when the buyer closed down his business stall because of mismanagement. From August 2010 to November 2011, the cluster delivered a total of 16,650 kg of assorted tropical vegetables such as squash, Baguio beans, tomato, Malabar spinach and karlang. These deliveries produced a gross income of PhP 126,908.

The cluster took the initiative to look for other buyers that could purchase their vegetables and were fortunate to find another wholesaler in the Bankerohan. However, the buyer was residing in a nearby *sitio*. Instead of bringing their vegetables to the Bankerohan, the cluster chose to deliver the vegetables to the buyer's residence. The buyer agreed to the request of the cluster. Under this arrangement, the cluster members were able to decrease the transportation cost by between PhP 10 to PhP 20 per unit for each delivery.

What activities occurred – revision to agro-enterprise plan

After their trial delivery, the cluster did not modify their agro-enterprise plan. However, members were reminded about their commitment to plant the seeds given to them by the project. The seeds were donated to help the farmers start their production and to enable them to contribute to the supply the vegetables that were to be sold to their chosen buyer. However, because of some erratic weather conditions, some members were not able to plant the seeds. For those members who did plant, the yields were low because of the poor weather conditions. Nevertheless, they were encouraged to continue planting and to consolidate their vegetables through the cluster.

In terms of cluster membership, some members chose to leave the cluster even before the start of their trial marketing. Those members who stopped were the ones who were discouraged because of the unfavourable weather.

Evaluation

Based on the initial agro-enterprise plan, the production plan was not followed. As above, the unfavourable weather prevented some members from planting their vegetables. Also, the supply plan of the cluster was not followed. Of the two vegetables that the cluster was expected to cultivate, only squash was cultivated and thus only one vegetable was consolidated and marketed by the cluster. Moreover, the expected 5% contribution from every cluster member after every delivery for their cluster fund was not strictly implemented. Some members requested to waive the 5% marketing fee because their sales were so small having produced only a small volume.

To increase the kind of vegetables and volume of vegetables consolidated by the cluster, they accepted other vegetables that their members cultivated even if it was not part of their supply plan. This greatly improved each farmer's net sales and their cluster fund as well.

11.6.7 Cluster assessment

Cluster members assessed their maturity on five categories that were indicative of their learning process as a cluster. Using the scale of 1 to 5, cluster members assessed the level of maturity in the key areas of organizational development, market position, supply capacity, business management capacity and financial resources (Table 7).

Organizational development

Members of the cluster assessed that as an organization they were functioning independently, were able to implement and assess their agro-enterprise plan, and the cluster had financial reports. Based on the performance of the cluster, the self-assessment by the members was accurate. Since the cluster started and formulated their agro-enterprise plan in November 2009, the cluster had partially followed the supply plan. However, the cluster had accepted other vegetables that were not part of their supply plan. Aside from squash, the cluster was consolidating Baguio beans, Malabar spinach, karlang and tomato. Their marketing officer kept a record of every cluster delivery.

The training and capacity building activities attended by the members of the cluster had empowered them which gave the farmers confidence and skills in negotiation and marketing. Currently, the cluster conducts its monthly meetings regularly. During meetings, the members of the cluster can freely express their opinions.

Market position

Cluster members believe that their group had a strong market position. Before joining the cluster farmers would sell whatever vegetables they had to random buyers. After clustering, the farmers were collectively marketing their produce to a preferred buyer on a regular basis. Their position had changed from being a price-taker to a price negotiator.

Currently, the cluster was supplying one buyer from the traditional market, but the cluster aimed to supply a supermarket if the federation of Davao clusters was formally recognized and the Davao clusters started to collectively consolidate their product.

Table 7: NABISALUM members' cluster maturity assessment

Organizational Development	Market Position	Supply Capacity	Business Management Capacity	Financial Resources
4	4	3	4	4
The cluster is functioning independently; able to: a.) Implement enterprise plans (marketing and supply) b.) Have regular assessments c.) Have written financial reports	Markets are diversified: a.) New products (value added) b.) Clusters pursue market research for higher value markets	Production technologies are in place for reliable quantity and quality standards of at least 80% of the cluster members. Production protocols (best practices), supply delivery monitoring system.	Capital build-up scheme from joint marketing is established: a.) Individual b.) Organizational; c.) Service fees are used to pay in full the marketing and management costs.	Enterprise plan enhanced to address new opportunities. (20%): a.) Performance based incentives

Supply capacity

Despite not being able to follow their initial supply plan, the members of the cluster were still delivering regularly to their buyer. The production system practiced by the farmers was producing vegetables of sufficient quality to meet the standards of their buyer.

Business management capacity

After trial marketing, the cluster accepted other vegetables aside from the products they had initially selected to enable the members to profit more from the collective marketing of their vegetables. This adjustment was able to increase member's income as well as the cluster fund. One of the incentives cluster members received in joining the cluster was the ability to borrow money for vegetable production from the cluster fund.

Financial resources

Over time the cluster had built its own cluster fund from the 5% marketing fee and the 5% seed repayment levy. The marketing officer kept a record of every delivery which were open to all cluster members. The records kept by the cluster were used in their registration as a farmer's organization.

Activities conducted to strengthen the cluster

Trainings and conferences

The following training programs were conducted to increase and improve the skills of the cluster members:

- Basic concepts of marketing
- Basic economics

- Basic record-keeping
- Basic accounting
- Basic recording of meeting Minutes
- Product packaging
- Crop protection and postharvest practices
- Cross-site visits
- Tabo sa UP Mindanao (flee market)
- DOLE pre-registration
- Field exposure on vermi composting
- Buyer negotiation
- Extension Advisors Training Workshop on Learning Lessons (EATWELL) Training
- Soil analysis testing

These training programs were conducted upon the request of the farmers or when the project staff saw a need for training. Some training programs were coordinated with other agencies that had the appropriate expertise to conduct the workshops and seminars. These training programs were also able to increase the capabilities and confidence of the farmers in negotiating with their buyers. The farmers had a better understanding of the market and were better able to respond to the demands of their buyer.

Farmers also attended numerous congresses and forums to share information about vegetable production and marketing:

- 8th and 9th National Vegetable Congress held in Palawan and Dumaguete
- 6th and 7th UP Mindanao Supply Chain Management forum
- 1st and 2nd Farmers and Partners Learning Alliance
- Davao City Organic Week Celebration
- Davao Trade Expo 2011

DOLE registration

Cluster members know that the interventions and assistance extended to them by UP Mindanao and the UPSTREAM Foundation Inc was made possible through the project. However, in the longer term, cluster members recognized the need to be legally registered as a farmer's organization so that they could still access assistance from government and non-government organizations after the project finished.

Project staff initiated and helped the clusters to become registered under the Department of Labor and Employment (DOLE) XI. The suggestion of registering the cluster under DOLE was made for the cluster to have a legal identity as an association. The suggestion was accepted by the cluster during their meeting in May 2011. The following month, the staff from DOLE XI conducted a pre-registration orientation for the cluster. This pre-registration orientation is a requirement for the registration process.

The orientation gave the cluster members a greater understanding of what it meant to be a registered association, the benefits, as well as the requirements needed when submitting the application. The requirements needed for the registration were Minutes of the meeting when the members of the cluster decided they wanted to become an association, the cluster's financial report since it started its operation in 2010, list of officers and members, and the constitution and by-laws of the cluster. All these documents were prepared by the cluster members and the notarization of the documents were assisted by the project staff.

In August 2011, the cluster received their certificate of registration from DOLE XI in the name of Nagkahiusang Bisaya ug Lumad (NABISALUM). Because of this registration, the cluster was able to access support from the local government unit to put up a water source in the *sitio*. During the start of the project intervention in the area, the lack of water

was one of the farmers' main problems. Because farmers were formally organized and registered as a farmer's organization, they were able to ask for support from government agencies.

11.6.8 Assessment of value chains associated with the cluster

Institutional chain

The NABISALUM cluster, represented by its cluster leader, joined in a series of negotiations with an institutional buyer in the latter part of 2010. During these meetings with the institutional buyer, the buyer presented samples of the vegetables they were willing to purchase and provided an indication of the quantity required. Nong Odo, the cluster leader, presented the information discussed during the meeting to all the cluster members of NABISALUM. After assessing their production and supply capacity, the cluster decided not to sell to the institutional buyer. The cluster openly admitted that they could not provide an assurance that they could deliver vegetables of sufficient quality, consistently.

Traditional chain

Members of the NABISALUM cluster are currently supplying their vegetables to a wholesaler based in the Bankerohan who resides in a nearby *sitio.* Because of the proximity of the buyer, the farmers went back to selling their vegetables individually, but the cluster members still contribute 5% of their sales income profit to the cluster funds.

Guiding questions

1. Approaches to improving capacity

The distance of the farm areas from the market prevents the cluster members of NABISALUM from delivering vegetables of high quality. Typically, the farms are approximately 4 km from the buyer's home. To be able to reach the farm, the farmers must traverse a narrow and unpaved path. During the wet season, the path becomes very difficult to pass. Transporting the vegetables along this road can physically damage the produce.

Poor road conditions have always been a problem for the farmers. What the farmers can do to reduce the physical damage during transport is to use suitable packaging to protect the vegetables and not to over pack the vegetables.

If farmers are able to improve the quality of the vegetables they produce, their buyer will give them a higher price. Their buyer already gives higher prices for those vegetables which have been graded and sorted.

2. Effectiveness of market linkage

Through the cluster, the farmers were able to gain knowledge that enabled them to confidently talk to buyers and present their products to that buyer. With this confidence, the farmers were able to identify a buyer who they could deliver their vegetables to regularly. The regularity of marketing their vegetables resulted in a significant change in the farmer's monthly household income (Table 8).

Table 8: Pre-clustering and clustering monthly household income

	2010 (PhP)	2011 (PhP)	% change
Junar Capucong	3,000	5,500	45
Merlyn Capucong	1,500	5,000	70
Jay Mar Capucong	2,000	6,300	68
Modesto Saurez	600	5,750	90
Rudy Maanib	6,000	1,200	-400

The increase in the skills in production, postharvest practices, negotiation and marketing brought about by the capacity building activities conducted through the project had a positive impact on the farmers' income. On average, the members of the cluster improved their income by 45%, from PhP 2,260 before clustering to PhP 4,750 after clustering

One farmer experienced a decrease in income because heavy rain affected the growth of his vegetables which impacted adversely on both the quantity and quality produced.

3. Identify and propose potential interventions

One intervention identified at the farmer level is protected cropping. This will help the cluster to produce good quality vegetables despite the heavy rain. Constructing such a facility will incur a significant cost. Currently, the cluster does not know what protected cropping structure will be suitable for their area.

Relationships

Farmers were asked about their relationships with their buyer and other cluster members. They were asked to rate aspects of their relationship: trust, satisfaction, power and relationship-specific investments on a school boy rating system of 75 to 100.

Farmer to buyer

Based on the survey results, farmers had an average level of trust (86.7) towards their pre-cluster buyer (Table 9).

Farmers think that their buyer benefited the most from their relationship. The buyer could not always deliver what he promised. However, farmers recognize that their buyer provides information about the price and offers assistance in their vegetable production.

The average rating for power and dependency towards their pre-cluster buyer was 89.6. Results suggest that farmers consider themselves to be at the better end of the relationship because they produce the vegetables their buyer sells. The farmers believe that both they and the buyers depend on each other to be able to generate profit. However, the farmers believe that the buyers control most of the information.

The farmers gave an average rating of 86.1 for the relationship specific investments made by their buyer. The buyer suggested to farmers which vegetables to cultivate and gave them advice about vegetable production. Moreover, the buyer taught the farmers how to sort their vegetables.

The over-all level of satisfaction towards their buyer was 87.3 because the buyer treated the farmers fairly by giving them reasonable prices for their vegetables. The buyer also addressed the farmers' complaints. Generally, the expectations of farmers were met by their buyer.

Farmer to cluster

Using the same measures, the farmers were asked to rate their relationship with the cluster (Table 10).

Farmers gave an average rating of 89.9 for their trust towards the cluster. Members had a good relationship with each other and the provision of seed from the project, through the cluster, was appreciated by the farmers. The farmers also trusted the information they received through the cluster.

In terms of power and dependence, the farmers gave an average rating of 90.8 to the cluster. Cluster members were able to exercise freedom of speech and practice democracy. They could express their ideas and views during meetings. Farmers depended on the cluster to provide seeds to start their vegetable crops and to facilitate the marketing of their crops. Farmers believed that no one in the cluster controlled the flow of information: information given to one of the members was disseminated to all the members.

Table 9: Relationship measures of NABISALUM members to their pre-cluster buyer

	Wholesaler/Retailer	
	Rating (%)	**Reason**
Confidence	87.0	Farmers feel that the buyer gain more benefits than them; inconsistent price; delayed payment
Correct information	86.6	Provides information about price
Trustworthiness	87.8	Farmers trust the buyer
Consider my best interests	86.0	Offers fertilizer and seed loan; sets price on his advantage
Honesty	88.0	Buyer never cheated on the farmers; pays the farmers
Keep the promises	85.0	Keeps his promises sometimes
Better offer	91.0	Buyer provides financing (production loan)
Ease to transfer	94.0	It would be impractical for the farmers to transfer buyers
Power	91.0	Farmers feel that they have the power since they produce the vegetables
Control of info	90.0	It is possible that the buyer controls the information
Freedom to adhere demands	91.0	There is freedom on both parties
Dependency	81.0	Depend on each other to have income
Provision of education	82.0	Buyer taught the farmers how to sort their products
Openness to suggest	84.0	Sometimes
Openness to advice	91.0	Buyer gives advice to the farmers on what crop to grow
Frequency of information	87.4	Gives technical information about production; dos and don'ts
Fairness of treatment	90.0	Treats farmers fairly
Quickness to handle complaints	86.0	Buyer accepts complaints
Provision of adequate rewards	87.0	Fair prices
Expectations met	86.0	Expectations were met

For the relationship-specific investments, farmers gave an average rating of 85.9. Farmers are aware that the training programs provided to them had come from the project. The cluster simply facilitated the organization of the members to attend the training. Within the cluster, members had conducted farm visits and shared farming experiences to draw out the best practices that could be applied in their respective farms.

In general, the farmers were satisfied with the cluster (90.6). Even although the survey was undertaken just as the farmers were starting to operate as a cluster, they still perceived that each member had been treated fairly and equitably. This is evident in how the cluster handled complaints. The farmers' expectations had been met because they were provided with seeds to begin their production.

Table 10: Trust and relationship measures of NABISALUM members to the cluster

	Rating (%)	Reason
Confidence	89.0	Cluster members have good relationship
Correct information	94.8	Always made available
Trustworthiness	92.0	Members can be trusted
Consider my best interests	90.4	Provide seeds
Honesty	85.4	Not everyone can be trusted
Keep the promises	87.5	Still uncertain since we just started
Better offer	96.4	Seeds are provided
Power	94.4	Every member can raise their concerns, suggestions and ideas
Control of info	87.0	None
Freedom to adhere demands	91.4	Farmers can raise/express their concerns or ideas
Dependency	85.0	Members do not depend on the cluster
Provision of education	89.0	Gives training and farm visit/demo about organic fertilizer and other technical matters about farm production
Openness to suggest	89.8	Members can suggest
Frequency of information	78.8	The cluster does not give any advice
Fairness of treatment	97.0	Equal/fair treatment for all members of the cluster
Quickness to handle complaints	90.0	Complaints are handled/heard actively
Provision of adequate rewards	79.0	It has not been carried out (delivery fee) since the cluster haven't started consolidation yet
Expectations met	96.2	Expectations were met; seeds were provided; the cluster is able to sustain and progressing

Chain analysis and gaps

For most of the vegetables produced by cluster members, the volume sold in 2011 increased except for tomato. In terms of price, only pechay decreased. This low price was not because the quality of the pechay sold was low but because there were high supply of pechay at the time of marketing. Producing and marketing chayote was the most cost-effective and gave the farmers the highest profit. All other vegetables incurred high costs of production and marketing that resulted in negative returns (Table 11).

Except for tomato, all other vegetables were purchased in *kuridas* (all-in quality). Tomatoes were sold after being classified into small, medium and large sizes. The price varied by size: the bigger the size of the tomato, the higher the price. Pechay was packed in rattan baskets, tomatoes in wooden crates, and squash and chayote in sacks.

Critical incidents and key lessons

The volume of vegetables produced by the cluster needs to increase if they are to deliver to high-value institutional markets. However, the distance of the farm areas from the buyer and the poor condition of the roads continue to present a major impediment. Furthermore, if the farmers are to meet the needs of the institutional buyer, they will need to revert back to collaborative marketing. When they collaboratively market their products, their buyer can be assured that they will receive a sufficient quantity of vegetables of the desired quality standard. However, farmers must also learn and adopt appropriate postharvest practices to decrease the amount of physical damage and wastage.

Table 11: Comparison of costs and returns, 2010 and 2011

Product	Squash		Chayote		Pechay		Tomato	
	2010	2011	2010	2011	2010	2011	2010	2011
Volume Sold	384	1,710	720	1,800	546	550	1,250	1,050
Farm Price	4.86	6	4	6	19.08	8	12	16.5
Cost (P/kg)								
Seeds	5.77	1.99	0	0.17	0.7	0.11	0	0.21
Fertilizer	5.28	1.69	1.67	0	0.56	1.03	0.58	2.1
Pesticide	1.09	0.31	0	0	1.77	0.16	0.51	1.73
Animal	0	0	0	0	0	0	0.12	0
Materials	0.01	0	0	0.5	0	0.45	0.36	0.95
Labor	0.27	1.32	0	0	0	0.07	0.29	0.8
Total Production Cost	12.42	5.31	1.67	0.67	3.03	1.82	1.86	5.79
Revenue less production costs	-7.56	0.69	2.33	5.33	16.05	6.18	10.14	10.71
Marketing cost	2.02	0.19	0.56	0.04	1.99	1.83	1.29	0.8
Transport	0	0.49	0	0.08	0.27	0.27	0	1.2
Cluster fee (5%)		0.03		0.3		0.4		0.83
Profit	-22.00	-5.33	0.10	4.24	10.76	1.86	6.99	2.09
Cost/Sales	142%	112%	114%	107%	112%	131%	111%	117%
Net profit/sales	-453%	-89%	3%	71%	56%	23%	58%	13%
Wastage	8%	4%	9%	0	0	3%	4%	7%

The leadership of Nong Odo is important to the operation and management of the cluster. Currently, Nong Odo is the federation president and representative of the farmers to the Vegetable Industry Council of Southern Mindanao. Through his leadership, the NABISALUM cluster and other Davao clusters have established linkages to other farmer's organizations that produce and market vegetables.

The management and monitoring of cluster members can sometimes be difficult for the cluster. This is attributed to the cultural differences of the cluster members. Sometimes, the cluster cannot come to an agreement because of these differences.

11.6.9 Impact of clustering

Cluster farmers were asked to rate their satisfaction with the clustering approach on a five point scale where 1 was the highest and 5 was the lowest. Overall, the farmers were quite satisfied because they rated the clustering approach 4/5. The advantages or benefits of clustering mentioned by the cluster members included: (1) access to production and packaging materials like seeds, weighing scale and plastic crates; (2) access to market, having a regular buyer and a fair price; (3) increased knowledge on vegetable production and marketing; (4) acquired knowledge on how to make organic fertilizers, pest management and budgeting; and (5) increased income. Most cluster members believed that their income from producing vegetables had increased after joining the cluster. This

increase in income contributed to an over-all increase in their household income, which was attributed to the higher volume of vegetables produced and marketed, as well as the higher prices received for their vegetables (Table 12).

Table 12: Perceptions of cluster members to the impact of clustering

Aspect	Increased (%)	Decreased (%)	No Change (%)
Income from vegetable production	80		20
Cost of production	60	20	20
Total household income	100		
Volume of vegetables produced	60	20	20
Volume of vegetables sold	60		40
Price received for vegetables	80	20	
Production losses/ wastage		40	60
Quality of vegetables produced	40		60
Number of people employed in the farm (both for production and marketing)		20	80
Understanding of markets	60		40
Ability to negotiate	60		40
Decision making skills	40		60
Skills in horticultural production	80		20
Skills in post-harvest practices	80		20
Skills in pest & disease management	80		20
Skills in marketing	80		20
Skills in record-keeping	60		40
Leadership skills	80		20
Access to markets	100		
Access to credit	20		80
Access to inputs	80		20
Relations with other farmers in the village	20		80
Access to farm-related government support	20		80
Linkages with external partners	60		40
Number of school-aged children who could not afford to go to school before but are now able to go to school	100		
Family health	20		80
Environment	60	20	20

As the volume of production increased, the cost of production incurred by farmers also increased. This increase in production cost was due to the increasing prices of production inputs. Only 40% of the cluster members thought that the quality of their vegetables had improved.

Looking at the knowledge acquired and the skills developed by farmers upon joining the cluster, farmers' ability had significantly improved. Farmers now had the ability to negotiate with a buyer, make their own decisions and produce vegetables. Skills in postharvest practices, pest and disease management, marketing, record-keeping and leadership all increased. These improvements were all brought about through the training and capacity building activities conducted among cluster members during the clustering process.

The biggest impact of clustering for the farmers was being able to have access to markets. After joining the cluster, farmers established a linkage with a regular buyer through the cluster. Access to production inputs also increased. As a result of the increased household income, farmers were now able to send their children to school.

11.6.10 Conclusions

As a group, the NABISALUM cluster is working well in spite of the instability of supply and their decision not to collectively market their vegetables. The cluster has grown from being a dependent group when they first started to being able to function independently as a cluster. When the cluster first started, members of the cluster were so dependent on the project to get what they wanted, but as they began to work together, cluster members realised that they needed to get things done on their own, rather than to depend on project intervention.

The good leadership of Nong Odo has contributed to the continuity of the cluster. Though some of the original cluster members have departed, Nong Odo continues to encourage the remaining cluster members to keep working together. Nong Odo also monitors his members periodically. Nong Odo's active participation in different organizations outside the cluster gives the cluster potential linkages for collaboration in the future.

11.7 Ned Sweet Pepper Cluster

11.7.1 Site description and group formation

Community profile

Brgy Ned is populated by 15,378 people who mostly depend on farming for their main source of income. The population is dominated by *Ilonggo* (80%), with T'boli making up 15% and Cebuano 5% (Landcare in South Cotabato 2003)

History of group

In 1999, several farmers in Barangay Ned became members of the Ned Landcare Association Inc (NLCA), which was a farmers organization organized with the assistance of the Philippine Australia Landcare Project. NLCA has approximately 400 members organized into 35 sub-groups in 30 *sitios*. In 2000, several members of the NLCA decided to shift from corn to vegetable production to secure higher returns since the cultivation and marketing of corn incurred high production and transport costs to bring the produce to Sto. Ni*ño* or Isulan. Even with a small area of land, the farmers soon realised that vegetable farming generated significantly more income, and as a result, vegetable farming was adopted by most of the farmers. However, it soon became apparent that the lack of markets was a significant problem for the association.

Initially, the farmers attempted to address the issue by linking with the Vegetable Council of Southern Mindanao (VICSMIN), a multi-stakeholder organization in Southern Mindanao, which had established a marketing arm called *Gulayan ng Timog Mindanao* (GTM) in Davao City. Unfortunately, the linkage with VICSMIN proved to be unsuccessful. Consequently, the NLCA vegetable growers established and developed a *suki* system in which cooperatives in the *sitios* and neighbouring farmers provided the major market outlet for the produce harvested. Farmers also developed marketing outlets in other nearby *sitios* and *barangays*.

Over time, as the NLCA members became more technically competent and the number of farmers cultivating vegetables continued to increase, the problem of marketing once again became the major concern. In February 2007, the NLCA sent three representatives to conduct a market survey in Surallah, Koronadal and General Santos City, sponsored by the then SEARCA - Landcare project. This activity revealed to farmers that there was both a strong demand for vegetables and a lack of supply. As a result, the NLCA made an initial agreement with the Barangay Upland Farmers Association Inc. (BUFAI) at Miasong, Tupi, who had access to a contract for marketing potato, sweet pepper and carrots to a tuna canning company. Again, this never materialized as the farmers had insufficient capacity to meet the market requirements.

Physical resources

Barangay Ned has approximately 41,247 ha of land area divided into *32 sitios* at an average elevation of 800-900 m above sea level. With a typical Type IV climate, which is characterized by the absence of any pronounced wet season and no dry season, the

mean annual temperature is 21°C. July and August are the coolest months while the hottest period occurs between March and May. The relative humidity is generally high (81-90%) in most months (Landcare of South Cotabato 2003).

The topography is rolling to mountainous, with some areas of arable plateau, although the northern margins are characterized by gently rolling terrain and valleys.

Infrastructure and services

Barangay Ned is located some 100 km from Koronadal, over 60 km from the National Highway at Isulan in Sultan Kudarat, and 45 km from Sto. Nino, the nearest market centre. Large trucks, jeepneys and motorcycles are the principle modes of transportation, but motorcycles and horses are used when the road conditions deteriorate. The most populated *sitios* in Ned are those in the northern part of the barangay, which is the most accessible to roads. Other *sitios* can only be reached on foot or horseback. Ned Proper, the original centre of *barangay* activities, is one of the least populated *sitio* because of limited accessibility and continued security problems (Landcare of South Cotabato 2003).

The remote location and inaccessibility has hampered the development of infrastructure and the delivery of services (Garcia et al. 1997, DAR 2000, 2002). There is no telephone line into the *barangay*, and thus two-way radios are the primary means of communication. Furthermore, there is no electricity supply other than the 20 or so small generators which serve about 100 households. Most households rely on wood as fuel for cooking and gas lamps for light. Local springs were used to provide water. Other water sources include open wells, rivers and creeks.

There is a health centre in nine *sitio*, but the limited supply of medical services has led local residents to rely on traditional medicine or to travel to medical practitioners in Isulan or Koronadal. There are 12 elementary schools and two high schools.

Seven cooperatives have been registered in Ned between 1991 and 1999. Small general stores are found in most of the larger *sitio*, and maize shellers, rice millers and solar driers are found throughout the area (Landcare of South Cotabato 2003).

Business activities

Most households in Brgy Ned are employed in agriculture. Typically, both household head and spouse are full-time farmers, either on their own land or as tenants. Farmers may obtain off-farm employment on neighbouring farms. Farmers employed during the harvest period usually receive a share of the daily harvest as payment. Farmers with horses are often employed to haul the farm produce from the farms to the nearest point accessible to trucks.

Development assistance

Most of the development assistance in Ned has come from the Philippine Australia Landcare Project. Consequently, the group adopted the named landcare in their organization. Farmers were taught soil and water conservation practices including contour farming.

Partnerships

Partnership building was established between CRS and the Landcare Foundation of the Philippines Inc. (LFPI) in September 2007, when the CRS Eight Steps Plan for Agro-enterprise Development was introduced. Ned farmers also partnered with the Integrated Cooperative Towards Unified Services (ICTUS), a micro finance institution in Surallah and

the Landcare Foundation of the Philippines Inc in Marbel. The Provincial Agriculturist Office (PAO) and the Tupi Municipal Agriculturist Office (MAO) are both mandated to assist the populace in terms of agricultural development.

11.7.2 Product supply sssessment and selection

Membership profile

Twenty seven (27) farmers were interviewed during the baseline survey. Most of the farmers were male (78%) and 22% were female. The average age of the respondents was 46 years, with most of the respondents having resided in the area for more than 20 years. Most respondents (93%) were married with an average of 7 people in the household. Most of the respondents had achieved only an elementary level of education (37%), with only 19% having attended high school. The majority of respondents (81%) were Catholic. Farming was the major source of income, with the average monthly income of the respondents approaching PhP 4,880. Other sources of income included operating a *sari-sari* store (retailing of goods), hauling and carpentry.

Farm production

The average land area occupied by each farmer was 3.4 ha. Aside from vegetables (sweet pepper, beans,) and corn, rice, peanuts and coffee, the farmers also cultivated fruit crops like durian, lanzones, mango, papaya and mangoesteen. The commonly used farm tools included: a *lagaraw* - single-edged flexible long sword with a bent tip (85%), *arado* – plough (81%), sprayer (63%), *guna* –knife for digging out roots and weeding (56%), *sadol* - hoe (48%) and a *karas* – a scythe for cutting grasses (30%). Some 81% of the farmers owned a carabao and 67% owned a horse.

The common fertilizers applied in the area included urea (93%), complete (89%) and sulphate of ammonia (14%). Some were using foliar fertilizers manufactured from any number of plant concoctions (19%). The most commonly used pesticides included Selecron (48%) for fruits flies and Wildkid for cutworms (44%), and Buswhack (41%) for aphids, worms and butterflies. Daconel (26%), Dithane (26%) and Ridomil (11%) were the most widely used fungicides. Some were using garlic juice or the juice of the *panyawan* (*Tinospora crispa*) vine and cosmos plant to deter pests and insects.

Most of the farmers (89%) practiced contour farming to prevent soil erosion.

The most frequently cited problems included pests and diseases like rats, fruit flies, grasshoppers, changes in the climate like severe hot weather, the poor condition of the roads and the lack of transport to take their produce to market, and the high cost of farm inputs.

Marketing practices

Most of the respondents (56%) were using their own money to finance their vegetable production. Other farmers sourced finance from formal institutions (30%) and from traders and neighbours (14%).

The product was sold to traders and wholesalers located in Norallah, Isulan and Sto Nino. The majority of sales were conducted on the basis of cash on delivery.

Multiple modes of transport were engaged including motorcycles, jeepneys and trucks. Most of the produce was packed in used sacks.

Some 63% of the respondents believed that there were a number of marketing problems. These included the low price, the lack of buyers, the lack of capital to buy farm inputs and the poor condition of the roads.

11.7.3 Market assessment

Rapid market appraisal results

Farmers were given some basic training on how to conduct a market chain study and how to interview potential buyers about their requirements. Role players were used for the members to practice their interview skills before visiting the markets. The Ned cluster farmers interviewed wholesalers in Surallah and Koronadal City. They also visited institutional buyers in Koronadal City and General Santos City. A group of farmers met with the purchasing manager and owner of a supermarket in Koronadal City and asked a number of questions about product quality and quantity, the mode of payments and processes. They also met with one of the consolidators for a tuna canning processor. The consolidator required 8 tonnes of red bell pepper per week, with a specific size requirement of 65-75 mm.

Initial (pre clustering) chain maps

Before the development organizations came to Barangay Ned, farmers were growing corn, rice, vegetables and peanuts as sustenance for basic family needs. Farmers were not organized; each farmer sold their products individually to whatever wholesale buyers were available. Some farmers, whose production inputs were financed by traders, had no option but to sell their produce to the financier, despite the lower price offered for it (Figure 1).

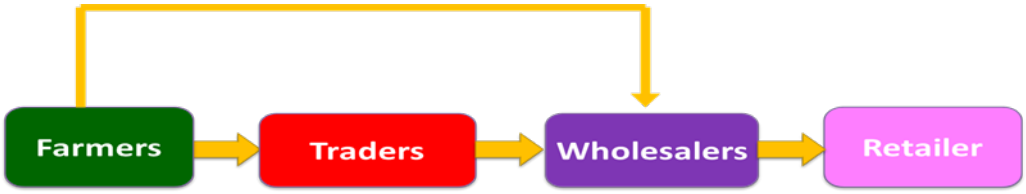


Figure 1: Initial chain map

Buyer's comparison

After returning from the market study, the group members presented their market findings to the larger group. As a result of the process, the cluster participants realized that in order to meet the product quality and quantity requirements of the large institutional buyers, they would have to work together in a cluster. The farmers not only learnt where their product went beyond the farm gate, but also the price differentials paid for different varieties, sizes and colours (Table 1).

Support needed

Before the formation of the cluster, the farmer participants identified the advantages and disadvantages of pursuing various marketing arrangements with institutional and wet

market buyers. Elements discussed between the members were the reliability of market demand, the price, the availability of planting materials, chemicals and fertilisers, and whether the members had the production skills to produce the crops or whether more training would be required. A range of constraints were identified including the availability of finance and access to post harvest facilities (Table 2).

Table 1: Market survey of institutional and wet market buyer

	Institutional Buyer	Wet Market
Buyer	CVD Trading and Agro Ventures	Buyer in Surralah Public Market
Crop	Sweet pepper, carrots, potato	Onion, carrots, native garlic, potato
Month when in high demand	All year round	Nov- March
Months when in scarcity	N/A	April – May
Price/kg	Sweet pepper – PhP 70-80/kg Carrots – PhP 15-16/kg Potato – PhP 18-20/kg	Onion – PhP 50 - 100/kg Carrots – PhP 30 - 60/kg Garlic – PhP 100 - 130/kg Potato – PhP 30 - 60/kg
Quality required	Good quality	Onion – good quality Carrots – big/medium Garlic – big Potato – Granola
Delivery needs	When purchase order is issued	Delivered
Volume requirements	Sweet pepper – 10 T Carrots – 25 T Potato – 50 T	Onion – 360 kg Carrots – 400 kg Garlic – 360 kg Potato – 1500 kg
Packing requirements	Sorted in crates	Net bag for onion, carrots and garlic Ramble sack for Potatoes
Frequency of purchase	Weekly	Weekly for onions, carrots and potatoes Monthly for garlic

11.7.4 Cluster formation and planning

In order to join the cluster, the farmers were required to: (1) participated in one of the agro-enterprise training workshops; (2) attended an NLCA meeting on cluster formation; (3) to have a vegetable garden; and (4) be interested in growing sweet pepper.

The association selected 17 Landcare members to serve as the pilot cluster for the vegetable agro-enterprise development in 2008. Two clusters were selected in Barangay Ned. Ned 1 was located in the Sitio Kibang and Ned 2 in Sitio New Tupi and nearby *sitios*. Each cluster had eight members.

Two sets of training and workshops were conducted in February 2008, followed by negotiations with buyers and linkages with a microfinance institution.

Initial cluster agreement

In February 2008, the 18 cluster members developed their cluster plan. An agro-enterprise plan has four basic components: the market plan, the supply plan, the management plan and the financial plan. The agro-enterprise plan puts substance into a desired objective through the integration of the four component plans. Also specified are the product quality management procedures to ensure the desired quality is reached.

