

# **Impact of Collaborative Marketing on Vegetable Production Systems: the case of Clustering in the Southern Philippines**

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## **Abstract**

**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 the buyers' requirements. This study explores the impact of cluster marketing on vegetable production systems in the Southern Philippines. Key changes in the production systems include the use of superior varieties to increase the marketable yield and to mitigate disease, the introduction of protected cropping through rain shelters to minimize losses from adverse climatic conditions, and the application of non-chemical inputs to reduce production costs.**

## **INTRODUCTION**

The vegetable industry in the Philippines is characterized by a marketing system where vegetables are usually sold in wet markets and trading posts (Montiflor, Batt and Murray-Prior, 2009). However, with the emergence of the modern retail formats and rapidly expanding demand from the food service industry, the traditional marketing system is changing. Unlike traditional buyers, institutional buyers are more demanding in terms of reliable supply and consistent quality. They are constantly looking for suppliers who can better meet their requirements more cost effectively. For smallholder farmers, these demands are largely unattainable as they do not have the economies of scale and they face numerous impediments in the form of perishable products, poor transport and marketing (Johnson, Weinberger and Wu, 2008).

Batt et al. (2008) argued that the poor quality of the fresh vegetables available for sale in the Philippines was largely determined by what happened at the farm level. Poor quality seed, poor production and post-harvest handling practices, excessive pest and disease damage, the high cost of inputs and the lack of appropriate transport and infrastructure were some of the reasons contributing to the poor quality. Furthermore, most smallholder vegetable farmers are unaware of the quantities of vegetables planted, the customers' quality requirements, preferred varieties, the seasonality of production and the supply and demand situation in both domestic and export markets.

To address these challenges, one strategy that has been proposed is for farmers to come together into small collaborative marketing groups. Known as clustering, the main objective of the process is for farmers to plant similar crops, to produce consistent quality product, to consolidate the produce to obtain a higher volume, deliver in bulk to save on transport costs and to increase household income (Montiflor, 2008).

In the Southern Philippines, clusters have been formed in three project sites in Bukidnon, Davao City and South Cotabato on the island of Mindanao. This paper explores the impact of clustering on the vegetable production systems of cluster farmers in the identified areas.

## **METHODS**

Over the duration of this project, some 29 vegetable marketing clusters were established in the Southern Philippines, which collectively involved 353 farmers. The Catholic Relief Services (CRS), Landcare Foundation of the Philippines Incorporated (LFPI) and the University of the Philippines Mindanao Strategic Research and Management Foundation (UPSTREAM) assisted in the development of the clusters using the CRS Eight-step Agro-enterprise Development process (CRS, 2007). Local government units (LGU), such as the Provincial Agriculture Office (PAO), Municipal Agricultural Office (MAO), City Agriculture Office (CAO), Department of Trade and Industry (DTI) and Department of Agrarian Reform (DAR), also collaborated in the establishment of the clusters. Other development agencies and microfinance institutions including the Kaanib Foundation Incorporated (KFI), the Bukidnon Cooperative Bank (BCB) and Integrated Cooperative Towards Unified Service (ICTUS) also provided assistance to the clusters.

For this study, information was collected from secondary sources and key informant interviews. A survey involving 67 cluster farmers in the three project sites was also employed, which provided information on the impacts of clustering to vegetable production systems.

## **DEVELOPMENT OF CLUSTERS**

Under the CRS Eight Step Plan for Agro-enterprise Development, farmers in a discrete area are initially brought together to attend a cluster orientation session. This was made possible through the clustering facilitators and local government units in the identified area, as well as some development agencies. In this first activity, the clustering process is presented to potential farmer-members. Discussions on how to form a cluster, the functions of each member, the production and marketing systems employed in a cluster, and how to sustain it are the main focus of the orientation.

Farmers are then introduced to the prevailing marketing system. Often for the first time, the farmers come face-to-face with their downstream buyers in the target market. Farmers ask questions about price trends, product specifications, delivery schedules and

payment methods. This information is very important when the farmers make their cluster plans. In total, four cluster plans are prepared: a production plan, marketing plan, financial plan and management plan, which then provide the farmers with a clear path towards attaining their common goals. As farmers decide what crops they will produce, they are also encouraged to make a cost and return forecast based on their proposed production plan. They have to identify potential buyers for their produce, as well as designating a marketing officer who will take responsibility for product delivery. When the harvesting period comes, clusters prepare their products by checking the quality and the quantity to be delivered to buyers.

