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Operational Policy Needs for Organic Agriculture Expansion in the Philippines: Focus on Vegetables

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ABSTRACT. In 2010, the Philippines passed a law (Republic Act No. 10068) to support the expansion of organic agriculture (OA) in the country, with a goal of 5 percent of total production area being devoted to this technology. Available data show that in 2012, only about 0.7 percent of the agricultural land area in the country was devoted to OA production. While several other administrative orders supported the law, there seems to be a need to understand the processes to operationalize the said law.

This paper analyzed the production, marketing, and consumption issues surrounding the organic vegetable industry to come up with operational policies to support the implementation of the law. The data came from a survey of 300 vegetable farmers and 180 consumers and non-consumers of organic vegetables supported by key information from government officials, farmers' associations, and traders. Results showed that the most critical constraint to OA production was the high cost of certification, lack of farmers' training on

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the technology, and access to organic inputs. Alternative certification processes, capacity building for both farmers and program implementers, and more IEC campaigns on the benefits of OA products are recommended.

Keywords: *organic agriculture, certification, labeling, vegetables, Philippines*

INTRODUCTION

The main rationale for research and development investments into organic agriculture is environmental sustainability and improved farmers' and consumers' health. Organic agriculture is "a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity, and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved" (IFOAM, 2009).

It is "a farming system, which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives to the maximum extent feasible; a farming system that relies on crop rotation, residues, animal manure, legumes, green manure, off-farm organic wastes, and the aspects of biological pest control measures, soil productivity and tilt, to supply plant nutrients and to control insects, weeds and other pests" (Alvares et al., 1999 as cited in Valerian, Domonko, Mwita, & Shirima, 2011, p. 1).

In developing countries, the health-related impacts of inorganic farming have become the central policy problems. Traditional farming with chemical technology affects farmers' health (Rola & Pingali, 1993) and the environment (Pingali & Roger, 1995). Organic agriculture was seen as one of the feasible options or valid substitute for such traditional farming. In general, it was observed that scientific studies on the environmental benefits of organic food production are lacking.

Organic Agriculture in the Philippines

Seen as a promising technology to support environmental sustainability and rural development, the Philippines enacted into law the Organic Agriculture Act (Republic Act No. 10068) in 2010. The Act provides for the development and promotion of organic agriculture in the Philippines. Its main goal is "to enrich the fertility of the soil, increase farm productivity, reduce pollution and destruction of the environment, prevent the depletion of natural resources, further protect the health of farmers, consumers, and the general public, and save on imported farm inputs."

Furthermore, Executive Order No. 481 in 2005, also known as the "Promotion and Development of Organic Agriculture in the Philippines," envisioned the establishment of organic agriculture in the country. The executive order provided for the extension of assistance to individuals and groups who practice and promote organic agriculture methods, as well as the documentation and evaluation of organic agriculture programs. House bills have been filed on various aspects of organic farming such as training programs at the *barangay* (village) level to educate more farmers about the organic farming practices; extension services to groups practicing organic farming; establishment of training facilities in every *barangay*; and grant of special loans to organic farmers. At the municipal and *barangay* levels, local government units are encouraged to engage in organic farming through various resolutions, master plans, and programs (Peñalba, Dizon, & Elazegui, 2007).

Several national institutions have also been assigned responsibilities for the promotion of organic agriculture in accordance with the provisions of the law. The National Organic Agricultural Board (NOAB), attached to the Department of Agriculture (DA) is the policy-making body that provides direction and general guidelines for the implementation of the National Organic Agricultural Program (NOAP). The DA-Bureau of Agricultural Research (BAR) has organized an organic agriculture research, development, and extension (RDE) network composed of research and educational institutions, local government units

(LGUs), non-government agencies, and the recognized associations of organic fertilizer manufacturers and distributors, agricultural engineers, agriculturists, soil technologists, farmers' groups and/or associations. The DA Bureau of Agriculture and Fisheries Product Standards (BAFPS) has been designated and authorized to grant official accreditation to organic certifying bodies or entities. All organic food and input establishments must register with BAFPS. The other policy requires retail establishments or stores of organic products to designate a separate area for the display of their harvest to avoid mixing it with non-organic produce.

At the local government level, the law likewise states that every provincial governor shall, insofar as practicable, form a provincial technical committee, and which shall, in coordination with and assistance of the BAFPS and/or the DA-Regional Field Offices (RFOs) implement activities in line with the NOAP. The LGUs as frontliners in the implementation of the program are expected to pass, provincial and/or city/municipal ordinances and/or resolutions as appropriate, thereby specifying the participatory and bottom-up approach to grassroots organic agricultural programs and projects. Subsequently, these would approve and adopt the provincial and municipal/city organic agriculture program in addressing concerns on food security, environment, health and wellness, and poverty alleviation.

At the farm level, social development groups since the 1980s have implemented projects on sustainable agriculture because of the perceived negative impact of conventional chemical farming on the environment. For instance, in 1984, MASIPAG started as a farmer-non-government organization (NGO)-scientist partnership that aimed to encourage and empower small rice farmers to develop their own technologies and farmer-to-farmer extension, and to have access to and control over production resources, especially on seeds. In the 1990s, organic agriculture became an important movement and many farmer organizations, and NGOs engaged in the development of organic agriculture (Källander & Rundgren, 2008).

The NOAP targets about 5 percent of the total agricultural areas to be devoted to organic agriculture. However, available data show that in 2012, only about 0.7 percent was devoted to organic agriculture production (FiBL-IFOAM Survey, 2014). According to Aquino (2005 as cited in Peñalba et al., 2007), the factors that constrained technology adoption included the following: slow conversion of conventional farms to organic agriculture due to the observed decline in yield; land tenure problem; limited support to production (lack of organic seeds and organic fertilizers; lack of training and extension services); marketing problems (lack of market information system, lack of marketing strategies and pricing scheme, lack of capital, inappropriate packaging); lack of government support for export of organic products; unorganized organic producers; low competencies in organic production; limited knowledge on national regulations; and limited skills on internal quality control systems.

