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Going organic: Understanding the organic vegetables production environment in Central Luzon, Philippines

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Organic vegetable production is a system based on the principle of taking care of nature accounting all life forms. It is a progressing industry in the Philippines given the increasing need for healthy and safe food and in effort to contribute in protecting the environment. The research aimed to characterize organic vegetables production environment in Central Luzon, Philippines. Survey, key informants interview and focus group discussion were used in generating data from 72 organic vegetable farmers and 32 conventional vegetable growers from the provinces of Nueva Ecija, Pampanga, and Zambales. Descriptive statistics, cost and return, input utilization, technology attributes, and extent of technology utilization were used in data analysis. Results indicate that despite the noted inadequacies, the bio-physical, socio-economic and institutional environment of organic vegetable production in Central Luzon can provide a good opportunity that can be tapped in the promotion and adoption of organic vegetable production in the region. His major organic vegetables raised across sites were eggplant, tomato, ampalaya and stringbeans. The common organic vegetable production technologies being adopted were the use of organic fertilizers, use of bio-pesticides, crop rotation, compost application, green manuring, use of biological control and mulching. As to farm management practices, the vegetable growers generally relied on their long years of experience in vegetable farming, infusing knowledge learned from the trainings in the use of organic inputs particularly in land preparation, nutrient management and control of pest and diseases. The returns in organic vegetable production in all sites is promising given the acceptable, at par and even better yield per 1000 sq m, net income, and return to total operating expenses compared to conventional vegetable production. There are generally very few organic farmers in Central Luzon at the time of survey with evident low utilization of organic vegetable production technologies. While they have a good understanding of the concept of organic farming, the capacity of the farmers to adopt organic farming standards including labelling and certification is generally low. The expanding vegetable organic vegetable industry in the country, the potential area for expansion, potential market and value adding activities, GOs and NGOs support and the evolving legislation on organic agriculture were the cited opportunities that can be taken into advantage in an effort to push for a vigorous organic vegetable production in the region. The risk, problems and constraints in organic vegetable production are many, but can be addressed through an integrated organic vegetable production program in the region. This calls for a holistic organic consciousness campaign, prioritization and localization of organic

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vegetable production, intensifying capability building, subsidizing and localizing organic certification, and effective price monitoring and dissemination mechanism.

Key words: organic vegetables, organic technologies, attributes, utilization

Introduction

Organic vegetable production is a system based on the principle of taking care of nature accounting all life forms. It is a progressing industry not only in the Philippines but mostly in Europe, America, and other Asian countries. This agricultural practice is economical and health-wise, it does not use costly synthetic and harmful toxic chemicals. Vegetables as part of the Filipino subsistence, be it as food or as source of livelihood cannot be undermined. All the 43 popular kinds and 250 lesser-known species of Philippine vegetables are important sources of minerals, vitamins, fiber and proteins.

Consumers' concern with food quality and safety, as well as the protection of the environment, were the first to stimulate demand for organic products that become the driving force in the development of organic agriculture, particularly in the industrialized countries. Governments have responded by setting targets for the expansion of organic production, and new market opportunities have been developed as part of the strategy to address such concerns (FFTC, 2007). Moreover, the ecological implications of organic vegetables production are without doubt and in accord with the Philippine government's policy of advancing the right of the people to a balanced and healthful ecology in concurrence with the rhythm and harmony of nature (Art. II, Sec. 6, Philippine Constitution).

Increasing sales of organic foods, changes in dietary habits, major food safety concerns, and greater personal health awareness have led to greater consumer interest in documentation of production practices for fresh fruits and vegetables, especially for certified organic crops. Research on organic farms, done over several decades, has revealed characteristics associated with sustainable farming, such as reduced soil erosion, lower fossil fuel consumption, less leaching of nitrate, greater carbon sequestration, and little to no pesticide use (Kuepper, et al 2004).

The present consumption of vegetables in the country has been increasing over time (Digal and Montemayor, 2007). From 1990-2005, the increase in the annual consumption rate of 1.6% has exceeded the local growth in annual production of 1.5%, thus resulting in annual deficit of 408,000 metric tons. The major reasons for the increasing trend in vegetable consumption include: growing urban population, increasing income and expanding demand

for quality and processed vegetables (Concepcion and Digal, 2004 and Concepcion, 2005 as cited by Digal, 2007).

However, data and information on organic vegetables production in the country are very few, if any. The Philippine Council for Aquatic, Agriculture Resources Research and Development acknowledges the inadequacy of the database apart from the minimal and fragmented research and development (R&D) efforts on organic farming in general and organic vegetables production, in particular. In the past, and even in recent times, policy planners and implementers, S&T experts, practitioners and other stakeholders did not have solid background as bases in enhancing the promotion of and providing the needed support to this budding sector. The project generally aimed to generate baseline data and information through documentation of the socio-economic, biophysical, technical, and institutional environment surrounding organic vegetables production in Central Luzon, Philippines as basis for identifying interventions, strategies, and policy directions to boost organic vegetables industry in the country.

Materials and methods

Project Sites and Respondents

The priority provinces of Nueva Ecija, Pampanga and Zambales.were identified as the research sites considering the area cultivated, volume of organic vegetable production and number of organic vegetable farmers.

Complete enumeration of the organic vegetables farmer-respondents was done in the covered provinces. A total of 72 organic farmers (19, Nueva Ecija; 26, Pampanga and 27, Zambales) served as respondents. Thirty two conventional growers (11, Nueva Ecija; 9, Pampanga and 12, Zambales) were also interviewed for comparison purposes.

Data collection and analysis

Reconnaissance survey, farm level survey using structured questionnaire, use of secondary data, key informants interview and focused group discussion were used in data collection. Descriptive statistics were used to qualify and summarize descriptive data. The descriptive part defined and assessed the organic vegetables production environment (socio-economic, biophysical, technical, and institutional) and ascertained the risks, opportunities, problems and constraints.

Technical data obtained from the documented management practices and organic input utilization, were compared with data generated from conventional vegetables production practices. To measure the extent of input utilization in organic vegetables production, the ratios between production factors and output were determined per unit area of 1000 sq m. The following ratios were used: a) Capital-Output Ratio (COR) is the ratio between total cost of production and the value of total output which implies how intensive capital was used; b) Labor-Output Ratio (LOR) is the ratio between total farm labor (in man-days) and total value of output which implies how intensive labor was used; and c) Land-Output Ratio (SOR) is the ratio between the total area cultivated (in ha) and total value of output which implies how productive land was used.

Cost and return analysis was used to determine profitability. Technology attributes of the organic vegetables technologies used were determined based on the five characteristics of technologies established by Rogers (1983), namely: relative advantage, trialability, observability, simplicity and compatibility. The attributes were measured using a 5-point scale where the respondents were asked to rate the attributes from 1-5.

