Market Study on Organic-Based Rice and Vegetables in the Province of Tarlac

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Abstract

The study focused on the market of organic-based rice and vegetables in the province of Tarlac. Respondents of the study included farmers engaged in organic-based farming, traders, and consumers in the province and nearby cities. Purposive sampling was adopted in determining the samples of the study due to inaccessibility of some farmers, traders, and consumers. There were 162 farmer respondents and 160 consumers interviewed. Out of the 162 farmer respondents, only 8.64% have organic-based crops certified by the 2nd party or trader certified while the rest were 1st party certified or farmer certified. High demand for organic-based vegetables was visible in areas where perfect information exists while in areas where markets are not well structured, supply creates its own demand. The presence of established market outlets stimulated supply at which crops were sold at a premium price. The distribution was facilitated by various channels including cooperatives, government institution, and peoples organizations. Factors like fluctuating price, imperfect information, and non- existence of market outlets were the major constraints in the market of organic crops. Hence, results of the study can serve as basis in the formulation of better policies to improve crop distribution that can contribute to better market opportunities.

Introduction

Organic agriculture is becoming not just a trend but also a change in lifestyle among consumers around the globe. The International Federation of Organic Agriculture (IFOA) defined it as a production system that sustains the health of soils, ecosystems, and people through dependence on biological processes, biodiversity, and cycles adapted to local conditions rather than the use of inputs that harm the environment (FAO, 1999). Republic Act 10068 or the Organic Agriculture Act of 2010 also adopted this definition. The implementing rules and guidelines gave the Department of Agriculture through the Bureau of Agriculture Research the task to strengthen organic agriculture in the country. Needs and gaps of the system were identified to promote the production and consumption of organically produced products (DA-BAR, 2011). One of the thrusts of the Organic Agriculture Act of 2010 was the continuing research on organic farming, its inputs, marketing of organic products, and efficiency of organic farms.

The main challenge in organic crop production is how to strengthen its local market and how to expand and sustain its production in the region. There are few organic farmers but the demand for organic products is growing fast. With its limited supply in the domestic market, the price rises (Maghirang et al., 2011).

Given the divergent views regarding its feasibility and productivity potential, it entails a great amount of resources and time to sustain organic agriculture. Organic production requires a high level of managerial knowledge, the ability to protect crops from pests and diseases, and compliance with production process requirements. Apparently, certification is one of the most important cost items. Reliable and independent accreditation and control systems are essential to enforce organic standards and regulations and to meet its general quality requirements (McIntyre et al., 2009).

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Organic food provides a lot of health benefits to consumers because it is grown without the use of pesticides and products, but also contaminates drinking water and watersheds. Higher vitamin C concentrations were found in organic leafy vegetables, such as spinach, lettuce, and chard versus the same conventionally produced vegetables in 21 of 36 (58%) studies. Other studies have found higher total phenols in organic produce versus conventionally grown produce and have postulated health benefits from antioxidant effects (Forman and Silverstein, 2012).

Organic agriculture stabilizes returns and improves the quality of life of small farmers. Although organic foods regularly command a significant price premium, well-designed farming studies demonstrate that costs can be competitive and yields comparable to those of conventional farming technique. Moreover, an efficient production and marketing system is crucial in sustaining the market of organic crops. The major hindrance in the development of organic farming include the low level of information, both in the consumers and farmers side and the labor-intensiveness of organic farming. Consumer demand for organic products provides opportunities for farmers and businesses to cater to the growing market (Food and Agriculture Organization, 1999).

Improving consumer awareness, accessibility, and acceptability of organic products can contribute to its market expansion. Likewise, markets selling organic products are not yet established — making the supply to be limited (Maghirang et al., 2011). An in-depth study on the market for organic crops, i.e. rice and vegetables in the province, is essential for the industry to trace out the flaws and strengths in its marketing system.

In general, the objective of the study was to evaluate the market of organic-based rice, vegetable, and other crops, e.g. corn, sugarcane, and livestock in the province in terms of pricing, distribution channels, structure, and constraints faced in the market. Likewise, it aims to determine the technical, financial, as well as, infrastructure development support provided by the government and other organizations to the farmers. The determination of variables or factors that weaken or strengthen the flow of products between the producers and consumers will contribute to the formulation of better alternative strategies that can enhance the economic welfare of sellers and consumers in the area. Hence, results of the study can serve as basis in the formulation of better policies to improve the exchange of transactions that can contribute to better market opportunities.

