



Institutional Perspective in Supply Chain Management: The Cases of Abaca, Vegetable and Bamboo Supply Chains in the Philippines¹

Ernesto O. Brown, Albert P. Aquino, Rocalyn C. Gayagay,
Christian L. Abeleda, and Jennifer C. Puntanar²

ABSTRACT

A globally competitive Philippine agribusiness sector is a must in a fast emerging borderless trade regime. For a sector saddled perennially with numerous problems, globalization poses yet another set of challenges which conventional and logistics-based solutions seem unable to address. The need for more integrated and innovative strategies cannot be overemphasized.

This paper posits that agribusiness/supply chain problems can be framed using the New Institutional Economics (NIE) lens. The role of institutions and institutional arrangements in shaping economic performance is a fresher perspective in dissecting and addressing inefficiencies in the agricultural supply chain. Some institution-related inefficiencies pertain to inadequate institutional mechanism, poor coordination among players, redundancy in distribution, and information asymmetry. All these redound ultimately to higher transaction costs. The application of NIE as a theoretical construct and practical approach to address the supply chain/agribusiness problem of high transaction costs in selected agricultural supply chains for abaca, vegetable, and bamboo is also showcased.

Key words: New Institutional Economics, Supply Chain Management, transaction costs, institutional arrangements, institutions

INTRODUCTION

¹ A policy paper submitted to the Food and Fertilizer Technology Center (FFTC) for the project titled "Asia-Pacific Information Platform in Agricultural Policy". Policy papers, as corollary outputs of the project, describe pertinent Philippine laws and regulations on agriculture, aquatic and natural resources.

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² Assistant Director and Supervising Science Research Specialist, Chief Science Research Specialist, Science Research Analyst, and Science Research Specialists, respectively, of the Socio-Economics Research Division of the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (SERD-PCAARRD) of the Department of the Science and Technology (DOST), Philippines.

Globalization is like a double-edge sword for Philippine agribusiness. While it brings forth tremendous opportunities, it also poses all sorts of challenges for all major players in the agribusiness sector. The emergence of one global market, bereft of any form of borders or barriers, heightens inevitably competition between and among all and sundry. The ultimate survivor in this game of global trade will be determined solely by its ability to provide superior products and services at lowest cost. And for this survivor, the benefits from conquering the global market shall not only be tremendous but shall find its way into boosting its nation's economic development.

As for Philippine agribusiness, it must hurdle first daunting challenges before it can even position itself in the global market and enjoy eventually the benefits from borderless trade. To begin with, the challenges seem non-surmountable for several domestic players whose agricultural products are unable to even compete domestically against cheaper imports as tariff rates are lowered. This is evidenced by the fact that the country remains a net importer of a number of agricultural products despite previous efforts to modernize agriculture and achieve food self-sufficiency.

One of the key problems besetting Philippine agriculture is weak institutions. Be it formal or informal, institutions refer to the 'rules of the game' which govern transactions among various players. Transaction cost is usually high in a typical agrarian economy, which, among others, is generally characterized by unclear rules (e.g., absence of grades and standards), information asymmetry, redundancy especially in the distribution system, and highly adversarial relationship among the various players. Weak institutions translate to weak and fragmented supply chains. When the rules governing transactions are unclear and the relationship among transacting players is too adversarial, supply chains become uncoordinated and inefficient. Such chains could hardly be trusted to satisfy customer values and will not be able to survive the growing competition in a highly globalized market.

New Institutional Economics (NIE) provides an emerging framework to dissect and address supply chain-related inefficiencies. It is an emerging multidisciplinary school of thought in economics that embeds aspects of economics, history, sociology, political science, business organization, and law. Central to NIE is the creation and role of institutions and institutional arrangements in shaping economic performance and addressing problems of economic development. This new direction of economics considers the cost of transaction in the market as the underlying key to economic performance (Kherallah & Kirsten, 2001). Transaction costs result to low performance of the economy by impeding exchange, that is, it is costly for individuals to engage in various kind of economic activity (North, 2000 as cited by Kherallah & Kirsten). Minimizing transaction costs, therefore, translate to economic efficiency.

Transaction costs are the costs of using the market mechanism, and are broadly understood to mean the costs of contracting, negotiating, and consummating an exchange. North (1992) argues that ideas and ideologies also determine transaction costs. North (n.d) claims that individuals have incomplete and limited mental capacity to process information. This scenario determines the cost of transacting because in such a world, information is asymmetrically held by parties (i.e., a party to the transaction has more market information than the other party involved)³.