A test marketing activity is undertaken by cluster farmers during their first cropping period. After every product delivery, farmers assess the performance of their cluster based on the buyer's response to their ability to comply with product requirements and the farmers' experiences during consolidation. They also review the agreements set by the clusters for the members and their buyers. After the initial cluster marketing, farmers revisit their cluster plans to scale up their production to meet the needs identified during test marketing. They also implement new policies based on the challenges they encounter during product delivery. By doing this, the clusters should be able to sustain the marketing linkages they have developed, as well as to strengthen the bond cluster farmers have established.

## **EFFECTS OF CLUSTERING TO VEGETABLE PRODUCTION SYSTEMS**

### **Adoption and sharing of farming technologies**

Prior to the establishment of clusters, some of the vegetable farmers in Bukidnon and South Cotabato were members of farmers' associations. Known as Landcare groups, the main purpose of these associations was to encourage land conservation through the application of contour farming. This is a traditional method of growing crops on hillsides, as well as a strategy for water conservation and soil protection on sloping fields (USDA, n.d.). Farmers were trained by various organizations such as ICRAF and LFPI on the most effective ways of establishing contour farming, which included the promotion of natural vegetation strips (NVS) as contour barriers.

This system was continued when clustering was introduced to the farmers. After contouring their land, farmers installed fruit trees along the contour lines. Some of them opted to plant other vegetables, such as eggplant and okra, while some intercropped with sweet corn. Through these crops, farmers were able to earn additional income.

The contour farming practice was transferred to the Davao clusters after they went to visit cluster farms in Bukidnon. Davao farmers were able to see how cultivating other vegetables such as root crops and spices could help them sustain their primary vegetable crops, which were intended for cluster marketing. As most of the Davao farmers grow vegetables on hillsides, many of them began to contour their lands, while others planted fruit trees and root crops along the contour lines.

Finding the right variety for each vegetable crop is very important to farmers to ensure better and more continuous harvests. As few farmers have any direct control over externalities such as weather disturbances and disease outbreaks, it was essential that they select the best variety from the outset. For example, the Impasugong cluster had a substantial crop failure because of the presence of a viral disease known as "*pamamarako*", which is similar to cucurbit aphid-borne yellow virus (CABYV). The disease caused curling, thickening and yellowing of the leaves, reducing the number of female flowers and consequently reduced fruit production (JICA, 2007). This decreased

their expected harvest, which hampered the delivery of bitter melon to buyers. To combat the disease, farmers selected a disease-resistant variety. As a result, bitter melon production improved in terms of both quality and quantity. More of the farmers' product was able to attain the quality specifications set by their buyers, such as straightness, smoothness and the required size of the fruit. After introducing the new variety, the marketable yield increased by 101%, while pesticide applications dropped by 11%.

In Davao, a similar case was experienced by those clusters producing squash. Prior to clustering, farmers were unable to harvest a sufficient volume of fruit because of problems like the fruit falling off the vine. Having selected a more appropriate variety, the harvest dramatically improved. For another cluster group in Bukidnon, having selected the wrong variety of squash, they were unable to sell the fruit.

Most of these improved seeds were given to farmers by LGUs and development agencies as a form of start-up capital for their initial production. However, there was an expectation that through the cluster, farmers would establish some revolving fund, putting aside a small proportion of their income to purchase the seed for subsequent crops.

### **Implementation of new production management protocols and strategies**

Aside from using superior varieties, it is important that the farmers have an array of crops so that the risks brought about by external factors, such as crop failure and unstable prices, are spread across many different crops. During the initial years of cluster development, many of the farmers marketed only one type of vegetable. However, after experiencing a number of uncontrollable situations, they soon realized the need to diversify.

Several clusters in Bukidnon and South Cotabato decided to improve their product portfolio after they have experienced various challenges arising from the production of sweet pepper, such as the loss of the target market (through having insufficient product) and the low buying price (as the result of supply exceeding demand). The introduction of additional crops brought new opportunities to link with more buyers in both the traditional and modern institutional market. In addition, crop diversification increased the knowledge and skills of the farmers.

When the Bukidnon and South Cotabato clusters decided to focus on other crops, they had to modify their production management protocol. Sweet pepper is not only a high value crop, but it is also a high input crop. When farmers shifted to lettuce and squash, as these crops are much less susceptible to attack by pests and diseases, the rate of chemical application dropped appreciably – in the case of bulb onion by as much as 80%.

The Davao cluster farmers were encouraged to use organic inputs as a means of reducing costs. This included the use of concoctions derived from fermented plant and fruit juices, processed chicken dung and vermi-compost. These were applied to leafy vegetables such as *alugbati* (Malabar spinach), *saluyot* (jute) and some root crops like *karlang*. Most of the ingredients required to make these concoctions were locally available.

