



Value chain analysis of corn (in – transition to organic) in region 02, Philippines

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Abstract

This study was conducted to explore the value chain of corn (in-transition to organic) in Region 02. Three distinct value chains were identified and mapped (i.e., green corn, corn grains milled for food and corn grains as raw material in producing “cornick”). In the value chain of green corn, the largest value added was created at the level of green corn farmers. Processor – retailers ranked second while trader – wholesalers contributed the lowest share to value creation. In the value chain of corn grains milled for food, the largest value added was created at the level of the retailers. Corn farmers ranked second whereas village corn millers contributed the lowest share. In the value chain of corn grains used as raw material in processing “cornick”, the largest value added was created by “cornick” processors. Retailers ranked second in terms of value creation, corn grain traders ranked third while corn farmers contributed the lowest share to value creation. In-transition corn farming in Region 02 is confronted by problems such as: limited production, minimal input supply (i.e., corn varieties suited to organic farming and other organic inputs); limited government and private sector support for research and product development; lack of facilities suited for handling organic corn produce; high production and handling cost; lack of certified outlets; and absence of price premiums for organically produced corn to compensate penalties in production.

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Introduction

In Region 02, corn (in-transition to organic) is harvested either green or may be allowed to mature and used for its grains. When harvested green, corn was either boiled or roasted and sold to consumers. When harvested for its grains, it is mainly processed as a snack item (“cornick”). In the corn eating municipalities of Isabela and Cagayan corn grains may be milled into grits and used as a cereal crop in substitute for rice. In Batanes, farmer – practitioners mainly produce corn to sustain livestock raised in backyards.

From 2014 to 2015, there were around 137 farmers engaged in in-transition corn farming in the Region. About 52.55% (72) of these farmer – practitioners harvest their crop fresh (i.e. green corn) while around 47.45% (65) harvest their crop for its grains. For green corn, the greatest number of corn farmers engaged in in-transition agriculture was recorded in Nueva Vizcaya (30.56% or 22 farmer –practitioners), followed by Isabela (27.78% or 20 farmer – practitioners), Quirino (25% or 18 farmer – practitioners) and Cagayan (16.67% or 12 farmer – practitioners). For corn grains, the most number of farmers engaged in in-transition agriculture was noted in Batanes (46.15% or 30 farmer – practitioners) followed by Isabela (23.08% or 15 farmer –practitioners), Cagayan (18.46% or 12 farmer –practitioners) and Quirino (12.31% or 8 farmer – practitioners). Overall, the most number of corn farmers engaged in in-transition farming in Region 02 was documented in Isabela (25.55% or 35 farmer – practitioners) followed by Batanes (21.9% or 30 farmer –practitioners), Quirino (18.98%or 26 farmer –practitioners), Cagayan (17.52% or 24 farmer – practitioners) and Nueva Vizcaya (16.06% or 22 farmer –practitioners). Generally, in-transition corn farming in Region 02 was carried in small swathes of land with an average area of 0.44 hectares for corn grains and 0.60 hectares for green corn. From 2014 to 2015, around 68.32 hectares was devoted to in-transition corn farming in the region. Around 62.88%or 42.96 hectares of which was devoted to green corn production while 37.12% or 25.36 hectares

was devoted to the production of corn grains.

Of the 42.96 hectares devoted to in-transition green corn production, 40.97%or 17.6 hectares were located in Isabela, 20.95% or 9 hectares were in Quirino, 20.48%or 8.8 hectares were in Nueva Vizcaya and 17.6% or 7.56 hectares were situated in Cagayan. Of the 25.36 hectares devoted to in-transition corn grain production, 37.85% of 9.6 hectares were in Isabela, 27.44% or 6.96 hectares were in Cagayan, 23.66% or 6 hectares were in Batanes and 11.04% or 2.8 hectares were in Quirino. Overall, Isabela has the widest area devoted to in-transition corn production (27.2 hectares) followed by Cagayan (21.25 hectares), Quirino (17.27 hectares), Nueva Vizcaya (12.88 hectares) and Batanes (8.78 hectares).

From 2014 to 2015, around 211.28 tons of green corn were produced in the region, 41.65% or 88 tons were produced in Isabela, 20.75% or 43.85 tons were produced in Quirino, 20.34% or 42.97 tons were produced in Nueva Vizcaya and 17.25% or 36.45 tons were produced in Cagayan. In the same period, about 24.4 tons of corn grains were produced, 39.34% or 9.6 tons were produced in Isabela, 28.47% or 6.95 tons were produced in Cagayan, 21.86% or 5.33 tons were produced in Batanes and 10.33% or 2.52 tons were produced in Quirino. Overall, 235.68 tons of corn (in-transition to organic) were produced in the region.

Green corn accounts for around 89.65% while corn grain accounts for about 10.35% of production. Although organic corn production remains a small component of the entire corn industry in Region 02, opportunities to grow organic corn are increasing both for human consumption and in support to the organic livestock and poultry industry.

This study examined the corn (in-transition to organic) industry in Region 02 using the value chain approach. Specifically, it aimed to: (1) map the core processes along the chain, (2) determine the key players and their roles in the chain, (3) quantify value addition along the chain, and (4) identify opportunities and challenges along the chain.

Materials and methods

The study areas

The study covered the five provinces of Region 02 which consists of the provinces of Isabela, Cagayan, Nueva Vizcaya, Quirino and Batanes.

Data sources and respondents of the study

Data were obtained via focus group discussions (FGDs), key informant interviews (KIIs) and surveys involving the different actors of the chain. The FGDs and KIIs involved input providers, farmers, traders, processors, members of the academe and representatives from government line agencies.

Simple random sampling was used to draw samples for input providers, producers, traders, processors, retailers and consumers. In cases where there were few respondents, total enumeration was done (Table 1).

Results and discussion

Marketing channels of corn (in-transition to organic)

Green corn

Within the region, green corn can be marketed by farmers to local traders (barangay, municipal, provincial) who eventually forward the produce to retailers for final sale to consumers. Farmers may also choose to sell the produce directly to retailers and eventually to final consumers. Outside the region, green corn enters the marketing system through regional traders (*“viajeros”*) notably from Bulacan and Pangasinan.