In such a disarrayed world, humans logically and reasonably impose constraints that will structure human interaction and market exchanges to minimize costs. These human-devised constraints are none other than 'institutions' in which North (n.d.) regards as medium to reduce uncertainties in human exchanges. This strand of thought in NIE literature is the Transaction Cost Economics which hypothesizes that institutions are transaction-cost-reducing arrangements (Kirsten, Mohammad Karaan, & Dorward, 2009).

Institutions is a set of formal (laws, contracts, political systems, organizations, markets, etc.) and informal rules of conduct (norms, traditions, customs, value systems, religions, sociological trends, among others) that facilitate coordination or govern relationships between individuals or groups. It has been known mostly as the 'rules of the game.'

The link between institutions and economic performance is the organizations or the economic players (the decision makers) that serve as catalysts of change in an economy. According to North (1992), a mixture of external changes and internal learning determines choices the decision makers have to make. In other words, their decisions are constrained by the institutions and the ideologies that shape the way they process the available information.

³ This thread of NIE literature is the Economics of Imperfect Information which posits that the lack of perfect and freely available information leads to risk and uncertainty in transactions. Parties in the transaction search and obtain information about products and demands to reduce the risk of transaction failure. This process is a source of transaction cost since searching and obtaining information is not costless (Kirsten, *et al.*, 2009).

Therefore, North (1992) suggests that to propel the economy toward development, creating and altering both institutions and participant' ideological perceptions are necessary. Modifying institutions entails the alteration of existing and/or the creation of new organization. On the other hand, ideologies or mental models can be altered by participants 'when outcomes are inconsistent with expectations' (North, 1992). In one way or another, institutions affect participant's ideologies on how they see the world because of the constraints imposed on them. Creating a conducive institutional environment, thus, affects individual behavior and economic performance.

This paper posits that challenges confronting Philippine agribusiness can be viewed using New Institutional Economics. It highlights the role of institutions and institutional arrangements in shaping economic performance and in addressing inefficiencies in the agricultural supply chain. It also showcases the application of the NIE theoretical construct in actual cases of supply chains for abaca, bamboo, and vegetables in the Philippines.

Roles of institutional arrangements in agriculture supply chain: case studies

Typical of agriculture supply chains in the Philippines are problems such as inadequate institutional mechanism, poor coordination among players, redundancy in distribution, and information asymmetry that ultimately redound to high transaction cost. An institutional arrangement that could effectively minimize transaction cost, thereby addressing problems of development, is imperative (Aquino *et al.*, 2012).

In general, the role of institutions in addressing problems of development is 'one of being a facilitating exchange' (Kirsten *et al.*, 2009). Institutions help individuals to overcome market and industry failures through collaborative effort of individuals on joint action and decision towards attainment of desired outcome⁴. Specifically, institutions facilitate coordinated exchange (bringing together of buyers and sellers); facilitate low-cost exchange and encourage trust (contracts and enforcement mechanisms); and provide incentives for exchange (opportunities for investment in the future).

Highlighted below are applications of NIE in addressing specific supply chain/ agribusiness inefficiencies besetting typical supply chains of vegetable, abaca and bamboo. The crucial roles of institutions and institutional arrangements as innovative interventions in minimizing transaction costs and improving the overall efficiency of these supply chains are discussed in-depth. Specific cases of institutions and institutional arrangements take the form of farmer cluster-managed 'bagsakan' market center, coordinative business support group, farmer clustering, and market matching arrangements⁵.

1. Farmer cluster-managed 'bagsakan' model: the case of vegetable supply chain

The growth and development of the vegetable industry in Northern Mindanao is constrained by low productivity, high postharvest losses and numerous redundant supply chain players. Low productivity arises from farmers' lack of appropriate technical information on vegetable production, thereby, limiting their adoption of improved technologies and practices. Moreover, high post-production losses due to poor and repeated handling results to low price received by the farmers for their vegetable produce.