Methodology

This study made use of the descriptive method. The listing of farmers engaged in rice and vegetable organic production from each municipality were obtained from the Department of Agriculture. Based on the list of farmers acquired from DA offices, the sampling frame was trimmed down to farmers who had continuously adopted organic fertilizers for 2 years onwards in order to acquire valid data related to the market. The unit of analysis in the study includes organic crops producers, agricultural traders, cooperatives and NGOs staff, organic distributors, and consumers from the different municipalities of Tarlac, as well as, in Metro Manila.

Purposive sampling was adopted in the determination of sample respondents including farmers, traders, and consumers due to the difficulty in accessing some farmers in the far-flung areas of the province. The total number of farmer respondents and consumers was 162 and 160 respectively. Few number of traders (10) were also interviewed to obtain relevant information about the market.

The gathering of primary data on socio-economic aspects and information on marketing practices of farmers were done using a questionnaire, while an interview guide was used in gathering information from consumers and traders. To facilitate the data gathering on the supply side, focus group discussions with farmers and farmer cooperatives were also undertaken. Likewise, local interviewers who were knowledgeable with organic practices were also mobilized in certain areas. For the demand side, meetings and interviews were conducted with consumers and institutional buyers such as traders and agricultural cooperatives. Data gathered were validated through actual interviews with the farmers and

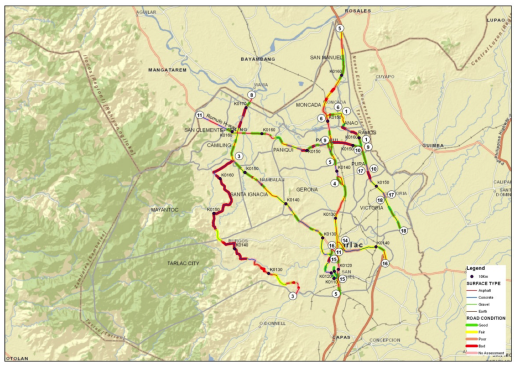

Figure 1. Map of the Tarlac Province

other distributors, e.g. wholesaler or retailer of organic crops in the area.

Scope of the Study

Generally, pure/certified organic farming is not yet adopted by farmers in the province since accreditation is expensive and requires very strict standards. No farmer has availed yet of this said certification from third party providers. However, second hand validation has been relied on by certain producers as buyers and farmer organizations knowledgeable on organic practices certify the quality of their produce. In this study, the best practice obtained was organic application from bed preparation that continued until it completed the whole plant cycle. Organicbased crops as defined in this study are those crops that were grown using a combination of organic and minimal inputs of inorganic. Respondents of the study were limited to those who have been using organic fertilizers and chemical free pest repellants with the combination of inorganic fertilizer for a span of two years or longer that have produced significant yield and were sold commercially. Farmer respondents of the study were residents of the sixteen (16) municipalities of Tarlac.

Results and Discussion

Based on the survey undertaken, there are only sixteen (16) areas/municipalities that were engaged in organic-based farming. Results showed that Gerona has the biggest population of farmers engaged in organic-based farming and the least population is San Manuel.

Farmers Profile

Most of the farmers raising organic- based crops belong in the age bracket 50- 59 years and are residing in their respective communities/barangays since birth. Their early exposure to farming made them venture in it till their old age.

In terms of educational attainment, 27.78% have finished college while 28.40% are high school graduates. The typical household size is 4-6 members that consists of 56.25% of the sample. The farmers knowledge and skill on organic technologies are quite divergent as indicated by varying length of experience in this field. Majority of them (55.56%) said that they have engaged in organic- based farming for 25 years.

Almost three-fourths of the respondents, 74.38%, own the land they are cultivating while the rest have tenant status. The average annual income from their farm is P95,000.00 per hectare.

Networking is an essential tool for sharing and acquiring new knowledge and techniques in agriculture. Majority of the farmers interviewed were not members of any farmer association or cooperative. However, some are still in the process of organizing their own in their respective areas. Thirty-three percent (33%) of the farmers are members of private organizations such as the FFF (Federation of Free Farmers) and ATOP (Association of Tarlac Organic Producers).Through their organizations, they were able to access financial subsidies, e.g. farm equipment and technical assistance from government and non- government institutions. As claimed by farmers, attendance in trainings and seminars was also a useful means by which the farmers were equipped with the current trends in organic farming.