These regional traders transport the produce to major wholesale markets where they are eventually delivered to small distributors and retailers for resale to final consumers (Fig. 1).

Table 1. Distribution of respondents by province.

Research approach	Province					Total
	Isabela	Cagayan	Nueva Vizcaya	Quirino	Batanes	
Focus Group Discussion	10	12	8	10	15	55
Key Informant Interview	8	7	5	7	7	34
Survey						
Input providers	3	4	2	2	2	13
In-transition corn farmers	35	24	22	26	30	137
Traders	5	4	4	3		16
Processors	30	30	30	30	10	130
Retailers	40	40	40	40	10	170
Consumers	110	103	100	100	98	511

Corn grains milled for food

Unlike the distribution system of conventional corn grains which is characterized by many tiers of intermediaries, the distribution system of corn grains (in-transition to organic) in Region 02 involved few active intermediaries between the farmer – practitioners and the end users.

This is because the volume of corn grains (in-transition to organic) produced in the region is just too small to generate a sizeable marketable surplus

that would permit scores of participants in the distribution system. Farmer - practitioners in the region can sell corn grains to households or they may opt to bring their produce for custom milling.

When milled, farmers may sell corn grits to local households while corn bran may be sold to backyard hog raisers or may be used to support livestock raised at home. Corn starch was used as a raw material by food processors in producing native cakes and delicacies (Fig. 2).

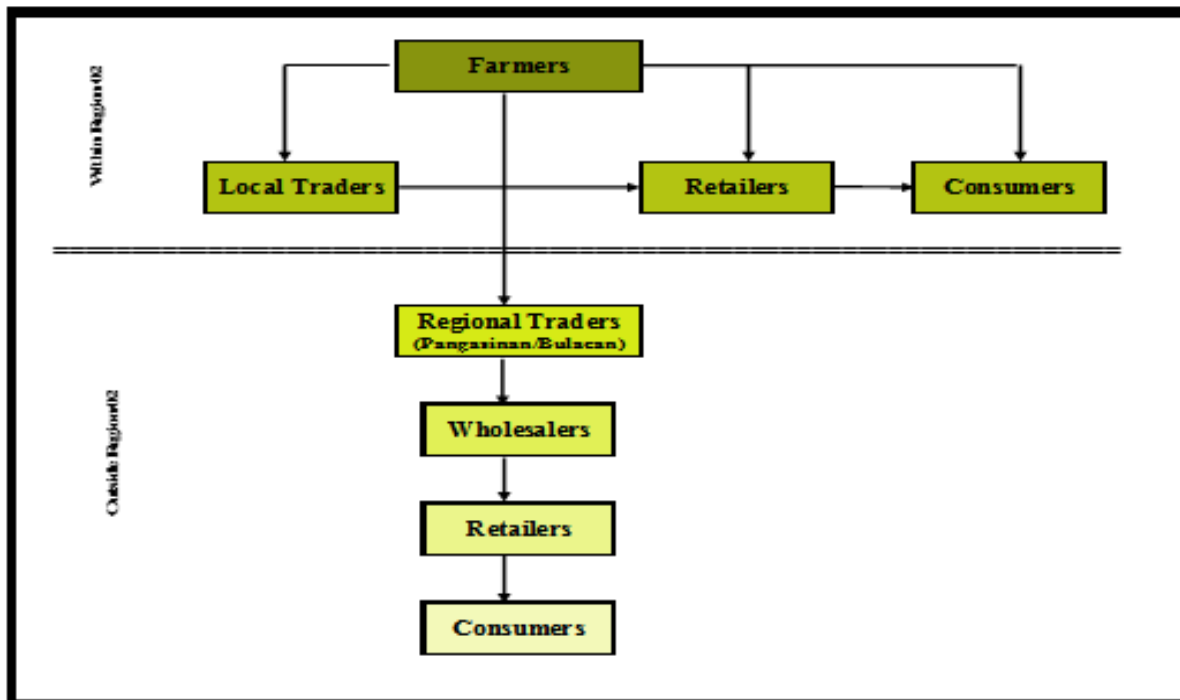


Fig. 1. Marketing channel of green corn (in-transition to organic), Region 02, 2014 – 2015.

Corn grains as raw material in processing “cornick”

Farmers market their produce either directly to food processors or to traders who eventually sell the produce to food processors. Food processors consequently use the produce in manufacturing “cornick” which are subsequently distributed to retailers for resale to consumers (Fig. 3).

Key players in the value chain of corn (in-transition to organic)

For green corn the major stages of the chain are input provision, production, trading and processing/retailing (Fig. 4). For corn grains (in-transition to organic) milled for food, the major stages are input provision, production, milling and retailing (Fig.5).

For corn grains (in-transition to organic) as raw material in the processing of “cornick”, the major stages are input provision, production, trading, processing and retailing (Fig.6). The major stages in the chain defines the key players and their respective functions.

Organic input providers

The Department of Agriculture (DA) played a very

important position in promoting organic agriculture as it was the foremost source of information, technologies and material inputs in agricultural production. As an input provider the DA was involved in the production and dispersal of certified corn seeds (i.e., OPV white flint and glutinous) to corn farmer - practitioners. Farmers revealed that the DA was their only source of certified seeds and trichogramma. Organic fertilizer manufacturers were, likewise, an integral part of the input subsystem of the chain. In Region 02, there were seven leading organic fertilizer manufacturers involved in the production, marketing, and distribution of organic fertilizers, i.e., the Wangal Farmers Association in Nueva Vizcaya; the Northern Philippines Farmers’ Cooperative (NORFARCO), Maristel Farm and Pamilya Sagrada in Cagayan; ABRASA in Quirino; and the Kapatagan Payoga Farmers Multipurpose Cooperative and Fred Alili Farm in Isabela (Domingo and Castillo, 2016). Farmers and households are considered components of the input subsystem as they were valuable sources of farm labor (family, hired or exchange). Furthermore, the high cost of procuring farm inputs sometimes stimulate farmers to save seeds from their own harvest or to produce their own organic fertilizers and pesticide.