Given these constraints to organic agriculture expansion, this paper aimed to understand from the policy perspective, the underlying reasons why organic agriculture was slow in its uptake. It hypothesized that there were operational policies that may have been needed to sustainably support the organic agriculture converts and to further facilitate farmer adoption.

Framework of Analysis

The national laws, ordinances, and other legal framework for organic agriculture cover the operational policies on certification, labeling, market support system, production and post-production support, LGU support, and other support services. These policies have an impact on the production, marketing, and utilization/consumption of organic produce. The framework in Figure 1 summarizes the policies that affect production, marketing, and consumption of organic crops that would ideally lead to the goals of environmental sustainability that would improve farmers' and consumers' health.

Operational policies. The implementing rules and regulations of the Organic Agriculture Act provides the operational guidelines for the implementing agencies/organizations in different levels. It contains policies pertaining to certification, labeling, support for marketing, production and post-production, as well as the inter-agency support from LGU, line agencies, academe, and NGOs.

Production. Several factors affect organic production including access to inputs, cultural and management practices, economic returns, role of farmers' organizations, and health and environmental benefits derived. For a farmer to go into organic production, it is important that natural inputs are available, accessible, and affordable. Cultural and management practices of organic farming are different from conventional farming. Additional knowledge gained will enhance their decision to go into organic farming. Meanwhile, returns to investments is a major consideration when farmers decide what crops to plant.

Marketing. Pressing concerns involving marketing of organic products include the sustainability of supply of these organic products including the lack of a sure or ready market, lack of product differentiation to take advantage of the price premiums, lack of market information system, high cost of third-party certification, and issues on pricing arrangements. All these factors would affect the profits or losses of farmers and traders.

Utilization/Consumption. Utilization or consumption focuses on the preference of consumers for organic food as indicated by their demand behavior. There are factors that affect consumers' willingness and decision to purchase. Price of organic products is a major determinant of demand. Consumers' knowledge and awareness of the benefits from consuming organic food may influence their consumption decisions. Further, consumers' perceptions on health and other benefits of organic food may also affect the extent of consumption of this food. Policies that would augment consumption of organic food are essential, i.e., labeling of organic food.

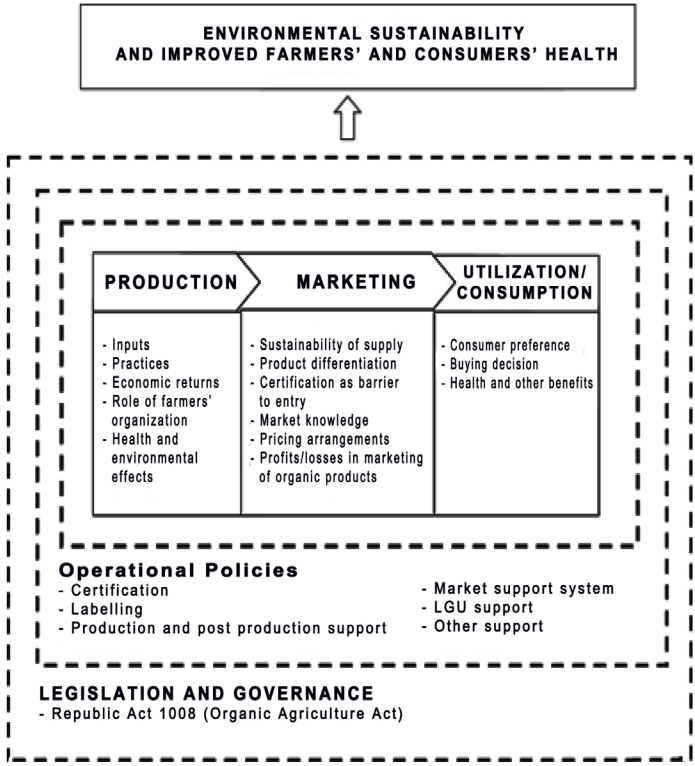

Figure 1. Policy and institutional framework for organic agriculture

The demographic characteristics of consumers such as age, education and income, among others, may influence their willingness and ability to buy organic vegetables. Their knowledge, attitude and perceptions, and practices likewise influence their willingness and decision to buy. Consumers' willingness and decision to buy would have influence on their level of utilization or consumption. Increases in demand for a product would most likely motivate producers or suppliers to offer more of a product or service. Increased production is viewed to improve the availability and affordability of organic vegetables in the local markets. Finally, increased consumption would have positive health and environmental effects that consumers perceive to gain from the utilization of organic vegetables.

Health and environmental impacts. The policies that support production, marketing, and utilization/consumption facilitate the achievement of the goal of environmental sustainability and improved farmer and consumer health. Rola and Pingali (1993) studied the effect of pesticide exposure on rice farmers' health by comparing the nonexposed group of rice farmers from Quezon with the exposed group of rice farmers from Nueva Ecija. The study revealed that prolonged exposure to pesticide results in health impairments affecting the eyes, skin, and respiratory tract. Prolonged pesticide exposure was also found to have cardiovascular and neurological effects. Pretty et al. (2001) stated that agricultural systems can have positive and negative effects. However, some costs are considered external and only a few have been costed. It is therefore important to carefully look at the interplay of agriculture, the environment, and consumer's health.

METHODOLOGY

Sources of Data and Data Analysis

Analysis in this paper was culled from a larger project funded by DA-BAR and implemented by the authors. In particular, the empirical application in this paper focuses on organic vegetables' production, marketing, consumption, and health and environmental implications. Both primary and secondary data were gathered.

Secondary data on production, area, yield, prices (e.g., farm, wholesale, and retail), and other relevant information were gathered from the Bureau of Agricultural Statistics (BAS) and related published and unpublished documents. Other secondary sources of data included reports and publications by the LGUs'–Office of the Provincial Agriculturist (OPAg) and Municipal Agriculture Office (MAO). Data obtained from the LGUs were the numbers, names, and addresses of farmers, traders, seed distributors, and dealers.