Table 2: Support needed by the farmers

Buyer	Advantage	Disadvantage	Plan	Need
Supermarket	Less transport Take all products Accommodating buyer	Consignment basis Lower demand Unfriendly farmers	Sell vegetables that are not needed by the consolidator Monitoring high selling vegetables in supermarket Constant price monitoring Education through examples	Working staff Vegetable seeds Several vegetables Planning
Consolidator	Accommodate bigger volume Prompt payment More opportunity	High risk of product damage in case of delayed in the delivery Limited supply Some members needs financial assistance	Provide safe packaging Bigger market Recruit more vegetable farmers Seek government support for resources	Proper packaging More linkages Working staff Working area Planning Vegetable seeds Financial assistance
Wholesalers-retailers	Accommodate bigger volume High price Cash on delivery	Strict classification They only get small size sweet pepper	Provide good quality vegetables Look for other buyers	Variety of seeds Financial assistance

Cluster policies were formulated that include:

- compensation/incentives – PhP 0.5 per kg for the marketing officer
- PhP 0.5 per kg for the NLCA
- all members will contribute sweet pepper (to meet the target volume)
- cluster penalties: 1st offence – warning, 2nd offence – expulsion
- using dangerous preservatives like formalin is prohibited
- transport cost, facilitators fee and meals will be covered by the members
- regular meetings to be conducted right after delivery
- regular monitoring of member growers will be done before and after delivery
- transparent delivery reports (all expenses must have supporting documents)

Initial marketing plan

Based on their agro-enterprise plan, the Ned clusters planned to sell to a consolidator who supplied a tuna processor. The tuna processor required 79 tonnes a week of sweet pepper, 30 tonnes of carrots and 50 tonnes of potatoes. The sweet pepper was to be extra large and medium size for which the consolidator was prepared to pay PhP 40 per kg for the large size and PhP 38 for the medium size.

Farmers involved in the Ned cluster selected sweet pepper because there was a ready market for the crop, the area was suitable for sweet pepper production, the crop was easy to manage, it could be harvested weekly after only three months, it could be subsequently harvested for up to eight months, and most NLCA members were already growing it.

A cost benefit analysis was conducted on the groups chosen product and the potential risks and problems were also identified (Table 3).

Table 3: Estimated costs and returns

Requirements	Cost (Php)
Labor	8,900
Land preparation	1,100
Seedling preparation	500
Planting	1,500
Care and maintenance	2,000
Harvesting	2,800
Sticking	1,000
Materials	15,395
Seed: 50 grams (hybrid)	450
Plastic twine	190
Plastic mulch	4,400
Fertilizers	6,875
1 bag Durabloom	500
1 bag 14-14-14	1,500
20 kg Kieseritas	240
1 kg Solubor	140
1 bag 16-20-0	500
1 bag 46-0-0	1,500
20 kg Kieseritas	240
1 kg Solubor	140
1 bag 16-20-0	1,500
1 bag 46-0-0	1,200
1 bag 0-0-60	1,300
3 litres foliar	450
Fungicides/Insecticides	3,480
1.5 litres	1,500
1 kg Vitigran Blue	500
1 kg Daconil	980
1 kg Pilarzeb	300
½ kg Gramoxonel	200
Marketing cost	2,000
GRAND TOTAL	26,295
Farm gate price with plastic mulch	12.05
Income (2,000 kg x 30)	60,000
Net with plastic mulch	33,705

(50 g seeds, 1,250 m^2, 5,000 hills)

Initial production/supply plan

In the initial agro-enterprise plan, four farmers agreed to plant carrots and 16 farmers agreed to plant sweet pepper. The estimated production for one cycle was 8 tonnes of carrots and 81.2 tonnes of sweet pepper.

It was agreed that the Ned cluster farmers would classify and consolidate their produce immediately after harvest. The vegetables would be transported to Lambak by horses, for an estimated cost of PhP 35 per sack. From Sitio Lambak, the vegetables would be carried to Isulan by skylab (PhP 150 per sack) or by jeepney (PhP 70 per sack). From Isulan, the vegetables would travel to General Santos City by van (Figure 2).

Figure 2: Physical flow

On arrival, the vegetables would be sorted and classified again.

Initial management plan

The Ned clusters had a very simple structure. The two cluster leaders were in charge of the operation of their respective clusters. The marketing officers were farmers themselves who consolidated the harvest from the other farmers (Figure 3).

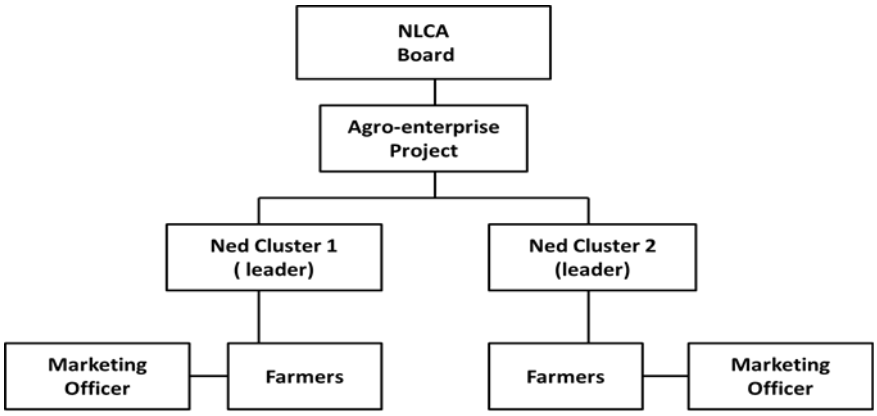


Figure 3: Ned cluster structure

Initial financial plan

It was anticipated that collectively the cluster would receive more than PhP 1.79 million in net sales.

Initial product quality plan

To protect the products from damage, farmers utilized sacks and cartons to protect the produce from bruising. The product was classified by size and colour, with larger fruit receiving a higher price and red fruit receiving a higher price than green fruit.

11.7.5 Test marketing

In March 2008, the Ned farmers met with Surallah local buyers and the consolidator of a tuna canning company. Cluster members discussed the details of a trial delivery of sweet peppers, clarifying the volume and quality requirements, the likely price, the delivery schedule and the mode of payment. In April 2008, another meeting was conducted with the consolidator where the cluster presented their Production Plan and a trial delivery was agreed. In August, 138 kg of sweet pepper were delivered to the consolidator (Figure 4).

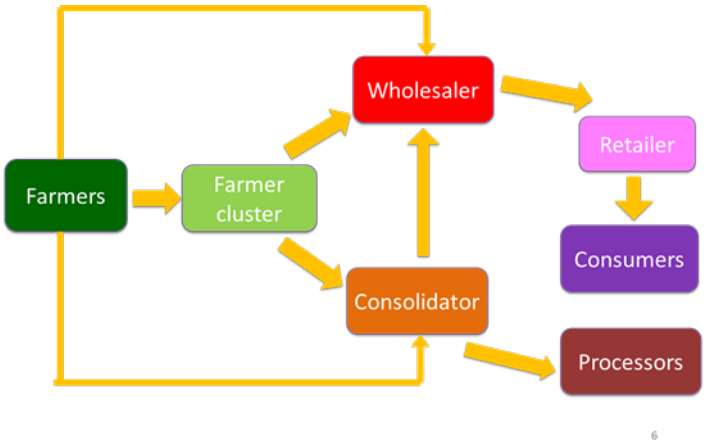


Figure 4: Institutional market supply chain

Evaluation of trial delivery

To meet the anticipated delivery schedule, the 17 cluster members planted 3.3 ha of sweet pepper. Over 10 deliveries, the cluster sold 17.5 tonnes worth PhP 523,300. After deducting the costs of marketing (PhP 135,202), the clusters received a net income of PhP 386,954.

Aside from the processors, the Ned cluster members were also able to establish a link with local buyers. They delivered regularly until November 2008 when the consolidator dishonoured them by issuing several cheques which bounced. According to the consolidator, the processors did not want the sweet pepper if the consolidator could not also deliver carrots and potatoes. This became an issue for the group because they incurred harvesting, post-harvest and marketing expenses, as well as interest on their loans. With little working capital, the group could not easily absorb the variation in their anticipated cash flow and tried to negotiate partial payment on delivery. The cluster also met with ICTUS to discuss the outcome of the test marketing and the payment with post-dated cheques. ICTUS agreed to cash the post-dated cheques issued by the consolidator if the cluster would open an account.

One of the major problems the cluster experienced was the deterioration in the road after continuous heavy rains. For the first part of the journey, the sweet pepper had to be transported by horse, which not unexpectedly caused considerable damage to the product. Sorting was done on three occasions to remove product which had either been damaged or in some other way failed to meet the buyer's specifications.

In November, the consolidator stopped buying for 3 weeks as no potatoes or carrots were available. However, at this time, much of the product was ripe and ready for harvest. In need of some alternative markets, the clusters supplied other buyers in Koronadal City, Isulan, Sultan Kudarat and in Davao City.

11.7.6 Scaling up

From July 2009 to December 2009, the cluster delivered over 79,240 kg of sweet pepper. The average monthly price ranged from PhP 19 to 41 per kg. About 55% of their produce went to consolidators of a major tuna canning processor, while the remaining 45% went to the local buyers in Davao and Koronadal. In 2010, productivity suddenly fell as a result of crop failure due to pest infestation (Table 4).

Table 4: Ned clusters actual production 2008-2012

Crops	2008	2009	2010	2011	2012
Sweet pepper					
Volume (kg)	17,712	60,383	10,831	16,890	8,730
Price(ave)	32	24	20	30	30
Sales	566,784	1,449,192	216,620	506,700	261,900
Bulb Onion					
Volume				138	1,613
Price				30	80
Sales				4,140	129,040
Chili green					
Volume					1,080
Price					30
Sales					32,400

11.7.7 Cluster assessment

Level(s) of maturity

In March 2009, the cluster members, LFPI, CRS facilitators and other partners met to review the outcomes of the clustering operationg. The facilitators guided the learning process which covered five key areas: (1) organizational development; (2) market position; (3) supply capacity; (4) financial resources; and (5) management capacity.

As part of the cluster's learning process, its level of maturity was assessed in a participatory way. To assist them, a set of indicators described each stage of maturity, which was ranked on a scale of 1 (lowest) to 5 (highest) (Table 5).

Table 5: Ned Maturity Level 2009 – 2011

INDICATOR	2009	2010	2011
Organizational development	3.5	3.0	3.0
Market position	3.0	3.5	3.5
Supply capacity	3.0	4.0	4.0
Financial resources	3.5	3.5	3.5
Management capacity	3.5	3.0	3.0

Organisational development

In 2009, a rating of 3.5 suggested that the Ned cluster could function independently, implement enterprise plans and make regular assessments, but they did not have a financial report. However, the maturity level declined to 3 in 2010 and 2011 because they failed to consolidate and market collectively. They still had regular meetings but they were not able to implement their marketing and supply plans.

Market position

In 2009, a market position maturity score of 3 meant that the cluster had developed markets with several buyers who were able to offer stable long term agreements at higher prices. In 2010, their market position increased to 3.5 as a result of introducing a new crop: bulb onion.

Supply capacity

After the first year, production protocols were in place for at least 80% of the cluster members. The ratings improved in 2010 to 2011 because of value-added products, new products and markets.

Financial capacity

The maturity level for the Ned clusters over three years did not increase. Income was regular, financial reports were discussed in the cluster meetings, and they had financial statements in place. The marketing and management costs were paid in full be the members.

Management capacity

The management capacity score declined because the cluster was unable to make plans and their operation was hampered by technical problems. Nevertheless, they did have an enterprise plan which enabled them to take advantage of new opportunities and the operational plan was reviewed routinely.

Activities conducted to strengthen the cluster

Different capacity building activities were provided for the Ned clusters to equip them with proper skills and knowledge. Cluster strengthening related activities were also provided to balance environmental management and enterprise development. These capability building activities include basic market training and market visits, cluster enterprise planning, buyer's negotiation, field tours, crop protection training, leadership training, and participation in vegetable congresses and the learning alliance.

Outcomes

Farmers who attended the crop protection training became more aware of how to control pest and diseases. They learnt how to detect the occurrence of the pest before they could cause damage and how to control them using integrated pest management. One of the farmers in Ned who attended a vegetable congress learned how changes in the climate might impact on production and some of the strategies producers could adopt for the future.

Cluster farmers in Ned are providing training for other farmers who are not part of the cluster. Fourteen (14) additional NLCA members and 17 non members requested technical assistance from cluster members and are now growing sweet peppers. Cluster leaders are now capable of exploring and negotiating with other buyers to expand their production to meet a bigger market. They can facilitate meetings without the presence of the local partner and maintain and update their financial management and recording system independently. Farmers have developed a mind set which requires adherence to a scheduled planting calendar.

11.7.8 Assessment of value chains associated with the cluster

Before clustering, vegetable farmers sold their produce to various traders (Figure 5). After clustering, the farmers delivered their produce to the cluster who subsequently distributed the produce to traditional wholesalers and a number of consolidators. The consolidators picked up the produce from the municipality of Isulan and Sto Nino and supplied it to wholesalers in Koronadal, Surallah and Davao (Figure 6).

Figure 5: Before clustering

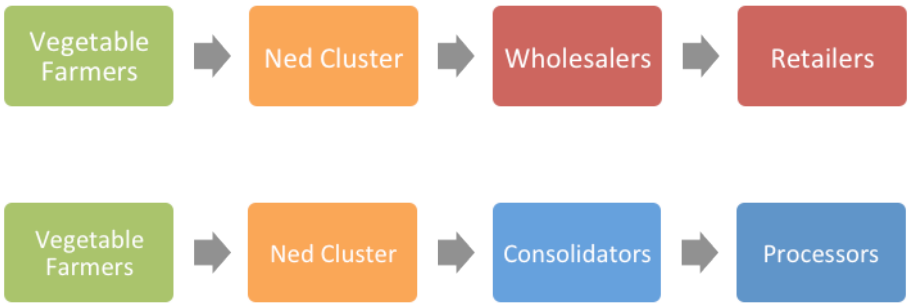


Figure 6: After clustering

Relationships

Farmers and buyers

The farmers relationship with their preferred buyers was evaluated on a school-boy grading system where 75% was the lowest and 100% was the highest. Two major buyers: the consolidator and the wholesaler were rated by the farmers (Table 6).

For most criteria, the farmers rated the consolidator higher than the wholesaler. The price that the consolidator paid was higher than the wholesaler and payment was more prompt. From the consolidator, farmers were not only paid cash on delivery, but having made the journey across rough roads they were able to sleep at the house of the consolidator before returning to the barangay. The consolidator provided clear requirements for quality, price and volume compared to the wholesaler. Prior to delivery, the consolidator and the marketing officer communicated through mobile phones. Conversely, the prices offered by the wholesaler were not consistent and there was always a chance that the prices would be renegotiated. For this reason, the consolidators were trusted, whereas the wholesalers were prone to change their minds and could not be fully trusted.

While the consolidators were prepared to take all the farmers produce, the wholesalers did not buy all sizes. As the consolidators knew that the Ned cluster members were Landcare members, they were prepared to offer them a better price. The consolidators purchased whatever vegetables the cluster had available.

In both cases, the cluster members were free to choose who they sold their produce to. Other than providing the volume that they had committed to supply, they were not obligated to either buyer as they did not have any outstanding debts.

As such, the buyers were unable to exercise any coercive power – the farmers were not dictated to by the buyer. Generally, the consolidators were very open, sharing price information with the farmers and being willing to negotiate a price commensurate with the quality and volume of produce available and the prevailing market price. The consolidator was willing to share their experience and to show cluster members how to classify and pack their produce.

Table 6: Farmers' ratings for the buyers

	Consolidator	Wholesaler
Trust	87	78
Confidence	86	79
Correct information	85	79
Trustworthiness	87	77
Consider my best interest	89	76
Honesty	88	77
Keep the promise	88	79
Power dependence	85	78
Better offer	89	76
Ease to transfer other buyers	87	84
Power in relationships	91	76
Control of information	86	78
Freedom to adhere demands	70	81
Dependency with the buyers	85	77
Relationship specific	80	79
Provision of education and training	77	76
Openness to suggest	81	80
Openness to advice	86	81
Frequency of information	78	
Satisfaction	87	80
Fairness to treatment	89	83
Quickness to handle complaints	88	83
Provision of adequate rewards	83	78
Expectation met	86	78
Overall rating	85	79

Farmers perceived that they had been treated fairly by their buyers, although the consolidators were more considerate when it came to pricing. Free transport and food were some of the rewards given by the consolidators. For being a member of the cluster, an additional price of PhP 2 per kg was added to the price.

Farmers with their cluster

During the cluster chain survey, farmers rated their relationship with their cluster in terms of trust, power-dependence, the making of relationship specific investments and satisfaction. The farmers gave high ratings to all criteria (Table 7).

Although the cluster was not perfect, the farmers perceived that several minds were better than one. Generally, there was a good relationship between farmers and the cluster. Fellow farmers could be relied upon to deliver what they had promised. Thus everyone benefitted from clustering.

Within the cluster, information such as the schedule of production, buyers profile and deliveries were appropriately recorded. At each monthly meeting, information was updated. At the monthly meeting, everyone could say what they wanted to say and the group would listen. The cluster was open and information readily shared among the members. Some farmers trusted the cluster because of the benefits they received like training and the implementation of the plans and programs. Farmers also mentioned that the group adhered to the policies and sanctions were enforced against those who violated them.

Table 7: Farmers' ratings to their cluster

Respondents	Cluster
Trust	92
Confidence	93
Correct information	92
Trustworthiness	93
Consider my best interest	92
Honesty	93
Keep the promise	90
Power-Dependence	90
Better offer	92
Power in relationships	89
Control of information	86
Freedom to adhere demands	92
Dependence with the cluster	92
Relationship-specific investments	96
Provision of education and training	96
Openness to suggest	96
Frequency of information	95
Satisfaction	94
Fairness to treatment	95
Quickness to handle complaints	95
Provision of adequate rewards	91
Expectation met	94
Overall-ratings	92

Most farmers believed that the cluster looked after the welfare of the members and their intention was good. The main reasons given were the opportunity to make additional income and to access the technical knowledge and advice. Even although the cluster did not provide financial support for individual members, it continues to support individual farmers.

Farmers considered the benefits of clustering to include minimizing cost. Even with small volumes, it was still possible for farmers to deliver to the marketing officer. With clustering, there is a sure buyer, a better price, and a clear arrangement.

Although farmers depended on their cluster, the cluster was there to service their needs. The cluster was open and farmers could talk openly about their worries and concerns. The cluster members depended on each other.

Wastage and losses

An assessment of field losses and wastage along the supply chain was undertaken for the cluster. Field losses included those losses which were incurred before harvest due to pest and disease infection and crop failure. Postharvest losses include those due to physical damage, rejection and *resiko*. *Resiko* was a practice whereby the buyers automatically made a deduction (by weight) to compensate for out-of-grade product and damaged product. This could vary from 2-5 kg for sack depending on the product.

Based on field data, the field loss decreased by 59% from 2010 to 2100 while the postharvest loss decreased by 11% (Table 8). This could be attributed to the improved performance of their farming, low pest infestation and good climatic conditions.

Table 8: Field loss and post-harvest losses

	2010	2011	% change
Quantity sold (QS)	14,056	20,417	
Field loss	11,354	4,498	
% of field loss	81%	22%	59%
Postharvest	2,772	1,722	
% Postharvest loss	19%	8%	11%

Key success factors

Marketing

The tuna processor, as the major market for the cluster, was largely responsible for the success of the cluster, as it provided a stable, high value market for some of the vegetables. The company, which produced 97% of the canned tuna for the domestic market, required red sweet pepper, carrots and potatoes. They traditionally purchased these vegetables from local consolidators in General Santos.

Finance

The presence of ICTUS helped the cluster access their capital for production and marketing. Because of their linkage with Landcare, they did not need to go through the usual procedure of visiting the farms due to the long distance and their trust in the LFPI facilitator, who also served as a guarantor for the loan. The main factor that influenced the decision to give the loan was that the NLCA was an existing, well organised group, already competent in production technologies. They were also impressed with the enterprise plan presented by the cluster and the market linkages that had already been made.

Group dynamics and leadership

The Ned Landcare farmers had a history of working together, sharing knowledge and adapting farming practices to suit the local conditions. It was recognised that the farmers were already helping one another with farm activities and exchanging information about how best to grow their crops and who their buyers were, as well as participating in other social activities. Landcare farmers had a long history of receiving technical support through group-based processes and adapting and sharing technologies. Their success can be attributed to their maturity and their ability to learn easily from their experiences, especially from their mistakes. They shared a common goal – to take good care of their land. One requirement to become a member of the cluster is that farmers should practice conservation farming.

Group organisation/rules/structure

The Ned cluster was very cohesive. About 90% of the members participated in every meeting despite the distance between their farms. The physical terrain and accessibility also contributed to the success of the cluster.

Record keeping

Cluster meetings provided an opportunity to assess performance against targets. As everyone was involved and informed, trust was built. During these meetings, cluster members openly discussed problems encountered during the last delivery, suggested alternatives to these problems, presented the association's financial reports, assigned marketing officers for the forthcoming weeks, reported on the status of the production area and expected date and volume of harvest, and reviewed and revised association policies.

During the cluster meeting, part of the agenda was the sharing of technology among cluster members. This allowed each cluster member to share their technical problems and good agricultural practices on farm. From reciprocal farm visits, cluster members obtained information to improve their own farming techniques and the quality of their produce, while at the same time, to strengthen group relationships. The sharing of technical information among cluster members also provided an environment for cluster members to build trust.

Links with other organisations

Much of the success of the NED cluster is credited to the presence of social capital, particularly the presence of Landcare in the area. The production and marketing systems among the Ned farmers has been evolving over the 10 years that Landcare has had a presence in the area. The relationship between the Landcare facilitators and the local government units helped Landcare farmers in Ned link with other institutions. The Provincial Agriculturalist Office (PAO) noted that as Landcare has evolved from soil and water conservation (SWC) to production and more recently marketing, it has maintained good linkages with other institutions such as the PAO, where other projects have often failed to consult local government units.

CRS has gained experience in agro-enterprise activities throughout the Philippines, but the partnership with LFPI has been different to their past endeavours. Other AE activities by CRS have been substantially financed, from production to the trial delivery stage of the process, by organisations such as USDA and the Small Farms and Marketing Project (SFMP). By working with existing Landcare farmers, much of the social capital needed for cluster marketing already exists hence the initial inputs for organisational development are reduced. According to the CRS staff, the Landcare groups are well organised with high existing levels of social capital, making facilitation easier. The farmers already have good production skills and are willing to try new things.

Capacity building

Capacity among the cluster members was gradually enhanced through the process of cluster implementation. Cluster leaders are now capable of exploring and negotiating with other local buyers, they could facilitate meetings without the presence of the local partners, and maintain and update financial and management accounts. Farmers collectively developed their planting calendar and some were recording farm expenses and income.

11.7.9 Impact of clustering

From Table 9:

- 88% of the cluster members indicated that their relationships with other farmers had improved because of clustering
- 80% of the cluster members mentioned that their skills in horticultural production, post harvest practices, pest and disease management had improved
- 72% of the members said that the cost of production had increased. However, a similar percentage said that they understood the market better and linkages with external partners had improved
- 72% of cluster members mentioned that there had been no change in government support
- 68% of the respondents said there is improvement in marketing skills
- 68% of the respondents said that there are changes in access of government support
- 64% said that their total household income had increased and the volume of fresh vegetables sold had increased

- 60% indicated that their income from vegetable production had increased
- 60% said that their ability to negotiate and make better decisions had improved
- 60% said that there were no changes in price

Table 9: Impacts of Clustering in Ned clusters

	Increased		Decreased		No Change	
	f	%	F	%	f	%
Income from vegetable production	15	60			10	40
Cost of production	18	72	1	4	6	24
Total household income	16	64	1	4	8	32
Volume of vegetables produced	16	64	1	4	8	32
Volume of vegetables sold	17	68			8	32
Price received for vegetable	9	36	1	4	15	60
Production losses/wastage	13	52	5	20	7	28
Quality of vegetable produced	11	44	4	16	10	40
Number of people employed in the farm	11	44			14	56
Understanding of markets	18	72			7	28
Ability to negotiate	15	60			10	40
Decision making skills	15	60			10	40
Skills in horticultural production	22	88			3	12
Skills in post harvest practices	21	84			4	16
Skills in pest and disease management	21	84			4	16
Skills in marketing	17	68			8	32
Skills in record-keeping	16	64			9	36
Leadership skills	10	40			15	60
Access to markets	15	60			10	40
Access to credit	9	36			16	64
Access to inputs	7	28			18	72
Relations with other farmers in the village	22	88			3	12
Access to farm related government support	8	32			17	68
Linkages with external partners	18	72			7	28
Number of school children sent to school	10	40			15	60
Family health	7	28			18	72
Environment	9	36			16	64

For some 68% of the cluster farmers, the major advantage of being a cluster member was improved access to technical information (Table 10).

The exposure of Ned farmers to buyers beyond their local areas had an immediate impact on their knowledge and ambitions. When the farmers realised the importance of cluster formation in linking with institutional buyers, they became more pro-active during meetings and were more interested in finding out information on how to improve quality.

With a greater knowledge of the market, farmers indicated that they were more willing to adjust the variety of sweet pepper planted, to increase the area dedicated to sweet pepper, more judiciously manage pests and diseases, the application of fertilisers, postharvest practices and plastic mulch.

Table 10: Advantage of clustering approach

Response	Frequency	%
Access to technical information/technological sharing/seminars on technology	17	68
Knows how to produce/plant sweet pepper	6	24
Increased income	5	20
Improved leadership	4	16
Learn how to deliver their products to the market	4	16
Access to markets/market linkage	3	12
Able to buy farms inputs and facilities	3	12
Attended seminars on Agro-enterprise (AE)	2	8
Improved relationship with the farmers	2	8
Find fulfilment in the group	2	8
Know how to contour their lands	2	8
Access to inputs (seedlings)	1	4
Access to credit	1	4
Improved skills in negotiation	1	4
Improved skills in record-keeping	1	4
Able to send children to school	1	4

Some individual cluster members experienced an increase of 100 – 200% in income from shifting crops (corn to sweet pepper), which helped them to achieve the things they have always longed for. Five cluster members had purchased mobile phones and learnt how to use SMS to communicate and negotiate with buyers. Three members said they were able to send their children to college and six members said that the income from sweet peppers went to the education of their children.

Within the community, employment opportunities for planting, weeding, harvesting and sorting had dramatically improved as a result of clustering. On average, each cluster member required an additional five man days per week for activities related to sweet pepper production. The motorbike (skylab) drivers who transport the sweet pepper to St Nino and the van drivers who then take the produce to General Santos have also increased their income.

As the project drew to its conclusion, the cluster members were asked to record the various changes that had occurred within their households and their communities as a result of the clustering process. It was evident that significant social and economic benefits had been derived for the Ned clusters (Table 11).

In building capacity, one of the principle aims was to ensure that beyond the end of the project, the clusters would have the necessary skills and linkages to survive. Cluster leaders were asked to prepare a future cluster plan, outlining their future desires, what resources they would need to achieve those desires and from where the cluster would draw the resources that it needed. The cluster plans developed for both Ned 1 and 2 suggest that the groups will: continue to improve the diversity of crops that they cultivate; continue to explore more sustainable production methods; seek formal registration and maintain regular meetings (Table 12).

Table 11: Changes observed by Ned clusters

Understand the difference between marketing as individual and collective marketing as a group Open the minds of the farmers that farming is not only an occupation but also a business Clustering is inspiring and enjoyable Establish close relationship within the community Better off financially Increased the number of children from 5 to 9 because of vegetable farming Ownership of carabao and cow Land ownership – able to repay money borrowed from someone in times of emergency (where the land title was used as collateral) Before we drink coconut wine because it is cheap – now we drink beer We can easily send our children to school. Visited different places – UP Mindanao for cluster alliance, Palawan for vegetable Congress, Samar for Farm Cross Learning Program Contact good buyers We have capital from ICTUS Now we have support that benefits our lives Through clustering we can deliver our produce to market Our neighbours are employed because we need help in sorting and transporting our vegetables We deliver different kinds of vegetables We have more friends

Table 12: Future plans of Ned clusters

Cluster	Future Plans
Ned 1 Cluster	Cluster will include other agri-crops for agro-enterprise Integrate organic farming like vermicomposting Institutionalize NLCA to local government unit Accreditation to DOLE Pursue application of livelihood proposal to DOLE Sustain regular cluster meeting and improve organizational management system Look for more advance ideas / technologies to minimize postharvest losses and product handling practices Strengthen the organization in handling projects to encourage donors and other supporting agencies in terms of handling finances
Ned 2 Cluster	Make the association more progressive and increase membership Continue the monthly meeting Continue the farming Continue learning More partnership with LGU Strengthen NLCA in managing the project so that UP Min will continue the program Sell our products to Visayas and Luzon

11.7.10 Conclusion

The cluster marketing approach adopted by the Ned Landcare Cluster Association may be a good model for other smallholder farmer groups. The farmers in the cluster have learned to develop their enterprise plan, to establish linkages with a microfinance institution, and to negotiate terms of trade with institutional buyers and other partners. Farmers have increased their technical and marketing knowledge, improved their farming and marketing practices, improved their access to capital, and increased their income. The benefits of clustering have provided income not only for the farmers but also for the entire community. Trust, confidence, commitment and unity among cluster members have been established through the cluster marketing approach.

The success of Ned can be replicated if several key success factors are present: high existing levels of social capital, the presence of several markets and financial institutions, homogenous beliefs and the desire to work together, to share knowledge and to adapt farming practices.

Nevertheless, without a substantial investment in infrastructure, the activities of the Ned cluster will remain constrained by it remoteness and inaccessibility, particularly during the wet season when the road often becomes impassable.

Vignette

Cluster marketing experience: John Villanueva

John Villanueva is one of the members of the Ned Sweet Pepper cluster. He resides in Sitio New Tupi, Barangay Ned. His home can be reached after three hours travel in a *habal-habal* (single motorcycle) from the nearest municipality of Isulan, Sultan Kudarat. He is 46 years old and a father of 10 children. He started farming at the age of 16. John owns 4 ha of land. Aside from corn, he also planted rubber and fruit bearing trees such as coffee, lanzones, rambutan, durian and papaya. He is the Chairman of the Ned Landcare Association Inc (NLCA), a farmer's organization which was established in 1999 with initial funding from the Australian Centre for International Agricultural Research (ACIAR) under the Landcare Project. The project introduced the farmers to conservation practices including contour farming which included diversified farming like planting fruit trees and vegetables.

John decided to join the project for the benefit of his children. Previously, his major source of livelihood was from cultivating corn, but the situation for his family prompted him to engage into vegetable farming.

"*My income as a corn farmer of corn was not enough",* he said*. "My children were growing up. I needed extra income for their education. I earn this income by planting vegetables for my children. The success of my children is my success. Their success is my success"*.

Vegetable production was initially an extension to his farm, but it was never an easy crop for him. When John first started selling vegetables, he had a local buying arrangement where the local cooperative in the *sitio* and neighbouring farmers were the main buyers for his produce. Other markets were not explored by the buyers.

"*There was a problem in marketing our products before this group became involved in the project. We have limited buyers and an oversupply of vegetables. I left some of my vegetables to rot. Now with partners, the farmers are motivated to improve their farming. We were assisted by our partners in linking our products to other markets and consolidators".*

"Unlike before, we used to deliver our products individually. It was laborious and expensive for us. One ride by habal-habal going to Isulan market cost us PhP 250. We paid PhP 100 per sack for hauling of our sweet pepper. It makes life much easier when you are in a group".

"The agro-enterprise training was a big help because we could go directly to the buyers and consolidators. With cluster farming, we are a group. Marketing expenses are now shared between the members. We ask our marketing officers to deliver our product and we minimize our costs".

Before the formation of the cluster, John sold his product directly to traders at Lambak or Isulan. He had little knowledge about the market requirements but he believed that he was often being deceived by the traders. One trader bought his sweet pepper at a lower price because it was red then promptly sold it to a tuna canning operation for a much higher price. Local markets preferred to buy mature green sweet pepper, while the tuna canning plant bought red sweet pepper at a higher price. Through market chain analysis, John learned where to sell the green fruit and the red fruit to assure the best returns.

When John realised the importance of cluster formation in linking with institutional buyers to meet product quantity and quality requirements, he became more pro-active during meetings. As a chairman, he asked for a regular monthly meeting so that he could discuss issues and concerns related to the development of the cluster.

"Before, our groups conducted quarterly meetings. With cluster farming, we changed it to monthly meeting. During the meeting we discuss the problems on our farms we present the financial accounts and review the production area, the expected date of harvest and the anticipated volume of harvest. I learned some technical knowledge from other farmers and I shared my farming experiences as well. A cross-visit to other farms was conducted to see the performance of other farmers. I am learning from them. This is how we constantly update our information to improve our farming and the quality of our produce, and at the same time, strengthen our group".

John also took advantage of a PhP 15,000 loan from a microfinance institution for his sweet pepper production. He became a member of ICTUS, a member-owned cooperative that provides saving and lending services, including input financing. A loan was released to the members of the cluster in the form of inputs.

The project also gave John the opportunity to visit institutional and local buyers. He attended seminars, training programs and vegetables congress. He was able to present the success of the group to other farmers in South Cotabato. He was very excited when the project chose him to participate in the 8th National Vegetable Congress in Puerto Princesa, Palawan. He learned a great deal and was able to provide current information about the industry situation for fresh vegetables. It was his first time to fly in an airplane.

Because of his participation in the project, John's income has substantially improved. His monthly income of PhP 3,000 from growing corn increased to PhP 6,000 from sweet pepper production. He earned PhP 1,500 - 2,000 every week during the harvest period.

"*My income improved because of sweet pepper farming. It really helped my family. The presence of our partners gave us inspiration and moral support. They helped us link our products to the market and to obtain a loan from ICTUS".*

Some individual cluster members have experienced a 100 – 200% increase in their household income after shifting from corn to sweet pepper.

11.8 Pamuhatan Farmers Association (PAFA)

11.8.1 Site description and group formation

Sitio Pamuhatan is part of Barangay Marilog, Davao City, Southern Philippines. The *barangay* has a total land area of 17,833 ha and a population of 14,255 (August 2007) (National Statistics Office 2007). The distance from Davao City to the sitio is approximately 65 km. The population of Sitio Pamuhatan in December 2009 was only 483, which was composed of 100 households.