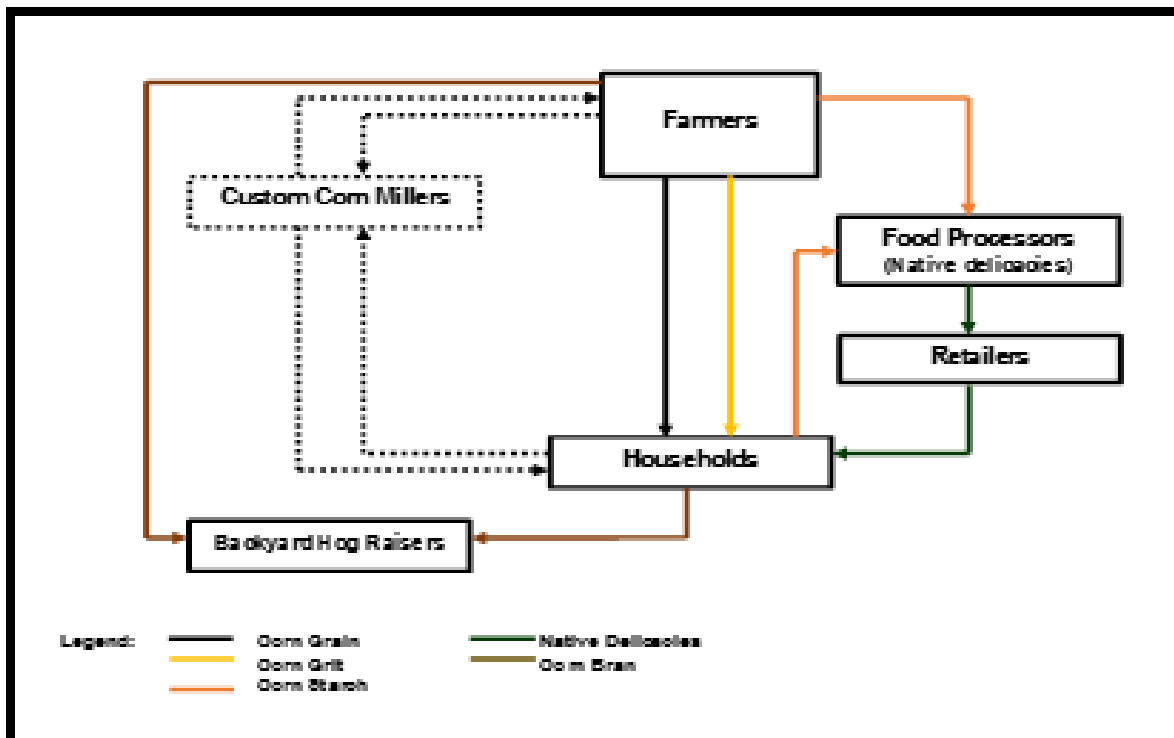


Fig. 2. Marketing channels of corn grains (in-transition to organic) milled for food, Region O2, 2014 – 2015.

Organic fertilizers were produced by the farmers mainly from animal waste and plant residues.

In-transition corn farmers

There were approximately 137 corn farmers practicing in-transition farming in Region O2 from 2014 to 2015. Farmer-practitioners perform the whole course of corn cultivation from land preparation, planting, cultivating and harvesting. Generally, farmer-practitioners in the region cultivate corn on less than 0.50 hectares of land. In the province of Batanes, farmer-practitioners produce corn mainly for domestic use and very little or none *at all* for the market.

In-transition corn farming in the said province was carried out in small plots which makes the volume of corn produced not sizeable enough to be marketed and was undertaken mainly to sustain livestock raised in backyards. In the provinces of Isabela, Cagayan, Quirino and Nueva Vizcaya in-transition corn farming was carried out in relatively wider tracts of land which allows for a marketable surplus. Generally, farmer-practitioners in the region plant corn in two cropping periods except in Nueva Vizcaya where farmers plant

corn in only one cropping season to give way for the cultivation of high value crops (i.e., vegetables).

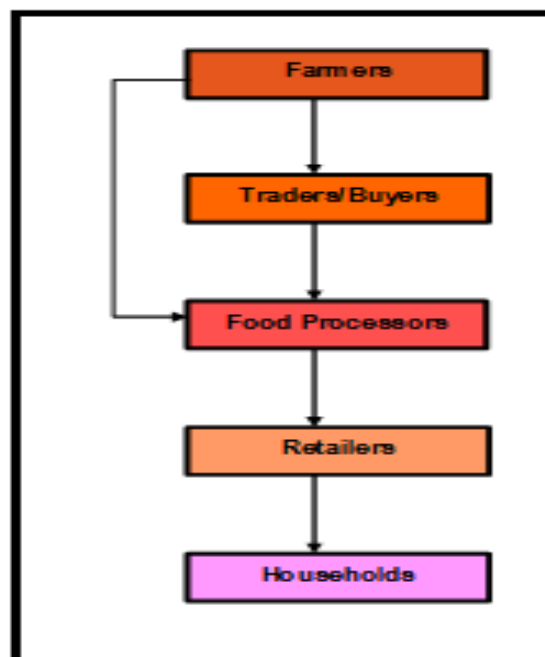


Fig. 3. Marketing channels of corn grains (in-transition to organic) as raw material in processing “cornick”, Region O2, 2014 – 2015.

On the average, farmer-practitioners were 47 years of age, most (60%) of them were male and majority (81%) were married.