Primary data were gathered through consultations, key informant interviews, surveys, or focus group discussions (FGDs) with the industry's stakeholders such as the farmers; OPAg, MAO, and other LGU officials; DA; scientists/experts; traders of organic products; seed distributors and dealers; and household consumers.

Socio-economic surveys of vegetables farmers were done in the Provinces of Laguna, Benguet, and Bukidnon. The interviewed respondents chosen purposively were equally distributed within the three areas (Table 1). The respondents were classified into three: 1) organic (120 farmers); 2) combined (60 farmers), and 3) conventional (120 farmers). Overall, there were 300 farmer-respondents.

Table 1. Distribution of vegetable farmer respondents by province and classification, 2013

CLASSIFICATION	PROVINCE			TOTAL
	Benguet (n=100)	Laguna (n=100)	Bukidnon (n=100)	
Organic	40	40	40	120
Combined	20	20	20	60
Conventional	40	40	40	120

Respondents under the 'organic' category were farmers who did not use chemicals or synthetic fertilizers or those who applied concocted inputs such as Indigenous Microorganisms (IMOs). The IMOs have been found useful in removing bad odors from animal wastes and in hastening composting. These respondents were classified as such regardless of whether they acquired a third-party certification or not. Meanwhile, those belonging to the 'combined' category were adopting some organic farming practices but were also spraying or applying chemicals.

Respondents categorized under the 'conventional' group used chemicals and synthetic farm inputs in their operation.

Information on production and cultural practices, technologies developed and practiced, postharvest practices, marketing and distribution as well as health and environmental benefits of organically-grown vegetables were asked from farmers.

The study on marketing involved the interview of 149 vegetable-based market participants. Key informant interviews (KIIs) were done to generate the data. Analysis was done through careful investigation of the roles of the different market agents. Data on the volume of organic products that passed through the marketing intermediaries until they reached the household consumers, prices, marketing costs, marketing investments, marketing losses, marketing channels, marketing practices, factors affecting the trading business, and problems encountered were likewise important data gathered from the various stakeholders.

The 180 consumption study respondents comprised consumers and non-consumers of organic vegetables. Interviews were undertaken in major organic markets and restaurants as well as supermarkets and public markets in each study province. Consumers' data included knowledge, attitude, practices, perceptions, willingness to pay for organic products, and arguments on labeling of organic products. Perceptions and willingness to label their organic products were gathered from farmers and traders.

Moreover, KII was conducted among the focal/point persons for information on their education and communication activities in promoting organic agriculture. These persons came from the government and line agencies in the national, regional, provincial, and municipal levels; academic institutions/state universities and colleges (SUCs); research and development (R&D) and extension network offices; and NGOs in the areas under study.

Research tools included the use of structured questionnaires and observations of organic farms and organic markets. Descriptive analysis was employed in analyzing the various indicators.

RESULTS AND DISCUSSION

Production

Average area harvested and yield. The average effective area harvested per farm and the average yield per 1,000 m^2 were determined across respondent classifications and by type of vegetable crop (Table 2). For all types of vegetables covered in the study, conventional farmers registered the highest yield. Lettuce, broccoli, cabbage, and tomato planted under the combined farming system were found to have higher yields compared with those planted under the organic farming system. The inverse was true for string beans, Baguio beans, and eggplant. This shows that certain vegetables responded well to organic farming system as compared with other vegetables.

Average income. Organic vegetable farmers derived the highest gross income (PhP25,072.04) followed by farmers practicing combined farming system (PhP16,692.87), while the conventional farmers had the lowest gross income PhP11,064.86 (Table 3). This was attributed to the premium prices received by organic farmers as supported by the findings of the study. Among the three respondent types, organic farmers received the highest average price (PhP37.83/kg), followed by the combined farmers who received PhP20.91/kg. The lowest price received of PhP16.38/kg was reported by conventional farmers. Organic farmers also had the highest total expense with the bulk of cost coming from labor, followed by material inputs. As a result, farmers practicing combined farming system derived the highest net income followed by organic practitioners. Conventional farmers obtained the lowest net income (Table 2).

Constraints to production. About 60 percent of the vegetable farmers in the study expressed that they encountered production problems such as lack of access to inputs, pest and diseases, and labor constraints. Across respondent classifications, organic vegetable farmers registered the highest number of farmers with production problems (86%), followed by farmers practicing combined farming system (57%), and then the conventional vegetable farmers (33%).

Table 2. Average effective area harvested, production per farm, and yield per 1,000 m^2 of selected vegetables, by farmer-respondent classification, 2013

ITEM	CLASSIFICATION		
	Organic	Combined	Conventional
String beans	n = 30	n = 7	n = 3
Average effective area harvested (m^2)	1,193.20	1,521.40	3,616.70
Average production per farm (kg)	264.07	165.33	1,669.13
Yield per hectare (kg/1000 m^2)	221.31	108.67	461.51
Baguio beans	n = 28	n = 9	n = 15
Average effective area harvested (m^2)	1,239.30	2,242.20	4,238.00
Average production per farm (kg)	493.87	588.80	2,509.40
Yield per hectare (kg/1000 m^2)	398.50	262.60	592.12
Eggplant	n = 26	n = 9	n = 9
Average effective area harvested (m^2)	885.10	2,666.70	625.00
Average production per farm (kg)	443.40	1,287.73	746.67
Yield per hectare (kg/1000 m^2)	500.96	482.89	1,194.67
Lettuce	n = 21	n = 20	n = 5
Average effective area harvested (m^2)	2,128.10	970.00	3,357.80
Average production per farm (kg)	956.40	869.00	3,580.00
Yield per hectare (kg/1000 m^2)	449.41	1,028.49	1,066.17
Broccoli	n = 10	n = 13	n = 20
Average effective area harvested (m^2)	1,455.00	2,846.20	3,709.90
Average production per farm (kg)	452.90	2,706.70	5,314.80
Yield per hectare (kg/1000 m^2)	11,031.70	19,398.00	21,624.60
Cabbage	n = 6	n = 11	n = 48
Average effective area harvested (m^2)	1,455.00	2,846.20	3,709.90
Average production per farm (kg)	301.93	1,804.47	3,543.20
Yield per hectare (kg/1000 m^2)	207.51	633.99	955.07
Tomato	n = 10	n = 8	n = 32
Average effective area harvested (m^2)	1,531.70	6,425.00	5,427.00
Average production per farm (kg)	583.20	4,979.33	5,391.47
Yield per hectare (kg/1000 m^2)	380.75	774.99	993.45