Since organic farming in the province is considered to still be in the start-up phase, support services are vital to the survival of the farmers especially to those who lack capital and technical know-how. The Local Government Unit (LGU) and the Department of Agriculture (DA) provide assistance, particularly in the technical and financial aspect, such as seed and fertilizer subsidy. Table 1 shows the nature and source of assistance

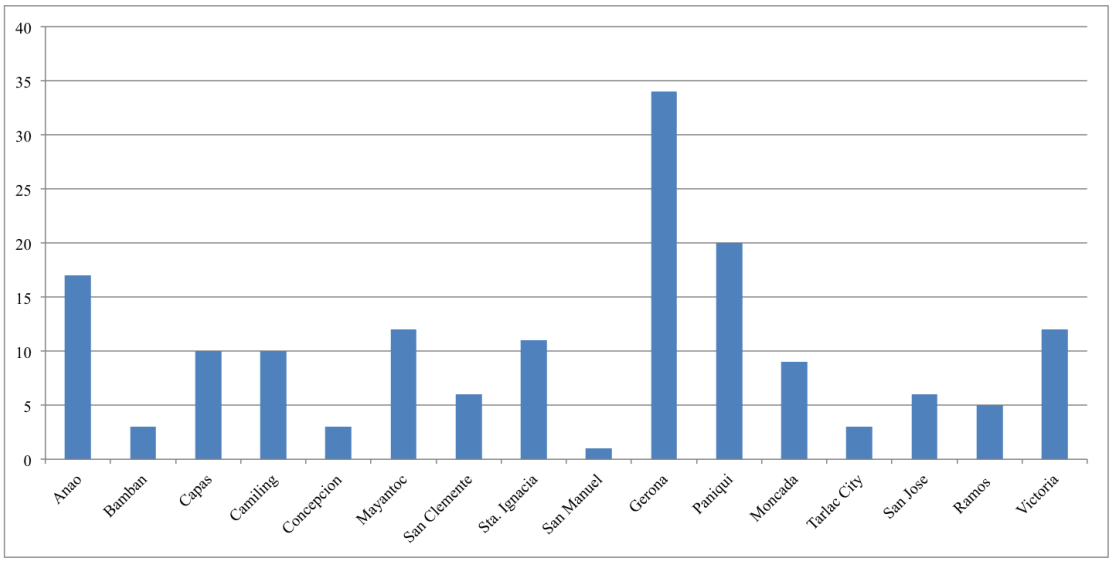

Figure 2. Number of Farmer Respondents Engaged in Organic-based farming per Municipality

availed by farmers. About 75.31% of the farmers availed technical and financial assistance, e.g. seed and fertilizer subsidy from the LGU through the DA (local). Technical assistance which is sponsored by DA and State Universities and Colleges (SUCs) at 64.81% is the most commonly availed support by the majority of farmers while the least (14.81%) is marketing assistance. Farmers cooperatives also contribute modest aid to its members.

Table 1. Nature and Source of Assistance Availed by Farmers

	Frequency	Percentage
A. Assistance		
Financial	47	29.01
Technical	105	64.81
Marketing	24	14.81
None	9	5.55
B. Source		
LGU / DA	122	75.31
SUC	12	7.41
Coop	11	6.79
Private Companies	5	3.09

Based on the survey, 77.85% are using a combination of organic and inorganic fertilizer in their crops. Majority of the farmer respondents (33.33%) are tilling land with an area of one (1) hectare and below. The use of pure organic fertilizer is commonly observed among farmers (35) raising vegetables. Other crops like palay, sugarcane, and corn are also treated with organic fertilizers in various forms like vermicast, composted wastes of animals, and dried leaves with a combination of inorganic inputs. There is only one farmer respondent from San Clemente who raises livestock using chemical-free feeds and vitamins extracted from fruit juices and combined with probiotic enzymes. Among the 162 farmer respondents, fourteen (14) of them have organic-based crops which are certified by the 2nd party and the rest are certified by the 1st party. Certification by the 2nd party implies that the organic produce are evaluated and certified as organic by the other party, e.g. institutional buyers, while 1st party certification is done by the farmers themselves who qualify that their produce is organicbased crops. None of the farmers has already availed of the 3rd party certification due to the high standard set by the accrediting/ certifying agency (DA) which is too costly and hard to attain. The farmers who have 2nd party certification are the farmers in Capas whose major market is the Good Food company that channels the

products to consumers in Metro Manila and other nearby cities.