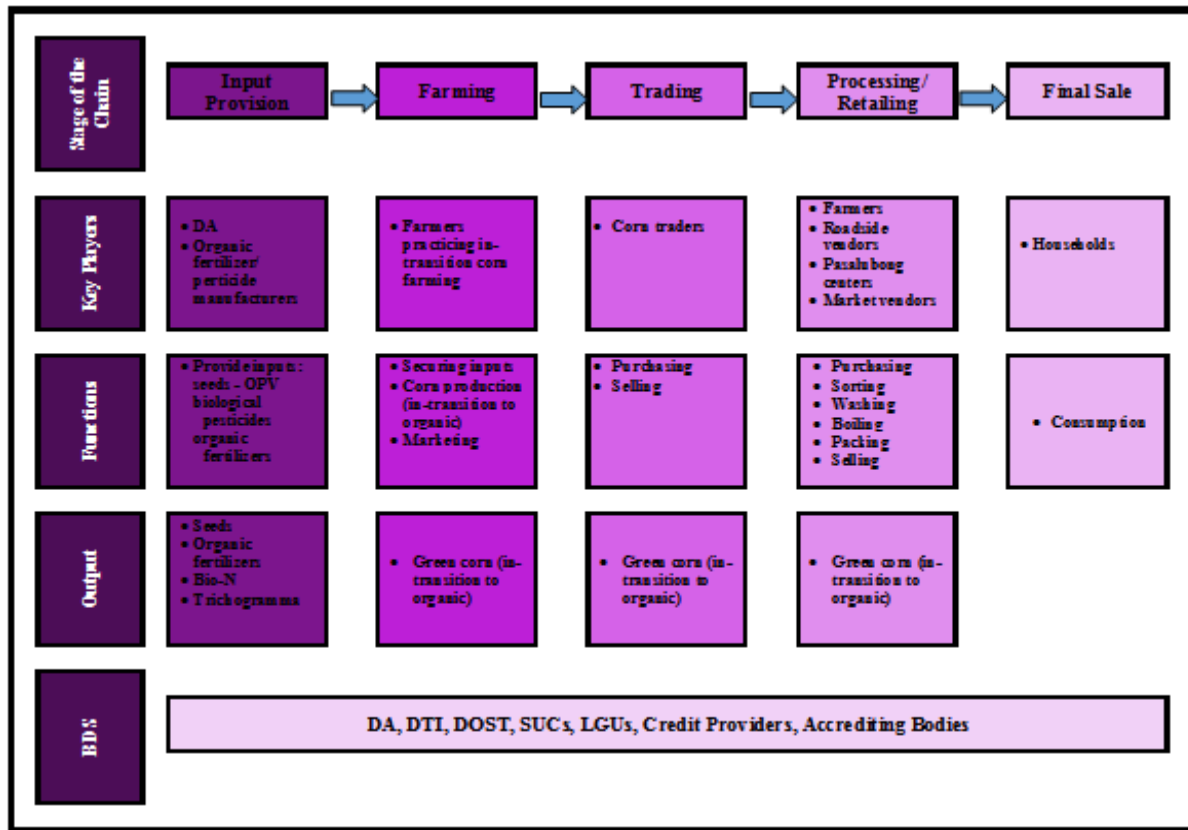


Fig. 4. Value chain map for green corn (in-transition to organic), Region O2, 2014 – 2015.

Around 43% of the farmer-practitioners were college graduates, 38% were high school graduates, 11% have reached high school and 8% were elementary graduates. Majority (71.5%) of the farmer-practitioners were landowners, 10.9% were leaseholders, 8.8% were amortizing owners, and another 8.8% were shareholders. In-transition corn farming in the region was dominated by the Ilocanos (26.28%), followed by the Ivatans (18.25%), Ibanags (12.41%), Ifugaos (8.03%), Yogads (8.03%), Igorots (7.3%), Ilongots (7.3%), Itawes (7.30%), Kalanguyas (3.65%) and Tagalogs (1.46%). The farmer-practitioners were largely Catholic (80%) followed by other religious sects such as Espiritista (8%), Presbyterian (7%), Methodist (3%) and Iglesia ni Cristo (2%). On the average, farmer-practitioners have a household size of 5, were engaged in corn farming for around 18 years, have been practicing in-transition corn farming for about 7 years, have an average on farm-income of PhP 37,540.00 per cropping period (4 months), attended at least 3 trainings in a year, and have memberships in two organizations. All of the farmer – practitioners were

first party certified.

Corn traders

During the study period, there were no certified corn traders that exclusively handled organically produced corn or corn that were grown through in-transition farming in the Region. Green corn and corn grains (in-transition to organic) were handled by traders in parallel with conventional corn. This was also true for other stages of the chain (i.e., wholesaling, milling, processing and retailing) where chemical free corn (green or grain) was handled in parallel with conventional corn.

There were two classes of traders in the value chain of green corn, i.e., the local and regional traders. The local traders operate within the municipality, province or region whereas regional traders operate outside the region.

The local traders bought green corn from farmers and sell to retailers within the municipality, province or region.