Table 3. Average gross income, total expenses, and net income by vegetable farmer respondents, by classification, 2013

ITEM	CLASSIFICATION		
	Organic (n=120)	Combined (n = 57)	Conventional (n=119)
	(In PhP/1,000 m^2)		
Gross income	25,027.04	16,692.87	11,064.86
Total expenses	15,184.76	5,393.05	4,272.46
Material inputs	3,321.31	2,040.20	1,754.53
Labor	10,345.88	3,126.21	1,951.69
Post-harvest and marketing	1,517.57	226.64	566.24
Net income	9,842.28	11,299.83	6,792.40

Note: In the computation of income and expenses, extreme values from combined and conventional farming were excluded.

The spectrum of production problems reported by the farmers ranged from pest and diseases to financial concerns. Even with the advances in the packages of technology for production, the occurrence of pest and diseases (64%) remained to be a major concern for vegetable farmers across respondent classifications. The proportion of conventional farmers who suffered from the occurrence of pest and diseases (77%) was higher than the proportion of combined (68%) and organic vegetable farmers (57%).

Only 11 percent of the vegetable farmers across respondent classifications had labor constraints. Organic vegetable farmers had the highest proportion of farmers who encountered labor constraints (18%), followed by combined farmers (12%), and conventional farmers (4%). Organic vegetable farming was labor intensive and required a certain level of knowledge and skills.

In terms of accessing farm inputs across respondent classifications, only 17 percent expressed that they had problems accessing farm inputs. Organic vegetable farmers had the highest proportion of farmers with problems accessing inputs (23%), followed by combined farmers (17%), and conventional farmers (12%). Lack of capital remained to be the major concern of vegetable farmers in terms of accessing farm inputs. Organic farmers (37%) and combined farmers (40%) also cited the lack of supply of organic inputs.

Role of farmer organizations. More than half (54%) of the total respondents were members of an agriculture-related organization. Across respondent types, trends varied. Majority of organic farmers (77%) and combined farmers (63%) were affiliated with an organization. In contrast, only a fourth (26%) of the conventional farmers joined an organization (Table 4).

Table 4. Membership in organization by respondent type, 2013

RESPONSE	RESPONDENT TYPE							
	Organic (n=120)		Combined (n=60)		Conventional (n=120)		All	
	No.	%	No.	%	No.	%	No.	%
Member	92	76.7	38	63.3	31	25.8	161	53.7
Not member	28	23.3	22	36.7	89	74.2	139	46.3

Almost half (47%) of the respondents who were affiliated with an agriculture-based organization claimed that there were no problems inside their organization. Some of the respondents had problems on attendance during meetings (11%), availability of funds (10%), and minimal cooperation of members (9%).

Across respondent classifications, the organic farmers (40%) had the lowest share of respondents who said that their

organizations did not have any problem while the conventional ones, the highest at 61 percent. Poor attendance, inadequate funds, and lack of cooperation were usually cited by organic farmers. Poor attendance was also a common problem mentioned by the combined farmers. Financial matters seemed to hamper the conventional farmers and were also probably causing the disagreements and lack of cooperation among the members.

The role of farmers' organizations in the promotion and eventual adoption of organic farming system for vegetable production cannot be undermined. Across respondent classifications, 40 percent believed that the officers of their organization needed a refresher course in the manufacture of biological inputs (Table 5). Unlike conventional farmers who relied on readily available chemical inputs, combined farmers and organic farmers had limited supply of readily available organic fertilizers and biopesticides. Both organic and combined farmers had to learn how to use natural resources abundant in the area and process them into concoctions and fertilizers to be used in their farms. The preparation of organic inputs required a certain level of knowledge and a particular set of skills in order to produce their own organic fertilizers and concoctions.

Farm level health and environmental impacts. Vegetable farmers suffered from various illnesses whether they were practicing organic, combined, or conventional farming. The most common types of illnesses mentioned were headache/migraine, dizziness/nausea, vomiting, cough, cold/flu, fever, body pain, over fatigue, and allergies. A comparison of the estimated cost incurred due to these illnesses was made. Organic vegetable farmers estimated cost of illness ranging from PhP250–PhP10,860 while they were producing vegetables through conventional methods. Conventional farmers on the other hand, estimated a cost of illness value ranging from PhP700–PhP3,600 while they were producing vegetables. Vegetable farmers under combined classification estimated the cost of illness value from PhP500–PhP5,660. One of the probable reasons why conventional vegetable farmers shifted to organic farming was to avoid the cost of illness attributed to conventional farming methods.

Table 5. Training needs of officers on vegetable organic farming identified by farmer respondents affiliated with organizations, by 2013

RESPONSE	RESPONDENT TYPE							
	Organic		Combined		Conventional		All	
	No.	%	No.	%	No.	%	No.	%
Follow up training/ refresher course in formulating inputs	34	37.0	15	39.5	15	48.4	64	39.8
None	30	32.6	15	39.5	9	29	54	33.5
Post-harvest handling, packaging and marketing of organic products	14	15.2	3	7.9	1	3.2	18	11.2
No answer	7	7.6	3	7.9	2	6.5	12	7.5
Do not know	2	2.2	1	2.6	4	12.9	7	4.3
Others	5	5.4	1	2.6	3	9.7	9	5.6

Organic vegetable farmers believed that organic farming methods had a positive effect on soil quality, soil fertility, soil structure, and texture. Likewise, organic farming was believed to have improved soil acidity. All these improvements were known to have a positive effect on productivity. It was estimated that on average, vegetable farmers could save as much as PhP180-PhP5,230 per year from improved soil quality. These estimates were based on the farmer's reduction or total abandonment on the use of synthetic/inorganic chemical fertilizers.