The extent of organic vegetables production technology (OVPTs) utilization was based on the component techniques/technologies and practices applied or used in the production of organic vegetables. The other criteria used were number of organic vegetables grown, percentage of organic vegetables to total number of vegetables grown and percentage of organic vegetable area cultivated to total farm area.

Results and discussion

Characterization of Organic Vegetable Production Environment

The characterization focused on size, accessibility, major productive enterprises, commerce, bio-physical characteristics and available institutional support services in the provinces of Nueva Ecija, Pampanga and Zambales. The three provinces of Central Luzon are endowed with human resources that can be utilized in vegetable farming given the substantial population (1,853,853 in Nueva Ecija, 1,911,951 in Pampanga and 493,085 in Zambales as of 2007) and the number of farmers engaged in vegetable farming (3,962 in Nueva Ecija, 7,985 in Pampanga and 9,463 in Zambales). The average household size ranging from 5-6 is indicative of available labor resources at the farm level.

The bio-physical endowments of the documented sites are favorable and beneficial to organic vegetable production in Central Luzon such as land area,

climate, topography, type of soil, relative humidity and amount of rainfall. The three provinces boasted of huge land area in particular, with Nueva Ecija having the biggest land area at 550,718 ha while Zambales and Pampanga had a total land area of 371,440 ha and 275,515 ha, respectively. Of the total area in Nueva Ecija, Pampanga and Zambales, agricultural arable lands is recorded at 264,736 ha, 149,527 ha and 73,366 ha, respectively, wherein higher proportion of the agricultural land in all sites are irrigated.

The three provinces are highly accessible with good road conditions and near the major organic vegetable demand center which is Metro Manila, with Pampanga being the nearest as (70 km away from Metro Manila).

The major productive enterprise in the three provinces is rice production, with onion, corn and vegetables as secondary crops. The biomasses produced by these major crops are important sources of raw materials for organic inputs production. The presence of substantial number of major animals raised such as carabao, cattle, goat, swine and chicken are indications of available sources of animal manure needed in the production of organic fertilizer which is a major input in organic vegetable production.

While a good number of input suppliers, mainly handling agricultural chemicals (inorganic fertilizers and pesticides) are also present in Nueva Ecija (95), Pampanga (49) and Zambales (27), very few or nil are supplying organic inputs.

As to institutional support services, all sites have access to R and D institutions where credit can also be accessed through the formal sources such as LandBank of the Philippines, rural and other private banks and cooperatives. Educational and health facilities, which are both government and privately run, are present in all sites. All sites also have existing cooperatives by which most farmers are members. The NGOs present include the Full of Grace in Nueva Ecija and the Federation of Free Farmers (FFF) in Zambales. These institutions are important and vital and indeed can be tapped in promoting organic vegetable production in the region. Marketing infrastructures such as wet markets, Bagsakan Center and malls, as well as agricultural processing facilities such as cold storages and processing plants, are also present in the sites.

The much appreciated initiatives of the NGOs in organic farming is complemented by the evolving government support services and initiatives that can be traced to the adoption of the Philippine National Standards for Organic Agriculture and Processing through the DA-BAFS; Administrative Order # 13 which provides the guidelines for certifying body; EO 481 which calls for the promotion and development of organic agriculture in the Philippines and very recently the Organic Agriculture Act of 2010 which hopefully will provide a

big boost in the pursuit of a robust organic industry in the region and the nation as a whole.

Socio-Economic and Demographic Characteristics of Organic Farmer Respondents

The organic vegetable growers in Central Luzon were generally very few. They were smallholder farmers with average farms less than two hectares. The average area cultivated by organic farmers was recorded at 0.27 ha, 0.31 and 0.36 ha in Nueva Ecija, Pampanga and Zambales, respectively. They were organized through associations and cooperatives getting support from GOs and NGOs (DA, Full of Grace and Federation of Free Farmers). The group of farmers in Nueva Ecija was into full organic vegetable production, while those in Pampanga were in transition, and in Zambales, in conversion. Those in Nueva Ecija were into full organic vegetable production, indicating that they had completed the three year conversion process and refrained from using chemical fertilizers and pesticides. They had undergone first party certification given the certification criteria and rules enforced and monitored by the farmers themselves. They had also undergone second party certification, with the Full of Grace, being the buyer of their produce. The Full of Grace defined, monitored, and enforced the certification criteria and rules.

The Pampanga farmers were categorized as into transition as they were still in the process of using 75:25 organic and inorganic inputs. In Zambales, the farmers were into conversion as they had started the period of organic management and intended to continue to do so after the three year conversion period.

Most of the organic vegetable grower-respondents were literate having reached and completed high school level with some who completed a degree and yet opted to venture in vegetable production. The Nueva Ecija farmers had more experiential knowledge in organic vegetable production having been into it for about six years as compared to Pampanga (2.8 years) and Zambales (2.4 years). The number of siblings could be as small as 2 and as large as 15 which is indicative of the potential source of labor in organic vegetable production. The farmers also owned the basic farm implements and animal needed in vegetable production.

The organic vegetable farmers generally received fragmented and topic oriented training which mainly focused on organic vegetable production technologies and the production of organic fertilizer. It is good to note however, that the Full of Grace and FFF and Organic Certification Center of the

Philippines (OCCP) as training providers, included organic farming standards and quality control/certification in the trainings provided. What remains to be missing were organic conversion guides and procedures to assist farmers in shifting to organic methods of producing vegetables including the establishment of internal control system which is a prelude to organic certification and in an effort to improve the capacity of farmers to adopt organic farming standards.

Despite the noted inadequacies, the existing socio-economic and institutional environment in the documented sites provides a good opportunity that can be tapped in the promotion and adoption of organic vegetable production in Central Luzon. The presence of NGOs such as Full of Grace and FFF in Nueva Ecija and Zambales, respectively, provides a much needed support mechanism and training, which is found wanting in Pampanga.

Cultural Management Practices and Organic Inputs Use

As to farm management practices, the vegetable growers generally relied on their long years of experience in vegetable farming, infusing knowledge learned from the trainings in the use of organic inputs particularly in land preparation, nutrient management, and control of pest and diseases.

The organic fertilizer and organic pesticides used and method of preparation were generally similar in all sites except for the raw materials used which correspond to the readily available raw materials in the said areas. In Nueva Ecija, rice straw and chicken manure were used in organic fertilizer production as well as Solex. In Pampanga, the raw materials used were chicken/pig manure, carbonized rice hull and sawdust, and used EM. In Zambales, rice hull, green leaves, fruit peelings and animal manure were used as well as vermi-worm as activator. Most of the farmers produced their own organic inputs except for some 13.9% of them who clamor for sufficient supply of quality organic inputs in the market.