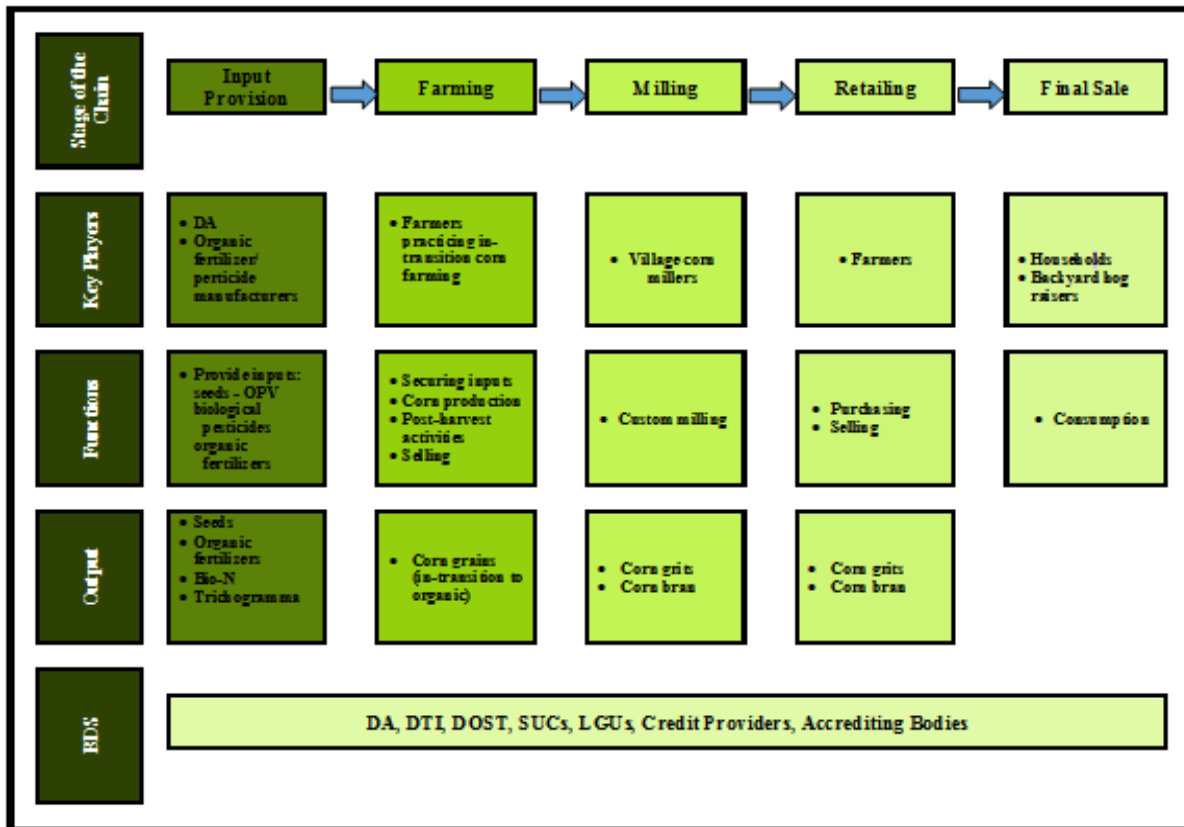


Fig. 5. Value chain map for corn grains (in-transition to organic) milled for food, Region 02, 2014–2015.

The regional traders usually come from Bulacan and Pangasinan. These regional traders bought green corn directly from farmers and transport the produce to major wholesale markets outside the region. There were no price premiums offered by greencorntraders for chemical free green corn.

In the value chain of corn grains (in-transition to organic), local traders procure directly from farmer – practitioners for resale to food processors (i.e., “cornick” processors). There were no price premiums offered by traders for chemical free corn grains. However, price differentials were based on variety, moisture content and grain purity.

Wholesalers

In the value chain of green corn (in-transition to organic), local traders act as wholesalers in municipalities or in the provinces. They procure green corn from farmers and distribute the produce directly to retailers. Outside the region wholesalers are located in the major wholesale markets, notably in Bulacan, Pangasinan and the Balintawak market.

Village corn millers

In the value chain of corn grains (in-transition to organic), custom corn millers are independent service providers, charging fees from farmers or households for milling services rendered. They simply process corn grains into grits. They are not directly involved in the purchase or sale of corn grains or its derivatives.

Food processors

In the value chain of corn grains, food processors buy corn grains as a raw material for the production of “cornick”. In the value chain of green corn food processors procure fresh corn directly from farmers or from traders, boil or roast the produce and offer it for sale to retailers or to final consumers. A minor segment of food processors buy corn starch, a by-product of milling, to produce native delicacies.

Retailers

In the value chain of green corn, farmers, roadside and market vendors, “pasalubong” centers and canteens offer boiled or roasted corn on retail to final

consumers. Grocery stores and neighborhood *sari – sari* stores are major retail outlets for “cornick”.

In corn eating municipalities, corn grains and corn grits may be offered on retail by farmers to

households. Corn bran, a by-product of milling, may be sold by farmers and households to backyard hog raisers while corn starch may be offered on to food processors.

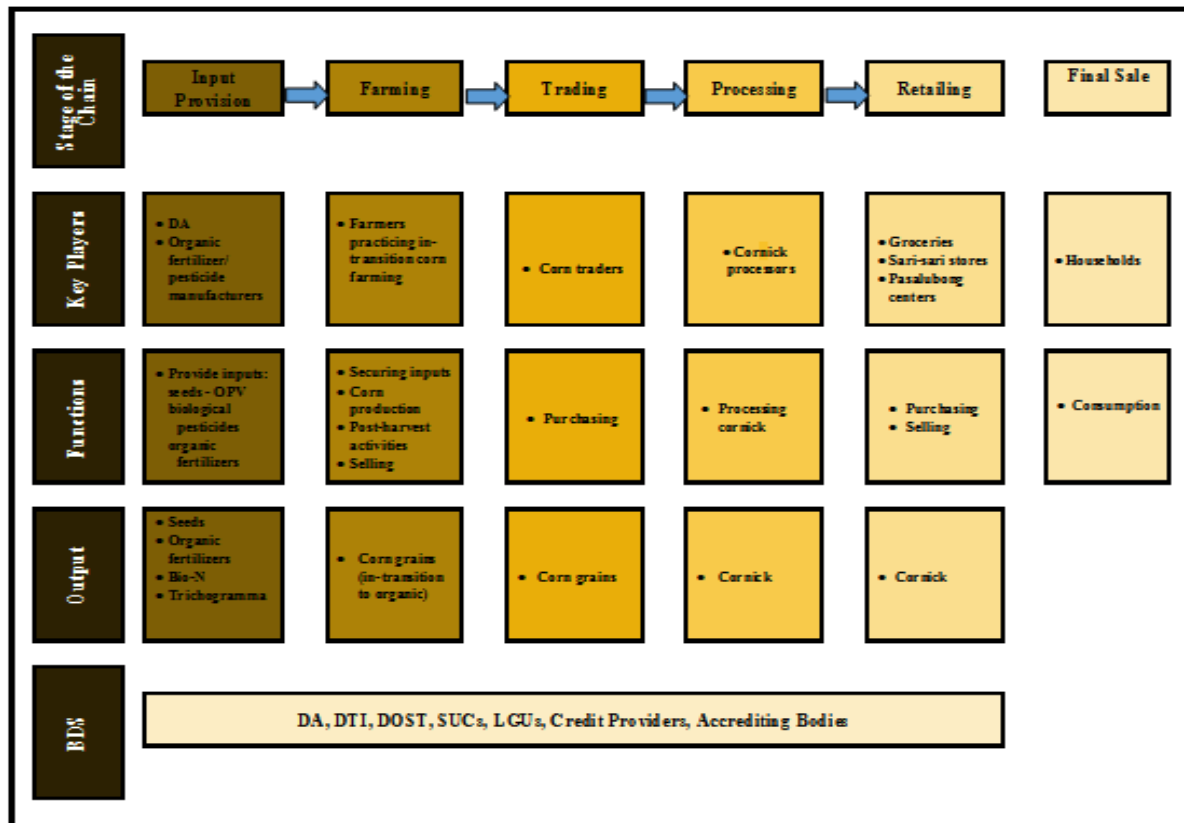


Fig. 6. Value chain map for corn grains (in-transition to organic) as raw material in producing “cornick”, Region 02, 2014 - 2015.