In terms of the effect of organic agriculture on water quality, vegetable farmers perceived that organic farming practices led to cleaner/safer water to drink. Estimated savings due to improved water quality ranged from PhP250 to PhP1,800 per year. These estimates were derived from not having to buy mineral water for drinking.

In terms of biodiversity, organic vegetable farmers perceived organic farming methods to have a positive effect on biodiversity and air quality. However, it was difficult to put a value on these effects.

In terms of health benefits, the organic vegetable farmers perceived the highest average total cost of illness while they are still producing vegetables through conventional means. Organic vegetable farmers gave an estimated range of values from PhP250 to PhP10,860, while conventional farmers gave estimates ranging from PhP700 to PhP3,600. The average cost of illness was estimated by factoring in the number of days the farmers are absent due to illness, the cost of medicines, doctor's fees, and the cost of transportation to and from the clinic or hospital.

Market

The lack of sustainable supply of organically grown products made it difficult for farmers to market their products, particularly to institutional buyers (e.g., malls). In order to market the organically grown produce to supermarkets in shopping malls, farmers had to be able to forecast and commit a steady volume of produce.

Differentiating the organic products from conventional produce at the local market created additional burden to organic farmers. Similar findings were observed by Piadozo et al. (2014) in their study on rice farmers' concept and awareness on organic agriculture. Without much product differentiation, farmers cannot benefit from the premium price set for organic vegetables. In order to differentiate organic vegetables from conventionally grown vegetables, farmers would have to go into certification.

There are first-, second-, and third-party certification for organic products. The law currently provides and acknowledges third-party certification only. However, there are only two accredited certifying bodies in the entire country. One is the Organic Certification Center of the Philippines (OCCP) and the other is the Negros Island Certification Services (NICERT). The cost of certification and the process that farmers and farmer-groups have to go through for certification serve as barriers to enter the organic vegetable market.

Likewise, imperfect market knowledge hampers price control and decisions by organic vegetable producers. Organic vegetable farmers were aware that their products must command a higher price because of environmental and health benefits. However, lack of a ready market outlet and the relatively small volume of produce from smallholder farms hindered them from controlling pricing decisions. Some farmer organizations realized the importance of and have adopted labeling to enjoy the premium price set for organic vegetables. However, labeling without certification guaranteed product differentiation only at the local level. The produce was generally not acceptable as organic without third-party certification. Without certification, information on labels is limited to the brand name, name of producer, and a claim of health benefits. Under RA 10068, these producers cannot use the word 'organic.'

On the demand side, Nocon and Fujimoto (2006) observed that "some food establishments were considering stopping or not expanding their purchase of organic vegetables due to unstable supply, high price, non-certification, unreliability, poor quality, and no demand from current clients."

Furthermore, approximately 70-80 percent of organically produced vegetables in the study areas are sold and a very limited proportion (4-21%) was consumed at home. More than half of those marketed went to Metro Manila. Payment scheme for organic vegetables was mostly in cash. However, selling prices of these organic vegetables were dictated by the prevailing market price for conventionally grown vegetables primarily due to lack

of certification rather than the lack of market price information for organically grown produce. In NOAP, the LGUs are supposed to take the lead in establishing trading posts specifically for organically grown products. The implementation of this provision in the program greatly relied on the political will of the local chief executive.

Lastly, organic vegetable producers with third-party certification enjoyed high profit margins. There were associations where the profit margin reached up to 25 percent of their selling price. Traders of certified organically grown vegetables also gained huge profits even when they experienced pull outs.

Utilization/Consumption

Given the increasing interest on food quality and food safety, consumption of organic food has become popular. This section highlights the results of the survey among consumers and non-consumers of organic vegetables. Surveys were carried out in organic markets, public markets, and restaurants.

Majority of the respondents for both consumers (73%) and non-consumers (78%) of organic vegetables were females, with ages averaging between 25-45 years old, and mostly married. Most of the organic vegetable consumers were college graduates, professionals, and with mean monthly household income ranging from PhP21,550 (Benguet) to PhP46,277 (Laguna) and PhP29,970 across the three provinces. Non-consumers of organic vegetables were mostly high school (27%) and college graduates (29%), with more than one third (36%) of them engaged in business and nearly one-fourth (24%) without work. Across the three provinces, mean monthly household income registered at PhP15,651.

Consumer preferences. Majority of the non-consumers (71%) were aware of organic vegetables, with friends/relatives (35%), media (32%), and market (11%) as the major sources of information. Based on this knowledge, most respondents perceived organic vegetables to be safe because none or less chemicals

had been applied and therefore safer to eat than conventional vegetables. They also perceived organic produce to be good for the health (i.e., a cure for illnesses, may prevent sicknesses, and a source of anti-oxidants) and for the environment.

Consumers of organic vegetables placed high importance on health, nutrition, food safety, and environmental effects. On the other hand, the food preference of non-consumers of organic vegetables depended on taste and appearance/freshness (35%), food safety (26%), health and nutrition effects (16%), and affordability (16%).

Buying practices. Organic consumers bought vegetables with frequency ranging from daily to once a week (73%) with 6 percent of them growing organic vegetables. Majority (72%) of them also ate at restaurants offering organic food, with almost half of them practicing this daily to once a week. Weekly expenditures for organic vegetables in organic markets were highest in Laguna (PhP797), followed by Benguet (PhP468) and lastly in Bukidnon (PhP268). Expenditures for organic vegetables (organic markets and organic restaurants) by respondents averaged at PhP418 per week.

Non-consumers of organic vegetables were asked whether they were willing to consume these vegetables. All respondents of Bukidnon (100%) and majority of Benguet (96%) and Laguna (95%) were willing to consume organic vegetables because they believed that organic vegetables were good for the health (73%). In contrast, some were not willing to consume organic vegetables because they viewed these to be too expensive (67%), not good tasting (17%), and not always available in the locality (8%).