Aside from the skills in formulating more cost-effective inputs, farmers adopted integrated pest management (IPM), which relies on non-chemical means to prevent and manage pest infestation (Patkus, 2007). Some cluster farmers installed insect traps with used grease to catch flying insect pests, while others made attractants by using recycled plastic bottles with coconut sap and muscovado sugar. Some farmers opted to plant shrubs like marigold (*Tagetes patula*) to deter insect pests from inflicting damage on the prescribed vegetable crop. The insecticidal properties of some indigenous plants, like

*tubli* (*Milletia piscatoria* Merr.), *panyawan* (*Tinospora rumphii*) and *madre de cacao* (*Gliricidia sepium*) have been cautiously applied as part of the farmers' production management protocol.

Through the cluster, farmers scheduled the planting of their products, whether in the open field or under protected structures, to maintain the continuity of supply. Different types of vegetables were planted through rotation and intercropping, enabling farmers to continuously obtain higher yields, while simultaneously lowering their input costs. Crop rotations provide an effective means of reducing the incidence of pests and diseases, especially when the vegetables are from different species. Some farmers opted to plant lettuce and bell pepper in order to reap higher margins. Other farmers added marigold along with potato and taro, which proved to be one of the best options to discourage insect pests. These strategies of applying cost-effective inputs and using non-chemical means to apply plant nutrients and manage insect pests have reduced input costs by 59%.

### **Provision of protected cropping system through rain shelters**

With rapid change in the climate, farmers needed to find a way of mitigating these unseasonal disturbances. Since heavy rain frequently falls in Bukidnon, the Municipal Agricultural Office in Lantapan agreed to construct six rain shelters for the cluster members as a means of providing a protected cropping system in the area. This was made possible as both the Songco and Kaatoan clusters were appropriately registered people's organizations (PO), which enabled them to comply with the legal obligations to receive a grant. Similarly, the Municipal Agriculture Office in Tupi, together with UPSTREAM and LFPI provided one rain shelter for the Kablon cluster. These facilities were constructed on farm land collectively owned by the cluster members.

The establishment of rain shelters has provided additional production capacity for the cluster farmers. Generally, they have focused on high-value vegetables such as broccoli, lettuce and bell pepper. For most farmers, it was their first opportunity to grow vegetables under a protected structure. Several adjustments to their farming systems were required. One immediate benefit was the significant reduction in the application of pesticides by more than 50%. In the open fields, farmers had to reapply the pesticide solutions more often as the chemicals were simply washed away when heavy rain fell. Under the rain shelter, there was less need to apply the chemicals, reducing their costs of production.

### **Establishment of communal farms**

Aside from their individual farms, cluster farmers have started to produce various crops through communal farming, where farmers equally share the production expenses and anticipate that they will equally share the proceeds. One farmer might provide some of the fertilizer required for the communal area, while others supply their labour, such as weeding, watering and trellising. With the provision of rain shelters, communal farming has increased.

With the introduction of communal farms, a new collective production system has been developed. Collectively, the cluster farmers decide what kind of vegetable they will grow, what inputs will be used and how each farmer can participate in the production process. Sharing emerges when farmers impart technological skills in vegetable production to other members. Through this, they can all improve their farming systems.

The establishment of communal farms has also paved the way for the introduction of new crops to add to the clusters' product portfolio. In Bukidnon, the Kilapagan cluster, who started with squash and eggplant, has now engaged in carrot production. The Davao clusters have also increased their product portfolio by cultivating bitter melon and squash in a communal farming operation.

## **CONCLUSION**

In a survey conducted in 2011, 71% of the cluster farmers stated that there had been an increase in the volume of vegetables produced as a result of clustering. This indicates that the clustering method is having a positive impact on vegetable production systems in the Southern Philippines. Montiflor (2008) identified that the presence of strong support organizations and the willingness of key farmers to collaborate were key elements in the success of the clusters. In this study, each of these factors were evident. With the assistance of LGUs and other development agencies, farmers were able to increase production because of the technical and material support provided, such as superior varieties of seed and rain shelters.

Another significant factor that contributes to the success of clustering is the increased production and improved product portfolio of the farmers. Through economies of size, farmers were able to lower their production costs.

The study has also revealed how cluster farmers were successful in introducing low cost production systems through the application of non-chemical means of pest and disease control. All of these were made possible through the skills the farmers acquired from attending training programs, participating in cluster meetings and in being active members of the cluster.

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