Consumers

The most commonly grown variety by farmer – practitioners was the OPV white flint and the glutinous, which are basically cultivated for human consumption. In the value chain of green corn, households buy corn either fresh, boiled or roasted.

In the value chain of corn grains, households use corn as a main staple or as a cereal substitute for rice. Households likewise purchase processed corn products (“cornick”, “chichacorn” and corn delicacies) as snack items. The backyard hog raisers are the end users of corn bran.

Support actors (BDS)

The DA, DOST, DTI and SUCs (ISU, CSU, QSC, NVSU

and BSC) were the sources of information, technologies and farmer trainings in support to organic agriculture in the region.

The financing needs of farmer – practitioners were usually sourced from three common sources *viz.* traders, cooperatives and informal money lenders.

Value addition in the value chain of corn (in-transition to organic)

Along the value chain of green corn

The gross value received by processors/retailers for boiled corn was about PhP 7.00 per ear. The cost of material input (fresh corn) at this level was PhP 4.30 per ear. The cost of other intermediate inputs, direct labor and transport have a collective value of PhP 1.50

per ear. When all these costs are deducted, the remaining value added of PhP 1.20 per ear is left to processors/retailers.

The material cost of boiled corn to processors/retailers (PhP 4.30 per ear) represents the

value transferred to the preceding key player in the chain i.e., trader – wholesaler. The value added at this point is estimated at PhP 1.00 per ear after deducting the all cost incurred by trader – wholesalers.

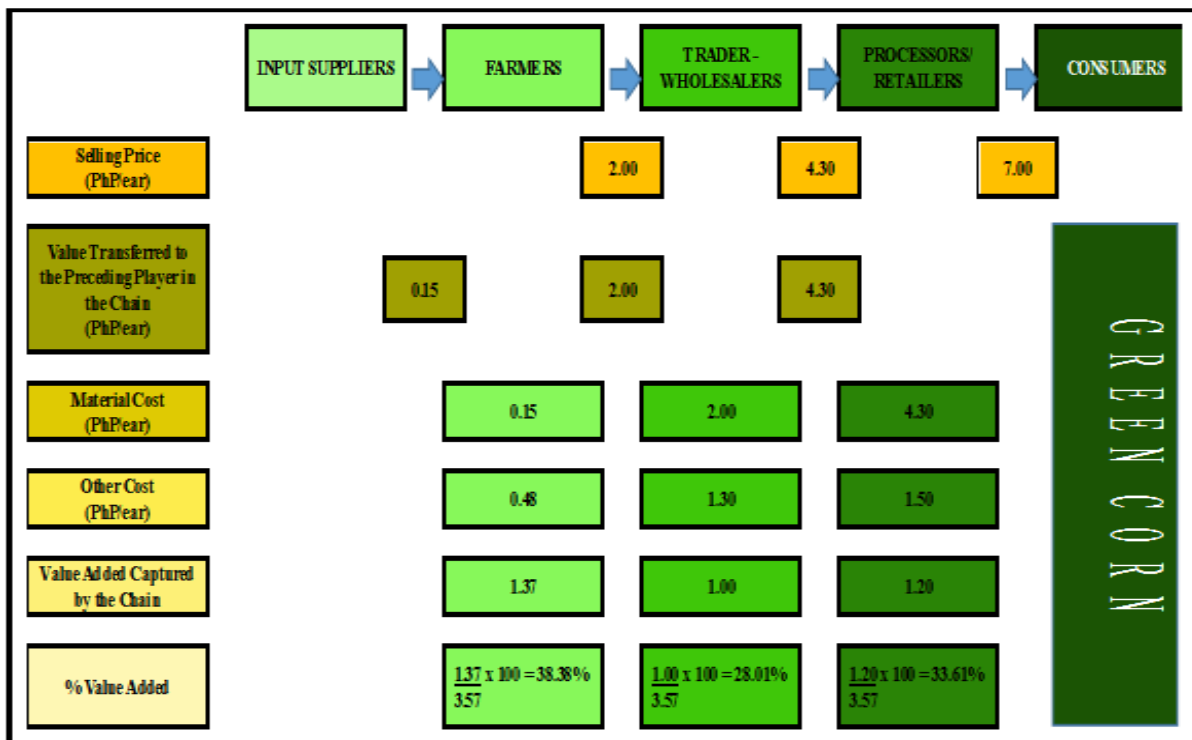


Fig. 7. Value addition along value chain of green corn, Region O2, 2014 – 2015.

The value transferred by trader – wholesalers to green corn farmers was PhP 2.00 per ear while the total cost of production at this stage was PhP 0.63 per ear. When these costs are deducted, the remaining value added of PhP 1.37 per ear is left to farmers to cover interest payments, depreciation (farm implements), indirect labor, and to earn profit.

The gross value added by all the key players in the value chain of green corn was estimated at PhP 3.50 per ear. The largest value added was created at the level of green corn farmers which is around 38.38% of the gross value added in the entire chain. The highest contributor to value added at this stage is the labor exerted by farmer – practitioners which affirms that the practice of organic farming is a labor intensive endeavor. Processors/retailers ranked second in terms of value creation which is approximately

33.61% of the gross value added in the entire chain. It is observed that the price received by processors/retailers for boiled corn is almost two times higher than the gross value added created in the entire chain. This may be attributed to the high cost of intermediate (i.e., fresh corn, plastic bags, fuel, etc.) and labor inputs used in producing boiled corn. Trader – wholesalers contributed the lowest share to value creation which is around 28.01% of the gross value added in the entire chain. This situation points to the fact that value creation at this stage is quite limited and is mainly derived from the buying and selling of fresh corn, with no transformation on the form of the product (Fig. 7).

Along the value chain of corn grains milled for food
Retailers receive a gross value of PhP 30.00 per kilo for the sale of corn grit and PhP 12.00 per kilo for the

sale of corn bran. The cost of material input at this point was PhP 28.00 per kilo (i.e., PhP 25.00 per kilo from the cost of corn grains and PhP 3.00 per kilo from milling fee). The cost of other intermediate inputs, direct labor and transport have a shared value

of PhP 1.30 per kilo. When all these costs are deducted, the remaining value added of PhP 12.70 per kilo was left to retailers to cover depreciation, capital and profit.