For both types of respondents, product price, product effects, availability, eating experience (taste), and visuals/ appearance influenced their decision to purchase. More than half (46%) of the non-consumers of organic vegetables preferred that the price of organic vegetables be the same as conventional ones. Close to one-third (32%) of them were willing to pay at price level higher by only 10 to 30 percent than conventional ones.

Health and other benefits. The growing interest on natural and organically grown crops is attributed to the perceived food safety and health benefits to consumers. Consumers' interest on food quality and food safety issues have resulted from the increased knowledge on the link between diet and health (McLennon, 2002). Piadozo et al. (2014) stated in their study that health benefits from consumption of organic products are enjoyed by both the consumers and the producers.

Respondents perceived that the consumption of organic vegetables to have benefits on health and nutrition. They said that these vegetables could lower sugar level, serve as sources of anti-oxidants, prevent some illnesses, regulate bowel movement, and lead to long life, among others. Another benefit of eating organic vegetables was the perceived food safety/quality because of no or less chemicals applied during production. Because these were naturally grown, these may be eaten raw or fresh.

Perceptions on labeling organic vegetables. Of the consumers of organic vegetables, 94 percent believed that organic vegetables should be labeled. Even non-consumers of organic vegetables (92%) perceived that organic vegetables should be labeled. The label should also indicate information on shelf-life, date of harvest, whether pesticides were applied or not (pesticide residue), and place of production. Most (87%) of the organic vegetable consumers surveyed were not aware of any policy on organic vegetables.

Operationalization of Organic Agriculture Law at the Local Level

It is important to know the status of the operationalization of the Organic Agriculture Law in the Philippines as previous studies have mentioned that advances in the organic agriculture sector have been driven by civil society (Salazar, 2005) and that there was a need for government to triple their efforts in disseminating information on organic agriculture (Piadozo et al., 2014).

Covering three selected vegetable growing provinces, Benguet, Bukidnon, and Laguna, the role and implementation mechanism of different stakeholder institutions (i.e., RFOs of line agencies, OPAg and MAOs, and NGOs) were studied.

The role of NGOs in promoting organic agriculture and in funding organic farming/sustainable agriculture and healthy lifestyle precedes the Organic Agriculture Act of 2010 (OAA). In Benguet (e.g., Jaime V. Ongpin Foundation, Inc. (JVOFI), Bukidnon (e.g., religious/church organizations), and Laguna (e.g., Costales Farm), organic agriculture was initiated by NGOs. When the Implementing Rules and Regulations (IRR) of OAA was finalized in 2012, the regional field offices (RFOs) of member-institutions of NOAB have been mobilized with DA, particularly BAFPS as the lead implementer.

The DA RFOs follow the guidelines (i.e., Philippine National Standards for Organic Agriculture and OAA-IRR) formulated by DA-BAFPS and the project monitoring system (PMS) of the certifying bodies (i.e., NICERT and OCCP). The NOAP funds are downloaded from DA and forwarded to RFO, which provide technical, financial, and other assistance to approved project proposals from the local government through the OPAg.

Both national and regional offices of the DA Agricultural Training Institute (DA-ATI) provide capacity-building activities (i.e., trainings and seminars) to provincial and municipal local government units (LGUs). It is mandated by law (e.g., OAA) that after the orientation training, LGUs should organize its Provincial and Municipal Local Technical Committee (P/MLTC). Once formalized, the LTC members would undergo a technical briefing to understand the organic protocols within the ambit of the Philippine National Standards on Organic Agriculture. The last activity in this capacity-building series would be the planning workshop for LTC to formulate the organic agriculture roadmap, which would specify the planned activities/projects. Project proposals that LGUs would submit to DA RFOs should be based on the roadmap. The capacity gap on project proposal preparation

and management, as respondents explained, was attributed to the low approval rate if not the low submission of project proposals (e.g., establishing trading post for organic product) from provincial LGU to DA RFOs).

Besides DA-ATI, the training (i.e., Internal Control System) that certifying bodies provide for group certification was seen as a mechanism to promote organic agriculture to farmers. The certifying bodies with membership and accreditation from international organizations [e.g., IFOAM, World Fair Trade Organization (WFTO), Certification of Environmental Standards (CERES), Gesellschaftmitbeschrankter Haftung (GmbH)] link domestic organic products to the world market with adherence to global standards. At present, the country has only two certifying bodies accredited by DA-BAFPS. With additional International Standard Organization (ISO) accreditation requirement from the certifying bodies, the perceived high cost of certification and the rigid certification process were pointed out as stifling the promotion of third-party certification, which is required by law.

The personnel of both the DA RFOs and the provincial/ municipal LGU agriculture offices narrated that they were "multi-tasking" due to lack of personnel in their offices. Multi-tasking meant that besides organic agriculture activities, they were carrying out other agriculture programs mandated for their offices. Aside from personnel, equipment and facilities were shared across different agriculture and fisheries programs. The DA RFOs relied on job contract (contractual) personnel due to fast staff turnover of focal persons on organic agriculture. The turnover came from retirement and transfer of office partly because of the rationalization plan. On the other hand, in the provincial/municipal LGU agricultural offices, the staff turnover and implementation of organic agriculture activities depended on the local leadership's priority programs. The active functioning of the Local Development Councils (LDCs) (i.e., conduct of regular meetings, formulation of organic agriculture ordinance or resolution for approval of *Sangguniang Bayan*, technology demonstration) necessitated the political will of the local executives.

Of the three provinces, Benguet (particularly La Trinidad) pioneered in organic agriculture and was named as the "Salad Bowl of the Philippines." This repute was earned through the initiatives of NGOs (e.g., JVOFI, the technical assistance of academic/higher education institution (e.g., Benguet State University), and the pro-active role of the provincial and municipal LGUs. Also in place were local ordinances for establishing organic market; the P/M LDCs that were regularly being convened; and interagency linkages among government, NGOs, farmers' organizations, and market distribution outlets/traders.