Table 2. Nature of Certification on Organic Crops

Nature of Certification	Frequency	Percentage
1st Party certified	148	91.36
2nd party certified	14	8.64

Market Structure

As observed, since rice is a basic commodity, with very minimal distinguishing features and characteristics, its market structure may be classified as perfectly competitive. Farmer sellers are just price takers, unable to exert influence on market outcomes.

For organic-based vegetables, market structure is also perfect competition. Consumers observed that the products are homogenous in nature even though there is a slight difference in taste compared to what is traditionally produced. In the remote rural areas where there is no established market outlet, products are just sold to neighbors or visitors. Since acquired at the source, produce are sold at farm gate price. Majority of the farmers in various municipalities have no designated area for organically grown crops. Sometimes they are directly channeled to the local public markets at prices determined by the prevailing price of goods in the market. Although in some areas like Tarlac City, Capas, San Clemente, and Bamban, where there are designated market outlets likeSM outlets and community markets in Metro Manila, products are offered at a premium price. The average price for vegetables is P5.00 higher than the price of conventionally produced goods. For other crops like sugarcane, corn and livestock, the products are channeled to institutions like corporations, i.e Central Azucarera de Tarlac, and other business establishments.

Supply of Organically Grown Crops

Basically, supply of organic- based crops is fluctuating, depending on the demand of the market. However, in some municipalities, supply creates demand for the crops.

Rice is the main organic-based crop commercialized in various areas in the province. Likewise, vegetables such as sweet potato, eggplant, tomato, turnips, sugarcane, chili, papaya, mongo, ampalaya, stringed beans, and pechay are also produced. In terms of output per cropping, Mayantoc has the largest harvest of rice which is approximately 175,000 kilograms per cropping season and the least is San Manuel. The farmers in Capas were able to expand their vegetable production by forming farmers cooperatives and establishing linkages with traders, e.g. Good Food and SIBAT, which channeled the goods to other markets outside the province. The presence of private organizations that promote organic farming, e.g. Federation of Free Farmers (FFF), also encourages the adoption of organic farming. Farmers of organic rice use local seed varieties, most of which are sourced from DA and Philrice, while the rest are from local/private growers (East West Corp.) Meanwhile, the vegetablecrops are produced using organic-based inputs such as vermicast, vermitea, organic compost, naturally occurring enzymes, and plant extracts as pesticides.

The area where farmer had planted is about 382.70 hectares of the land in the province of Tarlac. The 18 towns of Tarlac and the Gulayan sa Barangay Project of the Office of Agriculture were the sources of supply. The lands were devoted to organic-based and semi-organic cultivation of vegetables, livestock, and other crops.

Demand for Organic Crops

The demand for organic- based vegetables tends to vary from time to time. Demand is highly evident in areas where consumers are fully informed about the attributes and benefits of organically grown crops. In areas like Capas where there is an established market outlet, farmers are required to produce more because of great demand for their products. The highest demand was observed during the peak season, in the months of November up to January. After this period, the demand diminishes, then again starts to rise during summer. In the case of Capas, their market includes the Chinese and local residents in Metro

Table 3. Volume of Organic-based Crops and Livestock in Tarlac Per Cropping

Crops	Volume	Output / hectare	Output/ ha./ cropping
Rice	1,141,735 kg	180 cavans	90 cavans
Sugarcane	1,883.75 tons	170 tons	85 tons
Corn	869.80 tons	110 tons	56 tons
Sili	7,236.95 kg	3,000 kg	2,500 kg
Eggplant	53,650.00 kg	4,800 kg	2,400 kg
Sitaw	1,981.00 kg	1,600 kg	800 kg
Pechay	12,995.00 kg	3,840 kg	960 kg
Lettuce	8,275.00 kg	1,800 kg ,	900 kg
Tomato	28,640.50 kg	6,000 kg	3,600 kg
Sweet Potato	52,955.00 kg	10,000 kg	4,000 kg
Ampalaya	7,533.75 kg	3,600 kg	2,000 kg
Mongo	1,044.00 kg	900 kg	600 kg
Kangkong	1, 636.00 kg	1,800 kg	900 kg
Spinach	1, 696.00 kg	1,500 kg	750 kg
Squash	2,176.50 kg	75 kg	100 kg
Okra	1,595.35 kg	1,200 kg	950 kg
Upo	1, 254.25 kg	900 kg	500 kg