The vegetable supply chain analysis also reveals the existence of redundant players in the marketing channels. Redundant players (e.g. canvassers and dicers) are those who duplicate the functions performed by other players (Brown & Aranas, 2011). They engage in pure arbitrage (i.e., buying at a low price and selling for a given margin) because they are able to exploit their access to information on prevailing prices and volume requirements of wholesalers in different areas. Unfortunately, farmers usually do not have access to this same set of information, and

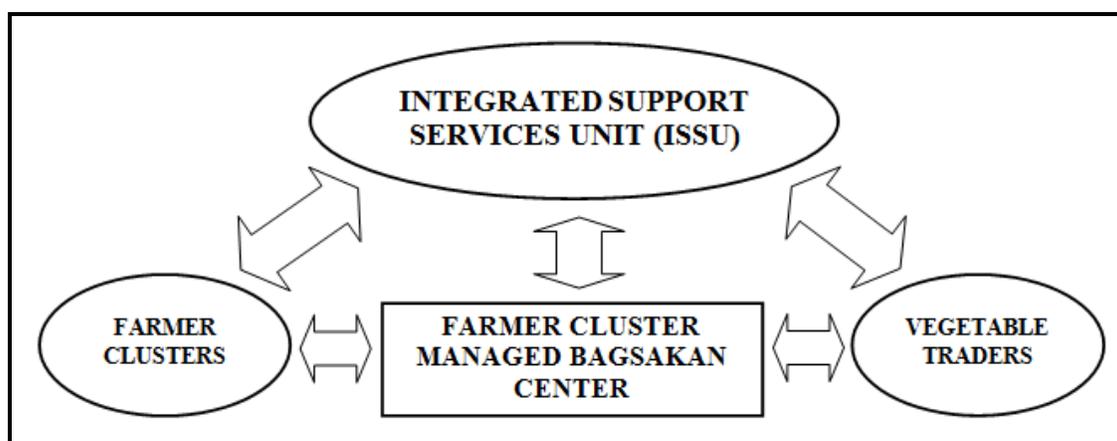
⁴ Another area of considerable interest in NIE literature concerns Theory of Collective Action. Under this strand of thought, the main agenda of institutional economics is collective action. 'Collective action arises when people collaborate on joint action and decisions to accomplish an outcome that involves their interest or well-being (Sandler, 1992 as cited in Kirsten, *et al.*, 2009). 'The theory of collective action is a useful tool to analyze how to overcome free-rider problems and fashion cooperative solutions for the management of common resources or the provision of public goods (Kirsten, *et al.*, 2009).'

⁵ These cases are extracts from the results of the PCAARRD-funded socio-economics research program on "Supply Chain Improvement for Selected Commodities in Agriculture, Forestry and Natural Resources (Phase II): Development and Application of Supply Chain Management Models to Improve Chain Effectiveness and Efficiency" conducted by select state universities in the Philippines in 2009-2011.

hence, transactions between the canvasser/dicer and farmer, tainted by information asymmetry, are largely in the former's favor.

Redundant players intercept farmers before the latter even reach the wholesale market and convince them to sell their harvest to the latter, which they in turn sell to wholesalers in the market or in other areas. These multi-layer intermediaries lengthen the route of product and information transfer which increases transaction costs within the supply chain. Moreover, the chain is characterized by the presence of numerous small, profit maximizing yet independent acting producers, who as described previously are neither production technology nor market information savvy. These very attributes make producers vulnerable at bargaining and exposed to trader opportunism.

In the completed vegetable supply chain improvement study⁶, a model of Farmer Cluster Managed Vegetable *Bagsakan* Center (Figure 1) was pilot-tested at Barangay Poblacion in Lantapan, Bukidnon to address the issues and problems on production, distribution, and marketing of vegetables. It is an innovative institutional arrangement that sought to directly link farmer clusters with vegetable traders by strategically locating the *bagsakan* center⁷ in major production sites thereby reducing transaction costs and consequently, improving the efficiency of the vegetable supply chain.



Source: Soliven, *et al.*, 2011

Figure 1. Farmer cluster-managed “*bagsakan*” center model for vegetable supply chain

One necessary mechanism for the institutional intervention is the formation of farmer clusters. Clustering is a form of horizontal arrangement that group farmers to focus on an activity. It is a vital approach used in the *bagsakan* model to reap the benefits of collective action. As a farmer managed model, its success hinges on the commitment of the members to support one another and contribute to the goal of making the *bagsakan* center a common ground for farmers and traders to sell quality vegetables of reliable volume at fair prices. Through campaigns and dialogues, the essence of collective action was deeply inculcated to cluster members resulting to behavioral changes that prevented free-riding and opportunism. Moreover, farmer clusters facilitated the efficient transfer of technological intervention and knowledge acquisition through capability building activities. With improved capacity, farmers are able to respond to the requirements of the modern market in terms of volume, quality, and reliability of supply.