The other organic inputs produced were fermented plant juice, calcium phosphate, ginger and garlic extract, Kangkong extract and fish amino acid. In the focus group discussion conducted, the respondents were in unison in claiming the benefits derived from the use of organic inputs. The benefits were health-related, low-cost, and availability of the raw materials. They also claimed however, that the preparation of these inputs, to some extent are laborious and time consuming. Considering the differing responses on the frequency, dosage and timing of application of the organic inputs, as well as the

inadequacy in identifying the pests, the farmers need follow-up hands-on training.

Organic Technology Utilization and Perceived Attributes of OVPTs

Of the organic vegetable production technologies (OVPTs) utilized as shown in Table 1, the use of organic fertilizer was adopted by almost all of the organic grower-respondents (98.6%), followed by the use of bio-pesticides (55.6%), crop rotation (51.4%) and compost application (51.4%). Green manuring and mulching were adopted by 31.9% and 16.7% of the respondents, respectively while the least adopted was the use of earwig as a biological control (3.8%).

Majority of the respondents indicated that they are willing to encourage other farmers in their area to use OVPTs, an indication of the good experience that they have in adopting the said technologies. They also reasoned out that the use of OVPTs will protect the farmers health condition (31.9%); help reduce/avoid utilization of synthetic fertilizer (29.2%); protect the environment (20.8%); share knowledge and benefits of adopting the OVPTs (13.9%); reduce cost of production and to join the organic farmers group (9.7%); food security (4.2%); high yield and farm waste utilization (2.8%) and improvement of soil condition (1.4%).

Table 1. Organic vegetable production technologies adopted

PARTICULARS	NUEVA ECIJA (n=19)		PAMPANGA (n=26)		ZAMBALES (n=27)		CENTRAL LUZON (n=72)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Technologies adopted*								
Use of organic fertilizer	19	100.0	26	100.0	26	96.3	71	98.6
Use of biopesticides	11	57.9	15	57.7	14	51.8	40	55.6
Crop rotation	18	94.7	8	30.8	11	40.7	37	51.4
Compost application	12	63.2	10	38.5	15	55.6	37	51.4
Green manuring	8	42.1	4	15.4	11	40.7	23	31.9
Mulching	1	5.3	8	30.8	3	11.1	12	16.7
Use of biological control (earwig)			1	3.9			1	3.8

The perceived technology attributes of the OVPTs were determined based on the five characteristics of technologies established by Rogers (1983). The mean rating obtained for relative advantage was 4.5 indicating a very high relative advantage of the OVPTs (Table 2). This means that the OVPTs have greater ecological, economic and other merits than the conventional means of producing vegetables. The respondents perceived the OVPTs to improve soil fertility; ensures food safety; provides health benefits; allows environmental

resource sustainability; entails less cost of production and apparent increasing consumers demand for organic vegetables.

Table 2. Perceived attributes of organic vegetable production technologies in Central Luzon.

PARTICULARS	MEAN RATING				
	Nueva Ecija (n=19)	Pampanga (n=26)	Zambales (n=27)	Central Luzon (n=72)	DESCRIPTION
Relative Advantage	4.7	4.5	4.5	4.5	**Very High**
Simplicity	4.6	4.2	4.2	4.3	**High**
Compatibility	4.3	4.2	4.0	4.2	**High**
Observability	4.5	4.2	4.2	4.4	**High**
Trialability/Adaptability	4.6	4.2	4.4	4.3	**High**
Overall Mean Rating	**4.6**	**4.3**	**4.3**		
Description	**Very High**	**High**	**High**		
Legend					
4.3-5.0 -Very High	3.5-4.2- High	2.7-3.4-2 -Moderate	1.9-2.6- Low	1.0-1.8- Very Low	

As to simplicity, the 4.3 mean rating indicates that the OVPTs were highly simple and can be learned and used easily, and adaptable with readily available inputs and materials. The compatibility attribute was also rated high with a mean rating of 4.2 which indicates that the OVPTs were compatible with the existing resources and other agricultural production practices of the farmers. With regards to observability, the 4.4 mean rating obtained indicates high observability which means that the outcomes/advantages/benefits of OVPTs were clear and demonstrable, and could easily be reported or communicated. The OVPTs were rated to be highly triable with a mean rating of 4.3 which indicates that these were applicable in small scale that could be tried by other farmers and in other locations other than their own.

Despite the positive perceived attributes, the organic technology utilization in all the documented areas was low (Table 3). The low organic technology utilization indicates the limited OVPTs used, limited kind of organic vegetables being produced and limited/small area devoted to organic vegetable production. Moreover, the low technology utilization, particularly in Pampanga and Zambales, is an indication that despite the expressed benefits of shifting to organic vegetable production, utilization did not happen spontaneously and that utilization clearly followed a pattern of a slow start given that most of the organic farmers were still in transition/conversion phase. This can also be attributed to the risk aversion characteristics of the farmers and their limited experiential knowledge where farmers' skepticism and wait and see attitude also come in as farm yields may decrease at the start of the conversion process. Further, farmers were often told that it takes time to fully

realize the benefits of organic farming and the conservative attitude in them, leads to apprehension on increasing the area intended for organic vegetables production.

The constraints to organic technology utilization included: infrastructure, given the apparent limited market for organically grown vegetables and local markets that can offer premium price for the organic produce. Moreover, the organic vegetable grower-respondents (33.3 %) cited the lack of financial support and access to credit facilities and absence of incentives in organic vegetable production as constraints. Another constraint is the simple unavailability or inadequacy of organic inputs in the market which requires not only the substantial introduction of quality organic inputs in the market but also the involvement of enterprising manufacturers, dealers and input suppliers to take active part in providing the required inputs.

Table 3. Extent of technology utilization of organic vegetable grower-respondents in Central Luzon.

UTILIZATION INDICATOR	MEAN RATING			Overall Mean Rating	Description
	Nueva Ecija (n=19)	Pampanga (n=26)	Zambales (n=27)		
Number of organic farming technologies used	2.6	1.5	1.9	2.0	**LU**
Number of organic vegetables grown	2.3	1.3	1.7	1.8	**VLU**
Percentage of organic vegetables to total number of vegetables grown	2.4	2.1	2.1	2.2	**LU**
Percentage of organic vegetable area to total farm area	3.8	1.3	2.3	2.5	**LU**
Overall Mean	**2.77**	**1.57**	**1.98**	**2.11**	
Description	**MU**	**VLU**	**LU**	**LU**	

Weighted Mean	Description
4.3-5.0	Very High Utilization (VHU)
3.5-4.2	High Utilization (HU)
2.7-3.4	Moderate Utilization (MU)
1.9-2.6	Low Utilization (LU)
1.0-1.8	Very Low Utilization (VLU)

Vegetable Grower-respondents Business Skills and Level of Awareness on Consumers' Preferences

Both the organic and conventional vegetable grower-respondents' perceived business skills in all areas (technical, marketing, financial, overall farm management) were generally fair to good indicating that they remain to view vegetable production as a farming endeavour rather than as a business enterprise and much is to be desired to improve their entrepreneurial knowledge and skills. The respondents rated their level of awareness on consumers'

preferences on vegetables using quality, preferred variety and size/grade as the criteria. Both the organic and conventional farmer-respondents were very aware of consumers' preferences on vegetables, indicating that they are greatly knowledgeable of what the consumers want and in effect use these as important information in decision making related to vegetable production.