Although Sitio Pamuhatan can be accessed by jeepneys, the farm to market road is passable only by foot, water buffalos or horses. During the wet season, the farm road is slippery which makes it difficult for farmers to transport their products to the highway. The cost of transporting the vegetables is PhP 1 per kg. Vegetable farming is the main source of income in the area.

Sitio Pamuhatan and Brgy. Saloy were the two areas chosen by the project to establish two new clusters. In August 2009, project staff from the University of the Philippines Mindanao conducted a project orientation among the vegetable farmers in Sitio Pamuhatan and nearby *sitios*. The project orientation was attended by 31 vegetable farmers, *barangay* officials and *purok* leaders.

During the orientation, attendees learned about the ACIAR Mega Horticulture program particularly about Component 4. The objectives of the project were presented to the farmers, *barangay* and *sitio* officials and the CRS 8-step clustering approach introduced to them.

During the orientation, vegetable farmers were informed that they were not obliged to join the cluster: only those who were willing to join needed to do so. The farmers were also made aware of the support that would be extended to the project so that farmers knew what to expect if they decided to join the cluster.

Of the many farmers present that day, only 25 indicated their desire to join the cluster. These farmers were grouped into two clusters based on the location of their residence: the Pamuhatan Farmers Association (PAFA) with 15 farmers and the Nagkahiusang Bisaya ug Lumad (NABISALUM) with 10 farmers.

Together, these two newly formed clusters were exposed to the basic concepts of marketing. The first workshop aimed to provide farmers with the knowledge and skills to produce and market their vegetables. The training workshop was conducted in November 2009. Part of the training was to exposure the farmers to both the traditional markets and the emerging institutional markets. Going to the market and having the opportunity to interview potential buyers was expected to assist the farmers in their future collaborative marketing activities. After the training workshop, the two clusters operated separately.

11.8.2 Product supply assessment and product selection

Membership profile

Of the 12 members of the PAFA cluster, seven were males and five were females. About 75% of the farmers were married while the rest were widow/er and single. The average household size of the members was four. Fifty percent of the members had graduated from elementary school, 25% had some high school education and 17% had graduated from high school. Most of the members were Seventh Day Adventists.

Vegetable farming was the main source of income for all cluster members. The average monthly household income was PhP 4,375. Other sources of income were derived from

selling coal, copra and tiger grass, owning a *sari-sari* store and carpentry. Cluster members have been farming for an average of 25 years.

Farm production

Squash (83%), tomato (83%) and baguio beans (50%) were the most common vegetables planted in the area. Other vegetables planted included bell pepper, pechay, eggplant, garlic, gabi, karlang and chayote. Other crops planted by the respondents include corn (17%), banana, coconut and cocoa (8%).

In terms of land area, the average size of the farm ranged from 0.042 ha to 4.5 ha. On average, each cluster members was farming around 1.41 ha. Some of the farmers had more than one piece of farm land. Fifty percent of the farm land had a rolling topography, 44% had a steep slope and 6% had a flat terrain.

When asked about the ownership status of their land, 88% of the farmers responded that they owned the land. The remaining 12% borrowed the lands from relatives.

Most farmers applied synthetic fertilizers and pesticides. Before application, some farmers chose to dissolve the fertilizer in water, especially during the dry season, to save time. Complete fertiliser (14-14-14) and sulphate of ammonia were the two most commonly used fertilizers by the farmers. On average, farmers used 335 kg of complete and 418 kg of ammonium sulphate. A few farmers also used 16-20-0, urea and potash.

Marketing practices

The farmers in Sitio Pamuhatan sold their products to wholesalers/retailers in the Bankerohan wholesale market. They chose to transact with these buyers because they had known them for some time. The farmers harvested, packed and delivered their vegetables to the buyers, one time per week, by jeepney. Generally they did not accompany their vegetables: they simply instructed the jeepney driver to deliver the products to their buyer and to collect any payment on their behalf. On most occasions, the buyer paid for the vegetables delivered at the end of every month. The farmers used sacks, *bukag* (rattan basket) and wooden crates as packaging materials for their vegetables.

11.8.3 Market chain assessment

Rapid market appraisal results

In selling their vegetables to wholesalers and/or retailers in the Bankerohan, farmers paid individually for the transportation cost. The transport costs incurred were charged on a per unit basis rather than the weight of the vegetables. Usually, farmers paid PhP 50 for each wooden crate and sacks, and PhP 60 for a rattan basket. The buyers generally accepted whatever quantity and kind of vegetables the farmers had available. Furthermore, they did not require the farmers to sort the vegetables according to any quality specifications. However, for some vegetables like tomato, buyers wanted them to be sorted by size: the bigger the tomato, the higher the price. For other vegetables, buyers gave the same price irrespective of the quality for they purchased the vegetables in a *kuridas* (all-in) system.

Prices were determined by the buyer, based on the prevailing market price. In most cases, farmers had no prior knowledge of the prices they could expect to receive. Given also that the buyer only paid the farmer at the end of each month, it was widely accepted that the buyers often recalculated the amounts of money owed to the farmers, thereby altering the buying price of the products.

Initial chain map

Before the cluster was formed, vegetable farmers in Sitio Pamuhatan delivered their fresh vegetables to wholesale/retail buyers in the Bankerohan (Figure 1).

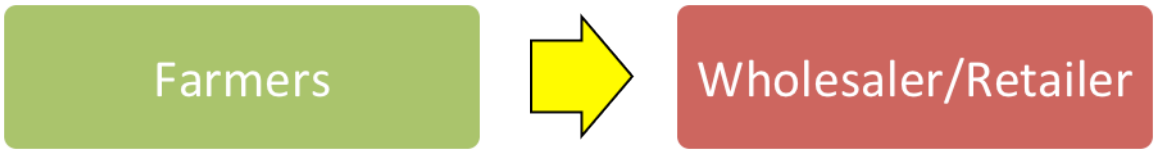


Figure 1: Pre-clustering chain map of Pamuhatan farmers, 2009

Buyer comparison assessment by farmers

Based on the interviews conducted by the farmers during their market visit to the Bankerohan, the following data was obtained about their potential buyers (Table 1).

Table 1: Buyer comparison by farmers after market visit, 2009

Buyer	Vegetables	Volume
Jimboy Dizon	Assorted vegetables	No limit
Neriza Lim	Assorted vegetables	No limit
Torina Ayo	Assorted vegetables	No limit
Jenefe Bangot	Assorted vegetables	1, 000 kg/day of all vegetables
Alot Bagacay	Tomato, bell pepper	No limit
Dodong Nene	Carrots, bell pepper, ginger, pipino	5 sacks/day/vegetable
Narcisa Lopez	Squash	No limit
Fe Seniza	Bitter gourd	No limit
Aldy Neroja	Pipino, sayote, karlang	No limit
Frankling Kamansi	Assorted vegetables	*40-50 sacks (2 times/ week) *squash – no limit
Daning Camacho	Raddish, pipino, pechay, eggplant, ginger	Small volume
Analyn Manlanay	Sibuyas dahon	No limit
Neneng Balagulan	Bitter gourd, eggplant, upo	No limit
Mary Jane Latayada	Squash, pechay, sayote	Small volume
Epi Micalso	Squash, carrots, baguio beans, bell pepper, onion	No limit
Rey Ranario	Assorted vegetables	No limit
Elith Antes	Pipino, bell pepper, ampalaya, tomato	Depends on the capital available
Doydoy Arbanilla	Tomato, radish, baguio beans, pechay	No limit
Anastacia Lopez	Squash	No limit

11.8.4 Cluster formation and planning

The cluster was formally organized in November 2009 when the basic concepts of marketing were delivered through a workshop. During this workshop, the farmers formulated their agro-enterprise plan.

Initial cluster agreement

Initially, the cluster agreed to contribute 5% of their net sales as a cluster marketing fee. The marketing fee was to be used to establish a cluster fund for the group members. Moreover, seeds were provided by the project to assist the cluster in their establishment. From the outset, it was anticipated that cluster members would repay the value of this seed, but several members failed to make their contributions. Consequently, the cluster decided to deduct an additional 5% from the net sales receipts.

Aside from these cluster policies, the cluster members created four plans which assisted them in operating the cluster.

Cluster plan

The cluster initially planned to plant a total of 20,000 hills of squash and 18,000 hills of tomato. Product was to flow from the farm to the consolidation centre where it would be delivered collectively to the cluster's preferred buyer (Table 2).

Table 2: PAFA initial supply plan, 2009

	Squash (hills)	**Tomato (hills)**
Lita	1, 000	
Ting2	2, 000	
Tata G.	1, 000	
Tata Y.	1, 000	
Tata A.	1, 000	
Bugay J.	1, 000	3, 000
Camao C.	1, 000	
Nang Nene	1, 000	
Galano J.	1, 000	2, 000
Timonio R.	1, 500	2, 000
Andalan A.	1, 500	3, 000
Arloy R.	2, 000	
Erwin H.	1, 500	
Neneng R.	2, 000	
Tata R.		2, 500
Alex A.		2, 500
Adimar E.		3, 000
Total	**20, 000**	**18, 000**

Financial plan

The cluster anticipated production costs of some PhP 13,870 for squash and PhP 13,070 for tomato (Table 3). The farmers chose to cultivate these crops as they had some prior knowledge on how to grow them.

Table 3: PAFA's initial financial plan, 2009

Production costs	Tomato	Squash
Seeds	150	1,560
Fertilizer	4,000	1,260
Chemicals		500
Land Preparation hagbas daro	360	 2,000 1,000
Planting	360	500
Care and Maintenance - sticking	3,000	2,000
Harvesting	600	1,000
Hauling/Loading	1,800	2,000
Transportation	1,200	2,000
Boxes	1,600	
Total Expenses	13,070	13,870
Yield	80 boxes[4]	6,600 kg

The costs would be offset by sales of PhP 452,725 for squash and PhP 146,250 for tomato (Table 4).

Table 4: PAFA's initial market plan, 2009

	Squash	Tomato
Buyers	Bankerohan Buyers	Bankerohan Buyers
Sales Target	24,000 hills = 90,545 kg	28,000 hills: 585 boxes
Gross Income Pamuhatan Bankerohan	 @ 5/kg = PhP 452,725 @ 7/kg = PhP 633,815	 @250/box = PhP 146,250 @350/box = PhP 204,750

Management plan

The members of the cluster elected four officers to be responsible for managing the cluster (Table 5).

Table 5: PAFA's initial management plan, 2009

Cluster Leader	Mar
Production/ Monitoring In-charge	Genmar, Romeo
Marketing In-charge	Neneng R.
Treasurer	Aileen

11.8.5 Test marketing

Conduct of trial delivery

In August 2010, the cluster began to function as a collaborative marketing group by consolidating the farmers produce at the marketing officers house (Figure 2).

[4] *1 box is equivalent to 25kg*

Figure 2: Initial cluster chain map of PAFA, 2010

The product (tomatoes) was then graded by size into three grades (small, medium and large) and packed into wooden crates for delivery the following morning. The cluster paid the jeepney driver to deliver the products for them. After unloading, the buyer checked the product, established and price and paid the jeepney driver who returned the cash to the marketing officer that afternoon. Once the marketing officer had received the money, the costs were deducted, including the cluster members 5% contribution to the cluster fund, and on the basis of the quantity each farmer had provided, the remaining funds were distributed to the farmers.

The cluster continued to make deliveries to the buyer for four months. From August to October, the cluster only delivered tomato and squash, but in November, the cluster started to harvest sweet pepper and pechay (Table 6).

Table 6: Initial delivery records of PAFA cluster, 2010

Month	Total volume (kg)	Total value (PhP)
August	1,845	8,927
September	726	3,776
October	1,694	6,360
November	832	5,618
TOTAL	**5,097**	**24,681**

After four months, the cluster had consigned over 5 tonnes of fresh vegetables valued at more than PhP 24,681.

11.8.6 Scaling up or down activities

Access to better markets

The trial marketing by the PAFA cluster was successful in the sense that the cluster members were satisfied with the price they received for their products. The farmers' sense of involvement in the marketing process made them feel that they had not been cheated during the exchange. While the cluster continued to supply different vegetables to their preferred buyer in the Bankerohan, the project staff initiated a meeting among the Davao City cluster leaders and an institutional market.

The first meeting was held in October 2010. Initially, representatives of the institutional buyer and the cluster leaders sat down together to identify the types of vegetables grown by each cluster. The buyers then presented a list of their top 15 vegetable products. The needs of the buyer were matched with the supply capacity of the clusters.

In a subsequent meeting, the cluster members brought samples of the vegetables they produced in their area to determine the extent to which these products would meet the customer's requirements.

After several meetings between the cluster leaders and the representatives from the institutional buyer, each cluster leader identified one or more vegetables that their cluster

could produce that would meet the buyer's specifications. Project staff only initiated the meetings: price negotiation between the cluster leaders and the institutional buyer was done by the farmers. The PAFA cluster decided to supply the institutional market with tomatoes (Figure 3).

Figure 3: Institutional market chain of PAFA, 2010

Before the negotiation with the institutional buyer, the cluster initially planned to provide only two products: tomato and squash. However, because they saw the opportunity to sell more products they decided on the spot to also supply chayote. Members of the cluster were already producing chayote, but they were selling it individually or cultivating it just for household consumption.

By January 2011, the cluster increased the volume of chayote because another cluster was no longer able to meet the quantity requirements of the buyer. During this time, the cluster also added Baguio beans and sweet pepper to the list of products they delivered to the buyer.

The cluster initially supplied to one store, twice a week. Over time, the frequency of delivery increased to three and then to two more store branches. By the mid May 2012, the cluster had supplied more than 36 tonnes of tomato, sweet pepper, Baguio beans and chayote and collected more than PhP 895,130 in gross sales.

The price received by the cluster for their vegetables increased significantly. In comparing the price between the traditional buyer and the institutional buyer, the price premium ranged from 33% to 85%. Aside from the improvement in price, the ability of the farmers to monitor prices in the market also improved. Prices in the traditional market served as their base price during price negotiations between the cluster and the institutional buyer.

Price negotiation occurred on a weekly basis, whereupon preferred suppliers were invited to bid. Bidding was conducted through text messaging. Unlike before, when the farmers were supplying the traditional market, farmers had to take whatever price was given by the wholesale/retail buyer. Now, the cluster had the power to negotiate the price of their vegetables for each week (three deliveries). If they were successful, the institutional buyer would text them to advise them of the volume they required.

To be able to consistently supply fresh vegetables to the institutional buyer, the cluster members commenced a program of staggered plantings. The farmers were also able to improve postharvest practices. As a requirement, both tomato and chayote needed to be washed before delivery. However, to improve the appearance of their products, they also chose to clean the sweet pepper and Baguio beans, and to pack them before delivery.

11.8.7 Cluster assessment

Cluster members assessed their maturity in five categories which indicate the progress they had made as a cluster. Using a scale of 1 to 5, cluster members assessed the level of maturity in the key areas of organizational development, market position, supply capacity, business management capacity and financial resources (Table 7).

Table 7: PAFA members' cluster maturity assessment

Organizational Development	Market Position	Supply Capacity	Business Management Capacity	Financial Resources
4	**3**	**3**	**5**	**3**
The cluster is functioning independently; able to: (i) implement enterprise plans (marketing and supply); (ii) have regular assessments; (iii) have written financial reports	Market is developed with more buyers who can offer stable arrangements: (i) more buyers tapped; (ii) markets entered into are for longer term agreements; (iii) special price negotiations done	Production technologies are in place for reliable quantity and quality standards of at least 80% of the cluster members. Production protocols (best practices), supply delivery monitoring system	Clusters have generated funds for business investment	Operational plan review is routinely done (40%); (i) agreed scheme of remuneration established; (ii) business operating systems in place

As an organization the members of PAFA cluster consider their group to be mature. A score of 4 indicates that the cluster can function independently. The cluster members meet regularly for their monthly meeting at which cluster members give updates on their production and share their experiences. The meetings are also a venue for farmers to express their concerns regarding the operation of the cluster. There was a time when the cluster was just starting to supply the institutional buyer that the marketing officer and the cluster leader were manipulating the volume of vegetables delivered to the buyer.

Since the cluster started in 2009, the group has implemented the agro-enterprise plan and made amendments to respond to the demands of their institutional buyer. Because of the increase in price received by the farmers for their vegetables and the regularity of demand, the cluster has increased their net sales. Because of this, the cluster fund has increased. The marketing records of the cluster are open for all cluster members to review.

In terms of market position, the cluster has a stable market. As a cluster, the farmers collectively market their products to the institutional buyer and have strengthened their position in the market. The link developed with the institutional buyer is on-going and will continue for as long as the cluster does not run out of vegetables. Although the cluster did not sign an agreement with the institutional buyer, there is a mutual understanding that the cluster must comply to the buyer’s demands. In return, through a competitive bidding process, the cluster is able to negotiate a price of the vegetables it supplies.

When the staggered planting schedules in place, the PAFA cluster is able to maintain a reliable supply of good quality vegetables. Not only does the cluster produce vegetables that meet the quantity and quality specifications of the buyer, in recognition of their services, the cluster was given an award for being a consistent and reliable supplier of fresh vegetables.

With continuous and regular deliveries to three stores, cluster members have been able to increase their weekly income. The cluster funds have steadily increased over time through the 5% marketing fee contribution and seed repayment. As the accumulated cluster fund increased in size, the cluster decided to open a bank account. As a business enterprise,

the cluster performs well with the aid of their agro-enterprise plan and cluster policies. The roles of the cluster members and officers are established and functioning well.

When the cluster started in 2009, they were assisted by the project staff. Initially, seeds and technical assistance were provided to kick-start the cluster operations. After three years of operation, the cluster has moved away from depending on the intervention of the project. The cluster is financially sound.

Over all, the cluster is in good shape. However, the members of the cluster must continue to follow their production schedule to ensure continuous and consistent supply to the buyer. The cluster members and officers continuously monitor performance to maintain the soundness of the cluster.

Activities conducted to strengthen the cluster

Trainings and conferences

The following trainings were conducted to increase and improve the skills of the cluster members:

- Basic concepts of marketing
- Basic economics
- Basic record-keeping
- Basic accounting
- Recording of meeting Minutes
- Product packaging
- Crop protection and postharvest practices
- Cross-site visits
- Tabo sa UP Mindanao (flee market)
- DOLE pre-registration seminar
- Field exposure on vermi composting
- Buyer's negotiation
- Extension Advisors Training Workshop on Learning Lessons (EATWELL)
- Soil analysis testing

These training programs were conducted upon the request of the farmers or when the project staff saw a need for training. Some training programs were coordinated with other agencies that had the expertise to conduct the workshops and seminars. These training programs were able to increase the capabilities and confidence of the farmers to negotiate with buyers and to be able to respond appropriately to the demands of their buyer.

Farmers also attended numerous congresses and forum that shared information about vegetable production and marketing:

- 8th and 9th National Vegetable Congress held in Palawan and Dumaguete
- 6th and 7th UP Mindanao Supply Chain Management Forum
- 1st and 2nd Farmers and Partners Learning Alliance
- Davao City Organic Week Celebration
- Davao Trade Expo 2011

DOLE registration

Cluster members know that the interventions and assistance extended to them by UP Mindanao and the UPSTREAM Foundation Inc was made possible through the project. However, in the longer term, cluster members recognized the need to be legally registered as a farmer's organization so that they could still access assistance from government and non-government organizations after the project finished.

Project staff initiated and helped the clusters to become registered under the Department of Labor and Employment (DOLE) XI. The suggestion to register the cluster under DOLE was made for the cluster to have a legal identity as an association. The suggestion was accepted by the cluster during their meeting in May 2011. The following month, staff from DOLE XI conducted a pre-registration orientation for the cluster. This pre-registration orientation is a requirement for the registration process.

The orientation gave the cluster members a greater understanding of what it meant to be a registered association, the benefits, as well as the requirements needed when submitting the application. The requirements needed for the registration were Minutes of the meeting when the members of the cluster decided they wanted to become an association, the cluster's financial report since it started its operation in 2010, list of officers and members, and the constitution and by-laws of the cluster. All these documents were prepared by the cluster members and the notarization of the documents were assisted by the project staff.

In August 2011, the cluster received their certificate of registration from DOLE XI in the name of Pamuhatan Farmers Association.

11.8.8 Assessment of value chains associated with the cluster

Institutional chain

Initially, the cluster delivered assorted vegetables to a wholesaler/retailer in the Bankerohan. After four months, the cluster had delivered 5 tonnes of fresh vegetables worth over PhP 24,680. During those four months of delivery to the traditional buyer, the cluster, represented by its cluster leader, began a series of negotiations with an institutional buyer. In December 2010, the cluster started supplying tomato to the institutional buyer.

Initially the cluster delivered to just one store, three times per week. In making the delivery, the marketing officer and a cluster member accompanied the produce. The produce was delivered in the morning and the institutional buyer paid the cluster in the afternoon. In response to the market opportunities presented, the cluster was encouraged to supply a wider range of products. In response, the cluster decided to plant additional crops including sweet pepper, chayote and Baguio beans. By March 2011, the cluster was delivering four products to three branches, three times a week. From December 2010 to the mid May 2012, the cluster had supplied over 36 tonnes of fresh vegetables and received more than P895,128 in gross sales.

Traditional chain

Despite their success, the cluster continues to supply fresh vegetables to traditional buyers in the Bankerohan. The vegetables they deliver to the traditional wholesaler/retailer are the vegetables that fail to pass the quality standards of the institutional buyer. However, as the farmers often have surplus product, they continue to trade individually with buyers in the Bankerohan. Product is send to the market by

jeepney. Farmers seldom accompany their vegetables: they simply load it into the jeepney and their buyer unloads it on arrival. The jeepney driver is then paid in cash.

Guiding questions

1. Approaches to improving capacity

One constraint that prevents the cluster from providing quality products to both their traditional and institutional buyers is the distance between farms and the consolidation area. Typically, the cluster member's farm is approximately 3 km from the consolidation area. To reach the farm, the produce must pass over a narrow and unpaved path, which becomes very difficult to pass in the wet season. The poor condition of the roads affects the quality of the product during transportation.

Farmers harvest and conduct an initial sorting of the produce on-farm. The farmers then transport the produce to the consolidation area. On most occasions, the farmer must make several trips to bring all the produce to the consolidation area.

To be able to overcome this constraint, farmers need to develop a transportation system that can decrease if not eradicate the physical bruising incurred during transport. The use of appropriate packaging materials may help.

Another constraint faced by the farmers is heavy rain. During the wet season, farmers experienced not only low productivity, but also poor quality. To overcome the adverse effect of heavy rain, farmers are considering protected cropping systems. This will help the farmers to produce a sufficient quantity of good quality vegetables in all weather conditions.

Another difficulty faced by the farmers was the irregularity of the jeepney schedule in the area. Since the cluster does not have their own vehicle, they depend on the jeepneys that pass by their area to transport their produce from the consolidation area to the institutional buyer. To overcome this constraint, the cluster contacts a jeepney driver prior to delivery. This will ensure the timely departure of the jeepney and its timely arrival in Davao, for the cluster will incur a penalty for late delivery.

Through clustering, the members of the PAFA cluster have been able to access the high-value market. The linkage created by the project staff enabled the cluster to enter into a long-term relationship with the institutional buyer. Through this linkage, the farmers participating in the PAFA cluster have been able to increase their monthly household income by up to 90% (Table 8).

The majority of cluster members have seen their monthly household income increase. This can be attributed to the higher price received by farmers from the institutional buyer. One farmer had a decrease in his monthly household income because at the time of data gathering, this farmer was just starting to give his vegetables to the cluster. Moreover, the increase in production skills, postharvest practices, negotiation and marketing brought about by the capacity building activities conducted through the project have had a positive impact on the farmers' income.

Table 8: Average monthly household income of cluster farmers before and after joining the cluster

	2010 (PhP)	2011 (PhP)	% change
Genevie Rosario	2,000	20,800	90
Ramil Fernandez	4,000	10,900	63
Adimar Estrera	4,000	18,000	78
Antonio Andalan	3,000	15,000	80
Ramil Rosario	7,000	3,800	-84

2. Identify and propose potential interventions

One potential intervention to be provided for the farmers could be postharvest management training. The farmers have already established their production system and schedule which provides a continuous supply of vegetables. What they need now is the ability to manage their produce appropriately after harvest. This enhancement will greatly decrease the amount of wastage that results from the mishandling of products.

Relationships

Farmers were asked about their relationship with their preferred buyer and the cluster. They were asked to rate aspects of their relationship: trust, satisfaction, power and relationship-specific investments on a school boy rating of 75 to 100.

Farmer to buyer

Results show that the farmers do not entirely trust their buyer in the Bankerohan, especially with regard to manner in which prices are determined for their produce. This can be attributed to the "faceless" transactions between the farmers and their traditional buyers (Table 9).

Table 9: Trust and relationship measures of PAFA members to their pre-cluster buyer

Trust Measure	**Wholesaler/Retailer**	
	Rating (%)	**Reason**
Confidence	80.0	Farmers do not fully trust their buyer (esp with price); the buyer delays the giving their profit
Correct information	85.0	Informs the farmers whenever there are buyer for their product and when the price is high
Trustworthiness	85.0	Inconsistent pricing; delayed payment
Consider my best interests	85.4	Offers fertilizer and seed loan; sets price on his advantage
Honesty	85.6	He gives good price only if the farmer is around;
Keep the promises	94.0	Keeps his promises
Better offer	87.0	Provides seeds
Ease to transfer	94.0	No contract made between the farmer and the buyer
Power	88.0	Buyer sets the price; buyer does not finance the production
Control of info	83.0	Buyer controls the info, we only rely on the info they give us
Freedom to adhere demands	91.0	The farmers are able to adhere their demands and the buyer listens and tries to adjust, if he can
Dependency	89.0	Trust exists; *suki* system
Provision of education	81.5	None
Openness to suggest	83.0	None
Openness to advice	88.4	Buyer gives advice to the farmers
Frequency of information	88.8	Gives technical information about production
Fairness of treatment	91.0	Treats farmers fairly
Quickness to handle complaints	89.0	Buyer accepts complaints
Provision of adequate rewards	87.4	Rewards are available
Expectations met	79.4	Not met (price is low)

The two parties only communicate through text messaging. Farmers sell to this buyer because of familiarity (*suki*), but few believe that they are receiving a fair price. Furthermore, farmers have no means of verifying the price they receive, in part, because the buyer does not always pay on delivery. In most cases, the farmers will receive payment one month after delivery.

Aside from buying the farmers' vegetables, the traditional buyers seldom provide any assistance to the farmers except where they have provided some seed.

Farmer to cluster

By comparison, the farmers trust and confidence in the cluster was high. Members of the cluster had a good relationship with each other and they could see that everyone was trying their best to participate in cluster activities. Farmers were more confident that any information from the project staff had been communicated to all cluster members. However, at the time of the survey, the cluster was still in the development phase and thus members were uncertain if the cluster could deliver on its promises (Table 10).

Table 10: Trust and relationship measures of PAFA members to the cluster, 2010

Trust Measure	Rating (%)	Reason
Confidence	89.0	Cluster members have good relationship and everyone is trying their best for the cluster
Correct information	94.8	Always made available
Trustworthiness	92.0	Members can be trusted
Consider my best interests	90.4	Provides seeds; not all interests of members are considered
Honesty	85.4	Not everyone can be trusted
Keep the promises	87.5	Still uncertain since we just started
Better offer	96.4	Seeds are provided; marketing and delivery fee;
Power	94.4	Every member can raise their concerns, suggestions and ideas
Control of info	87.0	None
Freedom to adhere demands	91.4	Farmers can raise/express their concerns or ideas
Dependency	85.0	Members do not depend on the cluster
Provision of education	89.0	Gives training and farm visit/demo about organic fertilizer and other technical matters about farm production
Openness to suggest	89.8	Members can suggest
Frequency of information	78.8	The cluster does not give any advice; UP does
Fairness of treatment	97.0	Equal/fair treatment for all members of the cluster
Quickness to handle complaints	90.0	Complaints are handled/heard actively
Provision of adequate rewards	79.0	It has not been carried out (delivery fee) since the cluster haven't started consolidation yet
Expectations met	96.2	Expectations were met; seeds were provided; the cluster is able to sustain and progressing

Within the cluster, members felt that they could freely raise their thoughts and ideas concerning the management and operations of the cluster. Through farm visits, the farmers were learning from each other, whereupon they shared their experiences and farm practices.

Over all, the cluster members are satisfied with their group. The cluster quickly responds to complaints and all members felt that had been treated fairly. Cluster members' expectations had been met.

Chain analysis and gaps

Farmer to cluster

On average, farmers received a higher price for their vegetables from the institutional buyer. The higher price compensated for the higher quality vegetables the buyer demanded. For farmers to be able to meet the institutional buyer's requirements, they needed to be more hands-on with their production, thus incurring a higher labour cost. Farmers also utilized more production inputs to meet the product quality specifications (Table 11).

Table 11: Comparison of costs and returns, 2011

Product	Traditional	Institutional	Traditional	Institutional
	Sweet Pepper		Tomato	
Volume Sold	320	530	1,650	750
Farm Price (P/kg)	71.25	87.50	12.00	40.00
Cost (P/kg)				
Seeds	1.05	1.35	0.12	0.40
Fertilizer	4.33	5.56	0.29	0.95
Pesticide	6.77	8.69	0.30	1.00
Animal	0.00	0.00	0.00	0.00
Materials	0.82	1.06	0.27	0.88
Labor	4.26	5.46	0.79	2.60
Total Production Cost	17.24	22.12	1.77	5.83
Total revenue less production Costs	54.01	65.38	10.23	34.17
Marketing Cost	0.11	0.12	0.32	1.06
Transportation	1.27	1.37	0.40	1.32
Cluster Fee	3.56	4.38	0.60	2.00
Net Profit	49.07	59.52	8.91	29.79
Cost/Sales	31%	32%	26%	26%
Net Profit/Sales	69%	68%	74%	74%

The only drawback in delivering to the institutional buyer was that they purchased a much smaller quantity. Furthermore, the institutional buyer had several other suppliers. Under the competitive bidding process, it was possible that on some occasions the cluster may not secure a contract for one or more weeks.

To meet the institutional buyer's specifications, the cluster was required to wash and clean their tomato and chayote. Baguio beans and sweet pepper also needed to be cleaned. All vegetables had to adhere to the quality specifications established by the institutional buyer. Tomato must be at least 4 cm in diameter and 4 cm in length. They had to be

clean, semi-ripe and firm. Sweet pepper was required to be at least 7.5 cm long and the stem intact. The sweet pepper delivered was to be red or red with green, with no cuts and bruising. Chayote had to be 10 - 12.5 cm long with a minimum weight of 300 g per piece. It also had to be clean, without bruising, firm and to have a mature green colour. Baguio beans were to be at least 12.5 cm long, like a pencil, clean, firm and with no cuts.

For tomato, the cluster used plastic crates to pack them, while rattan baskets were used to pack the sweet pepper, chayote and Baguio beans. Plastic crates are sometimes used to pack the latter two, but only when the cluster has extra plastic crates to utilize.

Initially, the cluster used plastic crates to pack all their vegetables for the institutional buyer. However, the cluster soon realized that they were incurring higher transport costs with the use of plastic crates for each crate could only accommodate 25 kg of vegetables. As a result, the cluster decided to use rattan basket for the other vegetables.

The cluster was committed to deliver to three store branches every Monday, Wednesday and Friday. Produce was to arrive before 12 noon. Any delays in delivery incurred a penalty: the price of 3 kg of every vegetable to be delivered would be deducted. In those instances were a penalty was incurred, the cost was shared equitably among all those farmers who had contributed vegetables to that delivery in proportion to the volume of vegetables supplied.

In facilitating payment, the institutional buyer went out of their way to reach some mutually acceptable position. As the cluster was not yet registered as a farmers' organisation, instead of paying by cheque, the buyer paid the cluster in cash. However, payment could not be made on receipt of the goods as it required some hours for the paperwork to be processed. The cluster could either receive payment late in the afternoon or early the next day. Given that the marketing officer needed to return home (around 2 hours), this position was not acceptable. After expressing their concerns with the institutional buyer, the processing of the payments was accelerated so the cluster could receive payment from all three branches by 3:00 pm on the day of delivery.

Critical incidents or issues for key lessons

While production from the cluster continues to improve, farmers experience difficulty in the wet season. Heavy rainfall damages their crops and can sometimes even wash out the crop. In terms of marketing, the irregular jeepney schedule was the only setback experienced by the cluster. Early in their transactions with the institutional buyer, cluster members often complained about the tedious process of sorting and cleaning their vegetables. For most cluster member this was something new, for they were used to selling to their traditional buyer without sorting and cleaning. However, attracted by the prospect of securing higher prices, the farmers willingly made adjustments to meet the institutional buyer's requirements.

The cluster has been organized for three years and they have made significant progress. Members of the cluster have a much better understanding of the market and are now accessing higher value markets. With the rapid and steady increase in farmer's income, it is important that farmers learn how to properly manage their finances.

11.8.9 Impact of clustering

The advantages of the clustering approach as suggested by the farmers were: (1) improved access to institutional markets, (2) better vegetable prices, (3) improved access to material and production support such as seeds, knapsack sprayers and weighing scales, (4) improved access to technical information about vegetable farming: pest and disease control, and crop management, (5) higher household income, and (6) greater confidence in dealing with people.

Some farmers mentioned that the only disadvantage they experienced in clustering was that small sized vegetables were not acceptable to the institutional buyer.

Survey results showed that all cluster members believed that their income from producing vegetables and their total household income had increased. However, not all farmers thought that the volume of the vegetables they produced and sold had increased (Table 12).

Table 12: Impacts of clustering (PAFA cluster), 2011

Aspect	**Increased (%)**	**Decreased (%)**	**No Change (%)**
Income from vegetable production	100		
Cost of production	60		40
Total household income	100		
Volume of vegetables produced	80		20
Volume of vegetables sold	80		20
Price received for vegetables	100		
Production losses/ wastage		40	60
Quality of vegetables produced	80		20
Number of people employed in the farm (both for production and marketing)	60	20	20
Understanding of markets	100		
Ability to negotiate	80		20
Decision making skills	100		
Skills in horticultural production	100		
Skills in post-harvest practices	100		
Skills in pest & disease management	80		20
Skills in marketing	100		
Skills in record-keeping	80		20
Leadership skills	60		40
Access to markets	80		20
Access to credit			100
Access to inputs	20		80
Relations with other farmers in the village	60		40
Access to farm-related government support	40		60
Linkages with external partners			100
Number of school-aged children who could not afford to go to school before but are now able to go to school	100		
Family health	80		20
Environment	80		20

With regard to the costs of production, most farmers believed it had increased. This may be true because the farmers had also increased their production and in most situations, there is a direct relationship between the cost of production and the volume of production. In relation to waste and losses, some farmers thought it had decreased while others thought it had stayed the same.