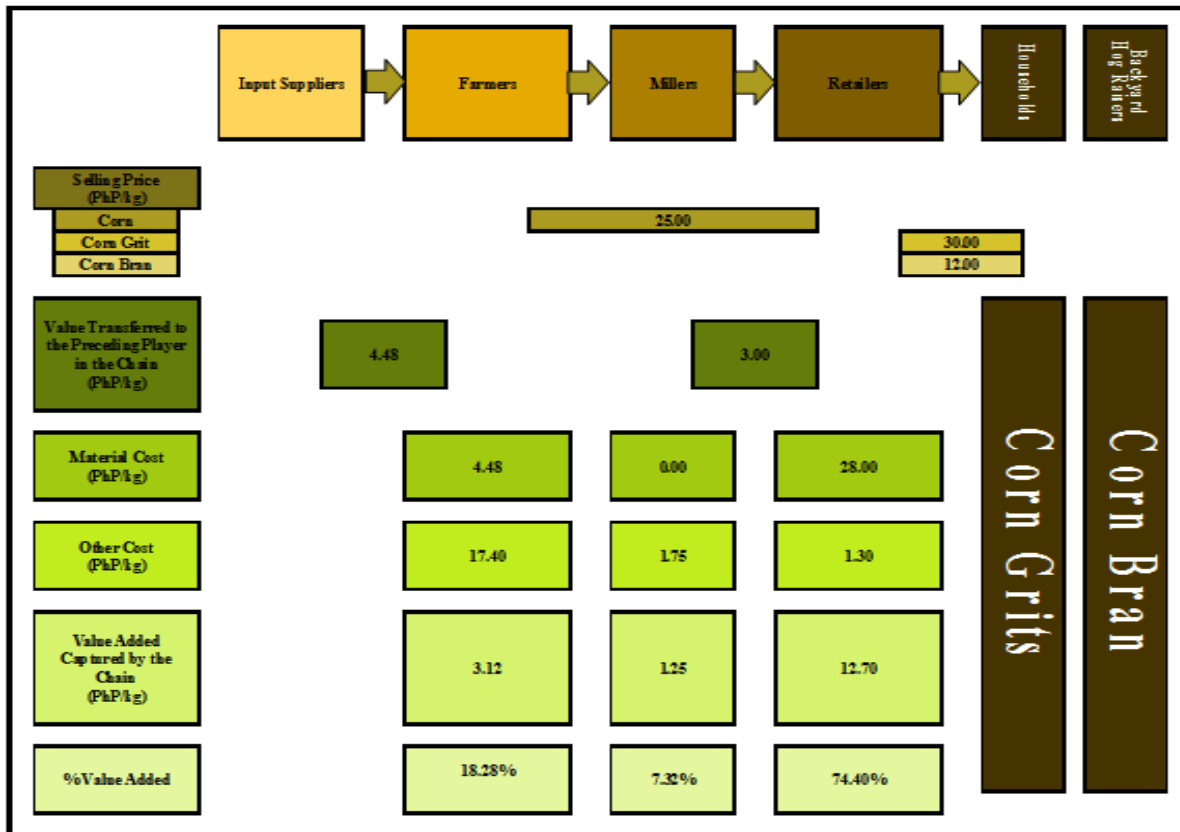


Fig. 8. Value addition in the value chain of corn grains milled for food, Region O2, 2014–2015.

The milling cost of PhP 3.00 per kilo (i.e., milling fee) represents the value transferred by retailers to village corn millers. Since village corn millers simply process corn grains into grits and were not engaged in the purchase or sale of corn grains or its derivatives, no cost for intermediate input was incurred at this point of the chain. However, an operation cost of PhP 1.75 per kilo was incurred. After deducting this cost, the remaining value added of PhP 1.25 per kilo was left to millers to cover depreciation, overhead costs and earn profit.

The value transferred by retailers to corn farmers was PhP 25.00 per kilo. Corn farmers incurred a direct material cost of PhP 4.48 per kilo and a direct labor cost of PhP 17.40 in producing corn grains. When these costs are deducted, the remaining value added

of PhP 3.12 per kilo is left to farmers to cover interest payments, depreciation (farm implements), indirect labor, and to earn profit.

The gross value added by all the key players in the value chain of corn grains (milled for food) was estimated at PhP 17.07 per kilo.

The largest value added was created at the level of the retailers which is around 74.40% of the gross value added in the entire chain. Farmer – practitioners ranked second in terms of value creation which is approximately 18.28% of the gross value added in the entire chain. Village corn millers contributed the lowest share to value creation which is around 7.32% of the gross value added in the entire chain (Fig. 8).

Along the value chain of corn grains as raw material in processing “cornick”

Retailers receive a gross value of PhP 100.00 per kilo for the sale of “cornick”. The cost of intermediate input at this point was PhP 85.00 per kilo. The cost of direct labor and transport have a shared value of PhP 8.80 per kilo. When all these costs are deducted, the remaining value added of PhP 6.20 per kilo is left to retailers to cover depreciation, interest expense and

earn profit. The value transferred by retailers to food processors was PhP 85.00 per kilo. The cost of intermediate input (corn) at this point was PhP 31.40 per kilo. The cost of other intermediate inputs, direct labor cost and transport have a shared value of PhP 35.50 per kilo. When all these costs are deducted, the remaining value added of PhP 18.10 per kilo is left to “cornick” processors to cover depreciation, interest payments, overhead costs and earn profit.



Fig. 9. Value addition in the value chain of corn grains as raw material in “cornick” processing, Region 02, 2014 – 2015.

The value transferred by “cornick” processors to traders was PhP 31.40 per kilo. The cost of intermediate input (corn) at this point was PhP 25.00 per kilo. The cost of other intermediate inputs, direct labor cost and transport have a collective value of PhP 3.00 per kilo. When all these costs are deducted, the remaining value added of PhP 3.40 per kilo is received by traders to cover depreciation, interest payments, overhead cost and obtain profit.