The role of the academe is important in the promotion and institutionalization of organic agriculture. The Benguet State University (BSU) in La Trinidad, Benguet has been conducting numerous information, education, and communication (IEC) activities for pro-organic agriculture since 2004, before the OAA was approved in 2010. The BSU had been declared as the organic agriculture university in the Cordillera Administrative Region (CAR) by the Regional Development Council. It now aims to be the organic agriculture university in Asia. The University receives local and international funding support for its various activities on organic agriculture.

The BSU houses the Cordillera Organic Agriculture Research and Development Center since 2009, now named as National Organic Agriculture Research and Development Center (NOARDC). It has integrated organic agriculture in its undergraduate and graduate academic programs as well as in its extension and production activities. The BSU has developed its Internal Guarantee System for Organic Farming, particularly in the production of strawberry, highland vegetables, and Arabica coffee. Besides having a research and extension building, BSU has a covered space for an organic vegetable market. This serves as an outlet for the organic vegetables produced by farmers and farmer cooperatives as well as by students of the university from their field trials or experiments.

In Laguna, even before the Organic Agriculture Act of 2010, the University of the Philippines Los Baños (UPLB) has been conducting research and extension activities in organic agriculture,

particularly on vegetables since 2006, with the project entitled "Determinants to Promoting Transition from Conventional to Organic Vegetable Production in CALABARZON." The project was funded by Japan International Cooperation Agency (JICA) through National Economic Development Authority (NEDA) IV-A. Moreover, UPLB faculty have developed learning modules for the non-formal education program of the University of the Philippines Open University (UPOU), which has been attracting more enrollees since it was first offered in 2012. The UPLB Institute of Plant Breeding and the DA-Bureau of Plant Industry Los Baños National Crops Research and Development Center (BPI-LBNCRDC) are in the forefront of developing organic seeds.

The Province of Bukidnon is popularly known as the 'food basket' of Mindanao, as well as "Mindanao's Baguio" (Benguet). It can also grow semi-temperate crops due to its climate. However, in terms of organic agriculture, the province is still just in its startup phase. During the FGD among the OPAg staff in Malaybalay, Bukidnon, participants revealed that they were unprepared about organic agriculture. Some of the agricultural extension workers or technicians did not even have a clear idea on what was organic. Further, they were confused which farming system to promote - conventional or organic - because they were handling both.

In all the provinces, the regional agricultural resources research and development consortia house the one-stop-information shop containing printed and learning resources developed/produced by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) of the Department of Science and Technology (DOST). In Bukidnon, the printed manual on organic agriculture of PCAARRD was photocopied by the regional and provincial agricultural offices, which served as their guide in providing technical assistance to farmers.

In the forefront of the implementation of organic agriculture program are the LGUs. They are expected to provide a conducive and supportive environment to expand more agricultural areas into organic farming especially with the lifting of the labeling moratorium in April 2016.

CONCLUSIONS

For all types of vegetables covered in the study, conventional farmers registered the highest yield, but they had the lowest gross income. Organic farmers incurred the highest total cost. Farmers practicing combined farming system derived the highest net income followed by organic farmers, and then the conventional farmers. Majority of the farmers were constrained by farm production problems, most especially the organic vegetable farmers. These problems included labor shortage, lack of access to inputs, and pest and diseases. Organic and combined farmers specifically pointed to the insufficient supply of organic fertilizers within their areas.

The organizations to which farmers were affiliated played pivotal roles in the promotion and adoption of organic farming as they served as providers of organic inputs as well as market outlets. Through such organizations (e.g., cooperatives), farmers were able to access information on organic vegetable farming. One concern in marketing was the relatively higher price of organic produce as compared with the conventional produce. Only high income groups could avail of or consume organic produce. Moreover, organic vegetables were not always available in the market.

The slow and costly certification process was another burden for organic farmers. For a developing country with numerous smallhold farmers, it is quite ambitious to pursue third-party certification at this time, especially in areas where organic farmers have not yet been organized into cooperatives or farmer associations. At the local level, the small number of traders and the lack of trading posts designated exclusively for organic product trading indicate that local demand for organic vegetables is still low.

The demand for organic products may be constrained by its high price as compared with conventionally or commercially grown products available in the market. While the Organic Agriculture Act of the Philippines in 2010 had long been passed,

implementing the salient provisions for market development is fraught with challenges. These challenges constrain both consumer demand and farm level expansion of organic agriculture. In the forefront of implementing the organic agriculture program are the LGUs, but capacity building is needed to enhance their effectiveness.

RECOMMENDATIONS

With the ASEAN integration in 2015 and the lifting (ending) of the moratorium on labeling/selling of uncertified products as organic in 2016, immediate action on supporting policies for the full implementation of the National Organic Agricultural Program is imperative. Below are the operational policy recommendations that can enhance expansion and adoption of organic agriculture as a technology.

Improve the Organic Agriculture Certification Process

Small-scale farmers do not have the financial capacity to certify their produce; hence, alternative methods of certification are needed. Although the law only allows third-party certification for organic products whether for domestic and international markets, the respondents recommended that certification should be relaxed. The government may consider the use of the Participatory Guarantee System (PGS) as first-party certification for locally consumed goods; the second-party certification will be for the country's regional consumption; and the third-party certification will be for the international market.

In preparation for the ASEAN integration, the BAFPS requires the organic certifying bodies in the Philippines to be ISO/IEC 17065 compliant to gain conformity with organic certifying bodies among ASEAN member countries. To intensify organic farming, more certifying bodies should be accessible to organic producers to enable them to compete in the ASEAN market.

The LGUs can help the organic agriculture industry by crafting ordinances to support the said industry in their locality, especially in helping farmer-groups undergo the certification process. The LGU can get an adviser for farmers to help them understand the certification process and prepare the requirements. Further, the LGU can assist in crafting guidelines for local or regional certification. For instance, the NICERT operates in the Visayas. In the same vein, a certifying body in the Cordilleras will be more efficient. There was also an observation that in other countries, the public sector certifies farmers' produce, while in the Philippines, this is done by the private sector. The public sector can possibly build capacities for a certification role.