The skills and abilities of farmers showed significant improvement. Farmers believed that since joining the cluster, they had gained considerable knowledge and skills about vegetable production, postharvest practices, pest and disease management, record-keeping and marketing. Their leadership skills had also improved. With greater access to higher-value markets and a better price, the farmers net income had improved and they were now able to send their children to school.

11.8.10 Conclusions

The Pamuhatan Farmers Association's accomplishments as a cluster can be attributed to the participation and cooperation of its members. The commitment of the members is evident by the extent to which they follow their institutional buyer's requirements no matter how much additional work is needed. The various training programs, workshops and seminars also helped the cluster members to better understand the demands of their buyer.

However, there were several issues and challenges faced by the cluster especially when they were first starting to supply the institutional buyer. Most of these issues were resolved because cluster members were willing to discuss them openly and honestly. The cluster leader handled any contentious issues well without demonstrating any preference for one member over another. Over time, the cluster members had learned to work with and to develop trust in each other. While cooperation, commitment and good leadership had contributed to the success of the cluster, support from government and non-government organizations had strengthened the cluster.

The Pamuhatan Farmers Association Collaborative Marketing Experience

Sitio Pamuhatan is part of Barangay Marilog, Davao City, Southern Philippines. The *barangay* has a total land area of 17,833 hectares with a population of 14,255. The distance from Davao City to the sitio is approximately 65 km.

Sitio Pamuhatan can be accessed using jeepneys. However, the farm to the market road is passable only by foot, water buffalos or horse. During the wet season the road is slippery which makes it difficult for farmers to transport their products to the highway.

Vegetable farming is the main source of income in the area. The main crops planted are tomato, sweet pepper, squash, pechay, Baguio beans and eggplant. On average, each farmer has just 1.41 ha.

Vegetable farmers in Pamuhatan experienced difficulty in marketing their products to traders or wholesalers in the wet market in Davao City. Fragmented and small, farmers had little access to information and they relied solely on their buyers for price information. The buyer informed the farmers of the price of their products through text messaging. Farmers generally experienced a "faceless" relationship with their buyer. Most farmers sent their produce to market through jeepneys, whereupon, after receiving the product, their buyer paid the jeepney driver.

On November 2009, the vegetable farmers in Pamuhatan were organised by the ACIAR HORT 2007/066/04 project. The farmers enrolled in a marketing workshop where they formulated their own agro-enterprise plan. This plan was composed of a production, marketing, financial and management plan which guided them in the formation of their cluster. Farmers chose tomato and squash as their main cluster products. The farmers also visited the Bankerohan wet market and interviewed potential buyers. Interviewing the buyers in Bankerohan gave the farmers an opportunity to acquire information on the buyer's volume and quality requirements. This was an important step in establishing an enduring supplier-buyer relationship between the cluster and a potential buyer.

In April 2010, the cluster received tomato and squash seed from the project. These were the two crops identified by the cluster members to be planted and supplied to their buyer in the Bankerohan from their agro-enterprise plan. Cluster members could also sell and consolidate other vegetable products through the cluster. Aside from seeds, the cluster also received a knapsack sprayer, weighing scale and plastic crates.

Apart from material support, the cluster members were given capacity building seminars and workshops on such diverse topics as basic record keeping, economics, accounting and how to record the Minutes of a meeting. These workshops were organized as the farmers' expressed their needs during cluster meetings. Through these workshops, cluster members understood why the prices of vegetables fluctuate, how to monitor their farm expenses, pest and disease control and crop management.

The cluster started marketing their vegetable products as a cluster on August 2010. As a cluster, the farmers delivered their products to a wholesaler in the Bankerohan wholesale market. While the cluster was delivering their products every Friday to their buyer in the Bankerohan, negotiations with an institutional buyer were taking place. In December 2010, the Pamuhatan cluster made their first delivery to the institutional buyer.

The cluster now produces and sells four main products – tomato, sweet pepper, Baguio beans and chayote – to the institutional buyer. The cluster negotiates the price with the institutional buyer every Monday and then delivers a pre-set quantity of the products to three stores three times a week.

Since the cluster started delivering to the institutional buyer, they have experienced numerous challenges in meeting the institutional buyer's demands. The farmers have made adjustments to their planting schedule to ensure they have a continuous supply. They also faced difficulty in getting used to the delivery system imposed by the institutional buyer. Because of the strict product specifications of their buyer, classifying their products became tedious and on some occasions became a point of conflict within the cluster. The cluster also faced problems in making timely deliveries, for the cluster does not have a vehicle of their own to transport the produce. When the jeepneys do not come on time, the institutional buyer imposes a penalty of 3 kg for every product in the consignment.

Though faced with challenges, the cluster members learned the importance of following the planting schedule to have a constant supply of products. Cluster members also developed their skills in sorting their products and in monitoring the wholesale and retail prices in the traditional market to assist in their price negotiations with the institutional buyer. More importantly, farmers now have the ability and the confidence to talk to their buyers and to collectively negotiate a price.

In May 2011, less than two years after becoming a cluster, the members of the Pamuhatan Farmers Association had increased their monthly income from PhP3,400 to PhP13,700. The cluster had delivered a total of 22,463 kg of assorted vegetables amounting to PhP509,037 and earned PhP19,617 from a 5% marketing fee it had imposed on its members. To safeguard their money, the cluster opened a bank account and in August 2011, the Pamuhatan Farmers Association received their certificate of registration from DOLE XI.

11.9 PAGLAMBU cluster

11.9.1 Site description and group formation

Community profile

As one of the largest municipalities in Bukidnon, Lantapan spans a land area of 318 km². It lies at an average height of 600 m above sea level. Endowed with rich fertile land, farming has become the major source of livelihood, where the farmers primarily cultivate corn, coffee, cabbages, potatoes and other temperate vegetables. These are cultivated on the gently sloping to rolling areas, on a variety of well drained soils.

The area experiences relatively dry weather in the months from November to April with frequent rain from May to October. The annual rainfall is in the range of 2,470 mm. The area is seldom subjected to typhoons due to the protection of the surrounding mountains.

History of group

The PAGLAMBU cluster is composed of two sovereign clusters: Songco and Kaatoan, both of which concentrate on the production of sweet pepper.

PAGLAMBU is an acronym of *Pag Amuma sa Gagmayng Luna Alang sa Malahutayong Baligya sa abot sa Uma*. Roughly translated, this means “Small Farm Management for Enhanced Profitability”. The organization aims to help smallholder farmers in the area to increase productivity and to improve quality. Through a 21 week training program organized by the World Agroforestry Centre and Syngenta Philippines Foundation, farmer-members were organized into three sub-clusters: Songco, Kaatoan and Cawayan. However, only the Songco and Kaatoan farmers remain in the PAGLAMBU cluster today.

Implementation of clustering

In late 2007, the Catholic Relief Services formally introduced the clustering approach to PAGLAMBU. A series of agro-enterprise development training programs were provided which included basic marketing concepts, orientation to the clustering approach, product supply and market assessment, business planning and strategy formulation. The training was facilitated by the Landcare Foundation and the Catholic Relief Services (CRS). The main goal of these agro-enterprise development training programs was to enable the group to become more market oriented.

In 2009, in the wake of the global financial crisis, CRS handed the group over to UP Mindanao and the UP Strategic Research and Management Incorporated Foundation (UPSTREAM) to further facilitate the clustering process.

Partnerships

Aside from Landcare and the CRS, several government institutions extended their support to the two clusters, including the Department of Trade and Industry (DTI) and the Municipal Government of Lantapan. Some private organizations provided input support for the clusters such as the Bukidnon Cooperative Bank (BCB).

Songco cluster

The cluster was composed of 13 farmers, with ages ranging from 43 - 75 years old, with a mean age of 53. Most of the members were married, while one was separated. The average number of people in the household was 5.

In terms of educational attainment, farmers had an average of 9 years formal education, ranging from elementary to college level. Most of them were Catholic, although one member was a Seventh Day Adventist (SDA).

Aside from cluster membership, most of the farmers also belonged to a number of organizations in their locality, such as civic groups and church-based groups.

On average, farmers were receiving a monthly income of PhP 5,923, which is derived mostly from farming. However, most of them did derive some income from other sources like working as a farm labourer, driver, government employee and photographer.

The amount of land each farmer had ranged from 0.25 – 0.5 ha to 1.0 – 5.0 ha. The majority of the land was classified as rolling. Most of the farmers were renting the land they cultivated. As most had been farming for more than 20 years, a diverse range of crops were planted including temperate and tropical vegetables, root crops and some fruit trees.

Farmers used a diversity of tools like wedges, ploughs, shovels, bolos, scythes and pickaxe to assist them. Animals such as carabao and cow were used to help prepare their land for planting. In terms of crop nutrient management, farmers used both conventional and organic fertilizers like complete, urea, ammonium phosphate, chicken dung and vermi-compost. These were regularly applied at least once per cropping season. For crop protection, they used a variety of brands including Selecron, Manzate, Alika, Karate, Voliam flex, Lannate, Prevathon and Score. They also applied natural methods including attractants to trap fruit fly. As a result of their involvement with Landcare, they were familiar with contour farming and crop rotation to prevent soil erosion and the build-up of disease.

In terms of financing, most farmers had taken up a production loan through the Bukidnon Cooperative Bank (BCB), while others were self-financing. In terms of marketing, farmers had a history of transacting with numerous buyers coming from Bukidnon, Cagayan de Oro City, Davao City and General Santos City. These buyers included wholesalers, consolidators, warehouse operators, market facilitators and traders. Products were packed in sacks, boxes or wooden crates. Some buyers preferred products to be delivered to their place of business, while others preferred to collect the produce from some predesignated point. From the farm, products were transported by animals or manually hauled to the collection point. Farmers were either paid cash-on-delivery or on installment basis some time after the market intermediary had on-sold the product.

Kaatoan cluster

Similar to the Songco cluster the Kaatoan cluster had 13 members with a mean age of 47 years old. While most of them were married, there were also a number of members who were still single. For each household, the average number of members was 5. Farmers had spent an average of 9 years in school, which ranged from elementary to vocational levels. Half of the members were Catholic, while the others belonged to Iglesia ni Cristo (INC). Most farmers also belonged to one or more other organizations in the area, such as church-based, civic and political groups.

On average, farmers were earning PhP 6,115 a month, which was derived mainly from farming. However, some farmers had other jobs like owning a store or working as a carpenter or a farm labourer.

The amount of land farmers were cropping ranged from 0.125 – 7.0 ha, with an average of 1.4 ha. Most of the land was classified as rolling. On average, the members had been involved in farming for 25 years. Most of the farmers were cultivating multiple crops including high-value, tropical and temperate vegetable crops, root crops and some fruits.

The farm tools used by the cluster members included ploughs, pickaxes, shovels, scythes and bolo. The farmers practiced both conventional and natural methods of crop management. This included the use of urea, complete fertiliser, phosphate, ammonium sulphate, potash, mono-ammonium phosphate, di-ammonium phosphate, chicken dung and vermi-compost. These were applied at least once during the per cropping season.

In terms of pest and disease management, farmers also a variety of brands including Karate, Selecron, Alika, Prevathon, Lannate, Magnum, Bushwack, Symbus, Tamaron and Decis. Application was usually done in a weekly basis and occurred soon after transplanting until just before harvest. Some of the natural methods used included the use of attractants and traps in the field and crop rotations.

Finance was very important for most of the farmers in Kaatoan. Consequently most of the farmers had taken up production loans worth PhP 30,000 - 80,000 from the BCB. Under the terms of the contract, the principal was to be repaid at the end of the cropping season.

In terms of marketing, the farmers were transacting with various buyers (wholesalers, consolidators, market facilitators and warehouse operators) from key cities in Mindanao including Cagayan de Oro, Davao and General Santos. Some buyers came to the area to purchase the produce while others preferred the produce to be delivered to their place of business. Farmers packed their produce in either sacks or crates. From the farm to the designated collection point, farmers either manually hauled the produce or used carabao or motorcycle. Payment was made either cash on delivery or instalments.

11.9.2 Market chain assessment

Rapid market appraisal

Using the rapid market appraisal method, the facilitator together with the working group conducted a market chain study for several commodities. The working group conducted market visits to a market facilitator, a consolidator that supplies supermarkets throughout the Philippines, supermarkets and the wet markets in Cagayan de Oro. The group interacted directly with the various buyers to obtain information regarding quality requirements such as varieties, grades and colour, demand patterns, volume requirements, price trends and communication procedures.

After the study tour and interaction with the various buyers, the group came together to discuss what they had learned and how they saw the process. Two food processing companies were identified as having a high demand for sweet pepper. One processor was the leading manufacturer in the domestic market for canned tuna. The other manufacturer was the market leader in specialty sauces, cooking oil and liquid condiments in the Philippines.

Initial chain maps

The supply chain was composed of farmers, *viajedors*, bodega owners, runners, classifiers, shippers and institutional buyers (Figure 1).

From the producer, several different marketing channels were identified. The first is from producer to *viajedor* to market stallholders, who come from Davao City and Cagayan de Oro City. The *viajedors* sell the produce in the Agora market in Cagayan de Oro and to the Bankerohan in Davao City. The other type of chain is from farmer to bodega owners. Some farmers go directly to the Agora market where they sell their produce to large bodega owners.

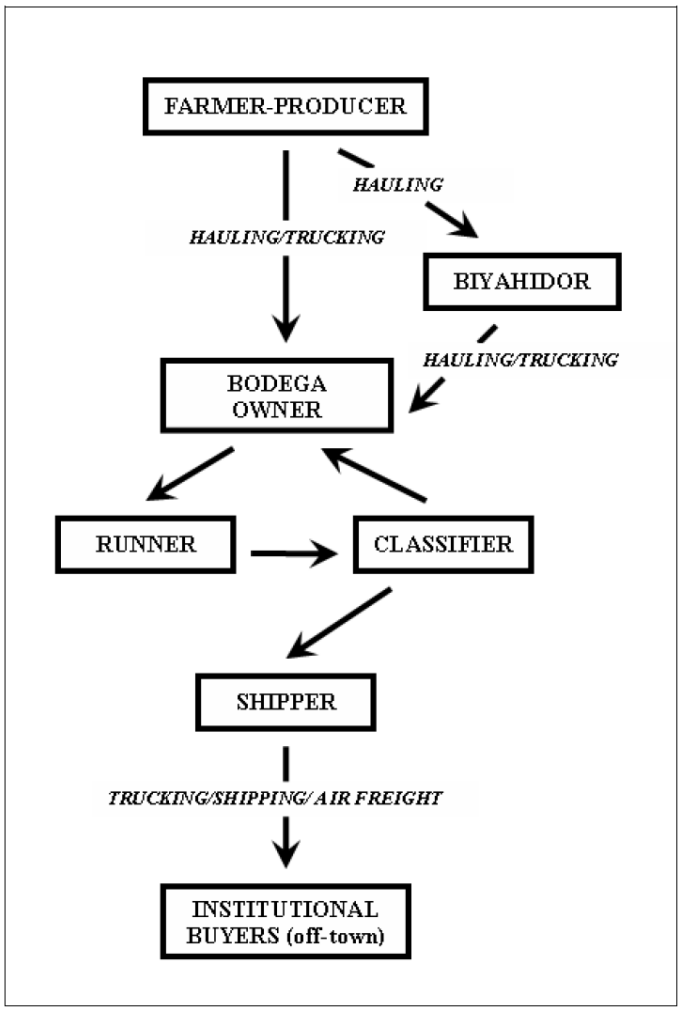


Figure 1: Vegetable supply chain in Lantapan

11.9.3 Cluster formation and planning

Initial agroenterprise plan

In 2008, the Songco and Kaatoan clusters jointly devised their agroenterprise plans, which included a market, supply and management plan.

Market plan

The cluster's marketing plan involved target buyers from General Santos and Cagayan de Oro. In both instances, the buyers required a large volume of sweet pepper on a regular weekly basis. Every sweet pepper must pass the quality specifications, such as the required size, colour and variety. In terms of pricing, the market facilitator offered a higher price compared to the consolidator. In terms of payment, the consolidator transacted through his bank, while the market facilitator was prepared to make an advance payment of 50% (Table 1).

Supply plan

The supply plan for the two clusters required an estimated volume of 3 tonnes per week for sweet pepper, which was to be supplied to the consolidator. To meet the target volume, each cluster member was required to comply with the planting program to ensure

the continuity of supply. To maintain the product quality, farmer-members were required to attend the training programs dealing with proper handling and packaging (Table 2).

Table 1: Joint marketing plan for Songco and Kaatoan clusters (2008)

Details	Target Buyers	
	Consolidator	Market facilitator
Address	General Santos City	Agora, Cagayan de Oro City
Product requirements	Sweet pepper – 8 t/week Carrots – 15 t/week	Sweet pepper – 8 t/week
Quality specifications	Sweet pepper Size: 6.5-7.5 cm Colour: red Variety: no particular variety Carrots: Size: 7.5 cm Variety: Coroda	Sweet pepper Size: 6.5-7.5 cm Colour: mature green to red Variety : Smooth Cayene
Price	Sweet pepper – PhP 30/kg (floor price)	Sweet pepper – PhP 47/kg
Sales target (per cluster commitment)	Sweet pepper – 3 t/week Carrots – 3 t/week	For final discussion with NorMin Veggies re: share of supply for Lantapan clusters to NutriAsia
Payment of terms	Seven (7) days upon receipt of delivery (bank-to-bank transaction) with option for 50% initial payment through marketing agreement/MOA with buyer and the financing institution upon presentation of proof of purchase order.	50% advance payment including trucking cost

Table 2: Joint supply plan for Songco and Kaatoan clusters (2008)

Suppliers	All farmer-members of Songco and Kaatoan clusters
Estimated Supply Volume	Bell pepper (atsal) = 3 tonnes/week
Product supply management	Volume Management Program planting shall be developed and adopted among cluster members on a weekly basis to ensure continuity of product supply(see attached production calendar) Quality Management A production and handling protocol shall be established and shall be adopted among cluster members In addition, all cluster members shall be continuously trained from production to product packaging & handling Quality controller shall be elected among clusters who shall take charge in the over-all quality management program such as product quality inspection during harvesting, sorting and packaging of goods prior to delivery
Material /Facilities Needed	Consolidation centre/sorting shed To be established by each cluster in a strategic location Production inputs Packaging materials Transportation

Management plan

A joint management plan was developed by the Songco and Kaatoan clusters. They identified the organizational set-up of the PAGLAMBU cluster and the roles and functions of each cluster officers. These included a president, vice president, secretary, treasurer and two cluster leaders: one for both Songco and Kaatoan (Table 3).

In terms of financial management, all sales were to be deposited in a bank account and regularly checked by the cluster leader and treasurer. The cluster also established a group trust fund which was created from securing a proportion of each member's sales. A financial report was to be tabled at every cluster meeting.

Table 3: Joint management plan for Songco and Kaatoan clusters (2008)

Organizational set-up	Since Songco and Kaatoan clusters are part of PAGLAMBU, the organizational set-up and its functions will comprise of: President Vice President Secretary Treasurer Cluster leaders for both Songco and Kaatoan
Operations	The elected president of PAGLAMBU shall take charge in the over-all operation of the group as the over-all cluster leader. Each cluster shall have a leader who shall ensure the implementation of their cluster agro-enterprise plan in consonance to the over-all agro-enterprise plan of PAGLAMBU. The cluster leader shall ensure the production and consolidation of their products and shall represent its cluster members in the over-all cluster meeting.
Finance and Administration	Its cluster shall open a bank account where all finances shall be deposited and properly disburse. With the assistance of the Landcare Facilitators from the Municipal Agriculture office the cluster leader and the cluster treasurer shall prepare an income and expense report including marketing facilitation cost and shall facilitate distribution of the net proceeds from the sales to its members. A certain percentage from each of the individual sales shall be collected/ deducted from their sales to serves as a group trust fund intended for its operation and honorarium for the cluster's marketing officer.

Revised agro-enterprise plan

After a year of implementing the agro-enterprise plan, the cluster farmers collectively made some revisions. These came about as a result of the various experiences that the two clusters encountered including the loss of markets, low prices and crop failure.

Revised marketing plan

The revised marketing plan included new buyers from Davao and Cagayan de Oro. They continued to transact with the market facilitator, but dropped the consolidator after the consolidator issued a number of cheques which bounced. The quality and volume requirements from the previous plan were retained but the payment terms were clarified, where the buyers must give payment after one week after the scheduled delivery (Table 4).

Table 4: Revised joint marketing plan of Songco and Kaatoan clusters (2009)

Target market	1. Consolidator Address: General Santos City Other buyers: 2. Davao Traders 3. CDO-Agora traders Warehouse operator Market facilitator
Product requirements and specifications	Consolidator Volume: 3 tonnes/week Size: medium to big (+6.5 cm) Colour: red Local Traders – all-in Market facilitator Volume: 1.5 tonnes two times a month Size: medium to big (6.5 – 7.5 cm) Colour: mature green to red Variety : Smooth Cayene
Target Sales	Consolidator: 2,990 kg Other buyers: 4,810 kg Davao and CDO-Agora traders (to be distributed or sold to CDO and Davao traders based on highest price offered and total volume required)
Terms of Payment	Consolidator – 1 week after delivery (bank-to-bank) Davao traders – 1 week after delivery Agora-CDO traders – cash upon delivery Market facilitator – 1 week after delivery

Revised supply plan

In the revised supply plan, the two clusters identified the target volume for their buyers: 38% was to be consigned to the consolidator and the remaining 62% for other buyers. They have also assigned a similar volume to every cluster member: 3,000 kg of sweet pepper. Each member was to have the same area of production.

Revised management plan

A revised management plan was also made by the two clusters to include quality, operational and organizational management plans. The quality management plan included the following policies:

- Strict implementation of proper production protocols based on the farm plan and budget
- Harvesting should be done one day before delivery, along with picking, air drying and cleaning
- Product quality inspection such as sorting/classification based on market or buyer specs prior to delivery of goods to the market
- Hauling from the farm to sorting area – use of appropriate transport such as motorcycle or animal drawn cart or "*caromata*" or whatever applicable transportation to minimize the losses;

- Use of appropriate packaging materials such as carton or plastic crates;
- Transporting (from consolidation center to market) – hired truck/reefer van to minimize postharvest losses (for Gen Tuna, Agora and other market outlets)

With regard to the clusters' operational management plan, this includes the activities that should be undertaken in different stages of product delivery (Figure 2).

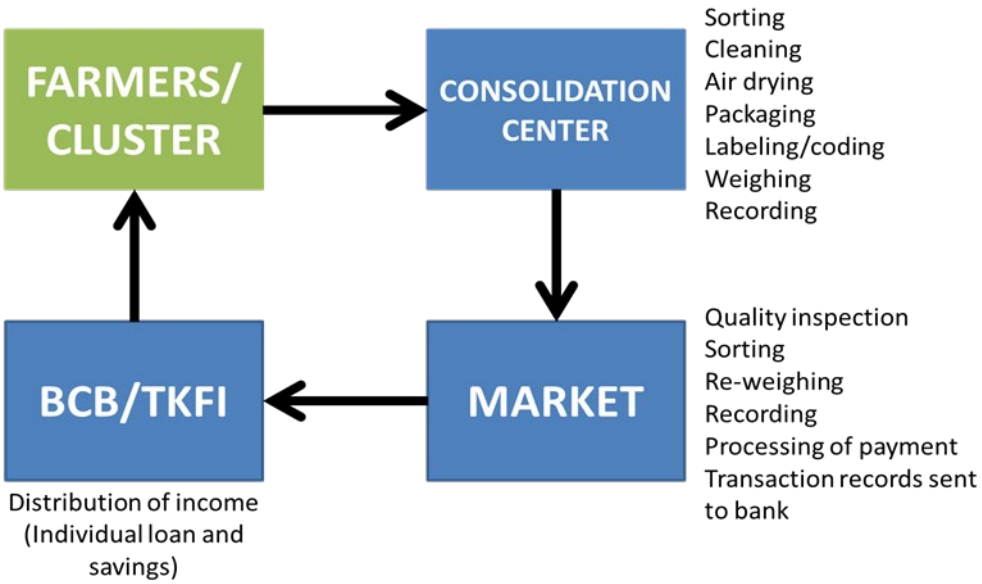


Figure 2: Operational flow of PAGLAMBU

An organizational management plan was also developed that included the following policies which should be observed by every cluster member:

- Attend regular monthly meeting
    - weekly cluster meeting
    - monthly inter-cluster meeting
    - quarterly institutional partners meeting
- Conduct project monitoring (production and marketing)
- Regular assessment of the cluster and review of the enterprise plan
- Conduct continuous capacity building programs related to:
    - integrated crop management (ICM)
    - NTFS and organic farming practices,
    - postharvest handling
    - financial management and simple bookkeeping;
- Establishment of project management team/set-up

Revised financial plan

The revised financial plan for the Songco and Kaatoan clusters included the calculation of the anticipated cost and return for sweet pepper production on a per farmer and per cluster basis. It is expected that the cluster member would earn a net income of PhP 70,320 - 74,330 if production reached 3,000 kg for one cropping season (Table 5).

Table 5: Revised financial plan of Songco and Kaatoan clusters (2009)

	Per farmer	Per cluster
No. of hills	3,000	39,000
Expected yield	1 kg/hill	1 kg/hill
Total yield	3,000 kg	
Buying price	PhP 35/kg	PhP 35/kg
Gross sales	PhP 105,000	PhP 1,365,000
Production cost	PhP 14,670	PhP 190,710
Marketing cost	15,000	195,000
Equity (labour)	4,010	52,130
Other cost	1,000	13,000
Total cost	30,670	398,710
Total cost (with labour)	34,680	450,840
Net income	PhP 74,330	PhP 966,290
Net income (with labour)	PhP 70,320	PhP 914,160

Agricultural loan arrangements

The PAGLAMBU cluster farmers were financially assisted by the BCB through its Tinubdan sa Kalamboan Foundation Incorporated (TKFI). Under a unique arrangement with a market facilitator, who was willing to facilitate the sale of the farmers' produce, funds for the repayment of the loan were to be deducted from the farmers net earnings before transferring the residual funds to the farmers personal accounts. Each cluster farmer was granted a loan from the BCB for the gross amount of PhP 43,000 at 3% interest per month. For each cluster farmer, the net amount received was PhP 37,000. Prior to selling, the BCB was to be informed at least three days in advance so that they could send their representative to the consolidation area at the Agora market to record the harvest and sales of sweet pepper and to collect that proportion of the loan that was due for repayment. The repayment process was expected to conclude at the end of the cropping season.

11.9.4 Test marketing

Conduct of trial delivery

In September 2008, the PAGLAMBU cluster delivered sweet pepper for the first time to the market facilitator. Three months after, the cluster began to deliver to the consolidator. However, the delivery of sweet pepper to both of these market channels could not be sustained due to a number of issues and challenges. Firstly, the cluster farmers experienced crop failure due to bacterial wilt disease. During the same period, the Lantapan area experienced excessive rainfall and long periods of drought, which hastened the effects of bacterial wilt.

As a result of the reduced yield due to disease and weather disturbances, the farmers lost both institutional markets as they were not able to deliver sufficient quantities to meet the

market's requirements. Furthermore, the quality of the produce deteriorated since most of their output was badly affected. As the supply dwindled, cluster farmers had to face the reality of losing their markets.

The PAGLAMBU cluster decided to discontinue delivering to the consolidator due to a series of bounced checks. As they no longer trusted the consolidator, they were left with no choice other than to drop this buyer.

Evaluation of trial delivery

In light of these issues and challenges, the farmers revised their agro-enterprise plan to include buyers from the traditional market. They were able to tap some wholesalers and consolidators from key cities in Mindanao who procured products in the farmer's area. Through this, they were no longer responsible for the cost of transporting their produce to market. They were able to secure buyers from selected areas in Bukidnon, such as the Lantapan Provincial Market and the cities of Malaybalay and Valencia.

From August 2009 until November 2010, the PAGLAMBU cluster farmers had a continuous supply of sweet pepper. For the Songco cluster, the accumulated volume of production was 10,513 kg, with a total value of PhP 364,613. Meanwhile, the Kaatoan cluster produced 14,130 kg of sweet pepper, with a value of PhP 568,400.

11.9.5 Scaling up

The PAGLAMBU cluster farmers undertook a number of scaling up activities to make their operation more sustainable. These included the addition of other crops, market linkages and their participation in various training program and capacity building activities. It also involved some "scaling down" decisions made by the cluster, such as discontinuing some market linkages.

Addition of cabbage

Specifically, the Songco cluster managed to include cabbage as one of their priority crops for cluster marketing. The initial arrangement was for the cabbage to be sold to a market facilitator whose primary market was a food chain in Cebu. Cabbage was shipped to Cebu from Cagayan de Oro where the market facilitator was situated. To meet the needs of the institutional buyer, the cluster had to meet the quality requirements: the size of the head (less than 1 kg) and the variety (Scorpio). The required volume was 500 kg per delivery per week, or 2,000 kg per month.

From November 2009 until 2010, the cluster produced 9,310 kg of cabbage, which was valued at PhP 279,300. During this period, the average buying price for cabbage was PhP 30 per kg. However, this market could not be sustained as the target volume was not always available from the cluster farmers. The market facilitator also had issues with the buyer in terms of the required quality. As a result, the Songco cluster decided to divert the cabbage to the traditional market.

Re-entry into the institutional market

The PAGLAMBU cluster did manage to re-enter the institutional market. On this occasion, they established linkages with supermarket chains in Davao and Tagum cities and one restaurant buyer from Boracay.

In March 2011, the cluster made their first delivery to a Davao-based supermarket. Seven vegetables were delivered including cabbage, bitter gourd, eggplant, squash, cauliflower,

carrot and ginger. Calamansi was also part of the list, but this was procured from the wet market as none of the cluster members produced this crop.

The Songco cluster leader was the lead marketing officer for this venture. It was his responsibility to ensure that his farmer-members were able to meet the required volume and quality needed by the supermarket. The delivery schedule was three times per week: Monday, Wednesday and Friday.

This market was established as a result of the negotiation the Bukidnon cluster leaders had with the supermarket. After discussing the product requirements and qualifications, the cluster leaders attempted to source the required vegetables from other Bukidnon clusters, but only Impasugong and PAGLAMBU were capable of delivering the desired vegetables. From March 2011 to May 2012, almost 39,560 kg of cabbage were delivered, which generated sales worth PhP 1,141,542. Over the same period, some 31,680 kg of squash and 24,603 kg of eggplant were delivered (Table 6). The Impasugong cluster provided the majority of the ampalaya (bitter gourd).

Table 6: Volume and value of deliveries to Davao-based supermarket (2011-2012)

Vegetable	2011 (March-December)		2012 (January-May)	
	Volume sold (kg)	Value (PhP)	Volume sold (kg)	Value (PhP)
Cabbage	23,214	708,354	16,343	433,188
Bitter gourd	11,855	500,332	7,013	288,078
Eggplant	14,108	381,120	10,495	280,481
Squash	19,941	258,345	11,739	105,572
Cauliflower	2,462	212,505	1,246	94,392
Carrot	5,852	177,209		
Ginger	1,719	50,238		

In terms of the prices received, cauliflower received the highest price (from PhP 76 -86 per kg), followed by bitter gourd (PhP 41-42 per kg) (Figure 3). On average, the prices received from the supermarket were higher than those achieved in the traditional market.

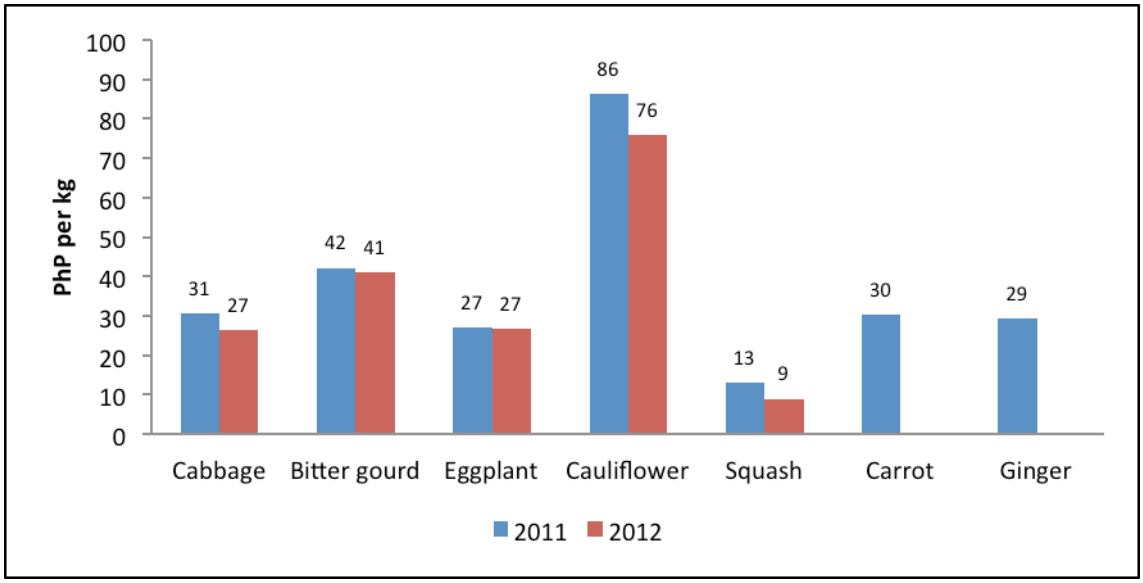


Figure 3: Prices received by PAGLAMBU cluster from the Davao-based supermarket

The PAGLAMBU cluster also managed to negotiate with another institutional buyer: a Tagum-based supermarket. Although this buyer wished to procure a smaller volume of vegetables, it required a wider range: 13 different vegetables. The buyer was also more lenient since it did not require the PAGLAMBU cluster to deliver a specific amount of vegetables, as long as the cluster informed the buyer ahead of the delivery schedule so that buyer could make alternative arrangements to source vegetables from other suppliers. From 2011-2012, sweet pepper was the main vegetable delivered to the Tagum-based supermarket, followed by Baguio beans, lettuce and Chinese cabbage (Table 7). By March 2012, the cluster had been able to generate sales worth PhP 70,611.