Subsequent to clustering is the forging of direct market linkage between farmer clusters and vegetable traders through the *bagsakan* center. This eliminated the presence of redundant players since the flow of products followed a formal marketing chain with shorter market layers wherein only the truckers separates the producers and the preferred vegetable traders. The arrangement allowed transparency and information-sharing which facilitated open communication and trading negotiation between the players. As a result, the farmers and the traders are able to agree

⁶ The project titled, 'Supply Chain Improvement for Fresh Vegetables in Region 10: A Farmer Cluster Managed 'Bagsakan' Model' was implemented by the Central Mindanao University from July 2009 to August 2011.

⁷ *Bagsakan* center from here on refers to Farmer Cluster Managed Vegetable *Bagsakan* Center.

that the vegetable price is a farmers-and-trader negotiated price. The *bagsakan* management also installed price monitoring mechanism to track changes in the selling price of the vegetables.

Moreover, the direct linkage minimized marketing and incidental costs related to transporting the vegetable produce. The proximity of the farmers to the *bagsakan* center reduced their travel time and minimized postharvest losses due to repeated handling. This helped maintain the quality of their produce. Likewise, a quality controller was assigned to check the vegetable delivered by the farmers in the center. All these redound to general increase in farmers' net profit margin (Table 1).

Table 1. Comparison of farmers' net profit margin before* and after establishment of the *bagsakan* center.

Vegetables	Before (%)	After (%)	Change (%)
Cabbage	76.67	93.75	22.28
Lettuce	60.00	93.33	55.55
Chinese Cabbage	76.67	93.75	22.28
Potato	85.00	96.00	12.94
Tomato	92.08	90.00	(3.02)
Eggplant	70.67	91.67	27.35
Baguio Beans	73.33	94.44	25.01
Carrots	80.00	93.33	18.05
Broco	60.00	93.33	55.55
Cauliflower	60.00	93.33	55.55
Sweet Peas	60.00	93.33	55.55
Bell Pepper	46.67	91.67	96.42

*Before refers to farmers selling their vegetable produce in Cagayan de Oro Bagsakan

Source: Soliven, *et al.* (2011)

To oversee the farmer clusters, vegetable traders and *bagsakan* center, an Integrated Support Services Unit (ISSU) was established. It is an overarching institution that ensures the growth and sustainability of the cluster managed *bagsakan* center. As a support service, it provides an institutional environment that encourages fair and trust-based exchange through guidelines that are just to the farmers, traders and other stakeholders. The design of policies and procedures serves as control and incentive mechanism not only to ensure smooth operation but also to reduce the opportunistic behavior of other players. Some of the stipulations are: (a) only traders with business permit are allowed to purchase vegetables on wholesale basis of at least 10 kilos per transaction; (b) consumers are not allowed to buy at the *bagsakan* center except when they would buy at least 10 kilos; (c) farmer clusters located in the barangay will be given 5% incentive quarterly from the total income generated by the *bagsakan* center from their respective cluster; among others. The sustainability of the *bagsakan* center, however, hinges largely on the continued patronage by the farmers since they, in more ways, "co-own" the *bagsakan* center itself. Hence, the role of the farmer clusters as manager and main players of the center cannot be overemphasized.