Quality wise, they were aware that consumers wanted fresh, newly harvested, without insect damage, glossy in skin and sweet in taste vegetables. As to variety, the commonly preferred varieties according to them were the hybrid varieties which they are using, while others indicated their own produced seeds. The **tomato v**arieties used and preferred by consumers were Atlas, Condor, Diamante and Apollo. For eggplant, the varieties were Dumaguete Long Purple, Casino, and Domino. For amplaya, Sta. Rita and Galaxy were the varieties used and preferred by consumers while for stringbeans, these were Galante, Negro Star and Mariposa. As to size and grade, the grower-respondents indicated that the consumers generally prefer the medium sized vegetables.

Capacity to Adopt Organic Farming Standards including Certification

The organic vegetable farmer-respondents generally have a good understanding of the concept of organic vegetable production (Table 4) as they have cited the following: chemical free vegetable production (72.2%); safe and healthy food (43.1%); soil fertility/soil health maintenance (20.8%); safe environment(15.3%); less cost of production (12.5%); and not prone to insect infestation (5.6%). The cited concepts adhere to the general principles of organic agriculture such as health, ecology, fairness and care. Generally, the principles point to the sustenance and enhancement of the ecosystems and organisms including human beings. Input reduction is also emphasized complemented by reuse, recycling and efficient management of materials and energy in order to maintain and improve environmental quality, conserve resources and produce high quality, nutritious food that contributes to preventive health care and well being (IFOAM).

Training proved to be an important avenue in understanding the concepts of organic vegetable production as cited by 63.2%, 76.9%, and 55.6 % of the farmer-respondents from Nueva Ecija, Pampanga and Zambales, respectively. Very few (2.8%) indicated that they learned the concepts through print and mass media that could be an indication of lack of access and inadequate avenues to access such information.

It is important to note that only 5.6% of the organic vegetable grower-respondents cited not prone to insect infestation as part of their concept of

going organic, in the same manner that only 1.4% of them indicated that organic plants are tolerant to insect pests. This indicates that pest and disease infestation remains a crucial concern and pose a risk since it is recognized that the efficacy of organic pesticides are generally less than that of chemical pesticides. This concern hence, calls for further research and development endeavours that will improve the efficacy of organic pesticides.

Table 4. Concepts and understanding of organic vegetable farming in Central Luzon.

Concepts/Understanding	NUEVA ECIJA (n=19) Full Organic		PAMPANGA (n=26) In Transition		ZAMBALES (n=27) In Conversion		CENTRAL LUZON (n=72)	
	Freq.	Percent (%)	Freq.	Percent (%)	Freq.	Percent (%)	Freq.	Percent (%)
Chemical free vegetable production	14	73.7	14	53.8	24	88.9	52	72.2
Safe and healthy food	7	36.8	14	53.8	10	37.0	31	43.1
Soil fertility/ soil health maintenance	1	5.3	13	50.0	1	3.7	15	20.8
Environmentally safe practices	5	26.3	3	11.5	3	11.1	11	15.3
Less cost of production	3	15.8	1	3.8	5	18.5	9	12.5
Not prone to insect infestation	1	5.3	1	3.8	2	7.4	4	5.6

The disadvantages in shifting to organic vegetable farming as cited by the respondents were: organic vegetable produce is not sufficient to feed the whole population/lesser yield; laborious fertilizer and bio-pesticide production; limited market outlet/low demand and organic products command same price with the conventional products. The perceived disadvantage on lesser yield is indicative of a perceived risk in organic vegetable production but could merely be an initial perception as most of the organic vegetable-grower respondents are still in conversion process. The preparation of organic fertilizers and pesticides are claimed to be laborious and time consuming by the farmers (16.7%) and this can be the reason why some 13.9% of the respondents clamor for the availability of quality organic inputs in the market, particularly to be found in the shelves of agricultural input suppliers in their locality. The limited market outlet, low demand and absence of price differential is more apparent in Pampanga and Zambales where marketing of organic vegetables is limited to local markets, and the low awareness of local consumers on the benefits of organic produce is crucial in creating a demand for such. Further, both organic

and conventionally produced vegetables co-mingle in the local markets in the two provinces, hence similar prices are received and premium price for organic vegetables cannot be expected.

While the organic vegetable growers have a good understanding of the concept of organic farming, the capacity of the farmers to adopt organic farming standards including certification is generally low although much better among the Nueva Ecija farmers. The Nueva Ecija farmers are to some extent knowledgeable of the organic farming standards and employ an internal control system (ICS) through the support of the church-based Full of Grace (Fig. 1). The Zambales grower-respondents are ably supported by the FFF in the conversion process. Inadequate or lack of production conversion guides and assistance particularly in Pampanga is evident that is important in assisting them in shifting to organic methods.