Table 7: Volume and value of deliveries to Tagum-based supermarket (2011-2012)

	2011 (June-December)		2012 (January-March)	
	Volume sold (kg)	Value (PhP)	Volume sold (kg)	Value (PhP)
Potato	250	9,700		
Broccoli	25	1,450		
Cauliflower	70	5,250		
Lettuce	119	7,234	32	238
Chinese cabbage	155	4,100	25	575
Sweet pepper	406	22,934	110	6,150
Tomato	75	2,125		
Baguio beans	84	3,160	170	4,125
Bitter gourd			20	720
Bell pepper	10	900		
Radish	25	600		
Jicama	20	400		
Zucchini	10	950		

Another buyer for the vegetables from the PAGLAMBU cluster was a Boracay-based restaurant. This buyer purchased seven kinds of vegetables from the cluster. For this buyer, lettuce and broccoli were the crops in greatest demand (Table 8). From this linkage, the cluster was able to earn PhP 107,405.

Table 8: Volume and value of deliveries to Boracay-based restaurant (2011-2012)

Vegetables	2011 (October-November)		2012 (February-March)	
	Volume sold (kg)	Value (PhP)	Volume sold (kg)	Value (PhP)
Lettuce	396	36,295	570	28,395
Broccoli	290	22,250	37	3,015
Cauliflower	80	7,100		
Zucchini	49	5,680		
Wansoy	15	2,400		
Parsley	24	1,920		
Celery	5	350		

Through the Municipal Agricultural Office of Lantapan, the Department of Agriculture - Region X agreed to construct six rain shelters for the PAGLAMBU cluster. This was possible as the PAGLAMBU cluster was a registered people's organization (PO), thereby enabling them to comply with the legal obligations to receive a grant.

Through the use of rain shelters, the cluster farmers were able to produce lettuce, cabbage, bell pepper, pechay and broccoli. Farmers observed that when these vegetables where grown under rain shelters, the quality, in terms of appearance and colour, was

vastly improved. Not only did they produce a greater volume, as there was less rejection, they were also able to earn a better income as the product was more acceptable to the buyer (Table 9).

Table 9: Cost and return of selected vegetables grown under rain shelter

Vegetable	Cluster	Size (ha)	Volume (kg)	Farmgate Price (PhP)	Income (PhP)	Cost (PhP)	Net profit (PhP)
Lettuce	Songco	0.25	300	50	15,000	3,000	12,000
Cabbage	Kaatoan	0.25	650	20	13,000	6,045	6,955
Bell pepper	Songco	0.25	245	65	15,925	3,488	12,438
Pechay	Songco	0.25	210	20	4,200	1,410	2,790
Broccoli	Songco	0.25	300	45	13,500	3,750	9,750

Participation in various symposia

Since the start of the clustering process, the PAGLAMBU cluster farmers have undertaken some important capacity building activities, which include cluster formation, initial market surveys and enterprise planning. These activities were spearheaded by CRS. When the facilitation was turned over to UPSTREAM, the cluster farmers became more active in participating in training workshops and even attending regular meetings that the cluster conducted. Some of the most important activities that the cluster farmers have undertaken include pests and disease management training, which was facilitated along with the Regional Crop Protection Center of DA-X. Several of the cluster members participated in the Farmers and Partners Learning Alliance Forum in both 2010 and 2011. Others have attended national and regional vegetable congress in Mindanao and Palawan.

11.9.6 Cluster maturity assessment

The PAGLAMBU cluster is considered to be the most mature among the Bukidnon clusters. Based on the cluster assessment, the farmer-members gave an average of 4/5 grade, which implies that the cluster has attained a higher degree of maturity (Table 10).

The organizational development indicator provides a measure of the extent to which the cluster is now working and functioning independently. Farmer-members have become more responsible in delegating their duties to the cluster, which includes the implementation of enterprise plans. The cluster conducts regular assessments during monthly meetings, where they also discuss the situation of the cluster in both production and marketing. Written financial statements are also presented during these activities.

For the market position indicator, the PAGLAMBU cluster is well-experienced in developing market linkages. From previous transactions, they have become more cautious in dealing with buyers so that they do not suffer from the same problems they experienced during the trial marketing in 2008-2009. The farmers' decision-making skills in dealing with potential buyers are much improved. Moreover, the cluster has improved its product portfolio by focusing not only on sweet pepper, but also on other vegetables which have the potential to generate higher profits. As a result, the PAGLAMBU cluster has managed to re-enter the institutional market and became one of the major vegetable suppliers to two leading supermarkets in Davao and Tagum.

The supply capacity indicator demonstrates that the cluster is able to regularly supply and deliver vegetables to different buyers. They were able to implement appropriate production protocol to ensure the quality and quantity requirements for their vegetables.

The financial resources indicator shows that the cluster has enough capital to sponsor different activities. They regularly collect a cluster and marketing fee from their members, which are subsequently consolidated and held to provide a revolving fund.

Table 10: Joint cluster assessment of Songco and Kaatoan clusters

Maturity indicator	Average	Description
Organizational development	4/5	The cluster is functioning independently; able to: Implement enterprise plans (marketing and supply) Have regular assessments Have written financial reports
Market position	3/5	Market is developed with more buyers who can offer stable arrangements. More buyers tapped Market entered into are for longer term agreements Special negotiation done Markets are diversified New products Cluster pursue market research for high value markets
Supply capacity	3/5	Cluster members can supplement each other supply in terms of deficit. Production technologies are in place for reliable quality and quantity. Regular product supply coming out based on the enterprise supply plan.
Financial resources	4/5	Capital build-up scheme from joint marketing is established. Individual Organizational Service fees are used to pay in full the marketing and management costs.
Management capacity	4/5	Enterprise plan enhanced to address new opportunities. Business operating system in place. Management looks forward to other market opportunities.
Average	*4/5*	

The PAGLAMBU cluster is able to work not only as a farmers' group, but also as a business enterprise as well. They have managed to negotiate with different buyers without the aid of the cluster facilitators. They were also able to enhance their enterprise plan, especially after securing institutional buyers whose demands are more stringent than the wet market wholesalers. Nevertheless, the PAGLMABU cluster is constantly looking for more potential buyers.

11.9.7 Assessment of value chains associated with the cluster

PAGLAMBU cluster chain map

For the PAGLAMBU cluster, the chain map involves buyers from traditional and institutional markets. For the Songco cluster farmers, they initiated started with a market facilitator and wholesalers before linking with two supermarket chains in Davao and Tagum and a restaurant based in Boracay (Figure 4).

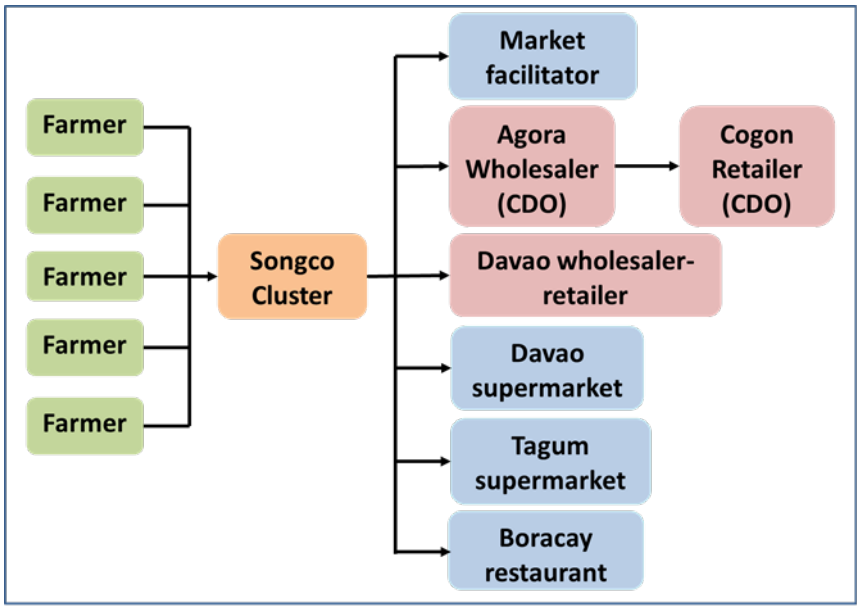


Figure 4: Songco cluster chain map

The Kaatoan cluster has the same buyers as the Songco cluster, but they are also transacting with buyers at the newly-opened buying station in Lantapan (Figure 5). The cluster no longer has to transport their produce to Cagayan de Oro as the buyers regularly come to the buying station.

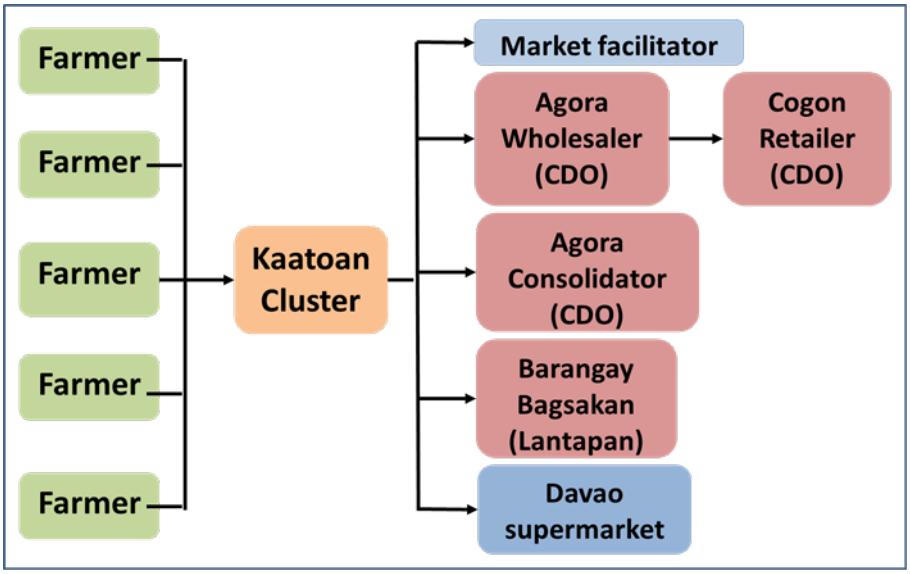


Figure 5: Kaatoan cluster chain map

However, the addition of new buyers to the two cluster chain maps does mean that the farmers have ceased delivering to those buyers they initially contacted. Most of the consolidators and wholesalers from Cagayan de Oro and Davao are still buying the

produce of the clusters. The maps show that the cluster farmers now have more options than before.

Relationship and trust measures

Farmers to their buyers

Looking at the grades provided by the Songco and Kaatoan clusters, most of the relationship dimensions were graded between 75-88% (Table 11).

Table 11: School-boy grades for the relationship between PAGLMABU cluster farmers and their focal buyers

Dimensions		Songco	Kaatoan
Trust	Confidence	79	79
	Correct information	77	79
	Trustworthiness	79	79
	Consider my best interests	75	79
	Honesty	78	79
	Keep the promises	75	79
	Better offer	75	79
Power-dependence	Ease to transfer	78	79
	Power	75	79
	Control of information	75	79
	Freedom to adhere demands	76	79
	Dependency	80	79
Relationship-specific investments	Provision of education	76	82
	Openness to suggest	82	82
	Openness to advice	80	80
	Frequency of information	80	82
Satisfaction	Fairness of treatment	88	80
	Quickness to handle complaints	76	81
	Provision to adequate rewards	75	80
	Expectations met	75	80

For the construct of fairness, most farmers believed that they had been treated fairly, for the products were of good quality and they had been paid prices slightly higher than the prevailing market price.

For many of the other constructs, the reason for the low grades were attributed to some of the problems farmers had experienced in dealing with some of their buyers. According to the farmers, the quality specifications were not consistent between deliveries and the information they were receiving from buyers was often inconsistent, particularly with regard to price setting and product rejection rates. In some instances, farmers perceived that their buyers had acted opportunistically, there was little trust and few guarantees that the product would be accepted without some price renegotiation. However, with few alternative buyers, the farmers were forced to accept the buyer's determination. Not unexpectedly, the buyers were slow to respond to the farmers complaints.

Farmers to cluster

Despite the unfavourable evaluation of their focal buyers, it was evident that this did not undermine the relationship individual farmers had within their clusters. With grades

ranging from 83 - 89%, a harmonious atmosphere between cluster members existed, which brought positive outcomes such as trust and honesty (Table 12).

Table 12: School-boy grades for the relationship between PAGLAMBU farmers and their cluster

Dimensions		Songco	Kaatoan
Trust	Confidence	86	86
	Correct information	86	86
	Trustworthiness	86	86
	Consider my best interests	88	87
	Honesty	86	88
	Keep the promises	86	87
	Better offer	88	86
Power-dependence	Power	88	86
	Control of information	88	87
	Freedom to adhere demands	86	89
	Dependency	86	86
Relationship-specific investments	Provision of education	85	87
	Openness to suggest	85	89
	Openness to advice	85	87
	Frequency of information	85	87
Satisfaction	Fairness of treatment	88	88
	Quickness to handle complaints	88	86
	Provision to adequate rewards	85	83
	Expectations met	86	87

In addition, the power vested in the cluster officers had been used appropriately. Members felt that they could freely express their sentiments without being judged and each of them felt that they had been treated fairly and equally. As information was always made available to them, especially the cluster records on sales and expenses, members had confidence in one another.

Becoming part of the cluster had provided benefits for the farmer-members. Now they could bargain for a better price with their buyers. They were more open in suggesting solutions or in providing knowledge on production techniques that might help another member. As a registered organization, farmers were rewarded with access to resources from various agencies that helped the cluster members to fulfill their aspirations.

Chain analysis

Surveys were conducted in 2010 and 2011 to gather production and price data for sweet pepper, as well as the production and marketing expenses incurred by farmers for one cropping period.

For the PAGLAMBU cluster farmers, fertilizer and pesticide costs were the most expensive components in the production of sweet pepper, ranging from PhP 5 - 8 per kg. The transportation cost was similar for both the Songco and Kaatoan clusters: PhP 3 per kg. With total costs ranging from PhP 15 - 23 per kg, the PAGLAMBU cluster farmers earned a profit of PhP 8 - 16 per kg (Table 13).

Table 13: Costs and returns for sweet pepper production (2010)

	Songco	Kaatoan
Total volume sold (kg)	3,913	3,960
Average farm price (PhP/kg)	32	27
Total Revenue (PhP)	125,216	106,920
Cost (PhP/kg):		
Fertilizer	6.65	8.40
Pesticide	3.32	5.81
Materials	0.51	0.78
Hired labour	1.58	0.21
Water	0.05	0.04
Hired animal	0.52	0.13
Production cost	12.63	15.35
Total revenue less production costs	19.37	11.65
Marketing	0.43	0.21
Transportation	3.00	3.00
Gross margin	15.94	8.45

In 2011, the PAGLAMBU cluster farmers were able to recover as a result of the improvement in the buying prices and the volume of sweet pepper produced. When prices increased to PhP 34 - 43 per kg, farmers were able to earn a profit of PhP 19 - 35 per kg (Table 14).

Table 14: Costs and returns for sweet pepper production (2011)

	Songco	Kaatoan
Total volume sold (kg)	21,550	3,918
Average farm price (PhP/kg)	43	34
Gross margin (PhP)	926,650	134,331
Cost (PhP/kg):		
Seeds	0.09	0.48
Fertilizer	2.08	6.11
Pesticide	0.87	3.99
Materials	0.04	0.33
Hired labour	1.12	0.63
Hired animal	0.06	0.10
Production cost	4.26	11.64
Total revenue less production costs	38.74	22.65
Marketing	0.36	0.89
Transportation	3.00	3.00

Gross margin	35.38	18.76

In exploring the gross margins along the chain, it was evident that the PAGLAMBU cluster received three different prices when they delivered sweet peppers to three different downstream buyers. The cluster received the highest gross margin when the farmers' produce was purchased by a wholesaler-retailer from Davao. Since the buyer goes to the area to procure the sweet pepper from the cluster, the farmers did not have to incur any cost for transportation, which significantly improved their net margin (Figure 6).

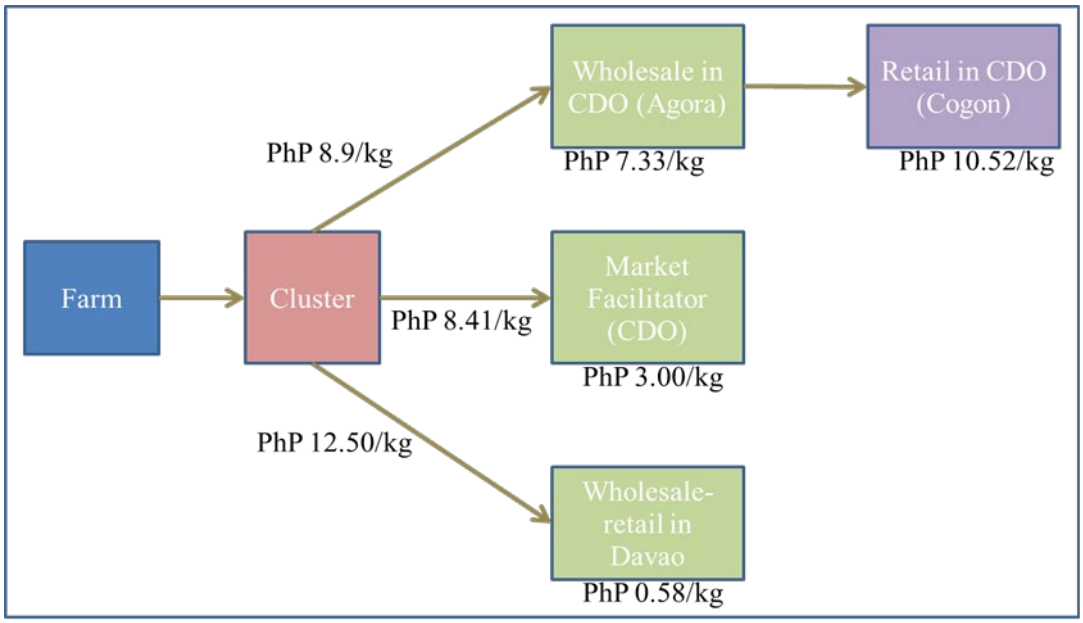


Figure 6: Gross margins along the chain

At the downstream level, buyers from Cagayan de Oro received better gross margins than the buyer from Davao due to the shorter travelling time and the absence of any transport costs. For the buyer from Davao, these costs substantially reduced the gross margin.

Aside from determining farmers' costs and margins, losses along the chain were calculated for both the farm and downstream levels. Field losses at the farm level occurred due to various production problems such as crop failure as a result of pest and disease outbreak, and extreme weather conditions. On the other hand, postharvest losses were incurred during the marketing stages, where crops are re-sorted and re-classified to remove any bruised or damaged fruit.

For sweet pepper, both the field losses (18.4%) and the postharvest losses (3.0%) incurred in 2010 were marginally higher than in 2011 (Table 15).

Table 15: Losses at the farm level

Year	Field		Post-harvest	
	Kg	%	Kg	%
2010	1,969	18.4	322	3.0
2011	5,795	16.0	20	0.1

The reduction in 2011 was due to a better growing season and a much better understanding of the buyer's quality specifications

Wastage among the downstream actors was found to be significantly lower than that incurred by the farmers (Table 16). As sweet pepper was one of the most frequently purchased vegetables in the market, buyers could easily dispose of all the produce to their various customers. For the market facilitator, it was apparent that the high loss was the result of miscommunication with the PAGLAMBU cluster farmers with regard to the desired quality specifications, which resulted in the wastage rate exceeding 25%.

Table 16: Losses at the downstream level

Type of buyer	Location	Vegetable	Wastage (kg)	%
Wholesaler	Davao	Sweet pepper	0	0
Wholesaler	Agora, CDO	Sweet pepper	31	13
Market facilitator	Agora, CDO	Sweet pepper	150	25
Wholesaler	Agora, CDO	Sweet pepper	25	25
Consolidator	Agora, CDO	Sweet pepper	6	20
Retailer	Cogon, CDO	Sweet pepper	0	0
Retailer	Cogon, CDO	Sweet pepper	0	1
Retailer	Cogon, CDO	Sweet pepper	0.25	5

11.9.8 Impact of clustering

Farmer evaluation of the clustering process

A final survey in 2011 was conducted to find out what benefits the PAGLAMBU cluster farmers had received as a result of their membership to the cluster. Farmers responded by indicating that the variable had either increased or decreased, or to show that there had been no tangible benefit.

According to the PAGLAMBU cluster farmers there had been some notable increases in production and marketing as a result of the clustering process. Vegetable production and the quantity of fresh vegetables sold had increased over time with a commensurate increase in the income received from vegetable production and in total household income (Table 17).

Farmers had received better prices since they were able to link with numerous market channels, particularly with institutional buyers who offered greater margins compared to the traditional wet market buyers. With an improvement in the quality of the fresh vegetables sold, losses had also decreased. However, even as members of the cluster, the farmers indicated that they had little control over the increasing cost of fertilizers and pesticides.

In terms of marketing, the PAGLAMBU cluster farmers had a better understanding of the dynamics of the marketing system. They had improved their skills in negotiation in order to access better market outlets. Collectively, the cluster farmers had become more skilled in production and post-harvest practices, pest and disease management, and record-keeping. All of these were improved through having participated in various trainings programs, workshops and capacity building activities. As a result, farmers were more

effective decision-makers as they had acquired more knowledge and experience having become a cluster member.

The clustering process brought positive impacts to the families of the cluster farmers, as they were able to send more children to school and their general health had improved.

Table 17: Clustering evaluation by PAGLAMBU cluster farmers

Impact	Response
Income from vegetable production	Increase
Cost of production	Increase
Total household income	Increase
Volume of vegetables produced	Increase
Volume of vegetables sold	Increase
Price received for vegetables	Increase
Production losses/ wastage	Decrease
Quality of vegetables produced	Increase
Number of people employed in the farm (both for production and marketing)	Decrease
Understanding of markets	Increase
Ability to negotiate	Increase
Decision making skills	Increase
Skills in horticultural production	Increase
Skills in post-harvest practices	Increase
Skills in pest & disease management	Increase
Skills in marketing	Increase
Skills in record-keeping	Increase
Leadership skills	Increase
Access to markets	Increase
Access to credit	Decrease
Access to inputs	Increase
Relations with other farmers in the village	Increase
Access to farm-related government support	Increase
Linkages with external partners	Increase
Number of school-aged children who could not afford to go to school before but are now able to go to school	Increase
Family health	Increase
Environment	Increase

Changes in farmer knowledge and practices

Aside from these identified impacts, the PAGLAMBU cluster farmers recognized some additional benefits including crop diversification. As a result of transacting with institutional buyers, farmers were now cultivating a greater range of semi-temperate vegetables such as cabbage, broccoli, cauliflower, carrot, lettuce, potato and tomato and more lowland types including eggplant and squash.

There were also changes in the farmers' production management protocol. Most recognized the need to use alternative inputs to reduce production costs. Aside from organic fertilizers, they also used insect traps and attractants to reduce the incidence of pest infestation.

In addition, the PAGLAMBU cluster farmers were practicing vegetable cultivation under protected cropping structures. Through rain shelters, farmers obtained better quality produce, incurred lower production costs and achieved higher net returns. With the presence of rain shelters, the cluster farmers introduced a communal farming system, where farmers collectively work in a farm area and decide what kind of vegetable they will grow, what inputs will be used and how each farmer can participate in the production process. As the participating farmers shared production inputs, they also shared the anticipated income.

The marketing skills of the farmers had appreciably changed after the implementation of the clustering process. Farmers not only benefitted from improved bargaining and negotiation skills, they were more cautious in dealing with potential buyers. Consequently they could make decisions about which marketing arrangement was more favorable for them. This resulted in the cluster re-entering the institutional market even although they had had an unfavourable experience in the past.

Farmers recognized the need to have better packaging materials to maintain the quality of the vegetables. This was very important for the PAGLAMBU cluster since they had three institutional buyers who had very demanding quality specifications. As a result, farmers shifted from the use of sacks to plastic crates.

The PAGLAMBU cluster farmers had increased their monetary benefits after joining the cluster. Their monthly average income from 2010 to 2011 improved by 33%, which was largely attributed to the increased production of sweet pepper. They had also diversified into many different kinds of vegetables, which added to their monthly income.

11.9.9 Conclusions

The clustering process for the PAGLAMBU farmer members has been very successful as a result of their continued support and participation. With this, the cluster facilitators are assured that the farmers will continue to work collectively to attain their goals. The process has also provided a number of benefits to the cluster farmers. They gained better production and marketing management skills, which enabled them to increase the quality and volume of vegetables sold, and to receive an increased income.

As observed in the maturity assessment indicators, the cluster is seen to be capable of making their decision. This demonstrates that the cluster members have better decision-making skills, which will be important in devising their future plans.

With all these changes, it can be concluded that the clustering process is an effective development tool in improving the lives of the cluster farmers.

Vignette

The challenges and lessons of loan repayment

The PAGLAMBU cluster is located in the land-locked province of Bukidnon. It is composed of two sovereign clusters, Songco and Kaatoan, which concentrate on the production of sweet pepper. In 2010, each cluster was composed of 13 members, with a mean age of 50 years old. On average, members were earning a monthly income from PhP 6,019.

Initially, sweet pepper production presented many financial benefits such as higher income. However, the buyers for sweet pepper required 8 tonnes per week, which the farmers could not supply. If they were to increase their production, they would need additional capital, but with no funds of their own, they would need to borrow from other institutions. This resulted in the PAGLAMBU cluster seeking financial assistance from the Bukidnon Cooperative Bank (BCB), through its foundation, the Tinubdan sa Kalamboan Foundation Incorporated (TKFI). Each cluster farmer was granted a loan for the gross amount of PhP 43,000 at 3% interest per month. For each cluster farmer, the net amount received was PhP 37,000. Prior to selling, their sweet pepper in the market, BCB were to be informed at least three days in advance so that they could send their representative to the consolidation area in the Agora wholesale market to record the harvest and sales of sweet pepper and to collect that proportion of the loan that was due for repayment. The repayment process was expected to conclude at the end of the cropping season.

However, farmers faced difficulties in settling their credit obligations with the bank. Widespread crop failure, due to the high incidence of diseases, was experienced by most farmers. Because of this, they were unable to meet their target production and were unable to deliver sufficient quantities to meet their buyers' requirements. Furthermore, because of the adverse conditions, the quality of the produce deteriorated. The farmers capacity to repay the loan was also impeded when a buyer issued a series of bounced cheques. As a result, the farmers became more indebted to the financial institution.

To ensure that there was some way in which the outstanding loans could be settled, the cluster farmers and the financial institution developed alternative strategies to resolve the problem. One of these was to restructure the loans to extend the repayment period for another 6 months. The interest rate was also reduced from 3% to 1.8% per month. However, when farmers were still unable to settle their loan during the restructuring period, the Board agreed to a three-year extension. This agreement, which started in 2010, will no longer bear the regular interest rate of 1.8% per month. Instead, the value of the interest borne by the original loan was added to the principal amount to be repaid by the farmers. The remaining balance is to be repaid either annually or semi-annually, depending on the capacity of the farmers.

One alternative strategy the farmers developed was through crop diversification, where a proportion of the income received from selling other vegetables was allocated to the repayment of the loan. They also established additional linkages with buyers in the traditional market who were willing to purchase their vegetables and they ventured into the institutional market to supply two Davao-based supermarkets and one restaurant in Boracay.

Having experienced a number of problems associated with their inability to repay the loan, the PAGLAMBU cluster farmers have learnt a number of very valuable lessons. One of these is the importance of unity among members. Rather than trying to solve the problem individually, they collectively listened to each other's suggestions and to the advice offered by partner organizations. The clustering approach has not only taught them how to enhance their production and marketing skills, but it has also enhanced the camaraderie among cluster farmers.

The cluster members have learned to be more cautious in dealing with prospective buyers. Not only must they look at the expected benefits, they must also look at the credibility and trustworthiness of the prospective buyers so that such incidents can be avoided in the future.

For the financial institutions, when they found out that the farmers were having difficulties in settling their loan, they acknowledged that vegetable production was a very risky proposition, moreso when production was facilitated through a loan arrangement. In response, the two financial institutions devised strategies to help the farmers settle their credit obligations. With this kind of support, it demonstrates that they were not only looking after their own well-being, but they were also considering the welfare of their clients: the cluster farmers.

The farmers experience with loan repayment showed just how risky agricultural finance can be. Farmers must be very analytical in deciding whether to take advantage of any loan arrangement and if they have the capacity to repay the loan, considering all the external factors that preclude the process of repayment. As they will continue to need assistance from financial institutions in the future, this arrangement should keep the farmers and the financial institutions together. However, it would be more prudent to advance some of the loan in production inputs, rather than cash, thereby ensuring that the funds are committed to the most appropriate use. By doing so, it may be possible to prevent farmers from becoming so heavily indebted.

11.10 Saloy Small Vegetable Farmers Association

11.10.1 Site description and group formation

Barangay Saloy is one of the 19 *barangays* located in Calinan District, Davao City, in Southern Mindanao. It is situated 53 km away from downtown Davao City. The *barangay* is composed of 15 *puroks* and has a total land area of 1,300 ha. As of 2010, the total population of Barangay Saloy was 2,157 with 428 households.

The barangay has four solar drying pavements and five water reservoirs. It also has one primary school and one high school. The barangay has a multi-purpose cooperative that buys agricultural products, particularly corn and coffee.

The barangay is accessible by a one-hour *habal-habal* (hired motorcycle) from Calinan. The fare per person is PhP 70. Livestock and crops can also be transported in the motorcycle where the fare is PhP 1/kg. A public utility jeep (PUJ) is available on both Mondays and Fridays to the Bankerohan wholesale market. The fare is PhP 80, both for a person or a sack of vegetables/fruits or grains.

Growing and selling coconut and coffee is the major source of income for the residents in the barangay. Other sources of income include products such as cocoa, banana, fruit trees and assorted vegetables. Owning a sari-sari store, being a motorcycle driver or a government employee also contributed to household income.

In August 2009, the ACIAR-C4 team presented the objectives and strategies of the project to the barangay. In attendance during the project orientation were barangay officials, purok leaders and vegetable growers: a total of 23. The orientation was conducted at Purok Kaunlaran. The CRS eight step clustering process was also discussed during the orientation. On September 2009, the cluster in Purok Kaunlaran, Barangay Saloy was formed. The cluster identified eggplant, squash, bitter gourd and string beans as their main products. The next month, an agro-enterprise planning workshop was conducted. As part of the basic concepts of market training, farmers were exposed to different buyers from both the traditional and institutional markets.

At present, the Saloy Small Vegetable Farmers Association (SASVEFA) has three independent clusters – two were created as a result of the growth and improvement in market position of the original SASVEFA-Kaunlaran cluster. SASVEFA-Kaunlaran has 17 members, headed by the former purok leader and other elected cluster officers. The cluster is now registered as an association under the Department of Labor and Employment.

11.10.2 Product supply assessment and product selection

Membership profile

The SASVEFA-Kaunlaran cluster was composed of 17 members of which 59% were males and 41% were females. Except for one, all the members were married and had an average of three children. The average household size of cluster members is five (5). In terms of education, members had an average of seven years of formal education. Forty two percent of the members had finished elementary level, 36% had finished high school and 12% had reached college level. The majority (94%) of the members were Roman Catholic.

Vegetable farming is considered the main source of income by 65% of the members. Other sources of livelihood by the cluster members included *hurnal*, *habal-habal* and *trisikad* driving, cultivating fruit trees, carpentry and local government. The average

monthly income was PhP 4,180. Aside from the cluster, farmers were also members of other organizations (e.g. cooperative, women's group).

Farmers had been engaged in farming for an average of 20 years. On average, 1 ha was allocated for production, ranging from 0.045 ha to 4.5 ha. The majority of farmers owned the land that they cultivated, most of which had a rolling topography. The crops farmers cultivated included fruit trees (coconut, cocoa, banana, lanzones), corn and vegetables (string beans, eggplant, bitter gourd, okra and Malabar spinach).

Farmers used different tools like a long machete, sickle, bolo knife, machete, plough, grass cutter and pick axe. Water buffalos were utilized during crop production and sometimes for hauling products and inputs. The inputs included fertilizers (ammonium sulphate, complete, 16-20-0 and potash) and pesticides (Malathion, Cypermethrin, Mancozeb and Methomyl). To prevent soil erosion, farmers practiced contour farming and mulching. Most of them used madre de cacao, rhenzoni, flamingia and banana for contour planting.

In planting their crops, most farmers (82%) had their own capital. Only one farmer borrowed from his buyer. Another farmer borrowed money from a relative and one farmer relied on seed support from the ACIAR-C4 project.

Product selection

During the product supply assessment, farmers from Barangay Saloy were asked to select those vegetables commonly grown in the area. The most common vegetables were bitter gourd, eggplant, okra, Malabar spinach, string beans, squash, sword pepper, sweet pea and carrots. From the list of vegetables, farmers chose the five vegetables that farmers had the most production knowledge: string beans, eggplant, okra, bitter gourd and squash.

Marketing practices

At the time of the intervention, the farmers in *Barangay* Saloy were selling their vegetables to retailers, dicers and the cooperative in the *barangay.* Retailers and dicers were residents of the *barangay* who collected different fruit and vegetables from farmers in the area and went to the Bankerohan to resell the produce collected in the *barangay* consolidation area. Farmers chose these buyers based on the proximity to their farms as they did not need to pay for transportation. All farmers had to do was to deliver their produce to the consolidation area and the buyer will shoulder all marketing costs. Furthermore, buyers did not require the farmers to sort their products. They simply had to harvest their produce and pack it. Farmers used a variety of different packaging methods including fertilizer or rice sacks, carton or basins. Farmers delivered their produce to the consolidation centre using animals (water buffalo or horse) or simply carried it to the buyer.