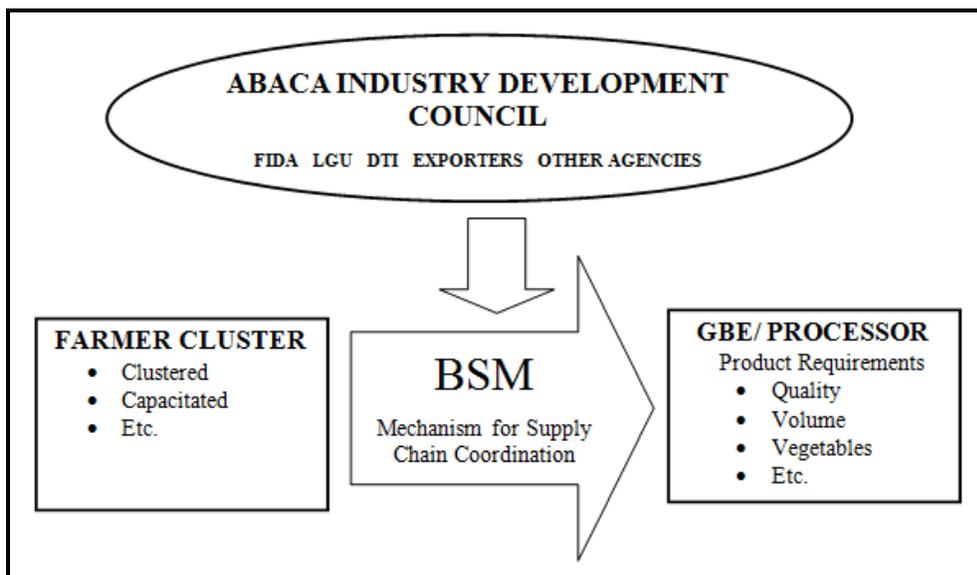
2. Business support model: the case of abaca supply chain

The supply chain analysis of abaca reveals that production problems such as poor quality abaca fiber, high handling losses, low price and quality of fiber are prevalent in the upstream node of the abaca supply chain. Farmers were unorganized and marketing of fibers were done in an individual and fragmented manner. There is also asymmetry of relevant market information such as product requirements, price and quality resulting to high transaction cost, weak bargaining position and low margin of benefit of upstream stakeholders.

Further, the selling of abaca fiber in an "all-in" basis is a long standing practice that has become the traditional transaction between farmers and traders. However, the empirical study found out that undifferentiated pricing of abaca fibers irrespective of quality grades actually acted as a disincentive hindering farmers from adopting stripping technologies that can improve the quality of their fiber harvests. The "all-in" buying arrangement lowers, on average, the price received by farmers from traders which translates ultimately to low profitability of abaca farming itself. Deeper examination of the abaca supply chain also shows that the continued practice of "all-in" transaction may be

traced to the existing institutional mechanism governing transactions in the abaca supply chain. The grades and standards (G&S) for abaca administered by the then Fiber Industry Development Authority (FIDA), now PhilFIDA, is applied only at the grading and balling establishments (GBE) level. Hence, the premium for high quality fiber accrues only to the GBE and not to the farmers. Grades and standards play an important role in reducing information and transaction costs and facilitating exchange by providing recognized information and quality assurance about a product (Kherallah & Kirsten, 2001). Unless certification is widely followed at farm gate, the production sector of abaca will continually be constrained from improving the yield and quality of abaca fiber.

In an attempt to manage the existing information asymmetry, improve marketing arrangements (all-in marketing) and extend the certification process to the farm level, a supply chain improvement project⁸ was implemented in the provinces of Catanduanes, Negros Oriental, Southern Leyte, and Agusan del Norte. It aimed to develop a business support model (BSM) (Figure 2) of coordination among the supply chain actors to ensure direct farmer cluster linkage with processors/exporters (GBEs) and at the same time enhance the ability of the abaca farmers to meet the product requirements of the final customer through clustering and capacity building.



Source: Abamo, *et al.*, 2011

Fig. 2. Business support model for abaca supply chain

After several meetings and consultations, abaca producer clusters were established as viable production units to meet the product requirements of the GBEs/processors. The clusters were grouped according to geographical location of the farms, area planted to abaca and supply chain network of connection. They served as active conduit for the delivery of extension and other support services to the farmers. Through this clustering arrangement, an integrated institutional reform, i.e., extending the certification process up to the upstream node was efficiently done which consequently improved the “all-in” practice of buying. The FIDA Improved Hand Stripping Device (FIHSD) designed to enable the farmers to produce fiber quality that meets the requirement of the buyer was introduced. A series of farmer cluster trainings was conducted across farmer clusters in all project sites on the processes involved in fiber grading and classification, and the use of the FIHSD gadget in order to educate them to produce and classify consistently fiber whose quality meets market specifications. As a result, the system of trading gradually shifted from individualistic “all-in” to bulk selling of graded abaca fibers that fetched higher prices in the four project sites. Farmer clusters also became flexible and responsive in meeting the volume and quality requirements of the market.