Source: Farmer respondents actual aggregated output

Manila, particularly Makati and Quezon City, and their average weekly demand for leafy vegetables like kangkong, pechay, spinach, and lettuce is about 20 kilos per week. In order to satisfy the increasing demand, farmers conduct meetings with the traders (Good Food Inc.) to make an agreement on the volume to be produced to avoid imbalance in the market.

However, in areas where consumers are not informed and have no full knowledge about organic crops, demand becomes visible only when there is an available supply. As claimed by farmers in Victoria, San Manuel, Ramos, and Sta. Ignacia consumers are not conscious and indifferent to what type of vegetables they are buying. This was proven as a result of an interview to some buyers in each municipality. There is approximately(50%) of buyers in Sta.Ignacia, San Manuel, Ramos, and San Clemente who have no distinct preference on organic crops relative to inorganic crops. They just resort to buying organic when supply is available. If no supply is available, people do not demand for them. This occurence is consistent to Says Law that states, supply creates its own demand (Younkins, 2006). On the other hand, the other 50% of buyers who prefer organic produce would directly buy the products from the farm. This was observed in areas like Capas, Paniqui, Camiling, and Mayantoc. As claimed by the farmers interviewed, their products do not reach the marketplace because buyers go directly to the farm. At the end of the day, a great amount of farm produce were sold at a lower price (farm gate price) relative to the prevailing market price.

Market Channels

The marketing scheme of organic-based rice does not differ with that of commercial/chemically grown rice. Almost 85% of the produce from the different municipalities are sold to traders without having enjoyed any price premium. Figure 2 shows the distribution of organic products to different market channels. About 75.88% of the total yield distributed to wholesalers included local traders in the province and nearby provinces like Nueva Ecija, Pangasinan, Pampanga, and Bulacan. The other bulk of rice harvest was sold to the National Food Authority (NFA) which offer similar pricing for both organic and non-organic based rice.

Finally, the smallest portion of rice produce is channeled to retailers that is almost equivalent to 5.06% of total produce. This practice is done by farmers who have connections with market outlets or own market outlets themselves. Still, in general, this practice is considered impractical since there is very little price distinction between the harvest sold as palay and the other sold as milled rice given the costs of milling and transportation.

Moreover, majority of vegetables are sold in bulk to traders and wholesalers who either pick up the produce at the farm at a designated bagsakan site in the market. Other farmers have tie ups with institutions including NGOs and agricultural cooperatives that link them to clients like restaurants and organic communities. In particular, the Capas farmers have linkages with SIBAT and Good Food community that cater to customers in Metro Manila. On the other hand, a farmer in Bamban has tied up with Dizon Farms and is regularly delivering produce to its depot in Clark, Pampanga. As for the produce of the Organikong Gulayan sa Barangay of the Provincial Government of Tarlac, these are sold to SM Supermarkets. Some farmers have retail stalls or have friends and relatives where they can consign their produce with. Finally, a minor portion of total vegetable harvest are traded informally to the neighbours, peddled to offices and relatives.

For other crops including sugarcane, corn, and sweet potato, most of the yield are sold in wholesale channels while negligible quantities are consumed and retailed. For instance, all of the sugar cane harvest are directly brought to Central Azucarera to be processed and refined as sugar. While corn and sweet potato are sold in bulk for animal feeds.

Price Range

As claimed by the farmers, the price of organic-based palay in the market is determined by the buyers, e.g.wholesaler/millers that rangefrom P13.00- P18.00 per kilo. During harvest season, however, where there is excessive supply the prices go down. Likewise, the quality of palay is also a determinant of the price. Some argued that price discrimination for certain groups of farmers exists like in Bamban and Concepcion. And that the price of vegetables also depend on the season. In the case of tomatoes, the price goes up during the rainy season from June to September and decreases during summer. Others like eggplant do the same. As mentioned by farmers who trade their products to institutional buyers and individuals outside the province, e.g. Dizon farm, price is relatively higher by P3.00 to P5.00 to the regular price offered in the local market, depending on the bulk of products traded. In addition,majority of the crops sold are not offered with a premium price— making farmer become less willing to adopt organic farming.