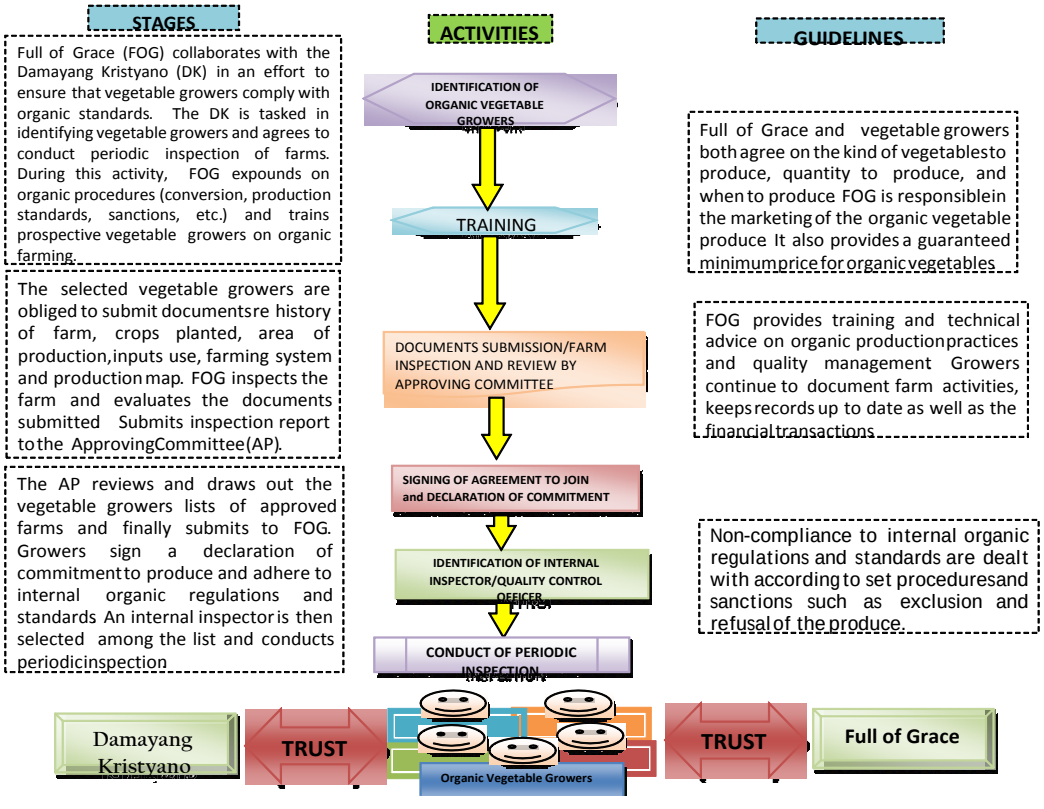

Fig. 1 Stages and guidelines, Internal Control System in Nueva Ecija

Profitability and Extent of Input Utilization

The returns in organic vegetable production in all sites was promising given the acceptable, at par and even better yield per 1,000 sq m, net income, and return to total operating expenses compared to conventional vegetable production.

The comparative cost and return analyses of vegetable production in Nueva Ecija showed a more profitable organic vegetable production than conventional growing (Table 5). In tomato, higher yield was obtained at 470.4 kg in 1000 sq m compared to 250 kg produced the conventional way, leading to higher net income and returns to total operating expenses at PhP4,171.6 and 55.0%, respectively, for organic farms than in conventional production (PhP2,398.8 and 47.0%, respectively). In eggplant, similar trend can be observed, as higher yield was obtained in organic production (739.4 kg per 1000 sq m) than in conventional eggplant production (391.3 kg).

A very high net income was obtained in organic eggplant production (PhP17,301.5) compared to only PhP2,661.7 in conventional, generating a return to total operating expenses of 201.7% in organic eggplant production compared to 44.8% in conventional. In stringbeans, higher yield and higher price was observed in organic production recorded at PhP18,357.1 and PhP25 per bundle, respectively compared to conventional production recorded at PhP9,570.3 and PhP17 per bundle, respectively. Consequently, higher net income was received in organic stringbeans production at PhP8,092.9 than in conventional production (P1,224.8) even though the total operating expenses was higher in organic than conventional stringbeans production (PhP10,264.3 and PhP8,345.6, respectively). The returns to total operating expenses obtained in organic stringbeans production was high at 78.8% compared to only 14.7% in conventional.

The comparative input utilization ratios of vegetable production in Nueva Ecija (Table 6) revealed a lower capital-output ratio (COR) in organic vegetable production (0.5894 for tomato, 0.2724 for eggplant and 0.5031 for stringbeans) than in conventional production (0.6802 for tomato, 0.6908 for eggplant and 0.8720 for stringbeans). This means that organic vegetable production is a non-capital intensive and a high-output generating activity.

Table 5. Comparative cost and return analyses of vegetable production in Nueva Ecija.

PARTICULARS	TOMATO (1000 sq m)		EGGPLANT (1000 sq m)		STRINGBEANS (1000 sq m)	
	Full Organic	Conventional	Full Organic	Conventional	Full Organic	Conventional
I. GROSS INCOME	**11,759.44**	**7,500.00**	**25,878.31**	**8,608.70**	**18,357.14**	**9,570.32**
Yield (kg-bundle)	470.38	250	739.38	391.30	734.29	562.96
Price per kilogram	25.00	30.00	35.00	22.00	25.00	17.00
II. EXPENSES						
A. Operating Expenses						
1. Labor	3,872.56	3,358.75	4,583.91	1738.77	7,541.97	2021.33
2. Material Inputs	3,058.47	1,742.50	2,466.28	4,208.21	1,693.03	6,324.23
3. Transportation cost	656.87		1,526.62		1,029.29	
Total Operating Expenses (PhP)	7,587.89	5,101.25	8,576.82	5,946.98	10,264.29	8,345.56
Net Income (PhP)	**4,171.56**	**2,398.75**	**17,301.49**	**2,661.71**	**8,092.86**	**1,224.76**
Return to Total Operating Expenses (%)	55.0	47.0	201.7	44.8	78.8	14.7
Average Production Cost (PhP/kg)	16.13	20.41	11.60	15.20	13.98	14.82
Break Even Yield (kg)	304	170	245	270	411	491

Table 6. Comparative input utilization ratios of vegetable production in Nueva Ecija.

PARTICULARS	TOMATO (1000 sq m)		EGGPLANT(1000 sq m)		STRINGBEANS (1000 sq m)	
	Full Organic	Conventional	Full Organic	Conventional	Full Organic	Conventional
Capital - Output Ratio	0.5894	0.6802	0.2724	0.6908	0.5031	0.8720
Labor - Output Ratio	0.0148	0.0011	0.0048	0.0005	0.0068	0.0016
Land - Output Ratio	0.0850	0.1333	0.0386	0.1162	0.0545	0.1045

A higher labor-output ratio (LOR) was observed in organically grown vegetables in Nueva Ecija (0.0148 for tomato, 0.0048 for eggplant and 0.0068 for stringbeans) compared to the conventionally grown vegetables (0.0011 for tomato, 0.0005 for eggplant, and 0.0016 for stringbeans). While the less than one values of the LOR obtained indicated a low man labor intensity for both, more man-labor is required in organic production than in conventional. Generally, man-animal labor remained being used across the organic farms in Nueva Ecija. Lower values were noted as to land-output ratio (SOR) in organic vegetable production (0.0850 for tomato, 0.0386 for eggplant and 0.0545 for stringbeans) than in conventional vegetable production (0.1333 for tomato, 0.1162 for eggplant and 0.1045 for stringbeans). Comparatively, the lower SOR meant that the land was more productive or fertile in organic vegetable production than in conventional.

Table 7 shows that in Pampanga, higher yield was obtained by the organic growers in transition in tomato production (1557.4 kg) compared to 789.5 kg in conventional production, consequently giving higher net income and return to total operating expenses in organically produced tomato

(PhP18,688.1 and 189.5%, respectively) than in conventional production (PhP7,879.9 and 165.8%, respectively). In eggplant, the organic growers in transition obtained higher yield at 2032 kg per 1000 sq m, generating a net income of PhP36,492.7 than the conventional growers getting a yield of only 749 kg and generating a net income of PhP13,595.1. The returns on total operating expenses were recorded at 352.6% in organic eggplant production and 265.0% in conventional. A reverse trend was observed in ampalaya production as higher yield and net income was generated in conventional production (1,886 kg and PhP56,635.5, respectively) compared to organic in transition (929.1 kg and PhP12,575.0, respectively). The return on total operating expenses was consequently higher in conventional (604.2%) compared to 92.8% in organic ampalaya production.