⁸ The project titled, “Supply Chain Improvement for Abaca: Development and Simulation of a Business Support Model for the Application of Fiber Grades and Standards at the Upstream End of the Supply Chain” was implemented by the Visayas State University, Bicol University, Negros Oriental State University and Caraga State University from September 2009 to December 2011.

Moreover, net profit margin of farmers increased and supply chain losses reduced (Table 2). Cluster entry and exit rules were implemented to maintain altruistic conduct and minimize if not avoid “pole-vaulting” behavior of its members which is critical for the long term survival of the clusters.

The Business Support Model facilitated a vertical linkage and coordination between the farmer clusters and GBE/Processor enabling a more direct marketing of abaca fibers which decreased marketing costs (Table 2). Information asymmetry was minimized allowing for free exchange of information on specific product requirement, quality, volume and prices.

Table 2. Percentage changes on price, cost, and reject rate of abaca fiber and net profit margin of farmers across study sites.

Areas of Comparison	Catanduanes	Southern Leyte	Negros Oriental	Agusan del Norte
Abaca Fiber Price (PhP/Kg)	57%	357%	20%	200%
Marketing/ Transport Cost (PhP/Kg)	(69%)	(61%)	(54%)	No data
Reject Rate (%)	(21%)	(16%)	(10%)	No data
Net Profit Margin (PhP/Kg)	202%	1,169%	14%	No data

Source: Abamo, *et al.* (2011)

3. Quasi-integration model: the case of bamboo supply chain

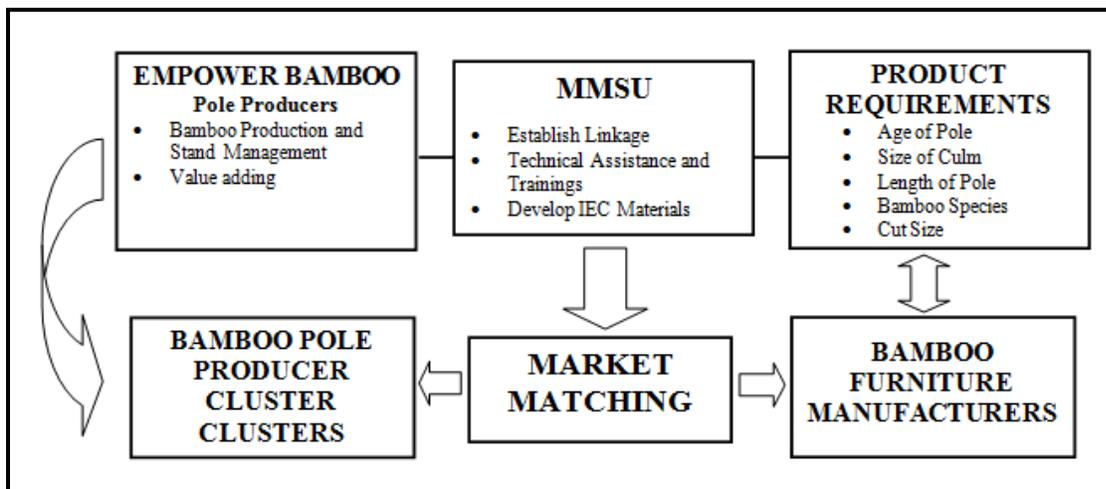
There is a renewed interest in bamboo as commercial crop with many uses and especially as raw material for bamboo furniture which is sold locally and abroad. However, bamboo supply chains in the industry are plagued with several problems.

A bamboo supply chain analysis revealed the absence of market information as the fundamental problem prevailing in the industry. This results to weak integration of operations and relationships among economic actors in the bamboo supply chain. Bamboo furniture makers lack adequate information on the location of suppliers who can provide their specific requirements in terms of pole characteristics, species and volume. Farmers, on the other hand, are unaware of these bamboo pole characteristics and quality needs that have to be met. They also lack information on market price causing them to depend on the price dictated by pole agents/ traders who get much of the margin.

In addition, farmers have insufficient technical knowledge on production, harvesting and processing technologies to improve bamboo stands productivity, produce quality poles and add value to the products which results to low price received for their produce. Meanwhile, the seasonality of bamboo supply and non-availability of pole gatherers particularly during rainy season when they attend to their rice fields lead to shortage of poles for the bamboo furniture manufacturers.