The certification requirement has an implication on the labeling of organic products. Results of the study showed that consumers look for the following information from a label of an organic product: source or location of production, date of harvest, and the phrase 'natural,' 'environmentally-friendly,' 'pesticide free,' or 'chemical free.'

Certification is better carried out within the context of farmers' organizations. Farmers' organizations also provide both a legal personality and an avenue for small farmers to reach their target market and in accessing farm inputs. They serve as venues where farmers can directly sell their produce to consumers and enjoy a comfortable profit margin. Moreover, they play a major role in the post-harvest handling, packaging, and marketing of vegetables. Post-harvest handling and packaging inputs need equipment that may be considered costly if it is to be acquired by individual farmers. Packaging should also be considered in future studies as this has also some bearing on the quality and safety of organic vegetables.

Enhance Access to Organic Inputs and IEC Activities

Production of organic inputs can be enhanced to address farmers' problems on access to these inputs. Regional centers of the Bureau of Plant Industry (BPI) as well as the state universities

and colleges (SUCs) in the province may be tapped for this purpose. The BPI is mandated to develop new organic varieties and provide organic planting materials and seeds to farmers. The SCUs have instruction, research, extension, and production functions that can contribute to the IEC campaign for organic agriculture. For instance, these can be included in the schools' formal and non-formal education and extension activities. Agriculture-based SUCs have laboratory facilities and experimental stations, which can help develop new seed varieties and produce organic seeds for farmers. However, given their current financial resources, SUCs should be provided supplementary funding and be given upgraded facilities for organic seed development and production.

In each region, networks of agencies with common mandates can work together and coordinate one another's development activities. These agencies include the Regional Development Council of NEDA and the regional consortia of DOST-PCAARRD. Besides the LGU units, the regional consortia house the one-stop information shop and farmers information technology service (FITS) centers containing the repository of science-based publications and IEC materials (e.g., brochures, posters, calendars). Expertise of the researchers and extension personnel in the member-agencies can also provide technical assistance to farmers and LGU units.

The pivotal role of NGOs (i.e., foundations, religious sects, hobbyist groups) has been documented by the study. These organizations can start up the organic agriculture advocacy with initial funding for sustainable, chemical-free farming, and marketing assistance. Peoples' organizations and civic groups are also listed in some networks (e.g., councils and consortia) to have interest in organic agriculture.

Sustain the Role and Strengthen Capacities of Cooperatives in the Production and Commercialization of Organic Inputs and Products

Cooperatives are expected to serve as conduits of services needed by farmers. They are legal entities, which are allowed to

undertake business activities such as producing and marketing of organic inputs. However, their capacities have to be enhanced by continuous and updated trainings on organic agriculture production. The DA-ATI, SUCs, and line agencies can provide farmers and cooperative members with systematic capacity-building programs on the production of organic inputs (i.e., organic seeds, vermicomposting, bio-fertilizers, bio-pesticides); processing, packaging and labeling of organic products; and business operations in consolidating and commercializing organic inputs and products, and in the management of common facilities.

Facilities (e.g., vermi-chopper, greenhouse) should be subsidized by LGUs or LGUs can facilitate acquisition of these facilities from grants, which will enable farmers to be self-reliant in production inputs. With these facilities, cooperatives can be accessible sources of organic production inputs and products, which will ensure a steady, ready, and quality supply in the locality. Since the average production area for organic vegetables is small, smallholder farms must be organized to be able to consolidate their produce. Well-planned planting and harvesting or crop rotation should also be set in place.

Improve the Marketing System

Interviews with farmer-respondents revealed that no actual trading post specific for organic markets in the areas have been established. The provincial and municipal LGUs should be assisted in developing project proposals or a business plan for a public-private partnership in the establishment of trading posts. They should not only rely on government funds allotted for organic agriculture lodged in the DA RFOs. The establishment of trading posts in strategic market demand centers can increase access to organic products by consumers and traders as well.

In the marketing of organic produce, no apparent product disaggregation was observed in the study sites. For the protection of the consumers and easy identification of products, market outlets (e.g., public markets, supermarkets, trading posts, fairs, and exhibits) should provide separate display areas for organic

products and non-organic products. Likewise, with product disaggregation, farmers, farmer-traders, and other traders would receive a higher price premium for their organic commodities. Use of appropriate packaging and labels for easy handling and differentiation of organic from conventional products would benefit producers, traders, and consumers. The study found that consumers looked for the source or location of production, date of harvest, and the phrase 'chemical free' or 'pesticide-free', which were deemed as very important.

Provision of functional market information system will benefit the farmers who, in general, have limited knowledge on the market, price, and demand for organic products. On the other hand, traders and consumers need information on the sources of organic products. Market information system does not only require a good database but also wide media coverage in terms of public service announcements, news or advertisements in the mass media (e.g. television, newspapers), and online/telecom media (e.g., internet, text messaging) in support of organic agriculture.

Poor farm-to-market road affects both production and marketing of organic inputs and products. The Department of Public Works and Highways (DPWH) or the concerned LGUs should be able to address this infrastructure concern.

Adopt Strategies to Increase Demand for Organic Products

Apart from enhancing consumer awareness on the benefits of organic vegetables, the government can help increase demand for organic products by encouraging public establishments such as hospitals, schools, and government offices to serve organic produce. This will redound to more income for organic farmers. In related manner, if the price of organic produce is lower, more people can have access to organic products. Increasing the production of organic vegetables will result to lower price and make the produce more available in local markets. Farmers said that they would also like to reach out to the lower income groups.

Build Capacities of Local Implementers of the Organic Agriculture Program

A cadre of personnel in the LGUs, field, regional, and national offices dedicated solely to organic agriculture can increase their credibility and trustworthiness among organic producers. The present study found that personnel were multi-tasking with different agricultural programs assigned to them as they shared common agency facilities (i.e., computer, vehicle). Capacity building of LGU personnel should go beyond teaching them the appropriate technology and technical training on organic agriculture. The trainings should include linkage to market outlets, business operations in managing trading posts, and proposal preparation of organic agriculture projects and memoranda of agreement with local communities and cooperatives.

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