The comparative input utilization ratios of vegetable production in Pampanga, as shown in Table 8, reflected little difference in the capital-output ratio in tomato (0.3454 in organic in transition and 0.3762 in conventional) and eggplant (0.2210 in organic and 0.2740 in conventional) in both organic and conventional production. This means that both organic and conventional tomato and eggplant production were almost similarly non-capital intensive and high-output generating farming endeavors. Comparatively, the higher COR value obtained in organic in transition ampalaya production (0.5187) showed that it is more capital intensive than conventional production (0.1420). This could be attributed to the mulching and trellising materials used by organic farmers in their ampalaya production which the conventional farmers in Pampanga were not using.

Table 7. Comparative cost and return analyses of vegetable production in Pampanga.

PARTICULARS	TOMATO (1000 sq m)		EGGPLANT (1000 sq m)		AMPALAYA (1000 sq m)	
	In Transition	Conventional	In Transition	Conventional	In Transition	Conventional
I. GROSS INCOME	**28,547.97**	**12,631.58**	**46,842.96**	**18,725.81**	**26,126.04**	**66,008.71**
Yield (kg-bundle)	1557.45	789.47	2032.23	749.03	929.09	1885.96
Price per kilogram	18.33	16.00	23.05	25.00	28.12	35.00
II. EXPENSES						
A. Operating Expenses						
1. Labor	4,760.86	1,976.86	3,043.38	1,648.78	1,610.32	1930.04
2. Material Inputs	5,099.05	2,774.79	7,306.92	3,481.95	11,940.70	7,443.18
Total Operating Expenses (PhP)	9,859.91	4,751.66	10,350.30	5,130.73	13,551.02	9,373.22
Net Income (PhP)	**18,688.07**	**7,879.92**	**36,492.66**	**13,595.08**	**12,575.02**	**56,635.49**
Return to Total Operating Expenses (%)	189.5	165.8	352.6	265.0	92.8	604.2
Average Production Cost (PhP/kg)	6.33	6.02	5.09	6.85	14.59	4.97
Break Even Yield (kg)	538	297	449	205	482	268

Table 8. Comparative input utilization ratios of vegetable production in Pampanga.

PARTICULARS	TOMATO (1000 sq m)		EGGPLANT (1000 sq m)		AMPALAYA(1000 sq m)	
	In Transition	Conventional	In Transition	Conventional	In Transition	Conventional
Capital - Output Ratio	0.3454	0.3762	0.2210	0.2740	0.5187	0.1420
Labor - Output Ratio	0.0087	0.0017	0.0043	0.0013	0.0036	0.0002
Land - Output Ratio	0.0350	0.0792	0.0213	0.0534	0.0383	0.0151

Lower labor-output ratio was noted in conventional tomato (0.0017), eggplant (0.0013), and ampalaya, (0.0002) than in organic transition production of tomato (0.0087), eggplant (0.0043) and ampalaya (0.0036). While the less-than-one values of the LOR obtained, indicated a low man-labor intensity for both, more man-labor is required in organic production than in conventional which could be attributed in the practice of mulching and trellising in organic vegetable production. The land-output ratio in organic tomato (0.0350) and eggplant (0.0213) production was lower than in conventional tomato (0.0792) and eggplant (0.0534) production. Comparatively, the lower SOR meant that the land was more productive or fertile in organic vegetable production than in conventional. The reverse is true, however, in ampalaya wherein a lower SOR value was obtained in conventional production (0.0151) than in organic (0.0383).

Among Zambales grower-respondents, the yield and net income obtained in organic eggplant production (1,204.5 kg and PhP35,189.0, respectively) was higher than in conventional production (10,605.6 kg and PhP15,028.1, respectively) at 1,000 sq m (Table 9). The return to total operating expenses for organic eggplant production was thus very high at

399.4% compared to only 71.0% in conventional. The same is true in organic ampalaya production wherein the yield and net income (871 kg and PhP 14,750.63, respectively) were also higher than in conventional (500 kg and PhP6,973.8, respectively). The return to total operating expenses obtained was lower, however, in contrast with organic eggplant production (84.8%) compared to conventional (126.2%) due to higher total expenses incurred by organic farmers in mulching and hybrid seeds they procured. While the yield in conventional stringbeans production was a bit higher (519.6 kg) than in organic (504.8 kg), the net income however, was higher in organic (PhP6, 129) because of a higher price received at PhP33.0 per kg compared to P25.0 per kg in conventional. Conventional stringbeans production generated a net income of only PhP2,078.6. Higher return to total operating expenses at 58.2% was obtained in organic stringbeans production than in conventional (19.0%).

Table 9. Comparative cost and return analyses of vegetable production in Zambales.

PARTICULARS	EGGPLANT (1000 sq m)		AMPALAYA (1000 sq m)		STRINGBEANS (1000 sq m)	
	In Conversion	Conventional	In Conversion	Conventional	In Conversion	Conventional
I. GROSS INCOME	**43,999.46**	**36,198.05**	**32,138.71**	**12,500.00**	**16,659.06**	**12,990.20**
Yield (kg-bundle)	1204.47	1064.65	870.97	500.00	504.82	519.61
Price per kilogram	36.53	34.00	36.96	25.00	33	25.00
II. EXPENSES						
A. Operating Expenses						
1. Labor	4,806.79	10,662.38	6,696.44	2,545.40	2,705.67	5,702.94
2. Material Inputs	4,004.03	10,507.56	10,691.64	2,980.79	7,824.36	5,208.64
Total Operating Expenses (PhP)	8,810.82	21,169.94	17,388.08	5,526.19	10,530.03	10,911.58
Net Income (PhP)	**35,188.64**	**15,028.12**	**14,750.63**	**6,973.81**	**6,129.03**	**2,078.61**
Return to Total Operating Expenses (%)	399.4	71.0	84.8	126.2	58.2	19.1
Average Production Cost (PhP/kg)	7.32	19.88	19.96	11.05	20.86	21.00
Break Even Yield (kg)	241	623	471	221	319	436

The comparative input utilization ratios of vegetable production in Zambales (Table 10) reflected a comparatively, lower capital-output ratios in organic than in conventional eggplant (0.0910 and 0.5848, respectively), ampalaya, (0.3327 and 0.4421, respectively) and stringbeans (0.4697 and 0.8456, respectively) production. The less than one values of the COR obtained, indicates a low capital intensity for both, meaning that more capital is required in conventional than in organic vegetable production. The labor output ratio however, was higher in organic than in conventional eggplant (0.0097 and 0.0040, respectively), ampalaya (0.0071 and 0.0010, respectively) and stringbeans (0.0065 and 0.0033, respectively) production. In effect, while the less-than-one values of the LOR obtained, indicated a low labor intensity for

both, more labor is required in organic than in conventional vegetable production in Zambales. This can be attributed to the labor use in seedling production and management, mulching and trellising done in organic vegetable production. The land-output ratios were generally lower in organic eggplant (0.0227), ampalaya (0.0311) and stringbeans (0.0600) than in conventionally produced eggplant (0.0276), ampalaya (0.0800) and stringbeans (0.0769). Comparatively, the lower SOR would mean that the land was more productive or fertile in organic vegetable production than in conventional.