In order to address these inefficiencies in the bamboo supply chain, a quasi-integration model (Figure 3) was designed and implemented in the provinces of Pangasinan, Ilocos Norte and Ilocos Sur⁹. It is an innovative institutional arrangement wherein bamboo pole producers were directly matched with bamboo furniture manufactures eliminating the presence of pole agents and traders as intermediaries. Prior to market matching, the Bamboo Supply Chain Project Team identified the names and locations of bamboo stand owners and furniture manufacturers in the three provinces. Market information on product quality and quantity requirements of furniture manufacturers were also determined and used as guide for bamboo stand owners in supplying the poles. The availability of complete market information eliminated the adversarial effect of informational constraints to the farmers and improved the operational efficiency of the supply chain. Farmers became more responsive to meeting requirements and the cost of looking for suppliers was eliminated.

⁹ The project titled, “Supply Chain Improvement of Bamboo: A Quasi-integration Model for Region 1” was implemented by Mariano Marcos State University from September 2009 to September 2011.



Source: Malab, *et al.*, 2011

Fig. 3. Quasi-integration model for bamboo supply chain

The availability of complete market information and absence of pole agents removed the transaction cost deducted from the benefits received by the farmers. Economic efficiency of the supply chain improved as shown by 44.24% decrease in variable cost per pole and 47.28% increase in farmer income (Return Above Variable Cost) (Table 3).

Table 3. Variable cost and RAVC per pole in indirectly and directly-linked bamboo supply chain.

Player	Indirectly Linked (before) P/unit	Directly Linked (after) P/unit	Change (%)
Variable Cost			
Farmer	3.33	3.33	
Agent/Trader/Assembler	45.41	0	
Bamboo Manufacturer	58.41	56.41	
Total Variable Cost	107.15	59.74	(44.24%)
Gross Return			
Farmer	34.00	48.50	
Less: Variable cost	3.33	3.33	
Return Above Variable Cost	30.67	45.17	47.28%

Source: Malab, *et al.*, 2011

Formation of farmer clusters is one of the major components of the quasi-integration model. ‘Clustering is a form of horizontal arrangement that organizes farmers within a defined geographical area’ (Aquino et al., 2012). There were three clusters in Ilocos Norte, six clusters in Ilocos Sur and one cluster in Pangasinan. Clusters were composed of 4 to 5 members with a cluster leader tasked to directly transact business with bamboo pole manufacturers.

This institutional arrangement served as “behavioral” intervention that promotes collective action and coordination among bamboo pole producers to meet the demand of the bamboo furniture manufacturers. It also

acted as facilitating mechanism in the transfer of knowledge and technical interventions such as technical and entrepreneurship trainings, post-training assessment and distribution of IEC materials helpful in improving the quality of pole produce. Through quality improvement, the bargaining power of farmer clusters became high which increased the pricing of bamboo pole price.

A binding act or contract of agreement (COA) was entered into by the farmer-cluster members and the furniture manufacturers. It stipulated that the farmers will supply bamboo poles to the manufacturers according to product requirements and they will in turn buy the products from them with the appropriate price. The contract encouraged building of trust between manufacturer and pole owner which in the long run will result to repeated transactions and ultimately personal trading.

CONCLUSION

Efficient agricultural supply chains make for a globally competitive Philippine agribusiness. However, logistics-related solutions, albeit necessary, seem insufficient to improve overall efficiency of agricultural supply chains. Combining these conventional solutions with strategic institutional interventions may offer fresher and holistic options to adapt to a fast globalizing agricultural economy.

Agricultural supply chains are plagued with numerous production, distribution and marketing problems such as information asymmetry, poor and inadequate coordination among players, and redundancy of players and functions, among others, that render the chain inefficient and thereby, hindering industry development. The three cases on the quasi-integration model, farmer cluster managed bagsakan center, and business support model showcased how appropriate institutions and institutional arrangements play important roles in bringing the producers closer to the preferred market, minimizing transactions costs, and thereby, improving the efficiency of key players of and the supply chain, as a whole.

It cannot be overemphasized that logistics-based solutions, e.g., technical/technological options to approximate the agronomic yield potentials of agricultural crops, are necessary and key to improving overall supply chain efficiencies. Institutional innovations complement these solutions by establishing the rules in engaging the market in facilitating exchange among supply chain players at least transactions costs.

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