The choice of who to sell to depended upon the availability of buyers at the time of harvest as well as who gave the highest price. Farmers traded with the cooperative if they had a small volume of vegetables to sell and where they needed some grocery items for their household. They exchange their vegetables for rice and other household items. However, if the farmers had more vegetables to sell, they would go to either the dicer or the retailer.

In terms of payment, both the dicer and the retailer paid the farmers after the vegetables had been sold in the Bankerohan. Buyers collected the vegetables every Friday and went to market that same day. They returned to the *barangay* two or three days later. At the time of consolidation, neither the dicer nor the retailer informed the farmers of the price, as they did not know what price they would get in the market.

When the buyer came back to the *barangay* and farmers collected their proceeds from the sale of their produce, farmers were very suspicious that the buyer was not always telling the truth. The buyer would often say that the price was very low, some vegetables were not sold because they were not fresh, or had been damaged during transport.

11.10.3 Market chain assessment

Rapid market appraisal results

In October 2009, the Saloy Small Vegetable Farmers Association undertook a three-day training program on the basic concepts of marketing. The objectives of the program were to enhance the farmers awareness that marketing is a process and not just selling; to determine the production and marketing costs of the selected vegetables for cluster marketing; to let the participants decide for themselves the best market options for their identified products; and to identify potential buyers, the volume, quality and packaging needed.

During the workshop the cluster was split into five groups for the market exposure activity to interview potential buyers in Davao City. Farmers visited the Bankerohan wholesale market and two supermarkets in the city. During the market visit, farmers were able to interview 12 buyers in the Bankerohan.

Except for one, all buyers purchased all types of vegetables. All buyers interviewed acted as wholesalers and retailers in the market. These buyers were willing to pay cash upon delivery of the products based on the prevailing market price on the day of the delivery. Since these buyers were wholesalers, they could purchase as much vegetables as the farmers could deliver. While some buyers had a specific delivery schedule (Friday only) others would accept daily deliveries. Moreover, there were no specific quality standards for vegetables.

Initial chain map

Based on survey information, the initial market chain in Barangay Saloy is illustrated in Figure 1. Vegetable farmers sold their produce to the cooperative or to a dicer. Whereas the cooperative paid them at the time the products were delivered, the dicer delayed payment until the following day or when they next came back to purchase products.

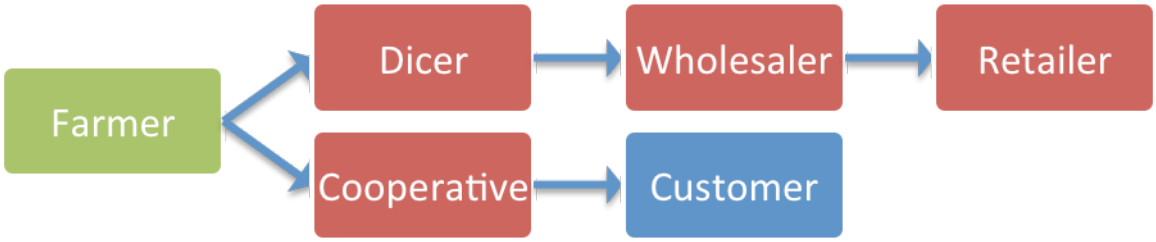


Figure 1: Pre-cluster marketing chain of Barangay Saloy farmers, 2009

The Saloy Farmers Multi-purpose Cooperative was the only cooperative in the area. The cooperative buys and sells agricultural products like coconut, coffee, cocoa and vegetables. Some farmers sold their produce to the cooperative in exchange for grocery items. However, most farmers sold their vegetables to a dicer. For most farmers, they were obliged to sell to the dicer because the dicer provided the finance for the production of their vegetables. From the proceeds of the sale, the dicer subtracted the value of the loan and interest charges. Any surplus amount was then handed to the farmers.

All of the farmers complained that the dicer gave them a low price and/or unstable price. The farmers felt that the dicer was fixing the price to her advantage.

Buyer comparison assessment by farmers

During their market visit in the Bankerohan wholesale market, farmers interviewed the buyers in groups of three or four (Table 1).

Table 1: Interviewed buyers and information on their preferred vegetables

Buyer	Information
Dodong Kupit	All types of vegetables (fruit, leaf, root) are bought. Wholesale buying mode.
Risa Paudin	All types of vegetables (fruit, leaf, root) are bought.
Alberto Loto	All types of vegetables (fruit, leaf, root) are bought. Schedule of purchasing – Fridays.
Maxima Palarca	All types of vegetables (fruit, leaf, root) are bought. Mode of payment – cash. Schedule of payment – the afternoon after the delivery. Pick-up system at Calinan. No limit in the volume purchased. Schedule of purchasing – daily.
Lydia Embudo	All types of vegetables (fruit, leaf, root) are bought.
Linda Doronio	Pipino was the vegetable mentioned she is purchasing even if all types of vegetables are seen in her area.
Freddi Elado	All types of vegetables (fruit, leaf, root) are bought.
Genie	All types of vegetables (fruit, leaf, root) are bought.
Nacy	All types of vegetables (fruit, leaf, root) are bought.
Virgie	All types of vegetables (fruit, leaf, root) are bought.
Lilia “Kapatagan”	Potatoes, Chinese pechay, cabbage and carrots are bought.
Joemar Escaber	All types of vegetables (fruit, leaf, root) are bought.

11.10.4 Cluster formation and planning

Initial cluster agreement

When the cluster started to conduct monthly meetings and to collaboratively arket their produce, the members realized that they needed policies to help them organize the group. These policies were developed to guide them and to avoid major conflicts. The policies written by the cluster include:

- We must be united in planting vegetables
- Teach members and other farmers about vegetable growing
- Negotiate with buyers
- Collaboratively market vegetables
- Attend regular monthly meeting every second Tuesday of the month
- Collect a 5% delivery fee which will be used as cluster fund
- Collect a 5% seed fee every delivery until the seed loan is repaid

Part of the basic concepts of the marketing workshop and training conducted was for the cluster to develop their own agro-enterprise plan.

Initial marketing plan

The market plan includes the identification of the cluster’s buyers, products, buyer’s quality requirements, sales target, payment arrangement and promotion (Table 2).

Table 2: SASVEFA-Kaunlaran's initial market plan, 2009

Target Market	Buyers identified: Dodong Kupit, Maxima Palarca and Lydia Embudo Location: Bankerohan Wet Market
Product	Product form: squash, bitter gourd, eggplant, string beans and okra Quality specification: sorted (Class A, B and C)
Target Sales	Estimated harvest to be consolidated (kg): Squash: 10,000 Bitter gourd: 2,700 Eggplant: 700 String beans: 350 Okra: 2,340 Buying price per kg: Squash: PhP 7.0 Bitter gourd: PhP 30.0 Eggplant: PhP 6.0 String beans: PhP 15.0 Okra: PhP 20.0 Projected sales: Squash: PhP 70,000 Bitter gourd: PhP 81,000 Eggplant: PhP 4,200 String beans: PhP 5,250 Okra: PhP 46,800
Payment arrangement	Cash upon delivery
Promotion	Giving product sample Informing buyers through text messaging

Cluster members agreed to collectively produce and market squash, bitter gourd, eggplant, string beans and okra. They identified three potential buyers from the Bankerohan.

Initial production/supply plan

Farmers had to determine what specific vegetables they would grow, what area and what quantity they would commit and contribute to the cluster (Table 3).

Initial management plan

The management plan identified the members in charge of implementing and overseeing the cluster plan (Table 4).

Two cluster members were elected to head the cluster; Nong Joven who was the *purok* leader and Rex, who was a BS Agriculture graduate. Four members were in-charge of the marketing process of the cluster.

Initial financial plan

The financial plan identified the anticipated costs and returns for each vegetable (Table 5).

Table 312: SASVEFA-Kaunlaran's initial supply plan (in kg), 2009

	Squash	Bitter gourd	Eggplant	String beans	Okra
Boy					2,340
Rex	4000				
Warlito	1000				
Jerson	2000				
Johnny	3000				
Teodora		500			
Elsa		500			
Marife		500			
Edito		500			
Joven		100	100	50	
Macario		100	100	50	
Benjie		100	100	50	
Jannet		100	100	50	
Elma		100	100	50	
Rudy		100	100	50	
Total	**10,000**	**2,700**	**700**	**350**	**2,340**
Quality management	Class A, B and C				
Materials and equipments to be used	- Trapal - Bukag - Carton - Twine - selector - scissors - sacks - knives				

Table 413: SASVEFA-Kaunlaran's initial management plan, 2009

Management set-up	Production: Joveniano Horio, Sr., Rex Manar Marketing: Jannet Horio, Jerson Hermino, Bengie Pardillo, Rex Manar Treasurer: Nining Alili
Policies	The vegetables must be delivered on time. Selling of vegetables to buyers other than the buyers of the cluster is not allowed. Help members who need help. Regular meeting: every last week of the month.
Compensation	5% marketing fee

Table 5: SASVEFA-Kaunlaran's initial financial plan, 2009

	Squash	Bitter gourd	Eggplant	String beans	Okra
Target volume (kg)	2,340	12,000	10,000	3,000	2,000
Buying price (PhP per kg)	7	30	6	15	20
Expected gross income (PhP)	16,380	360,000	60,000	45,000	40,000
Cost items					
Seeds	1,800	2,295	130	150	1,200
Fertilizer	700	750	300	300	150
Pesticide	600	840	200	200	150
Labor	10,500	7,500	4,500	2,250	2,085
Harvest		800	3,500	1,000	
Transportation	2,340	12,000	10,000	3,000	2,000
Total costs (PhP)	**15,940**	**24,185**	**18,630**	**6,900**	**5,585**
Net income (PhP)	**440**	**335,815**	**41,370**	**38,100**	**34,415**

11.10.5 Test marketing

Conduct of trial delivery

The SASVEFA cluster commenced their trial deliveries in January 29, 2010. The cluster chose a wholesaler/retailer in the Bankerohan as their buyer. From the farm, the farmers consolidate their products in the barangay's *bagsakan* (consolidation area located in front of the cluster leader's house). Cluster members then sorted the products according to their buyer's specification and loaded the produce into a jeepney. The vegetables delivered included bitter gourd (Class A and B), okra, string beans (Class A and B), chilli pepper, eggplant (Class A and B), sword pepper, Malabar spinach, *saluyot* (jute leaves), *karlang* and *patola* (sponge gourd).

The costs incurred during the delivery of the products were deducted from the farmer's gross income in proportion to the volume of vegetables delivered to the cluster. After five consecutive deliveries, the cluster had delivered 771 kg of vegetable products from which they obtained PhP 12,488 (Table 6).

Table 6: Volume and sales of trial deliveries

Delivery	Date	Total Sales (PhP)	Volume of assorted vegetables (kg)
1st	January 29, 2010, Friday	3,018.50	223.0
2nd	February 5, 2010, Friday	3,812.10	179.2
3rd	February 8, 2010, Monday	1,754.30	111.6
4th	February 12, 2010, Friday	3,093.20	203.9
5th	February 15, 2010, Monday	810.00	53.5
TOTAL		**12,488.10**	**771.2**

Evaluation of trial delivery

The chain map for the trial deliveries is shown in Figure 2.

Figure 2: Initial chain map of SASVEFA cluster, 2010

During the evaluation of the trial deliveries, cluster members observed that there were some deviations between the developed agro-enterprise plan and the results. High temperatures had adversely affected the growth of the vegetables which reduced productivity. Land preparation and planting schedules were not followed by the cluster, which resulted in the inconsistent supply of vegetables. Hence the planting schedule was revised (Table 7).

Table 7: New planting schedule

Date	**Cluster Members**
February 22-28, 2010	Rolando Tulin Warlito Manar Jannet Horio Vernida Davis Rodolfo Bocton
March 1-7, 2010	Joveniano Horio Bengie Pardillo Mayolito Bugani
March 8-14, 2010	Edito Bugani, Jr. Azucena Sabino Leonila Sabino Roselda Pardillo Edgardo Bugani, Sr. Rex Manar

Moreover, the marketing officer was confused about how to deduct appropriately the costs incurred by each farmer. Marketing costs included the transportation of the products, a dropping fee, a collector's fee at the Bankerohan and food and the fare for the marketing officer(s) who delivered the produce to the market. This made some cluster members question the amount of money they received. Project staff suggested a new way to compute their returns that would reflect the per kilogram costs of each farmer for every vegetable delivered. This system was tedious but the marketing officer agreed to adopt the system to improve transparency.

The cluster assessed their strengths and weaknesses to know whether they were ready for scaling-up. Five of the original 17 members of the cluster had become inactive. However, there were two new members. The members were confident with the group's unity and enthusiasm to continue planting vegetables. Moreover, the strong leadership of Nong Joven bound the cluster together.

Cluster members respected the authority of their leader and at the same time, Nong Joven respected the opinion of his members. During their monthly cluster meetings, Nong Joven initiated the discussion or assessment of the cluster's performance to enable the members to improve or to adjust to current situation and to respond to their buyer's immediate needs.

Despite the confusion encountered with the computation of sales, members were happy with the outcome of the deliveries. Because of the improvements in marketing, the members noted that some farmers in other *puroks* wanted to join the cluster.

Although many farmers wanted to join the cluster, the members decided that they would not expand beyond 20 members. They suggested to those interested farmers form their own cluster with their assistance. Eventually, two sub-clusters were formed, from two nearby *puroks*.

Consistency of supply was recognised by the farmers as their weak point as a cluster. They had failed to plant in a staggered manner. Some felt that their colleagues did not pay enough attention to the day-to-day management of their vegetable farms, which contributed to the low productivity. Moreover, farmers had faced extreme weather conditions at the start of planting. Extreme heat affected their plants which led to low productivity. Still, the cluster was positive that with the new planting schedule, active monitoring of each member and the consolidation of produce, they could increase the volume of vegetables to be delivered.

Another aspect that they considered as a weakness was the lack of individual financial records of their production and marketing expenses and sales. However, as a cluster they had a complete record of the transactions during each delivery.

11.10.6 Scaling up activities

Decisions of cluster as result of test marketing

After the trial deliveries, the members decided to continue to sell their produce to the wholesaler in the Bankerohan. The cluster members were satisfied with how the buyer transacted with their marketing officer and with the prices that they had been given. Farmers were confident that they could continue to deliver their produce despite the distance from the market.

What activities occurred?

After the trial deliveries, other vegetable farmers in the *barangay* were encouraged to join the cluster. These farmers wanted to join the cluster because the farmers were obtaining a better price for their produce compared to that given by the buyer in the *barangay*.

Cluster expansion

With the organization of the cluster and with its cluster members experiencing better prices for their products, vegetable farmers from other *puroks* became interested in joining the cluster. As the number of farmers who wanted to join the cluster reached more than 50, the cluster members conducted a meeting to discuss what was happening.

The cluster wanted to help other farmers in their *barangay*, however, they decided that they could not accommodate more than 20 farmers in the group. The members decided and assist the other farmers in forming a new cluster of their own. Two new clusters; SASVEFA – Lanzones and SASVEFA – Pag-Asa were subsequently formed.

Communal Farm

During the first quarter of 2011, the Kaunlaran cluster started operating a communal farm as a way of addressing the problem of the declining and inconsistent quantity of the vegetables they delivered to their buyer.

The cluster members applied the *bayanihan* system to start their communal farm. Using 0.3 ha of land provided by their cluster leader, members of the cluster helped in preparing the land, planting the first crop and taking care of the crop. The cluster planted bitter gourd for the first cropping season followed by squash.

The harvest from the communal farm is sold together with other cluster members' produce. The income from marketing the product from the communal farm, after deducting the marketing expenses, was divided between the cluster (the cluster fund) and the members who helped on the farm during the cropping season (50-50 share).

11.10.7 Cluster assessment

Levels of maturity

Cluster members assessed their maturity in five categories: organizational development, market position, supply capacity, business management capacity and financial resources, as an indication of the progress they had made in the learning process. Cluster members self-assessed the maturity of their group with the help of different criteria for each key area (Table 8).

Table 8: SASVEFA-Kaunlaran member's cluster maturity assessment

Organizational Development	Market Position	Supply Capacity	Business Management Capacity	Financial Resources
4	**3**	**4**	**4**	**4**
The cluster is functioning independently and is able to: implement enterprise plans (marketing and supply) have regular assessments have written financial reports	Market is developed with more buyers who can offer stable arrangements: more buyers tapped. markets entered into are for longer term agreements. special pricing negotiations done	Value addition in the supply: value added existing products (packaging) new products, new markets value addition measures implemented; better logistics in place	Enterprise plan enhanced to address new opportunities; performance based incentives	Capital build-up scheme from joint marketing is established: individual organizational; service fees are used to pay in full the marketing and management costs

As an organization the members of SASVEFA-Kaunlaran considered their group to be mature. The score of 4 indicated that the cluster could function independently. This means that the cluster conducts meetings regularly and the leaders can facilitate meetings where members can freely communicate their opinions and decisions and members can reach a consensus. The cluster also practiced transparent accounting, especially with their financial records. Furthermore, members of the cluster recognized that they can connect with other clusters and agencies from government and non-government organizations. However, the cluster is aware that they cannot be dependent to external agencies for assistance. Members of the cluster understood that they must first strengthen their group as an organization and as a marketing group before they can confidently ask for assistance.

In terms of market position, the cluster had a preferred buyer and had increased their bargaining influence. Since the cluster started marketing as a group, they had consistently delivered their produce to a wholesaler in the Bankerohan wholesale market every Monday and Friday. Cluster members understood that they had to maintain a stable supply of products and a consistent quality of products to maintain a good relationship with their buyer. The cluster has been monitoring the sorting and packaging of their

produce by meeting in their consolidation area before they delivered their produce. Moreover, the cluster represented by their cluster leader, had sat down with the procurement specialist from an institutional buyer. These meetings were done with other cluster leaders from Davao City. Several meetings were conducted. The institutional buyer presented the specifications of the products they wanted to buy from the clusters. These requirements were presented by the cluster leader to the members of the cluster. The cluster was in a better position to negotiate with the institutional buyer; however, the cluster members were aware that they needed to provide a consistent volume and quality of products to have a good relationship with the buyer. During that time, the cluster members decided not to pursue a relationship with the institutional market as they did not have sufficient production.

The cluster has a steady supply of many different vegetables for their buyer in the Bankerohan. Cluster members delivered their produce to the cluster's consolidation area. Together, they sorted the vegetables according to their buyer's specifications. Before, none of the farmers practiced any sorting of vegetables based on the quality specifications of their buyer. Farmers only harvested, packed and then gave the products to the buyer. To be able to sustain their supply of vegetables, the cluster developed a communal farm. This communal farm was intended to increase their supply of vegetables and the cluster's income. The cluster members tried to follow the production schedule they have developed but because of the variable weather conditions, farmers found it difficult to follow.

In terms of managing the cluster, the members have elected from among themselves a set of officers that would function to ensure the development of their group. The group, led by their cluster leader, conducted regular monthly meetings to keep the cluster members informed, especially with regard to the cluster's financial position. The meeting also provided a venue for members to discuss setbacks in implementing the plans they had made. Through these meetings, the cluster was able to develop policies which they did not have when they first started. The cluster gave incentives to the marketing officer every delivery and those farmers who worked on the communal farm received a share of the profit.

Financially, the cluster had a very clear policy on how much should be deducted from the member's profit after every delivery. The cluster received a 5% cluster fee; another 5% was given to the marketing officer; and 5% as payment for the seeds they received upon joining the cluster. Every after delivery, each member was given a piece of paper with the computation of his or her profit. The marketing officer and the treasurer recorded every transaction the cluster undertook. The cluster practiced transparency as all records were open and members could see and review it at any time. Where a member wanted to borrow money from the cluster, the members met and deliberated whether or not to allow that member to borrow from the fund.

Activities conducted to strengthen the cluster

Various training workshops and symposia were conducted to strengthen the cluster. Most of the activities were provided upon the request of the cluster members. Some were given through the initiative of the project staff. Where the activities requested by the farmers were beyond the expertise of the project staff, assistance from project partners and other agencies were sought to be able to provide the training for the farmers (Table 9).

Table 9: Activities conducted with SASVEFA clusters

Major Activities conducted	Venue	Date conducted
Crop protection and post harvest practices training	Brgy. Saloy	July 8, 2010
8th National Vegetable Congress	Puerto Princesa, Palawan	February 22-17, 2010
Basic record keeping, basic economics, basic accounting, and how to make minutes in a meeting training	Brgy. Saloy	April 14-15, 2010
Farmers Forum	UP Mindanao	April 13, 2010
1st UP Mindanao Farmers and Partners Learning Alliance	UP Mindanao, F. Inigo St., Davao City	July 2010
Wet market visits/ rapid marketing appraisal	Bankerohan Public Market	July 21, 2010
Basic Concepts on Marketing training	Brgy. Saloy	July 27-29, 2010
Cluster negotiation with an institutional buyer	Buyer's office	October 13, 2010 October 27, 2010 November 5, 2010
Cross-site visit	Bukidnon	April 27-19, 2011
Unang Tabo	UP Mindanao	February 10, 2011
Vegetable Packaging Training	UP Mindanao	February 10, 2011
2nd UP Mindanao Farmers and Partners Learning Alliance	UP Mindanao	July 14-15, 2011
Ikaduhang Tabo	UP Mindanao	February 2012

DOLE registration

Through the initiative of the C4 project staff, the cluster was registered under the Department of Labor and Employment (DOLE) XI as a legally-operating farmers group. The suggestion of registering the cluster under DOLE was made for the cluster to have a legal identity as an association. This identity enabled the cluster to gain access to institutional support from local government units (LGUs), non-government organizations and other agencies. Furthermore, this decision was made to allow the cluster to continue even after the assistance from the project had concluded.

The cluster accepted the suggestion in a cluster meeting conducted in May 2011. That same month, a representative from DOLE gave a pre-registration orientation to the members. The orientation provided the members with information on what it meant to be a registered association, the benefits, as well as the requirements needed to be submitted for the application. The requirements needed for the registration were Minutes of the meeting when the members of the cluster decided they wanted to become an association, the cluster's financial report since it started its operation in 2010, list of officers and members, and the constitution and by-laws of the cluster. All these documents were made by the members of the cluster and the notarization of the documents were assisted by the project staff.

In August 2011, the certificate of registration from the DOLE XI was released and awarded to the cluster with the registered name Saloy Small Vegetable Farmers Association. Since the registration of the cluster, access to material support from LGUs has improved.

11.10.8 Assessment of value chains associated with the cluster

Institutional chain

With insufficient product, the cluster chose not to sell their products to the institutional buyer.

Traditional chain

Members of the cluster consolidate their products twice a week in their *bagsakan* or consolidation area. Together they sort the vegetables according to the preference of their buyer. After sorting, the vegetables are packed and delivered to their buyer in the Bankerohan.

For the initial deliveries, the marketing officer went with the vegetables to the market. However, after several deliveries, the cluster realized that it was very tiresome for the marketing officer and, as additional costs were incurred, they decided to negotiate with the jeepney driver for him to hand the products over to the buyer and to collect any payment.

Initially, the buyer would send a text message to the marketing officer indicating how much they were willing to pay for the clusters vegetables. If the price is agreeable, the cluster would accept it: if not, the cluster would negotiate a better price until an agreement was made. Towards the end of 2011, the cluster noticed that their buyer was complaining more about the quality of their products which led to the buyer paying a lower price. The farmers were sure that they were still giving the same quality they used to deliver. In January 2012, the cluster leader and some officers went to the Bankerohan wholesale market to talk to their buyer and to clarify the issue. During the meeting, the cluster found that the buyer had a new supplier. As the farmers and the buyer could not agree anymore, the cluster members decided to look for another buyer.

The new buyer was also a wholesaler in the Bankerohan who buys assorted tropical vegetables. The cluster delivers twice a week if their supply permits.

Guiding questions

1. Approaches to improving capacity

The poor condition of the roads and transportation are the major difficulties faced by the farmers in Brgy. Saloy. The *barangay* is more than 50 km from the Bankerohan wholesale market. As the roads in the *barangay* are mostly unpaved, during the rainy season, the road is very difficult to pass. The poor condition of the roads contributes to the physical damage of the vegetables during delivery. The long travel from the *barangay* to the market plus the high temperatures make the vegetables wither faster and become unappealing.

To overcome these difficulties, members of the cluster use more appropriate packing materials including plastic crates and rattan baskets (*bukag*). The cluster puts vegetables that are highly perishable and easily damaged in a plastic crate and uses sacks and cartons for vegetables such as squash.

To meet the requirements of their buyer, the cluster sort the vegetables according to type and size. Once sorted accordingly, vegetables are placed in the correct packaging. As an incentive, the buyer is giving different prices for different quality products. A higher price is given for better quality (Class A) vegetables and a slightly lower price for Class B vegetables.

All vegetables that do not pass the requirements of their buyer are sold to local buyers in the *barangay* or consumed by the household.

2. Effectiveness of market linkage

Although the cluster chose not to sell to the institutional buyer, the cluster members are still very satisfied. The cluster's regular weekly delivery gave the members a regular weekly income. This income was used by the farmers for their household expenditure and to help send their children to school. The increase in income was also used by farmers to finance their production and other enterprises.

From the survey conducted in 2011, the members of the cluster also perceived that their income had increased from 15% to 74% (Table 10).

Table 10: Average monthly household income of cluster farmers before and after joining the cluster

	2010 (PhP)	2011 (PhP)	% change
Zosima Aparicio	2,000	6,950	71
Joveniano Horio Sr.	2,000	6,400	69
Edito Bugani	4,500	5,300	15
Edgardo Bugani	1,000	3,800	74
Jannet Horio	3,000	4,300	30

3. Identify and propose potential interventions

To further enhance the performance of the cluster, the farm to market road must be improved. Currently, the condition of the road from the *barangay* to the Bankerohan wholesale market is causing physical damage to the vegetables during transport. Improving the road condition will also result in an improvement in the quality of the products from the cluster.

Moreover, the cluster needs to develop production practices that will enable production to continue during the wet season. The heavy rain experienced by the farmers during the wet season lowers their production and decreases the quality of their produce. When the time comes that the cluster will have enough quantity and quality of products, they will have the capacity to supply high-value markets.

Relationships

Farmer to buyer

Farmers were asked about the nature of their relationship with the buyer and the cluster. They were asked to rate aspects of their relationship based on trust, satisfaction, power, and relationship-specific investments. A school boy rating of 75 to 100 is given for every aspect of the relationship (Table 11).

The relationship between the farmer and the buyer was indirect since only the marketing officer had any interaction with the buyer during delivery. Nevertheless, members of the cluster evaluated their relationship with the buyer based on their marketing experience. Farmers believed that their buyer was honest and fair even if there were times that not all of their produce was purchased and the buyer set the price. Although the buyer set the price, farmers can still ask questions as to how the price had been set. Farmers were still confident that their buyer depended on them to supply vegetables. In terms of relationship-specific investments, farmers said that the buyer did not provide any training on vegetable production. However, the buyer suggested delivering more frequently to avoid wastage and identified the type of vegetables to be delivered. Farmers had an open line of communication with their buyer who could provide feedback about price, volume and the quality of the vegetables delivered.

Table 11: Trust and relationship measures of SASVEFA-Kaunlaran members to their pre-cluster buyer, 2010

Trust Measure	Wholesaler	
	Rating	Reason
Confidence	75	Not all vegetables were bought since our buyer already have many volume of our vegetables
Correct information	80	Provides information about price; teaches us how to classify our vegetables
Trustworthiness	90	Seldom meets the buyer
Consider my best interests	90	Allows the farmers to be present during selling of vegetables
Honesty	100	True to her word
Keep the promises	90	There were times when some of the vegetables were not bought
Better offer	90	Offers to help us find another buyer
Ease to transfer	100	We can sell to other buyers anytime
Power	100	Can choose to sell to other buyers
Control of info	75	Buyer controls the information; she sets the price
Freedom to adhere demands	90	Farmers can ask how the buyer sets the price
Dependency	80	Buyer depends on the farmers for the supply of vegetables
Provision of education	75	None
Openness to suggest	100	Buyer suggested that we harvest thrice a week so as to avoid oversupply and wastage
Openness to advice	80	Gives advice on what vegetable to sell
Frequency of information	75	Does not give technical information about production
Fairness of treatment	75	Treats farmers fairly
Quickness to handle complaints	80	Buyer accepts complaints
Provision of adequate rewards	80	Rewards are available
Expectations met	100	Given prices were followed

Farmer to cluster

The relationship between the farmers and the cluster was fairly good. Members observed that cluster members were actively participating in the meetings and consolidating their products for delivery. Cluster members were confident that the marketing officer was correctly computing their income from every delivery. Transparency was being practiced, for at each meeting, the marketing officer was reporting the cluster's financial position. Farmers were also happy with the consistency of the price offered by their buyer.

Internally, cluster members felt they could raise any issues and concerns regarding the production and marketing of vegetables. Sometime there were issues between members that needed to be resolved. The cluster leader mediated the discussion to maintain the order of the cluster (Table 12).

Table 12: Trust and relationship measures of SASVEFA-Kaunlaran members to the cluster, 2010

Trust Measure	Cluster	
	Rating	Reason
Confidence	98	Cluster members are active and united
Correct information	93	Price list is available; information is available
Trustworthiness	80	Members can be trusted; there is cooperation
Consider my best interests	100	Consolidates our vegetables
Honesty	100	Transparent; provides additional income for farmers
Keep the promises	82	Seeds repayment is not yet complete
Better offer	92	Consistent price
Power	95	Every member can raise their concerns, suggestions and ideas; united and honest members
Control of info	90	Cluster leader controls bad issues within the cluster; information are made available
Freedom to adhere demands	93	Farmers can raise/express their concerns or ideas
Dependency	95	Members depend on the cluster in selling their vegetables since the cluster can give them high price
Provision of education	94	Provides training on vegetable production and recording
Openness to suggest	87	Production schedule was not followed due to bad weather
Frequency of information	91	Cluster members share their experiences and expertise during meetings
Fairness of treatment	96	Equal/fair treatment for all members of the cluster
Quickness to handle complaints	92	Complaints are handled/heard actively
Provision of adequate rewards	82	Not yet available
Expectations met	93	Expectations were met in terms of good pricing, delivery and consolidation

Cluster members were dependent on the cluster to market their products. Through the help of the project staff and other agencies, the cluster provided training that assisted the farmers in vegetable production and marketing. During the meetings, cluster members had an opportunity to share their experiences and effective farming practices.

In general, cluster members were highly satisfied with how the cluster had been operating. Cluster members perceived that they had been treated fairly and equitably. To date, the farmers' expectations of receiving a good price for their vegetables had been met.

Chain analysis and gaps

Chain

Vegetable farmers in Saloy used to sell their produce individually to a local trader prior to the formation of the cluster. This local trader was either a dicer or a wholesaler. The buyer picked up the vegetables in the *barangay* and paid for the products after they had been sold in the Bankerohan wholesale market. The price received by the farmers depended on the prevailing market price at the time the vegetables were sold. Most of the time, farmers complained about the low price, believing that the buyer had manipulated the price.

However, farmers had no way of finding out what really happened, since they were not there nor did they have any other source of price information.

After the formation of the cluster in 2009, the members of the cluster brought their products to the cluster for consolidation, sorting and packing. The marketing officer then delivered the products to their preferred buyer in the Bankerohan two times a week. However, the cluster could only deliver every Monday and Friday according to the jeepney schedule in the barangay.

The farmers start delivering their products to the consolidation early in the morning. The farmers sort the products according to the specifications of their buyer. Products are usually sorted according to its size and length. There are only two classifications for the vegetables grown by the cluster: Class A or Class B. Class A products are long (string beans, bitter gourd) and big (okra). Other vegetables that do not pass the Class A classification are considered Class B, except for vegetables that are bruised, cut or very small. All vegetables that do pass the standards are not included in the delivery. No quantitative measures are used by the farmers during product sorting: they base their judgment on the physical appearance of the vegetables based on what they were shown by their buyer during their negotiations. When farmers are doubtful about how to classify a vegetable, they consult the marketing officer.

When farmers are done with product sorting, they weigh the vegetables and the marketing officer records each member's contribution. After weighing and recording, the vegetables are packed. The packaging material used depends on the type of vegetables. The cluster uses plastic crates and sacks to pack their vegetables. Farmers see to it that they pack the vegetables properly and their vegetables are protected from any damages that may occur during transport. However, because of the poor road condition and long duration of travel, the vegetables are often bruised and withered.

The price is negotiated between the marketing officer and the buyer. Price negotiation occurs prior to delivery. To be able to communicate with the buyer, the marketing officer must climb a coconut tree to get a strong signal to send a text message. Farmers receive payment for the vegetables they delivered when the marketing officer returns from the Bankerohan.

Once the marketing officer returns in the *barangay*, the expenses incurred during the delivery are divided among those members of the cluster who delivered the vegetables. The costs or expenses incurred by a farmer are proportional to the quantity of vegetables delivered. Any wastage sustained during the delivery is equally divided among the members of the cluster and priced accordingly.

Productivity and profitability

In 2011, the farmers experienced low productivity for bitter gourd due to extreme rainfall. Furthermore, they were not able to undertake any mitigating measures to eradicate the pests and diseases that followed the heavy rain. Many of their plants did not grow because they were washed out by the rain. Members of the cluster planted squash for additional income since the vegetable was easy to manage and incurred a low production cost.

The cluster receives a 15% share of the farmer's gross returns to; (1) establish a revolving cluster funds; (2) establish a seed loan account; and (3) an incentive for the marketing officer. The funds retained by the cluster are held by the cluster's treasurer. These funds may be used by the members of the cluster to facilitate the planting of new crops. However, funds can only be released if approved by the majority of cluster members.

String beans and squash were the two most profitable vegetable crops for the cluster members (Table 13). Conversely, because of the high production cost, those farmers cultivating bitter gourd were unable to generate any profit.