Market Constraints

Table 5 summarizes the problems faced by farmers in organic farming. Majority of the farmers (32.72%) claimed that they experience unstable prices by which the price becomes lower especially if crops are in season resulting to lower income for farmers. About 20.99% of the farmers claimed that lack of information dissemination to buyers resulted to inefficiency in the distribution of the crops. They argued that some consumers are not aware of the organic crops, hence, this made them have no distinct preference for organic vegetables. Likewise, some of the farmers (15.43%) are less motivated to continuously adopt organic fertilizer because they claimed that their produce have no established market outlet besides the fact that there is no price difference imposed on organically grown crops compared to inorganic crops. Moreover, around 17.28% of the farmers experienced unsustainable government support in terms of fertilizer and seeds subsidies. This results to less willingness to make use of organic farming that leads to a negative effect on the supply. The least factor that was claimed to have a negative effect on the market is the outmoded farming facilities.

Conclusions

Organic-based farming is not yet adopted intensively in the province of Tarlac. With the strong support of LGUs and DA offices to the farmers, a more sustained adoption of organic farming can be evident in the future. In addition, through the trainings provided, the farmers can

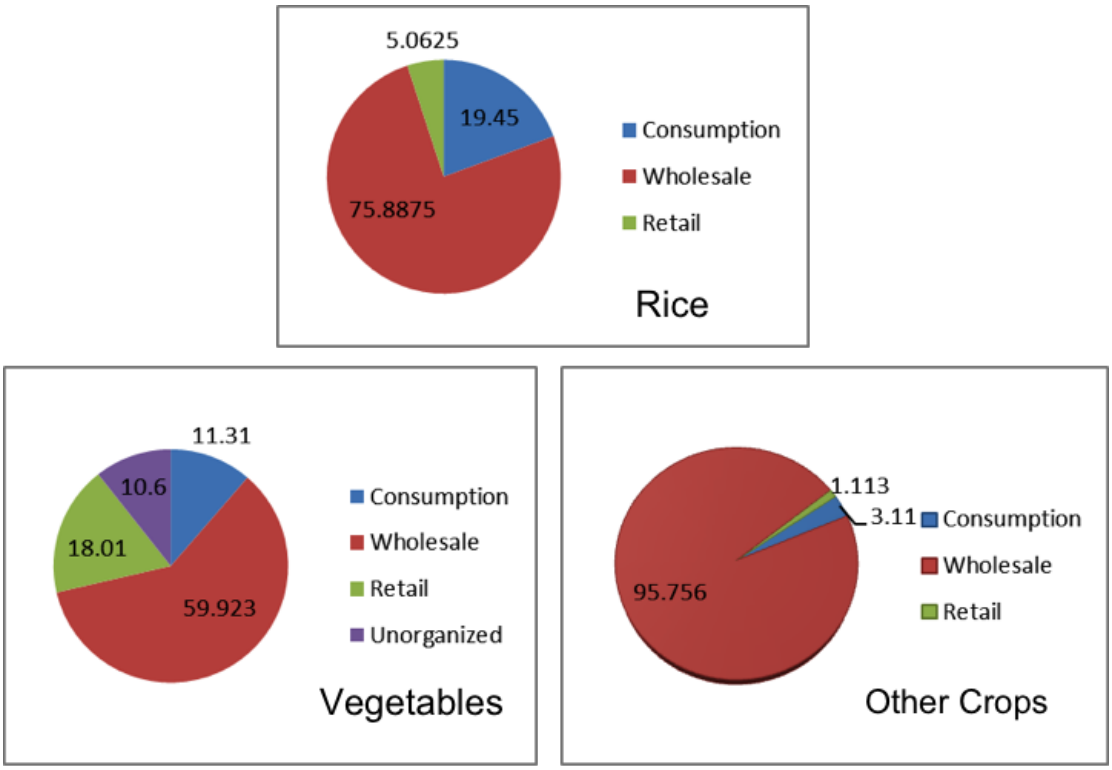

Figure 3. Market Channels for Organic Based Rice, Vegetables

Table 4. Problems Faced by Farmers

Constraints	Frequency	Percentage
Lack of Supply of Inputs	12	7.4
Lack of demand of organic products	29	17.9
Lack of information	34	20.99
No established market	25	15.43
Competition	14	8.64
Transportation	12	7.4
Outmoded farming facilities	10	6.17
Lack of government support	28	17.28
Trade Barriers	19	11.73
Unstable price	53	32.72
Presence of calamities and pest	11	6.79