Table 10. Comparative input utilization ratios of vegetable production in Zambales.

PARTICULARS	EGGPLANT		AMPALAYA		STRING BEANS	
	In Conversion	Conventional	In Conversion	Conventional	In Conversion	Conventional
Capital - Output Ratio	0.0910	0.5848	0.3327	0.4421	0.4697	0.8456
Labor - Output Ratio	0.0097	0.0040	0.0071	0.0010	0.0065	0.0033
Land - Output Ratio	0.0227	0.0276	0.0311	0.0800	0.0600	0.0769

Problems, Risks, and Opportunities in Organic Vegetable Production

As reflected in Table 11, more than half of the organic vegetable growers (52.8 %) interviewed in Nueva Ecija, Pampanga and Zambales cited the lack of knowledge, skills and training on organic agricultural technologies. High cost of greenhouse construction was also cited by 16.8% of the organic grower-respondents which understandably reflect unaffordability and a demerit of the greenhouse technology. Insufficient supply of quality organic inputs (13.9 %) was also one of the cited problems particularly in Pampanga and Zambales. They further stated that organic vegetable farming is laborious (16.7%) in the sense that preparation of organic inputs like biopesticides and organic fertilizer took much of their time. Availability and adequate supplies of quality and ready to use organic farm inputs in the locality was highly recommended to solve these existing problems. High cost of organic certification alongside rigidity in the certification process was cited as one of the problems by 13.9% of the organic vegetable grower- respondents. As most of the farmers were smallholders, it became difficult for them to avail of the certification process particularly the issue of the unaffordable certification fees. Acidic soil was also a problem as cited by 12.5% of the same respondents. Acidic soils greatly affected vegetable production and as such, the application of organic fertilizer or humus can be done to correct this problem soil. Only very few of the interviewed organic vegetable farmers mentioned that there was limited source of clean irrigation water (11.1 %), vulnerability to adverse

weather conditions (11.1), inadequate government support services (6.9 %), high cost of organic inputs (5.6%), and inadequate knowledge on crop programming. While few had cited these problems, there is also a need to have appropriate action and intervention to lessen the effect on organic vegetable production in terms of adequate supply of clean irrigation water, government subsidy to reduce input cost and assistance on crop insurance for vegetables.

Table 11. Problems encountered in vegetable farming in Central Luzon.

PARTICULARS	CENTRAL LUZON	
	Organic (n=72) Percent (%) Reporting	Conventional (n=32) Percent (%) Reporting
PRODUCTION		
Lack of knowledge, skills and training on organic agricultural technology	52.8	3.1
Laborious	16.7	-
High cost of greenhouse construction	16.7	3.1
Insufficient supply of quality organic inputs & other materials	13.9	-
High cost of certification as organic farm	13.9	-
Acidic soil	12.5	3.1
Limited source of clean irrigation water	11.1	-
Vulnerability to adverse weather conditions	11.1	-
Inadequate government support services	6.9	3.1
High cost of organic inputs	5.6	28.1
Crop programming	4.2	-
No regular visitation of DA Technician in the area	-	3.1
FINANCIAL/INSTITUTIONAL		
Lack of financial support and access to credit facilities	33.3	12.5
Absence of incentives for investing in vegetable production	5.6	-
MARKETING		
Unstable price of vegetables	43.1	56.3
Limited outlet for vegetable produce/product	27.8	6.3
Lack of information for standard pricing	13.9	-
Difficult to collect payments from institutions	13.9	-
Packaging and labeling	2.8	-

For the conventional vegetable growers, majority of them cited high cost costs of inputs (28.1 %) as their major problem in vegetable production. Only very few farmers mentioned lack of knowledge, skills on agricultural technology (3.1 %), insufficient supply of quality inputs and other materials (3.1 %), inadequate government support services (3.1 %) and the irregular visitation of DA technicians (3.1 %) as problems. With these identified problems, they recommended that the costs of inputs be subsidized and that more government support services be extended to them.

The financial/institutional problems mentioned by the organic vegetable grower-respondents were the lack of financial support and access to credit facilities (33.3 %) and absence of incentives in organic vegetable production. About 12.5% of the conventional grower-respondents mentioned the lack of

financial support for vegetable growing and accessibility to credit facilities. They highly recommended that financial support through accessible lending institutions in the area be provided as well as providing incentives to growers investing in organic vegetable production in terms of lower interest rates on loans and subsidized inputs and certification fees.

As to marketing problems, 43.1% of the organic grower-respondents cited price instability as their major marketing problem. This was compounded by the limited market outlet for organic vegetables as cited by 28.0% of them. The major problem mentioned by the conventional grower- respondents was the unstable price for the vegetable produce (56.3%) and limited market outlet for vegetables which was cited by 6.3% of the respondents. Other marketing problems cited were the lack of information for standard pricing for organic vegetables (14.0%), difficulty to collect payments from institutions for some of those who contracted and directly sold their produce in supermarkets in malls through an agent (14.0%), and packaging and labeling (3.0%). To address the problems, the respondents recommended the dissemination of the benefits of organic vegetables, promotion/establishment of more market outlets and standardized premium price for organic vegetables. They also recommended price control for vegetable produce, market assurance and high price for vegetable produce.

The major risk, as cited by both organic (80.6%) and conventional (78.1%) vegetable grower-respondents, was the adverse effects of calamities such as droughts and heavy rains which can cause flooding. The presence of multinational companies which push for GMOs and continued use of agrochemicals in crop production was cited by 23.6% of the organic vegetable grower-respondents.

The adverse effect of water contamination/pollution was recognized as a risk by 11.1% of the organic vegetable grower-respondents and 12.5% of the conventional growers. Perceived reduction in yield was also a risk cited by 11.1% of the organic vegetable grower-respondents and 12.5% of the conventional growers. Other risks cited by the organic vegetable grower-respondents were: government bias for green revolution which promotes the heavy use of agrochemicals (8.3%); lack of awareness re benefits of organic produce and limited to lack of available organic inputs (6.9%) and changing consumer preferences (1.4%). Among the conventional grower-respondents, the other risks identified were insect pest infestation (9.4%) and lack of water supply (3.1%).