Table 13: Costs and returns, SASVEFA-Kaunlaran, 2011

Products	Bitter Gourd	String Beans	Eggplant	Squash
Volume Sold	110	1,057	1,360	205
Farm Price (P/kg)	18.00	16.00	9.29	12.00
Cost (P/kg)				
Seeds	10.91	0.80	0.44	2.44
Fertilizer	0.48	2.15	3.86	0.37
Pesticide	0.13	0.57	0.63	0.00
Animal	0.00	0.00	0.22	0.00
Materials	4.55	0.79	0.11	0.00
Labor	4.36	0.20	0.26	0.00
Total Production Cost	20.43	4.51	5.53	2.81
Gross Margin	-2.43	11.49	3.76	9.19
Marketing Cost	3.64	0.10	0.00	0.20
Transportation	2.00	0.79	0.00	0.00
Cluster Fee	0.90	0.80		0.60
Net Profit	-8.97	9.79	3.76	8.39
Cost/Sales	150%	39%	60%	30%
Net Profit/Sales	-50%	61%	40%	70%
Wastage	51 (46%)	266 (25%)		40 (20%)

Critical incidents or issues for key lessons

In terms of group dynamics, the cluster has developed a good relationship with its members. The cluster members can openly discuss problems and issues related to vegetable production and marketing as well as issues arising among the members of the cluster.

In terms of production, several farmers have yet to follow the cluster's production schedule because of the lack of money to finance production.

In marketing, the main problem faced by the cluster is the poor condition of the farm to market road. Especially during the wet season, the poor road conditions contribute to the physical damage caused during transportation. Furthermore, the cluster is limited by the lack of transport in the area. The jeepney only comes to the *barangay* twice a week. This is one of the reasons why the cluster chose not to deliver to the institutional buyer, for they required delivery three times a week.

11.10.9 Impact of clustering

Cluster farmers were asked to rate their satisfaction with the clustering approach on a five point scale where 1 was the highest and 5 was the lowest. The advantages of clustering mentioned by the farmers were: (1) access to material and production support such as seeds, knapsack sprayer and weighing scale; (2) access to technical information about vegetable farming, pest and disease management and crop management; (3) additional knowledge about contouring farming practices through cross-site farm visits; and (4) additional weekly income to offset household expenditures. Farmers did not identify any disadvantages associated with cluster farming (Table 14).

Farmers recognize that their income from selling vegetables increased after they joined the cluster and the production of vegetables was more efficient than before. With the increase in production and price for their vegetables, farmers believed that their household income had increased. Farmers perceived that the amount of waste they incurred was almost the same, but they did believe that the quality of the vegetables they produced and sold after clustering was significantly better.

Table 14: Impacts of clustering SASVEFA-Kaunlaran cluster, 2011

Aspect	Increased (%)	Decreased (%)	No Change (%)
Income from vegetable production	100		
Cost of production	40	60	
Total household income	100		
Volume of vegetables produced	80	20	
Volume of vegetables sold	100		
Price received for vegetables	100		
Production losses/ wastage	40	40	20
Quality of vegetables produced	60		40
Number of people employed in the farm (both for production and marketing)	40		60
Understanding of markets	100		
Ability to negotiate	80		20
Decision making skills	100		
Skills in horticultural production	100		
Skills in post-harvest practices	100		
Skills in pest & disease management	100		
Skills in marketing	60		40
Skills in record-keeping	60		40
Leadership skills	80		20
Access to markets	80		20
Access to credit	20		80
Access to inputs	20		80
Relations with other farmers in the village	80		20
Access to farm-related government support	40		60
Linkages with external partners	20		80
Number of school-aged children who could not afford to go to school before but are now able to go to school	80		20
Family health	80		20
Environment	40		60

After joining the cluster, farmers believed that they had the confidence to face a buyer and negotiate a better price for their products. The skills and knowledge they had acquired helped them to understand the market, minimize postharvest losses, become efficient in production and receive higher prices for their vegetables.

Because farmers collaboratively market their products through the cluster, they could access more markets. In terms of credit, although there were no formal and informal lending agencies offering production loans to the cluster, through collaborative marketing the cluster had established its own revolving fund. However, many farmers said even if credit was available, they would prefer not to take up the service because they did not want to be indebted should they experience crop failure. Furthermore, most farmers said that they could provide for their own production and marketing expenses and thus loans were unnecessary.

11.10.10 Conclusions

The development and success of the SASVEFA-Kaunlaran cluster can be attributed to the strong leadership of Nong Joven (cluster leader) as well as the members' understanding of their role in sustaining the cluster.

The members of the cluster understand that each of them plays a role that will either increase or decrease their chances of success. The members understand that the sustainability of the cluster depends on their adhering to the cluster plan. The cluster has developed a mind set that before they ask for support (e.g. better road access, cluster vehicle), they must first develop a production system that results in a sustainable supply of good quality vegetables. The cluster members are committed to improve their livelihood by actively participating in all activities of the cluster.

11.11 Small Farmers Association of Quirogpang

11.11.1 Site description and group formation

Sitio Quirogpang is part of *Barangay* Marilog in Davao City. In 2009, *Barangay* Marilog had a total population of 14,255 of which 225 resided in *Sitio* Quirogpang.

Household heads were the predominant members of the cluster. However, both partners were active in the cluster, regularly attending workshops and meetings, making marketing plans and implementing production activities.

On average, the farm size of cluster members was only 1.24 hectares. Most of the land is rolling to steep. None of the farmers had any formal title to the land. Stewardship was the most common means of ownership, although some farmers had ancestral domain claims.

Cluster members had been farming for an average of 23 years. In addition to vegetables, they cultivated cacoa, banana and coffee, and raised chicken for home consumption.

The distance from Davao City to the *barangay* is approximately 51 km. The road from *Sitio* Quirogpang to the nearest highway is little more than a dirt track which becomes impassable after heavy rain.

11.11.2 Product supply assessment and product selection

In February 2009, at a farmers planning workshop, the Quirogpang cluster identified a number of tropical vegetables including bitter gourd, squash, string beans, eggplant, Malabar spinach and sword pepper.

The majority of the farmers in Quiropang had been trained in the adoption of sustainable farming practices including the use of vermiculture and animal manure, integrated pest control and contour farming. However, whenever the need arose, chemicals such as Karate or Bushwack were applied to control pests.

Pests were the major production problem for the farmers in Quiropang. The main pests and diseases included *dangan* (blight), *ulod* (worms) and rats. The other production problems were the low buying price and low yields. Environmental events such as floods and continuous rains were beyond their control.

Most of the farmers relied on their own capital to finance their farms. With an average household income of only PhP 2,500, the inability of the farmers to buy enough pesticides was the major problem explaining the high levels of pest and disease infestation.

Most cluster members sold their vegetables to Felly Tampos at Crossing S. Aniceta (Itang) Temperatura also purchased the farmers vegetables and delivered them to a mall. Victoria Prieto, a relative of some of the cluster members, also purchased their vegetables.

Most of the farmers delivered the vegetables to the buyers at Crossing S. Quirogpang was more than 3 km from Crossing S and the roads were bad and impassable by vehicles (including motorcycles). Sometimes farmers let others (often *karyada*) bring their products to Crossing S. The common mode of transport from the farm to the roadside was by horse or carabao. However, from the roadside, the produce was delivered to the Bankerohan Public Market by the jeepney.

The cost of a *karyada* is PhP 1.00/kg and the cost of the jeepney was PhP 60.00/sack. A low buying price and fluctuating prices were the marketing problems identified by the cluster members.

11.11.3 Market chain assessment

As part of the Agro-Enterprise planning workshop, cluster members were exposed to potential markets. They were able to interview institutional buyers and wet market buyers to obtain information on varieties, quality and prices. They also visited two supermarkets.

In the Bankerohan, the farmers were able to interview potential buyers and inquire about the kinds of vegetables required, the volume, the buyer's quality specifications and the mode of payment. Six Bankerohan buyers were interviewed.

The most popular vegetables mentioned were bitter gourd, eggplant, Malabar Spinach, okra and string beans, lettuce, cauliflower, broccoli, tomato, carrots and cabbage. Marilog, Bukidnon and Kapatagan were the main sources of supply for these vegetables.

The peak months of supply were November to February, while March to May was when supply was the most difficult.

On average, the farmers discovered that vegetable prices in the 2 malls were generally higher than the wet market.

Since it was the first time for some farmers to interview buyers, they were tense and shy during the whole exercise. They were also not properly guided during the supermarket tours. According to the farmers, the CRS staff in charge were not helpful either.

Initial (pre clustering) chain map(s)

The farmers usually have local buyers from Crossing S who were thought to be supplying several local malls (Figure 1). There are also buyers/traders who regularly come to Crossing S to buy vegetables brought there by the farmers. Some of the Quirogpang farmers also chose to bring their produce to the Bankerohan public market and to sell to spot buyers who can give a better price.

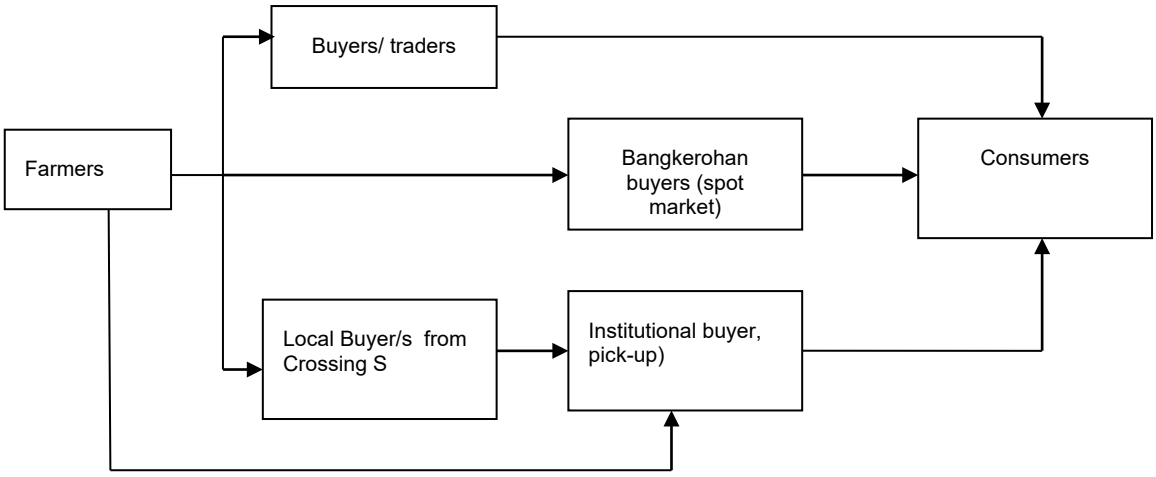


Figure 1: Quirogpang Supply Chain

Initial marketing plan

The initial cluster plans were done by two groups. The enterprise planning was done by farmers based on the market demand identified during the market survey. Farmers jointly formulated the plan taking the market demand and requirements into consideration.

Most of the farmers were producers of squash, eggplant and Malabar spinach. The total volume of squash was 21,545 kg, eggplant was 25,184 kg and Malabar spinach with 12,700 kg (Table 1).

Table 1: Marketing plan for SFAQ

Target Market/s = Bankerohan		
Products	Volume (kg)	Sales Target (PhP)
1. Squash	21,545 x 8.00	172,360.00
2. Eggplant	25,184 x 20.00	503,680.00
3. Alugbati	12,700 x 20.00	254,000.00
		930,040.00
Cash on delivery		

Initial production/supply plan

Ten farmers were identified as suppliers. The materials most needed by the cluster were carabao (water buffalo), horse, baskets and sacks. They also made a production plan which scheduled their planting and harvesting time. Malabar spinach (alugbati) was expected to be harvested every month except in May. Squash was scheduled to be planted in February, May and October. Their target market for the projected 59 tonnes of vegetables was the Bankerohan public market.

Initial management plan

In their initial management plan, it was the role of the cluster leader to contact buyers from Bankerohan, while the assistant cluster leader was assigned to manage the packaging. One of the policies in place was to conduct a cluster meeting before and after every delivery. The cluster members also pledged to give 5% of their income to the cluster.

Initial financial plan

In the financial plan, the estimated total production cost of the three crops amounted to PhP 103,268. Squash had the highest production cost. If the sales target were met, the cluster would have an income of PhP 46, 502 from the marketing fee: 5% from the gross income/sales.

Deducting the production costs and marketing fee, the net income from the three vegetables were projected to exceed PhP 780,270. Each of the 9 farmers who pledged to produce the vegetables would have an estimated net profit of PhP 86, 697.

11.11.4 Test marketing

The farmers tried to sell to some contacts in Bankerohan. However, because of the financial support received by some farmers from their *suki* (preferred buyers), the cluster members only sold 40% of their harvest through the cluster.

In October 2009, the cluster made its first delivery to a new institutional buyer. This was the result of several meetings and telephone conversations with the company. The institutional buyer met the farmers at Crossing S. Ten vegetable crops were sold including eggplant, sword pepper, Malabar spinach, Baguio beans, taro, banana, okra, bitter gourd, sweet potato and sponge gourd. A total of 219 kg were sold, which generated sales worth PhP 2,296 (Table 2).

The agreement was that the buyer would order the kind and volume of the vegetables required every Wednesday. On Thursday, a price range would be sent to the cluster to assist them in deciding whether to sell at those prices. On Friday, the vegetables were to be collected and paid for. The prices paid for the vegetables depended on the quality of the vegetables as defined by the buyer. The institutional buyer would then pay the cluster in cash after the transaction.

Table 2: Test marketing volume and value of institutional market in comparison with local buyers

Vegetable	Institutional buyer quantity (kg)	Institutional buyer price (PhP)	Value of institutional sales (PhP)	Crossing S price (PhP)
Eggplant	48	14.00	672	10.00
Sweet potato	48	7.50	360	
Banana	36	4.00	144	4.00
Baguio beans	23	20.00	460	20.00
Malabar spinach	22	8.00	173	4.00
Taro	15	7.50	113	
Sword pepper	10	23.00	230	15.00
Sponge gourd	9	5.00	45	
Okra	6	10.00	60	
Bitter gourd	2	20.00	40	
Total	219		2, 296	

On the delivery date, the cluster farmers brought their vegetables to a sorting shed provided by the Catholic Relief Services (CRS). The vegetables brought in were weighed and recorded. There was no quality control for any of the vegetables brought in by the farmers. The cluster promised an average price for each of the vegetables, so the farmers would have some idea about how much they could expect to receive. The vegetables were then packed in sacks and baskets and transported via horses to the highway. At the highway, the institutional buyer classified and weighed the vegetables and paid for what they were willing to accept as good quality.

Following test marketing, the farmers complained that the communication/transaction system that was agreed upon during the negotiation was not followed. The institutional buyer did not provide prices earlier than Friday but instead insisted that they first check the prices at Crossing S and the Bankerohan.

However, the buyer complained that the cluster did not provide the agreed volume of vegetables. This was a problem for the buyer since they had travelled specifically to pick up the vegetables as promised by the cluster. It was costly for them if they arrived at the pick-up area and did not get the volume and variety of products they ordered.

There were also disagreements about the quality of the products delivered. The buyer stipulated what they called Class A quality vegetables. However, it was not spelled out what characteristics described Class A quality vegetables. The discretion was in favour of the buyer.

Another issue was the calibration of the scales, with the total weight as measured by the cluster's scale being higher than the buyer's scale. As it was the buyer's scale that was used to determine the total volume and value, this created a problem for the cluster as it was the cluster's records that were used to pay the farmers. To ensure that some cluster members make subsequent deliveries, the cluster leaders paid the full amount to the farmers based on the cluster weighing scale. The cluster then absorbed the loss.

Those vegetables that did not pass the standards of the institutional buyer were sold at Bankerohan at a lower price.

Revisions made to plan

In March 2010, the SFAQ evaluated and revised some of their agroenterprise plans (Table 3).

Table 3: Revised plans for SFAQ

	Positive things	Weaknesses
Cluster members	10 members deliver their produce for the cluster	8 members supply to other buyers who financed their vegetable production
Supply capacity	Ampalaya (Bitter gourd): 1,374kg x 20 = PhP27,480 Talong (Eggplant): 1,000kg x 15 = PhP 15,000 Kalabasa (Squash): 500kg x 3 = PhP 1,500 Spada (Pepper sword): 500kg x 20 = PhP 10,000 Alugbate (Malabar spinach): 400kg x 10 = PhP 4,000 Pipino (Cucumber): 300kg x 10 = PhP 3,000	8 members do not supply to the association because they sell to the people who financed them
Market	Supermarket buyer picks up the vegetables at Crossing S The cluster continues to deliver to its suki in Bankerohan. Cluster pays jeepney to deliver the vegetables to Bankerohan	Supermarket buyer and Bankerohan do not give the same price The cluster does not receive a text from the supermarket buyer informing them of the price a day before the delivery. Supermarket buyer adds PhP 1 per kilo of the buying price
Organization/ Management	At Thursday, 3PM the vegetables must be in the highway (Crossing S) already There will be a PhP 0.5/kg labour cost for classifiers and 5% marketing fee for the association	The cluster classifies the vegetables before the buyers arrive. Supermarket buyer reclassifies the vegetables
Financial management	Total 5% mktg fee from 19 deliveries PhP 6,127 Cash on hand: PhP 4,529	Expenses: PhP 1,598

There were some members who did not supply to the cluster. This was identified as one of the weaknesses. The reason given by the farmers was that their crops were financed by other people such as traders.

11.11.5 Scaling up or down activities

Scaling up activities included continuous cluster meetings, on-going negotiations with new institutional buyers, attendance at training workshops and visits to other areas.

Two Quirogpang farmers attended the First National Vegetable Marketing Summit in Davao in April 2009. The objective was to acquire additional knowledge on the latest vegetable production technologies, post-harvest practices, packaging and logistics, and potential markets with specific volume and quality requirements.

The farmers continued to sell vegetables to the institutional buyer and to the public markets. However, as the farmers were aware that the supermarket could not absorb all their produce, they continued to sell to local buyers and wholesalers in the wet market.

This option created alternative markets for their produce and improved their knowledge of market prices and alternatives.

Each farmer in the cluster is also entitled to voice his or her opinion during meetings and gatherings so there is always a richness of experiences and ideas.

After about one year, the cluster discontinued selling to the supermarket buyer. This was due to the low volume absorbed by the buyer. Furthermore, the quality deteriorated due to pest infestation and changing weather conditions.

Moreover, their original arrangement was not being realized. The buyer had initially agreed to inform the farmers through SMS of the volume, kind of vegetables and the price. However, the price was seldom pre-arranged. Cluster farmers believed that the supermarket buyer simply asked local buyers for the price of vegetables then adjusted their price accordingly. However, to ensure that the cluster farmers would sell to her instead of the supermarket buyer, the local buyer purposefully gave a lower price. Then after the supermarket buyer had left, she offered the farmers a lower price, leaving them with no choice other than to accept the lower price.

In 2011, the cluster was certified by the Department of Labor and Employment as a legally organized farmers' organization. As a result, their membership rapidly increased, for as a certified group, land was formally transferred from the Department of Environment and Natural Resources under stewardship.

The cluster members are now selling individually and as a cluster to the wet market and local buyers. However, the volume was not as high and consistent as before.

11.11.6 Level of maturity

The SFAQ rated their organizational development as 4 (Table 4). This means that their cluster is functioning independently and is able to implement enterprise plans, to have regular assessments and have written financial reports.

They rated their cluster position as 4 which means that they have diversified markets and that the cluster is actively looking for higher value markets.

However, their supply capacity was only rated 3. They could only guarantee that around 80% of cluster members would follow the production protocol.

On the other hand, they rated their financial capacity as 4, since they were able to collect money for the cluster and used it to cover marketing costs and other related expenses.

Collectively, they rated their supply management capacity as 4. They had performance based incentives such as providing a percentage for the marketing officer who delivered the product to the buyers.

Even though the cluster is busy with stewardship appropriation activities, continuous meetings to update the group regarding the activities of the officers and other members have been scheduled. The meetings provide an opportunity for the cluster to report to the members on the financial status of the cluster and their marketing activities.

11.11.7 Chain analysis and gaps

The SFAQ farmers used to deliver their products to a wholesaler in Crossing S and to a wholesaler/retailer in Bankerohan. They would ask the jeepney driver to take their products to the Bankerohan, and upon the driver's return, they would get their money and the sacks or baskets used to transport the produce. This arrangement continues to be practiced today.

Table 4. Cluster maturity

KEY AREAS	MATURITY LEVEL	DESCRIPTION
Organizational Development	4	The cluster is functioning independently; able to: (a) implement enterprise plans (marketing and supply); (b) have regular assessments; (c) have written financial reports
Market Position	4	Markets are diversified: (a) new products (value added); (b) cluster pursues market research for higher value markets
Supply Capacity	3	Production technologies are in place for reliable quantity and quality standards of at least 80% of the cluster members. Production protocols (best practices), supply delivery monitoring system.
Financial Resources	4	Capital build-up scheme from joint marketing is established: (a) individual; (b) organizational and (c) service fees are used to pay in full the marketing and management costs.
Business Management Capacity	4	Enterprise plan enhanced to address new opportunities. (20%): Performance based incentives

11.11.8 Impacts of Clustering

Cluster members agreed unanimously that as a result of clustering, the income they derived from vegetable production had increased and commensurate with that, their household income had also increased (Table 5).

Through clustering they were able to access more markets and had greatly improved their linkages with other support organisations. However, their access to credit and production inputs was relatively unchanged.

11.11.9 Conclusions

Key success factors for the cluster were having alternative markets, strong leadership, open communication, trust, social connections, and strong institutional support.

The cluster delivered to an institutional buyer for one year but eventually went back to the traditional markets due to some misunderstanding with the buyer, while other farmers could not deliver their products due to crop failure.

Table 5: Impacts of clustering for SFAQ

Aspect	Increase	Decrease	No change
Income from vegetable production	100		
Cost of production	40	20	40
Total household income	100		
Volume of vegetables produced	80	20	
Volume of vegetables sold	80	20	
Price received for vegetables	80		20
Production losses/ wastage	20	20	60
Quality of vegetables produced		20	80
Number of people employed in the farm (both for production and marketing)	20		80
Understanding of markets	60		40
Ability to negotiate	80		20
Decision making skills	80		20
Skills in horticultural production	80		20
Skills in post-harvest practices	80		20
Skills in pest & disease management	80		20
Skills in marketing	80		20
Skills in record-keeping	100		
Leadership skills	60		40
Access to markets	100		
Access to credit			100
Access to inputs			100
Relations with other farmers in the village	40		60
Access to farm-related government support	80		20
Linkages with external partners	100		
Number of school-aged children who could not afford to go to school before but are now able to go to school	100		
Family health	60		40
Environment	20	40	40

The cluster had a strong leader who the members trusted. The cluster leader was also a *Gagmay'ng Kristohanong Katilingban (*GKK*)* or Small Christian Communities, under the Roman Catholic Church and *Purok* Leader. She was the major motivator of the clusters activities. The leader had been chosen by the cluster members. There is trust among the members since they had willingly handed over the responsibility of collating, selling and negotiating the sale of their fresh vegetables to just one person.

Cluster cohesion was enhanced by the social connections between the members, such as belonging to the same family, being neighbours, belonging to the same church group and speaking the same language. It was noted that 14 out of the 19 members belonged to just three families. In one family, there were ten cluster members who belonged to one family tree. These included the parents, sons, daughters, in-laws and cousins. The other two families were composed of brothers. Most of the members also spoke Cebuano.

The cluster leader and cluster officers were in constant contact with the members. In return, the members gave feedback for improvement or if there were any problems that needed to be addressed.

Institutional support organizations have been crucial to the cluster. Aside from the market linkages, SFAQ also received support from other government and non-government agencies. The CRS-PCEEM provided them with water reservoir. CRS initially provided

field officer support and also provided the sorting shed. UP Mindanao provided facilitation support from a field officer plus material support for a sorting shed which also doubles as a waiting shed at Crossing S. Other support included seed, fertilizer, crates and seed trays from the Department of Agriculture through the Davao City Agriculturist's Office (CAO).

The UP Mindanao/UPSTREAM Foundation helped SFAQ to comply with the requirements of the Department of Labor and Employment (DOLE) for them to be registered as a farmer's association.

Vignette

Hardwork goes a long way

"I'm very thankful that there are agencies that help us. They taught us about vegetables despite the distance, they were able to reach us. The trainings were of great help with our vegetable farming to improve our livelihood. The trainings also assisted me as a leader".

Jesebel Tugap, 32, is a resident of Sitio Quirogpang, Barangay Marilog in Davao City, Mindanao, Philippines. The sitio is a 3 km walk from Barangay Marilog which is approximately 51 km from Davao City.

Ms. Tugap is currently the cluster leader of the Small Farmers Association of Quirogpang (SFAQ). This group was formed through the initiative of People Collaborating for Environmental and Economic Management (PCEEM). PCEEM officially ended in April 2008, but the Catholic Relief Services (CRS) continued to assist the association from July 2007 to June 2009 when CRS handed over the group to UP Mindanao

Jesebel farms 4 hectares of land which are planted in eggplant, tomato, snake gourd, squash, okra and sword pepper. The other crops she grows includes cacao, coffee, coconut, corn, rice, durian, mango, lanzones, rambutan and marang.

Jesebel started growing vegetables in 1997. She sold her produce to the Bankerohan, the biggest public market in Davao City. Every week she would sell her own products. To be able to reach the market, she must haul her produce from the farm to the roadside by horse. From the highway, she then rides a jeepney to reach the Bankerohan. Marketing was very difficult and takes much of her time and money.

Since CRS introduced the clustering approach to SFAQ, the group has gradually shifted from selling their produce individually to selling it through the cluster. This way, marketing costs are minimized. The cluster only pays PhP 1.00 per kg to transport the vegetables to the Bankerohan where the jeepney driver delivers it to the group's *suki*.

In September 2009 UP Mindanao initiated a meeting between SFAQ and the owner of a supermarket mall in Tagum City. The meeting aimed to create a link between the cluster and the mall and to promote sustainable and productive trade for both parties. Since then, SFAQ has supplied various vegetables to both their Bankerohan buyer and the mall. The supermarket picks up the vegetables from the highway every Friday. Through the project, Jesebel and the cluster now have a reliable buyer for their vegetables.

Jesebel is very thankful for all the support the project has extended to the group. She is grateful that even though their place is very far, the project was able to reach them. On a personal note, the project has made her a better leader (as a cluster and Purok leader) and farmer through the training activities in which she has participated.

Through vegetable farming, Jesebel has been able to send her three children to school. The family's weekly income provides a school allowance for her children and their everyday food at home. She was very proud to say that with the income she has earned from selling vegetables, her family will soon move into a concrete house.

11.12 Taguican Cluster

11.12.1 Site description and group formation

Taguican cluster is named after Sitio Taguican Valley in Barangay Can-ayan, which is a part of Malaybalay City, in the province of Bukidnon, Northern Mindanao. The barangay is 7 km away from the city and can be readily accessed by road by motorcycles, jeepneys and trucks. Sitio Taguican lies at an elevation of 763 m above sea level.

In 2009, there were 68 households in Sitio Taguican Valley, or approximately 326 inhabitants. Only 49% of the households had access to electricity, while 96% had access to clean drinking water. Agricultural production is the main source of livelihood for most of residents in Taguican.

In 2010, the Taguican Valley Lumad and Dumagat Farmers Association was established, which is composed of two sub-clusters and 18 members. The name *dumagat* stands for a tribe living in the coastal areas, while *lumad* is a group of indigenous people. These farmers identified squash, eggplant and bitter gourd as the primary crops for collaborative marketing.

11.12.2 Product supply assessment and product selection

Membership profile

The mean age of the Taguican cluster farmers is 46 years old. All of them are married and have lived in the area for more than 18 years, except for one who is residing in the city. The average household size is six, with between 4-5 children per household. On average, farmers had completed 7 years of formal education, although most of them did not complete their secondary schooling. In terms of religion, the majority of cluster members were Catholic. Farming was the main source of livelihood, from which cluster members derived an average monthly income of PhP 6,250. Aside from the cluster, farmers belonged to a number of other organizations including church-based affiliations and civic groups.

Farm production

The majority of the farmers owned only one area of land for their crop production. On average, the farm size was 3.4 ha, with the topography ranging from flat to rolling. Aside from vegetables, farmers cultivated a diverse range of plant species including fruit trees (coconut and durian) and cereals (corn).

Farmers used a wide array of farm tools including spades, scythes, ploughs, wedges and bolo knives. They also utilized farm animals such as carabao, cow and horse to assist in cultivating the land and in transporting the produce to the collective sorting area.

The majority of farmers applied ammonium sulfate (21-0-0) and urea (46-0-0), while a few used ammonium phosphate (16-20-0) and complete fertilizer (14-14-14). Some of them also applied organic fertilizers such as vermi-compost and chicken dung to mix with the synthetic inputs. In controlling diseases, farmers mainly used mancozeb. Additional techniques included crop rotation and contour farming.

Financing

The majority of the farmers were able to self-finance the cost of vegetable production, which ranged from PhP 1,000 to PhP 500,000. Others accessed loans from a local financier or family members.

Marketing

The majority of the buyers were situated in Malaybalay City, Bukidnon. They were primarily wholesalers and warehouse (*bodega*) operators who had purchased produce from the Taguican farmers on numerous occasions. These buyers preferred to have the products delivered to their respective selling areas.

Sacks were the major packaging material used by the farmers to transport their produce to market. From their farm areas, the produce was carried either by animals or motorcycle. From the highway to the buyer, jeepneys or trucks were the most convenient modes of transportation.

Farmers preferred COD (cash-on-delivery) as the primary mode of payment.

Product selection

Taguican farmers identified 14 vegetables that were grown by the residents of Sitio Taguican (Table 1). Squash was the vegetable produced in the greatest quantity in the area, while sweet peas offered the highest farm gate price.

Table 1: Crops grown in Sitio Taguican

Crops	Average Volume Harvested (kg)	Average Farmgate Price (PhP/kg)
Squash	50,000	5
Tomato	25,000	13
Sweet pepper	20,000	38
Eggplant	15,000	10
Bitter gourd	10,000	23
Pechay	10,000	15
String beans	10,000	10
Chayote	8,000	4
Soy beans	3,000	28
Cucumber	3,000	13
Radish	3,000	8
White beans	3,000	35
Taro	2,000	10
Sweet peas	1,000	45

11.12.3 Market chain assessment

Rapid market appraisal

In June 2010, those farmers who had participated in the Basic Concepts of Marketing workshop were taken to the Agora Public Market in Cagayan de Oro City to interview potential buyers for their products. They were divided into five groups and collectively they interviewed 11 buyers. Using a guide questionnaire, farmers obtained relevant information

about the prevailing prices of vegetables, quality specifications, volume requirements and terms of payment.

Initial chain map

Before the implementation of clustering in Sitio Taguican, farmers had transacted with warehouse operators and wholesalers in Malaybalay. A warehouse operator (*bodega*) is a buyer who owns a storage facility where they hold a range of vegetables that they have purchased from various sources.

Wholesalers, on the other hand, are those situated in the public market who distribute the product they have purchased to a number of retailers (Figure 1).

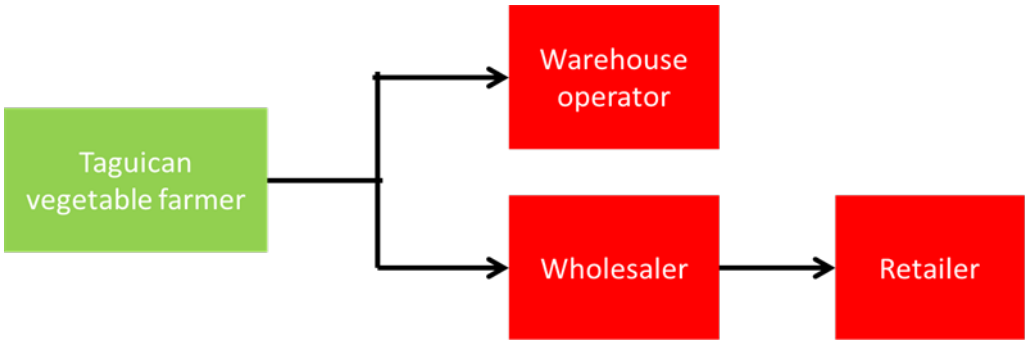


Figure 1: Chain map before clustering

Buyer comparison assessment by farmers

From the results of the market survey, farmers learnt that the majority of buyers were all using the same mobile network, which coincidently was the same one the farmers were using. This had the potential to greatly reduce the cost of acquiring market information, especially prior to product delivery when the farmers wanted to know the prevailing price and the required volume that they should consign to the buyers.

Since there was a high demand for fresh vegetables, buyers required daily deliveries. They seldom placed a limit on the volume of vegetables they were willing to receive from various suppliers. What the buyers were mostly concerned about was quality. They needed an assurance from their suppliers that the vegetables delivered to their warehouse would be good so that they could easily dispose of the product to their customers. Proper packaging materials had to be used to maintain the quality of the vegetables in transit. They also required the vegetables to be delivered before the scheduled time.

The pricing system for most vegetables was based on the prevailing market price. Buyers could not establish a price prior to delivery, for the price could change at any time depending on the volume of produce present in the market.

All of the buyers interviewed expressed an interest in purchasing the farmers produce once they had consolidated their products as a cluster.

Support needed

In order to commence vegetable production as a cluster, the farmers needed a source of good quality seeds. To overcome this constraint, the UPSTREAM agro-enterprise

coordinator provided squash, bitter gourd and eggplant seeds. Apart from the seeds, a calibrated weighing scale was also provided in preparation of their trial marketing.

11.12.4 Cluster formation and planning

Agro-enterprise plan

The agro-enterprise plan for the Taguican cluster included supply, financial, market and management plans. These were developed with the assistance of the agro-enterprise coordinator.

Supply plan

The cluster's supply plan involved the assignment of the identified vegetables that were to be planted by individual cluster member (Table 2).

Table 2: Supply plan of Taguican cluster

Farmer-members	No. of hills assigned per farmer per vegetable		
	Squash	Eggplant	Bitter gourd
Merlinda Ramirez	1,000		
Rodolfo Ramirez	1,000		
Nelia Maquiling	1,000		
Lyndie Maderse	1,000		
Nonito Maderse	1,000		
Julito Ranido	1,000		
Luciano Salvador	1,000		
Reynera Bernaldo	1,000		
Ma. Jessie Mae Sucgang	1,000		500
Simplicio Salingguhay	1,000		
Danilo Ramirez	1,000		500
Maricris Ramirez	1,000		
Rodrigo Callejas	1,000		
Rodel Callejas	1,000	2,000	
Rodelito Gorgonio	1,000		
Nelson Gorgonio	1,000		
Diony Lumbayan	1,000		500
Edsel Quimado	1,000		500
Juliet Callejas		2,000	500
Carlo Okit		2,000	
Rodrigo Vicera		2,000	
Judy Vicera		2,000	
Roderick Callejas		2,000	
Allan Callejas			500
Bonifacio Requina			500
Total	**18,000**	**12,000**	**3,500**

For squash, the average number of hills (plants) to be planted by each farmer was 1,000, while eggplant and bitter gourd could be planted with up to 2,000 and 500 hills per farmer, respectively. For one hill of squash, the anticipated volume was 3 kg; for eggplant the anticipated harvest was 1 kg per hill while the expected harvest for bitter gourd was 750 kg per hill.