gain more insights and improve their skills that are essential to higher productivity. Likewise, the provision of free or subsidized organic fertilizers and other inputs can serve as means of support to farmers. Hence, this also implies a more sustained use of the technology. Furthermore, through their membership in farmers associations and cooperatives, farmers were able to access subsidized farm inputs that promote the adoption of organic farming. And that aside from farming support, they are also ensured formal market channels which facilitate exchanges.

The market size of organic- based crops, i.e. vegetables, fluctuates over time. The said outcome is dependent on the seasonality of the crops and the structure of the market. Moreover, the presence of market outlets in areas contributes to greater supply and therefore, the establishment of such structures is crucial in the sustainability of its market. Lastly, when buyers are informed about organic vegetables, a greater demand for these crops is created.

Establishment of market linkages such as wholesalers and traders in certain areas help improve the distribution of the crops. In the case of rice, majority of the output were channeled to wholesalers in the area and outside the province like millers and rice traders. The biggest bulk of market for vegetables comprises the institutional buyers, e.g. cooperatives and private organizations outside the province.

Furthermore, lack of information on the benefits derived from organic crops results to consumer indifference to such crops. This discourages some farmers to adopt organic-based farming considering the fact that the market sets the same price on organic-based products relative to traditionally produced crops. These said organic products are also prone to the same price fluctuations caused by oversupply, shortage, timing, and quality of harvest.

Moreover, raising consumers awareness of the difference between naturally-grown products and conventional products must be strengthened. Assistance from DA, LGU, and other private organization must be synchronized to ensure the sustainability of organic agriculture in the province. Accreditation assistance must also be extended to farmers, enterprises, and other establishment in order for them to be informed of the requirements of maintaining quality standards set by the regulating body. This will, likewise, expand their customer base if the National Organic Agriculture Board will certify them.

References

Braber, K., Wai, O. K., and Panyakul, V., editors (2003). *Developing Local Marketing Initiatives for Organic Products in Asia – A Guide for SMEs*.

DA-BAR (2011). Gap analysis on the r and d of organic agriculture. Electronic copy from www.bar.gov.ph/programs/major-programs, Department of Agriculture – Bureau of Agricultural Research.

Food and Agriculture Organization (1999). Organic agriculture. Technical report, Food and Agriculture Organization of the United Nations.

Forman, J. and Silverstein, J. (2012). Organic foods: Health and environmental advantages and disadvantages. *AAP Gateway Journal*, 130(5).

International Federation of Organic Agriculture (2005). Definition of organic agriculture.

Maghirang, R. G., De La Cruz, R., and Villareal, R. L. (2011). How sustainable is organic agriculture in the philippines? *Trans-National Academy Science and Technology*, 33(2):281–321.

McIntyre, B. D., Herren, H. R., Wakhungu, J., and Watson, R. T., editors (2009). *A Synthesis of the Global and Sub-Global IAASTD Reports*. Island Press, Connecticut Avenue, NW, Suite 300, Washington, DC 20009.

Nocon, N. and Fujimoto, A. (2006). Demand for organic vegetables in the philippines: A study of food establishments and consumers in metro manila. *Journal of Agricultural Science*, 50(4).

Padilla, L. L. (2012). Organic rice-vegetable farming: Good quality produce good profit. *DA-BAR Research and Development Digest*.

Portocarrero, E., Panyakul, V., Zeijang, Z., Kasterine, A., Wolf, J., Carpenter-Sprungli, D., Della Corte, K., and Hagen, V. (2011). Organic food products in china: Market overview. Geneva: Itc, 2011. xii, 36 pages (technical paper), International Trade Center.

Republic of the Philippines (2010). Republic act 10068 (organic agriculture act of 2010). S. No. 3264 H. No.7066.

Younkins, E. W. (2006). Jean-baptiste say's law of markets: A fundamental, conceptual integration capitalism and commerce. Web Page (http://www.quebecoislibre.org/06/060212-4.htm).