In terms of opportunities, the organic vegetable grower-respondents acknowledged the expanding organic vegetable industry as an opportunity. The potential area for expansion was at hand for vegetable production as cited by

18.1% of the organic vegetable growers and 18.8% of the conventional growers. Potential market and value adding activities were also cited as opportunities by both organic (15.3%) and conventional (21.9%) vegetable grower-respondents. Other opportunities cited by the conventional vegetable grower-respondents were: steady support from non government organizations, as well as the growing support from the government (13.9%), and evolving legislation on organic agriculture (8.3%).

The expanding vegetable organic vegetable industry in the country, the potential area for expansion, potential market and value adding activities, GOs and NGOs support and the evolving legislation on organic agriculture were the cited opportunities that can be taken into advantage in an effort to push for a vigorous organic vegetable production in the region.

Conclusions and recommendations

The three provinces of Central Luzon namely, Nueva Ecija, Pampanga and Zambales were endowed with natural, human and institutional resources that can be utilized in organic vegetable farming. The biophysical characterization of the documented sites was favorable and beneficial to organic vegetable production in Central Luzon (climate, topography, type of soil, relative humidity, amount of rainfall, etc). The existing socio-economic and institutional environment in the documented sites provided a good opportunity that can be tapped in the promotion and adoption of organic vegetable production in Central Luzon.

The organic vegetable growers in Central Luzon were generally smallhold farmers with farms less than two hectares. They were organized through associations and cooperatives getting support from GOs and NGOs (DA, Full of Grace and FFF). The group of farmers in Nueva Ecija were into full organic vegetable production, while those in Pampanga and Zambales remain in transition/conversion.

As to management practices, the vegetable growers generally relied on their long years of experience in vegetable farming, infusing knowledge learned from the trainings in the use of organic inputs particularly in land preparation, nutrient management and control of pest and diseases. The organic fertilizer and organic pesticides use and method of preparation were generally similar in all sites except for the raw materials used which corresponds to the readily available raw materials in the said areas.

Organic technology utilization in all the documented areas was low indicating the limited OVPTs used, limited kind of organic vegetable being produced and limited/small area devoted to organic vegetable production. The

capacity of the farmers to adopt organic farming standards including certification was low except among the Nueva Ecija farmers. The Nueva Ecija farmers were, to some extent, knowledgeable of the organic farming standards and employ an Internal Control System through the support of the church-based Full of Grace.

The farmers' perceived business skills were low indicating that they remain to view organic vegetable production as a farming endeavour rather than as a business enterprise. The returns in organic vegetable production in all sites is promising given the acceptable, at par and even better yield per 1000 sq m, net income, and return to total operating expenses compared to conventional vegetable production. Comparatively, lower capital-output ratio and land-output ration can be noted in organic than in conventional vegetable production indicating a non-capital intensive and land productive organic vegetable production. The labor output ratio (LOR) however, was generally higher in organic than in conventional vegetable production indicating a more labor intensive organic vegetable production.

The expanding vegetable organic vegetable industry in the country, the potential areas for expansion, potential market and value adding activities, GOs and NGOs support and the evolving legislation on organic agriculture were the cited opportunities that can be taken into advantage in an effort to push for a vigorous organic vegetable production in the region.

The risks and problems in organic vegetable production cited were many and notable, among these were the adverse effects of natural calamities, lack of knowledge, skills and training on organic technologies, perceived risk of reduced yield, limited to lack of available quality organic inputs, lack of consumers awareness on the benefits of organic vegetables and changing preferences, costly and rigid organic certification process, lack of incentives and financial support, government bias on green revolution, limited market outlet and unstable price.

The risks, constraints and opportunities the farmers face in converting to organic vegetable production are real and many but can be addressed, moreover needs a clear, integrated organic vegetable production program in the Region.

Based on the research results, the following are recommended:

Holistic Organic Consciousness Campaign

With the generally very few organic farmers in Central Luzon coupled with the evident low utilization of organic vegetable production technologies and the many notable risks and problems encountered, it is but important to embark in a consciousness raising campaign. There is a need to organize a

massive and holistic campaign to promote organic vegetable production in the region through a social marketing program that will help build capacities; disseminate benefits and correcting misconceptions about organic farming; highlighting market opportunities for organic vegetable produce; push for local market integration and beyond; and increasing awareness and support towards an integrated program for organic vegetable production in Central Luzon. Support of experts, advocates, and media and known personalities will be solicited to bring the organic culture in the consciousness of the stakeholders. The inclusion of a consumers awareness campaign in particular, shall highlight the benefits derived from organic vegetable consumption and shall also be addressed to school children and their family in the hope of encouraging them to eat vegetables.

Prioritization and Localization of Organic Vegetable Production Program

There is a pressing need for the inclusion and localization of organic vegetable production as a priority program of the Department of Agriculture down to the local government units (LGUs) which can provide valuable assistance in intensifying promotional campaigns and expand vegetable production areas. This has to be complemented with capacity building of the DA-LGU personnel undergoing a rigorous training on organic farming process and standards to ensure the building of their competency and positive attitude. The program shall also include among others, access to government support and services in terms of facilities, infrastructure, training, extension, credit facilities, etc. Greater support and collaboration with NGOs whose successes in advocating organic vegetable farming is proven, shall form part of the program, to widen their reach in mentoring and providing extension services on organic vegetable production, conformity to organic production processes and standards as well as developing/improving marketing/entrepreneurial skill and putting in place a price monitoring and dissemination mechanism.

Intensified and Integrated Approach in Strengthening Capabilities

More than half of the organic vegetable growers (52.8 %) interviewed in Nueva Ecija, Pampanga and Zambales cited the lack of knowledge, skills and training on organic agricultural technologies. Moreover, as the organic vegetable farmers generally received a fragmented and topic oriented training which mainly focused on organic vegetable production technologies and the production of organic fertilizer, the organic vegetable production program in the region shall also pursue an intensified and integrated training for farmers

which among others shall include the following: organic conversion guides and procedures to assist farmers in shifting to organic methods of producing vegetables including the establishment of internal control system which is a prelude to organic certification and in an effort to improve the capacity of farmers to adopt organic farming standards; organic inputs production and its utilization in vegetable production; and new developments on OVPTs to improve productivity. The Farmers Information and Technology Services (FITS) centers shall be tapped to serve as a learning resource center that will assist/handle the development of IEC materials, market information and advocacy.

Subsidized and Localized Organic Certification

While the organic vegetable growers have a good understanding of the concept of organic farming, the capacity of the farmers to adopt organic farming standards including certification is generally low. The organic vegetables produced in the three provinces are not certified organic although it is first party certified in Nueva Ecija. High cost of certification and rigidity in the certification process are the cited reasons. Compliance with organic certification requires therefore better policy environment in the form of a subsidized or free certification fee, reducing rigidity in the certification process as well as establishing localized grassroots certification entity to lower cost and better access of services and easier monitoring.

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