Financial plan

The financial plan for the Taguican cluster estimated both the anticipated cost of production (Table 3) and the likely returns (Table 4).

For squash, the average production cost amounted to PhP 5,620, while eggplant and bitter gourd production could incur up to PhP 7,660 and PhP 7,780, respectively. With gross sales of PhP 9,000 for squash, a farmer could expect to earn a net income of PhP 3,380. For eggplant, a net income of PhP 8,340 and for bitter gourd, a net income of PhP 3,470 was not unrealistic.

Table 3: Production cost for each vegetable

Input	Squash	Eggplant	Bitter gourd
Seeds	1,800	900	1,000
Fertilizer	2,120	1,360	680
Chemicals	700	5,400	3,200
Materials			2,900
Total	5,620	7,660	7,780

Table 4: Estimated cost and return

Vegetable	Farmgate price (PhP/kg)	Gross Sales (PhP)	Cost of Production (PhP)	Net income (PhP)
Squash	3	9,000	5,620	3,380
Eggplant	8	16,000	7,660	8,340
Bitter gourd	15	11,250	7,780	3,470

Market plan

The marketing plan that the Taguican cluster developed identified the potential buyers, the quality specifications set by the buyers for each vegetable, the anticipated prices and terms of payment (Table 5).

Table 5: Marketing Plan of Taguican Cluster

Details	Squash (Suprema)	Eggplant (Casino 901)	Bitter gourd (Galactica)
Name of buyers	Gloria dela Cruz - Cagayan Doming - Cagayan Bebe Sanchez - Cagayan Greenland - Cagayan Ebalito - Cagayan Nelson Ceballos - Cagayan Roly Catigbak - Cagayan		
Quality specifications	3 kg above, high price; below 3 kg, low price	shiny and regular size	regular size, more or less 4 pcs/kg
Price (per kg)	PhP 3.0	PhP 8.0	PhP 15.0
Sales target (cluster income)	PhP 162,000	PhP 96,000	PhP 78,750
Payment term	Cash on delivery		
Promotion	Maintain good quality, reliability and sustainability of supply		

Management plan

During the cluster formation workshop, the Taguican farmers elected a set of officers to manage the activities of their cluster (Table 6).

Table 6: Taguican cluster's set of officers (2010-2011)

President	Nonito Maderse
Vice President	Reynera Bernaldo
Secretary	Merlinda Ramirez
Treasurer	Ma. Jessie Mae Sucgang
Auditor	Danilo Ramirez
P.I.O.	Mr. Vecira
	Lanie Callejas
Marketing Officers	Rudelito Gorgonio
	Julito Ranido
Board of Directors	Carlito Okit
	Luciano Salvador
	Rodrigo Callejas

The management plan established the appropriate means for governing the activities of the cluster. This included the provision of a 5% cluster marketing fee which would be collected during product delivery to remunerate the marketing officer who was responsible for delivering the vegetables to the identified buyers. The cluster also collected 10% from the gross value of sales to establish a mutual cluster fund. Cluster farmers were to attend the cluster meetings which were scheduled for the first Sunday of every month.

11.12.5 Test marketing

Conduct of trial delivery

The first delivery of squash took place in April 2011 when the cluster farmers harvested 4,500 kg of squash. It was also a favourable marketing period as the farm gate price for squash approached PhP 9 per kg, which was significantly higher than what they anticipated (PhP 3 per kg). As the majority took advantage of the high process in April, the supply of squash dramatically decreased in the following months as did the average buying price (PhP 6 per kg).

For bitter gourd farmers, the first trial delivery also happened in April 2011. The supply of bitter gourd was quite unpredictable. At first, the harvest was only 50 kg but then it increased to 450 kg, before decreasing until August 2011. Similarly, the farm gate price tended also to decrease. After reaching PhP 25 per kg and maintaining that for three months, the price dropped to PhP 24 per kg in July.

In August 2011, the Taguican cluster had its first trial delivery for eggplant. They had a good start by harvesting 650 kg at a farm gate price of PhP 12 per kg. However, the cluster also experienced decrease in supply and farm gate price when the harvest only reached 340 kg, while the price was PhP 10 per kg.

Evaluation of trial delivery

By the end 2011, which was considered to be the end of the trial marketing period, the Taguican farmers had produced 11,225 kg of squash, 1,028 kg of bitter gourd and 1,565 kg of eggplant. This corresponded to gross sales of PhP 96,705 for squash, PhP 25,470 for bitter gourd and PhP 16,950 for eggplant (Table 7).

Table 7: Volume and sales for the Taguican cluster (2011)

	Squash		Bitter gourd		Eggplant	
Month	Volume (kg)	Sales (PhP)	Volume (kg)	Sales (PhP)	Volume (kg)	Sales (PhP)
April	4,500	40,500	50	1,250		
May	500	4,500	498	12,450		
June	500	3,000	250	6,250		
July			195	4,680		
August	770	4,620	35	840	650	7,800
September	1,450	13,050			520	5,200
October	350	3,150			340	3,400
November	2,900	26,100				
December	255	1,785			55	550
	11,225	**96,705**	**1,028**	**25,470**	**1,565**	**16,950**

These figures suggested that more farmers had concentrated on squash than the other vegetables. Indeed, several bitter gourd farmers shifted to squash production because squash required less effort and fewer skills and could be more easily managed without devoting so much of time. As a result, the farmers continued to produce squash from August 2011 until January 2012, while bitter gourd farmers temporarily halted their production in August 2011.

11.12.6 Scaling up

Continuous supply

By the end of the first trial marketing period, the Taguican cluster farmers decided to increase their squash production for the second cropping season. By May 2012, the farmers had produced 14,385 kg of squash, with corresponding gross sales of PhP 109,505.

Increasing cluster fund

Aside from continuous production, the Taguican cluster was able to increase the value of their cluster fund. By May 2012, the cluster's gross sales for the three vegetables had reached PhP 152,475, which had contributed PhP 15,248 to the cluster fund.

Participation to various capacity building activities

From 2010-2012, the Taguican cluster farmers had participated in the Farmers and Partners Alliance forum, which was initiated by UP Mindanao, UPSTREAM and Curtin University to provide an avenue for all the cluster leaders to come together and share their experiences in the production and marketing of their produce, issues and challenges faced and how they were managing their clusters.

Aside from these symposia, the Taguican farmers had participated in various capacity building activities during the cluster formation stage, including basic marketing, market survey activity in the Agora market in Cagayan de Oro, and a cluster enterprise workshop.

For the first time, farmers were trained in the use of a soil analysis test kit provided by the agro-enterprise coordinator (an output from the ACIAR project Component 1).

11.12.7 Cluster maturity assessment

Unlike the other clusters in Bukidnon, the Taguican cluster was relatively young in terms of the maturity indicators. By conducting a cluster assessment, the farmer members learned that they had opportunities for further development (Table 8).

Table 8: Maturity assessment of Taguican cluster

Maturity indicator	Average	Description
Organizational Development	2/5	Cluster formed with cluster leader. Cluster has: Meetings Common production and market plans Verbal agreements
Market Position	2/5	Market is strengthened Markets are maintained and product volume is scaled up There is build up of buyer relations
Supply Capacity	2/5	Regular product supply coming out based on the enterprise supply plan. Cluster members can supplement each other's supply in times of deficit.
Financial Resources	2/5	Cluster start to experience marketing earnings. Enterprise transactions are recorded. Service fees (cluster and marketing) are initially paid
Management Capacity	2/5	Cluster leaders and assigned management people are functioning. Roles and responsibilities spelled out. Task related trainings done. Agreed scheme of remuneration tried out.
TOTAL	*2/5*	

In terms of organization development, the farmers gave themselves a grade of 2/5, which implied that the cluster managed to conduct regular monthly meetings and to communicate between farmer-members with regard to the implementation of its production and market plans.

With regard to their market position, a grade of 2/5 signified that the cluster had established market channels with a wholesaler based in Malaybalay and farmers had regular transactions with the buyer. By doing so, they were able to maintain the relationship they had developed.

For the supply capacity indicator, the farmers gave themselves a grade of 2/5 which meant that they were able to harvest and deliver their products to their buyers. However, they had only just managed to achieve what they have planned to due to some uncontrollable circumstances such as crop failure and the low price which encouraged a shift in production.

In terms of financial resources, a grade of 2/5 meant that the cluster was able to generate funds for the cluster from the collection of a cluster fee (10%) and marketing fee (5%). The cluster treasurer diligently recorded the cash flows of the cluster and was able to document every transaction.

Finally, the cluster gave themselves a grade of 2/5 for their management capacity, which implied that the cluster leader and cluster officers had been administering the cluster affairs appropriately.

11.12.8 Assessment of value chains associated with cluster

Cluster chain map

The decision by the Taguican cluster to concentrate solely on the delivery of vegetables to a wholesaler-retailer in Malaybalay was a good strategy because of the ease of transportation, since it only took 30 minutes to reach their chosen market outlet.

Another reason was that until they achieved their planned production target, they did not have enough product to deliver to other buyers (Figure 2).

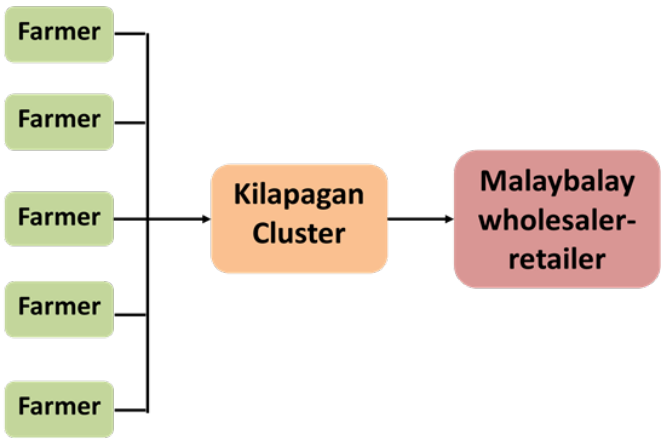


Figure 2: Taguican cluster chain map

Chain analysis and gaps

Cost and return

On average, a cluster farmer in Taguican could produce 510 kg of bitter gourd in one cropping season. With a farm gate price of PhP 20 per kg, the gross sales amounted to PhP 10,200. Meanwhile, the costs of producing bitter gourd, including fertilizer, pesticides, materials and labour, could incur as much as PhP 5,660. With a 10% cluster fee deduction, a cluster farmer earnt an average net income of PhP 4,540 (Table 9).

Table 9: Costs and returns for bitter gourd

Total volume sold (kg)		510
Gross income (PhP)		10,200
Average price (PhP/kg)		20
Production cost (PhP)		
Fertilizer	1,850	
Pesticide	840	
Labour	650	
Animal	150	
Materials	1,150	
Total production cost		4,640
Cluster fee (10%)	1,020	
Total cost		5,660
Net income (PhP)		4,540

For eggplant, the average volume harvested was 750 kg. With a farm gate price of PhP 10 per kg, a cluster farmer earned PhP 7,500 in one cropping season.

Production expenses, on the other hand, including fertilizers, pesticides and labour, amounted to PhP 3,720. After deducting the cluster fee, the average net income for eggplant was PhP 2,080 (Table 10).

Table 10: Costs and returns for eggplant

Total volume sold (kg)		750
Gross income (PhP)		7,500
Average price (PhP/kg)		10
Production cost (PhP)		
Fertilizer	1,850	
Pesticide	970	
Labour	600	
Animal	300	
Total production cost		3,720
Marketing cost		950
Cluster fee (10%)		750
Total cost		5,420
Net income (PhP)		2,080

For squash production, the average quantity sold in one cropping season was 1,243 kg. With a farm gate price of PhP 6 per kg, the average value of gross sales was PhP 7,046. Total cost, which included production, marketing and cluster expenses, amounted to PhP 3,158, resulting in a net income of PhP 3,888 (Table 11).

Table 11: Costs and returns for squash

Total volume sold (kg)		1,243
Gross income (PhP)		7,046
Average price (PhP/kg)		6
Production cost (PhP)		
Fertilizer	1,268	
Pesticide	210	
Labour	450	
Animal	150	
Total production cost		2,078
Marketing cost		375
Cluster fee (10%)		705
Total cost		3,158
Net income (PhP)		3,888

Eggplant was the most expensive crop to produce (72% of gross income). While bitter gourd farmers spent 55% of the gross revenue on production and marketing costs, squash farmers retained almost 55% of the gross income.

Losses/wastage

For the Taguican cluster, the postharvest losses were greater than the field losses for all three vegetables: bitter gourd, squash and eggplant (Table 12).

Table 12: Losses at the farm level

Vegetable	Field losses (kg)	Post-harvest losses (kg)

Bitter gourd	20	25
Squash	18	515
Eggplant	50	70

Squash had the highest postharvest loss because the farmers experienced very humid conditions that resulted in a greater proportion of the harvest failing to reach the desired size. While the farmers planned to sell the reject fruit, the farm gate price was so low that they were barely able to recover their production expenses. Consequently, the undersized fruit was simply left to rot.

Some of the reasons for the losses at the farm level included crop failure due to diseases and erosion, low production management skills which resulted in the inappropriate use of pest control and fertilizers and the low price.

Trust and relationship measures

To evaluate the nature of the relationship between farmers and their focal buyers, a school-boy grading system was used, where 75% was the lowest grade they could give and 100% was the highest.

Farmers to buyers

In terms of their relationship with the buyer, the Taguican cluster farmers gave favorable ratings in all dimensions, except for relationship-specific investments (Table 13).

Table 13: School-boy grades for the relationship between Taguican cluster farmers and their focal buyer

Dimensions		Buyer
Trust	Confidence	85
	Correct information	83
	Trustworthiness	84
	Consider my best interest	83
	Honesty	84
	Keep the promise	84
Power-dependence	Better offer	83
	Ease to transfer other buyers	89
	Power in relationships	85
	Control of information	84
	Freedom to adhere demands	83
	Dependence with the cluster	84
Relationship-specific investments	Provision and frequency of education and trainings	75
	Openness to suggest in coordinating production schedules	75
	Openness to advice what crops to grow	75
	Frequency of information	75
Satisfaction	Fairness to treatment	85
	Quickness to handle complaints	85
	Provision of adequate rewards	82
	Expectation met	83

For the trust dimensions, an average of 84% was given by the cluster farmers. This implied that they had confidence in their buyer, the buyer was honest, always kept their promise, and always acted in the farmers best interests.

The power-dependence dimension was given a grade of 85%. This meant that the farmers could readily switch to an alternative buyer. As the farmers had access to multiple sources of information, their buyers could not willingly withhold or distort information. Farmers continued to trade with their preferred buyer because they wanted to, not because they had to.

In exploring the relationship-specific investments, a grade of 75% indicated that their preferred buyers seldom assisted the farmers in any way. The buyers did not provide any production or market training nor did they participate in any way in coordinating the production calendar or advising farmers what crops to grow.

The satisfaction dimension was awarded a grade of 84%, which meant that the cluster farmers were generally satisfied with the relationship they had established with the buyer. As the buyer responded quickly to the farmers' complaints, the majority of farmers felt that they had been treated fairly and equitably, adequately rewarded and their expectations had been met. Collectively, such a positive outcome indicated that there was a strong likelihood that this relationship between the cluster farmers and the buyers would continue in the future.

Farmers to cluster

Aside from rating their relationship with preferred buyers, farmers were also asked to evaluate the performance of their cluster by looking at satisfaction, trust, power-dependence and relationship-specific investments.

Table 14: School-boy grades for the relationship between Taguican farmers and their cluster

Dimensions		Rating
Trust	Confidence	84
	Correct information	84
	Trustworthiness	84
	Consider my best interest	84
	Honesty	84
	Keep the promise	84
Power-dependence	Better offer	84
	Power in relationships	86
	Control of information	85
	Freedom to adhere demands	85
	Dependence with the cluster	85
Relationship-specific investments	Provision and frequency of education and trainings	75
	Openness to suggest in coordinating production schedules	75
	Frequency of information	75
Satisfaction	Fairness to treatment	83
	Quickness to handle complaints	84
	Provision of adequate rewards	83
	Expectation met	83

Specifically, the average level of trust farmers gave to their cluster was 84%. This implied that the cluster farmers had confidence in their colleagues. Other members of the cluster were considered to be honest and trustworthy and could be relied upon to fulfill their promises. The cluster leaders seldom withheld information from other cluster members or acted in a way that did not serve the best interest of the members.

For the power-dependence construct, the farmers awarded a grade of 85% to the cluster. The cluster leader exercised a democratic style of leadership that allowed every member

of the cluster to voice their concerns. Information was freely exchanged within the cluster. Although members were free to leave the cluster at any time, they chose to stay because of the additional benefits they were able to obtain. However, having made the decision to stay, the cluster members recognized that they were bound by the cluster rules. Consequently, the members were mutually dependent upon one another.

For the relationship-specific investment dimensions, a grade of 75% was given to the cluster. This low grade was in part the result of the relatively young age of the cluster, for to date, the cluster had not provided any training or capacity-building activities. They still needed assistance from the facilitators and partner organizations in the conduct of any activity that would be beneficial for the cluster.

The satisfaction dimension was given a favourable grade of 83%, which signifies that the cluster farmers were pleased with the development of their cluster, especially in terms of human capital.

11.12.9 Impact of clustering

Even although the cluster is still considered to be young, the Taguican cluster farmers have already experienced significant change. They have been able to establish a linkage with a buyer and as a result, they have a market for their product. For the cluster members, the cost of marketing has gradually decreased. There is no need for them to market individually as the cluster marketing officer takes responsibility for delivering their produce to the buyer.

The farmer members are more disciplined after becoming part of the Taguican cluster. They are more active in participating in the cluster meeting, communal farming activities, and in informal discussion with other members. They have also gained additional production skills in growing their vegetables. They have learned what fertilizers need to be applied and how to apply them judiciously. Most importantly, the members have one single goal, which is for the further development of their cluster. To achieve this, they need to work together.

Project termination plan

In May 2012, the Taguican farmers made a future plan during the C4 Project Closing Program held in Malaybalay City. Attended by all the Bukidnon clusters, the closing activity was initiated by the cluster agro-enterprise facilitators as a means of saying farewell to the farmers who had participated in the clustering project from 2008-2012. It was also a day where the farmers had the chance to make their own future plans for their own cluster.

For the Taguican cluster farmers, since they had been able to locate a suitable piece of land that was owned by one of the cluster members, they intended to sustain their communal farming activities. They made plans to increase the production of squash and eggplant through communal farming. To achieve this they would also seek support from the City Agriculture Office (CAO) where they could access free seeds (Table 15).

Through the partnership established by the project and the CAO, the farmers were able to access material support for the construction of a rain shelter. As the farmers had now identified a suitable area to construct the rain shelter, all they needed to do was to re-engage with the CAO so that construction could commence.

Farmers intended, through the cluster marketing officer, to negotiate with potential buyers from Malaybalay and neighbouring cities such as Cagayan de Oro. However, if they were to achieve this, they needed to establish and maintain a staggered planting schedule to ensure they had sufficient product to meet the buyer's expectations. Again, the farmers intended to contact the CAO for seed support.

Table 15: Future plans of Taguican cluster

Future plans	Who will accomplish	Key person(s) or agency	Time frame
Sustain communal farming	Cluster	City Agriculture Office – Malaybalay	May 2012
Follow-up rain shelter	Cluster leader	City Agriculture Office – Malaybalay	May 2012
Maintain vegetable production based on buyer's requirements	All members	City Agriculture Office – Malaybalay; Barangay Can-ayan Council	May-December 2012
Conduct regular meeting	All members	Invite City Agriculture Office – Malaybalay and Barangay Can-ayan Council	Monthly
Conduct negotiations with potential buyers	Marketing officer	Buyer	This coming harvest

Maintaining their monthly meetings was a top priority for the Taguican cluster. In the future, they intended to invite the Barangay Council of Can-ayan so that the officials would have better knowledge about the activities of the cluster. This was also an opportunity for farmers to discuss the challenges and issues they faced as a cluster and whether the Barangay Council would have some solutions that they could provide for the farmers.

11.12.10 Conclusions

The implementation of clustering for the Taguican farmers has paved the way for the farmers to make an alliance under one group. Through the commitment of each farmer member, the cluster has been able to achieve some astonishing results within just a few years. This includes the conduct of regular meetings initiated by the cluster leader, sustaining a cluster fund through increasing the supply of fresh vegetables and the participation of the cluster farmers in a number of capacity building activities.

With the existing maturity level of the cluster, the Taguican cluster farmers are expected to continue to develop based on the strong camaraderie that they have already established.

12 Appendix Two

12.1 Social Capital and Trust in Collaborative Marketing Groups: the case of Vegetable Cluster Marketing in the Southern Philippines

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Over the past two decades, numerous studies have explored the role and effect of social capital in organizations. Social capital helps overcome problems of institutional access to information, credit, the supply of farm inputs and the provision of government services. However, despite the increasing number of studies, there is little evidence of the benefits of social capital and trust in collaborative marketing arrangements for smallholder producers. This study examines social capital among cluster marketing groups in three regions of the Southern Philippines. The results show that social capital in the form of affiliations and networks, social cohesiveness, open communication and trust had positive benefits in each of the cluster marketing groups.

12.2 Benefits Derived from Clustering: the Case of Vegetable Clusters in the Southern Philippines

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One of the limiting constraints for improving the profitability of smallholder farmers is poor marketing. With the lack of knowledge and inability to negotiate with downstream buyers, farmers have little option other than to sell their products through the traditional markets. To facilitate access to technical information and institutional markets, smallholder farmers are forming collaborative marketing groups. Clustering is one form of collaborative marketing in which smallholder farmers are organized into small groups within a defined territory or geographic area. Using the CRS Eight Step Plan for Agro-enterprise Development, 29 clusters were formed in three provinces in the Southern Philippines. This study explores the various benefits smallholder farmers have achieved after joining their cluster. Sixty seven vegetable farmers from 10 clusters were interviewed using a structured questionnaire. Results show that the household income of cluster members increased by an average of 76%. Household income improved as a result of higher prices and substantially reduced production and marketing costs.

12.3 Leadership Perceptions in Collaborative Marketing Groups: the Case of Southern Philippines

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Numerous smallholder vegetable farmers in the Southern Philippines have been organized into clusters or collaborative marketing groups. The purpose of these clusters is to gain production, marketing and capacity building support, consolidate produce for higher value markets, deliver in bulk to save on transport and transaction costs, and to increase household income. One of the factors influencing the ability of the clusters to achieve these goals is leadership. Using the case study method, this study looks at the leadership traits of cluster leaders in Bukidnon, South Cotabato and Davao.

12.4 Theory and Practice of Participatory Action Research and Learning with Cluster Marketing Groups in Mindanao, Philippines

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Researching and developing new arrangements for marketing smallholder products in the transitional economies is complex and messy and requires a systems approach. One approach to addressing these problems is for researchers to facilitate an action learning process with farmers and market intermediaries. This paper briefly reviews the literature on action learning, action research and participatory processes in an attempt to clarify some of the terminology and define the similarities and differences. It outlines the application of these processes in the formation of cluster marketing groups for smallholder vegetable farmers in Mindanao, the southern Philippines.

12.5 Impact of Collaborative Marketing on Vegetable Production Systems: the Case of Clustering in the Southern Philippines

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In the Southern Philippines, the clustering method has been introduced to smallholder vegetable farmers as a development approach to facilitate linkages with markets, while simultaneously assisting farmers to establish more organized and effective groups. For the clusters to sustain their linkages with buyers, they must often adapt their production systems to meet buyers' requirements. This study explores the impact of collaborative marketing, through clustering, on vegetable production systems in the Southern Philippines. Key changes in production systems include the use of superior varieties to increase the marketable yield and mitigate diseases, the introduction of protected cropping through rain shelters to minimize losses from adverse climatic conditions, and the application of organic inputs to reduce costs.

12.6 Does Clustering Matter? Impact of Clustering on Vegetable Farmers in the Philippines

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Over the past four years, an action research project has taken place in Southern Philippines to assist farmers to improve their income from vegetable farming through clustering. Rather than continuing with their conventional practice of growing vegetables with minimal consideration to markets, farmers were encouraged to better understand current and potential markets in order to meet market demand and in the process increase their returns from vegetable production. Using the 8-step clustering process, farmers adopted an agribusiness systems view and made adjustments to their production, post-production and marketing practices. Consequently, farmers were able to have a better understanding of what the market wants. They were also able to identify and link with institutional markets and receive higher prices for their produce. Farm management and post-harvest practices improved and farmers started sorting, grading and packing their products to market specifications. To examine the impact of clustering, farmers' performance before and after clustering was examined. The study found that, on average, postharvest losses decreased by 12% and farmers increased their net returns by 76%.

12.7 Addressing Quality Impediments in Fresh Vegetable Supply Chains in Mindanao

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Quality, price and reliable delivery are regarded as the key criteria by which buyers evaluate potential suppliers. To supply the emerging institutional market, smallholder vegetable producers in the Philippines must form collaborative marketing groups to secure a sufficient volume of good quality produce. Even then, the ability of smallholder producers to meet the needs of their downstream buyers will be limited by external (environmental) factors, production and marketing constraints, infrastructure and institutional impediments. To improve productivity and quality, technical support and capacity building are required to enable smallholder producers to engage with downstream buyers. Where necessary and where farmers have the capabilities, new crops are being cultivated to extend the product range. Some clusters have chosen to adopt protected cropping structures while others are adopting low input farming systems as a means of reducing risk To better meet the needs of institutional buyers, farmers are washing, grading and sorting the produce prior to sale and adopting, where it is profitable, alternative methods of packing to reduce the damage in transit.

12.8 Exploiting opportunities in the institutional market for fresh vegetables in Mindanao and the Visayas

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Qualitative interviews with wholesalers and retailers in traditional vegetable markets, supermarkets, food caterers and restaurateurs in Mindanao and the Visayas reveal that the market for fresh vegetables on each island is different. Given the diversity of climate types and topography, population and the household distribution of income, infrastructure development and food culture, both the supply and the demand for fresh vegetables are vastly different between islands and even within the one island. While the traditional lowland *pakbet* vegetables are readily available in most markets, the demand for the temperate *chopsuey* vegetables, *salad greens* and *lamas* differs between market segments. With the exception of a few specialist gourmet vegetables and culinary herbs which are required by only the most discerning buyers, most institutional buyers are readily able to procure the fresh vegetables that they require from preferred suppliers. However, as product shortages do inevitably arise, a significant amount of trade occurs between the different types of institutional market. In the institutional market, the majority of the problems arise with the higher value, temperate *chopsuey* vegetables, leafy green vegetables and herbs. For those institutional markets that service the five star tourist hotels and resorts, the up-market restaurants and retailers, the non-availability and poor quality of the *salad greens* (lettuce), fresh herbs and *lamas*, present the greatest problems.

12.9 Experiences with the CRS Clustering Process and Some Suggestions for Improvement

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An evaluation of the Catholic Relief Services Eight Step Clustering Approach was a key focus of the ACIAR-PCAARRD Horticulture Project on *Enhancing the profitability of selected vegetable value chains in the Southern Philippines*. The CRS approach encourages farmers to form small collaborative marketing groups (clusters) and to facilitate the sustainable development of these clusters. The research, which used Participative Action Learning and Action Research processes, identified that an enhanced clustering approach should incorporate processes that overcome issues such as: input financing arrangements to replace loans from informal moneylenders and traders; risks associated with production failures and pest and disease problems; maintaining relationships with buyers; and building group resilience and independence so that donor agencies have an exit strategy. The research findings suggest that the CRS Eight-step clustering process should be expanded to three phases: (i) establishment, (ii) building resilience and (iii) implementing an exit strategy, to enhance the sustainability of the clusters.

12.10 Impact of Clustering on Vegetable Farmers in the Philippines

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This assessment was done as part of a systematic process of evaluating the impacts of clustering vegetable farmers in Southern Philippines. Program theory was used to map the impacts. The performance of cluster farmers and non-cluster farmers were compared. Farmers' performance before and after clustering was also examined. The study found that, on average, cluster farmers have higher income than non-cluster farmers. Moreover, farmers increased their income by about 47% after clustering. Examining the returns to investment of the research project, it was found that NPV was PhP 35.3m, IRR was 48.6% and BCR was 2.47. When spillover effects are considered under 5% adoption rate, NPV, IRR and BCR increased to PhP106.9m, 81.5% and 3.8, respectively.

12.11 Experiences in Linking Smallholder Vegetable Farmers to the Emerging Institutional Market in the Philippines

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In the Southern Philippines, under a collaborative research project funded by the Australian Centre for International Agricultural Research (ACIAR), Component 4 (C4) is working with small groups or clusters of smallholder vegetable farmers to link them to high-value institutional markets. For smallholder producers, the key benefits of cluster marketing arrangements include; greater access to markets, technical information, inputs and micro-finance; improved bargaining power; higher prices and lower costs. For the community, with an assured market, cluster marketing provides greater opportunities for employment associated with land preparation, planting, harvesting and sorting, and transport. However, cluster marketing also brings the community closer together, making it easier for them to access public investments in infrastructure. For the environment, the adoption of low input biodynamic production systems has resulted in a significant reduction in the use of chemical fertilisers, pesticides and herbicides. However, in the long term, cluster marketing groups will only survive where there is an appropriate level of trust, confidence and unity; a personal commitment; active leadership; open communication; collective decision making; multiple buyers and abundant institutional support.

12.12 Socio-economic impact of cluster marketing: the case of Ned Landcare Association Sweet Pepper Cluster

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Through clustering, opportunities exist for smallholder farmers to organize their output and to sell directly to institutional markets. This paper analyses the experiences of the cluster marketing approach in Barangay Ned, Lake Sebu, South Cotabato. The case demonstrates how farmers in the cluster group developed an enterprise plan, established linkages with a micro-finance institution and negotiated sales to downstream market intermediaries. Farmers in the cluster increased their technical and marketing knowledge, improved their farming and marketing practices, improved their access to capital, and increased their income. Trust, confidence, commitment and unity among cluster members were established through the cluster marketing approach.

12.13 Exploring the institutional market for fresh vegetables in the Southern Philippines

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Given the many different ways fresh vegetables may be used, the institutional market for fresh vegetables in the Southern Philippines can be segmented on the basis of the role market intermediaries perform in the supply chain, where they are, what customers they serve, the range of products required, the volume of product required and the quality specifications. Potential market opportunities are identified and the various constraints smallholder farmers face in endeavouring to meet the needs of institutional buyers are highlighted.

12.14 Factors affecting farmers' adoption of natural farming technologies in New Albay, Maragusan, Compostela Valley, Philippines

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In the Philippines, the sustainability of natural resources and the profitability of farming has become a major concern for smallholder farmers. To address these concerns, government agencies and the private sector are delivering workshops on natural farming technologies to farmers. Training includes the preparation of different concoctions such as indigenous micro-organisms (IMO), fermented fruit juice (FFJ) and fermented plant juice (FPJ), fish amino acid (FAA), oriental herbal juice (OHN) and calcium phosphate (Caphos). Other natural farm technologies include vermiculture. The products from the training are applied to the farmer's own farms with any surplus products sold to other farmers. In Maragusan, Compostela Valley, Philippines, a group of smallholder farmers have successfully produced organic fertilizers as a result of the training provided to them. Initially, while training was provided to the group to facilitate the marketing of the fresh vegetable crops they produced, the skills learnt were readily transferable. This study discusses the development of the New Albay cluster and factors leading to its decline as a marketing cluster. This study will also explore the costs and returns associated with the application of organic fertilizer to vegetable crops in comparison to conventional farming practices. Furthermore, this study will look into the factors affecting farmers' adoption of natural farming technologies. The crops covered in the study are rice and assorted tropical vegetables. Results of the study show that the cost of production arising from the use of natural farming technologies is lower than conventional farming.

12.15 Social connections and smallholder vegetable farmers' collaborative marketing strategy: the case of the Small Farmers Association of Quirogpang in Davao City, Philippines

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In the Philippines, vegetable farmers generally have only small land holdings. Because of this, plus an apparent lack of financial capital, it is difficult for smallholder farmers to meet the large volume demands imposed on them by institutional buyers and wholesalers. The small volume and the large variation in quality put the smallholder farmers at a significant disadvantage when it comes to arranging transport and marketing. However, smallholder farmers can engage in collaborative cluster farming in order to answer the demands of the market and to bolster production volume. In the cluster, the farmers carry out production planning and marketing activities collectively. Utilizing the case study methodology and the 8-step clustering approach formulated by the Catholic Relief Services, this paper will present key success factors and several challenges faced by the Small Farmers Association of Quirogpang (SFAQ) in *Barangay* Marilog, Davao City, Philippines. The paper identifies important institutional support and strategies that may enhance the success of this and other clusters and highlights key success factors such as the social connections shared by the cluster members and leaders. In this case, these commonalities exist because it is an area-based cluster which includes neighbours and relatives who all practice the same religion and speak the same language or dialect.

12.16 Micro-finance as the key factor affecting farmers' investment decision-making: cluster experiences in Impasugong, Bukidnon, Philippines

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This paper focuses on how micro-finance has affected the investment decision-making of squash and bitter gourd cluster farmers in Impasugong in the Southern Philippines. The farmers received loans from a micro-finance institution (MFI), however, because of production problems farmers were unable to meet their buyers' requirements. The squash cluster disintegrated, while the bitter gourd cluster made some sound investment decisions to diversify into bulb onion production and to adopt organic fertilizers as a more cost effective means of production. As a result of these setbacks, both the clusters and the MFI learned some valuable lessons including: the role of micro-finance in production; the risks associated with loans; and the level of support received by the farmers. Sustainability of livelihoods is the key factor that keeps the MFI and the farmers together. As the farmers aspire to maintain their production, they will continue to need access to financial resources to meet their farm and family commitments.