The value transferred by traders to farmers was PhP 25.00 per kilo. Corn farmers incurred a direct material cost of PhP 4.48 per kilo and a direct labor cost of PhP 17.40 in producing corn grains. When

these costs are deducted, the remaining value added of PhP 3.12 per kilo is left to farmers to cover interest payments, depreciation (farm implements), indirect labor, and to earn profit.

The gross value added by all the key players in the value chain of corn grains as raw material in processing “cornick” was estimated at PhP 30.80 per kilo. The largest value added was created by “cornick” processors which is around 50.73% of the gross value added in the entire chain. Retailers ranked second in terms of value creation which is approximately 20.12% of the gross value added in the entire chain. Corn grain traders ranked third in terms of value

creation which is around 11.03% of the gross value added in the entire chain. Corn farmers contributed the lowest share to value creation which is around 10.12% of the gross value added in the entire chain (Fig. 9).

Opportunities and Constraints along the Value Chain of Corn (In-transition to Organic)

Input provision

In the input subsystem, seed producers and organic fertilizer manufacturers were hampered by the

laborious process of producing seeds or fertilizer and the high cost of production. Organic fertilizer manufacturers were further impeded by the rising scarcity of substrates or raw materials for producing organic fertilizer.

However, the growing number of farmers participating in organic farming and the rising demand for organic meat were viewed as promising opportunities among organic input suppliers.

Constraints	<ul style="list-style-type: none"> • Not enough raw material to produce organic fertilizer • High cost of producing organic inputs (i.e., seeds and organic fertilizer) • Inadequate technical training • Slow adoption of organic production technologies 	<p>Production:</p> <ul style="list-style-type: none"> • Significant drop in production • Organic corn farming is laborious • High production cost • Rigorous certification requirements and documentation • High cost of certification <p>Marketing:</p> <ul style="list-style-type: none"> • Lack of developed distribution and marketing outlets for organic/chemical free green corn • No price premium for green corn produced via natural farming (chemical free) 	<ul style="list-style-type: none"> • Absence of second and third level certification among producers sets difficulty in entering the niche market for organic products • Limited and unsustainable supply of organic corn 	<ul style="list-style-type: none"> • Handle chemical free and conventional boiled corn as identical (homogenous) products and no price differentials were given • Limited and unsustainable supply of chemical free corn 	<ul style="list-style-type: none"> • Absence of certified market outlets that are accessible to consumers • Inability to distinguish chemical free from conventional green corn • Higher price compared to conventional products • Limited supply of organic products
	Opportunities	<p>INPUT PROVISION</p> <ul style="list-style-type: none"> • Growing number of farmers engaged in organic farming 	<p>FARMING</p> <ul style="list-style-type: none"> • Available government support • Growing awareness on the benefits of natural farming practices 	<p>TRADING</p> <ul style="list-style-type: none"> • Few competitors • Growing awareness on the benefits of consuming organic products 	<p>PROCESSING/RETAILING</p> <ul style="list-style-type: none"> • Growing awareness on the benefits of consuming organic products

Fig. 10. Opportunities and Constraints along the value chain of corn (in transition to organic), Region O2, 2014-2015.

Farming

Corn farmers practicing in-transition farming stated that natural farming practices are laborious and the high cost of farm labor can actually increase production cost. Moreover, in-transition corn farms are faced with lesser yield relative to conventional

farms. Farmer – practitioners were also confronted by the rigorous documentation requirements for certification and accreditation. In marketing, farmer – practitioners were constrained by the lack of a developed distribution and marketing outlet for organic/chemical free green corn and corn grains.

Upon harvest, fresh corn or corn grains grown through natural farming methods enter the conventional market channel and do not receive a price premium. For corn grains, price differentials were more centered on variety, moisture content and the purity of grains instead of being chemical free. In spite of these obstacles, corn farmers continue to adopt natural farming methods because of tremendous government support and the growing awareness on the benefits of natural farming.

Trading

The lack of a sizeable volume of corn produced via natural farming methods restrain traders from specializing and investing in the distribution and marketing of chemical free fresh corn and corn grains. Hence, chemical free green corn and corn grains were handled by their respective traders in parallel with conventional ones. At this point in the marketing chain chemical free and conventional produce were handled as identical (homogenous) products and no price differentials were given. This is partly due to the absence of second or third level certification among farmers which makes it difficult for traders to enter the niche market for organically grown or chemical free green corn or corn grains where prices are higher. Since the market for organic or chemical free products is an emerging market, the presence of few or absence of competitors encourage traders to enter the industry. Traders are also stimulated by the growing consumer awareness on the benefits of consuming organic products.

Processing and retailing

Processors/retailers, also treat chemical free and conventional corn as identical (homogenous) products and no price differentials were given. For boiled corn, the inability of consumers to distinguish chemical free from conventional products creates problems in marketing and pricing while in the processing of “cornick” in-organic additives were used. Village millers were constrained by the increasing cost for repairs and maintenance, and the rising cost of fuel and electricity. However, processors and retailers were encouraged by the

growing consumer awareness on the benefits of consuming organic products.

Consumption

Consumers were constrained by the absence of accessible accredited market outlets, quality uncertainty, higher prices and the limited supply of organic or chemical free farm products. Consumers are likewise hampered by their inability to distinguish between chemical free and conventional green corn. Nevertheless, the increasing number of farmers practicing organic farming could mean safer and healthier food to households (Fig. 10).

Conclusion

The study revealed that industry is far from being developed. There are very few corn farmers who are engaged in in-transition corn farming and there are no certified organic corn handlers to distribute and process these products. Furthermore, value addition along the chain is quite low.

To develop the industry a critical mass of corn farmers practicing in-transition or organic farming is needed. This is a necessary condition in order to develop and expand the industry. Hence, government efforts should focus on increasing the number of farmer – practitioners. Encouraging conversion among corn farmers or inducing beginners to engage in organic corn production may be achieved by providing incentives. This may be in the form of low interest rates on production loans and funding organic certification cost. Subsidies to acquire land for organic farming only may also be considered.

A conversion plan and farm plans that would articulate organic management practices should be a requisite in availing any government support. Introducing improved organic farming technologies in order to increase gains or profit from organic farming may also be a form of inducement and a means for increasing the volume of production. Certification along the chain must also be intensified in order gain access to special markets for organically grown products where prices are higher.

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