

BIBLIOGRAPHY

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ABSTRACT

Most of the chain actors moderately agree on the statements related to product quality satisfaction in measuring performance. Respondents moderately agree on the reliability of potatoes with regards to its quality while they strongly agree on their satisfaction to fulfill orders and deliveries when needed. Results revealed that chain actors significantly differ as to; always achieving their production/procurement/delivery targets, their satisfaction to fulfill the orders and deliveries when needed and the reliability of potatoes supplied in the market. On the flexibility performance, majority of the farmers and wholesalers gave extreme responses (undecided, and moderately agree) on buyers and sellers has little conflict to their business transaction. Test statistics shows that chain actors significantly differ on responses on all the statements related to flexibility except statement number three. Regarding to efficiency performance; farmers, trucker-wholesalers, wholesaler-retailers and retailers strongly agree on exerting effort to reduce the cost of production/procurement. Majority of the trucker-wholesalers strongly agree on scheduling of deliveries to meet the time in the market for the reason that they were the one who really assigned for this task. Test statistics findings shows that chain actors significantly differ on responses in all the responsiveness statements.

In order to have a good performance, chain actors must reclassify the potato to meet product quality satisfaction. Establishment of business to business relationship especially trust must be observed and there should be communication to have a good bonding of each actor to

avoid opportunistic creditors. As to the flexibility, buyers must have an advanced notice in accordance with the quality and volume to be procured to give an ample time to suppliers in order for them to supply what they want. Moreover, chain actor's responsibility to deliver potato must be always on time. Chain actors must also act on demand/complaints of buyers related to quality/quantity for the improvement of business transaction.



INTRODUCTION

Rationale

Cordillera Administrative Region particularly Benguet and Mountain Province is the major producer of potato in the Philippines. It supplies eighty five percent (85%) of the total requirement of the NCR (Gayao and Sim, 2000). Majority of the producers bring their product to the spot markets like trading posts and sell to traders such as assembler wholesalers, wholesalers and retailers (Sim and Tagarino, 2009).

In the year 2005, Benguet potato production is 44,922 metric tons with a production area of 2,762 hectares (ha) compare with Mt. Province which was the second major producer, produces an 8,101 metric tons with an area of 733 ha. However, Benguet decrease its production in the year 2006 from 44,922 metric tons to 43,800 metric tons with a decreased in production area from 2,762 ha to 2,707 ha. Moreover, Mt. Province makes to increase its production from 8,101 metric tons to 8,360 metric tons with an increase of production area at about 9 ha. The two major producer doubled their production in the year 2007 from 43,800 (Benguet, year 2006) to 84,622 metric tons with a production area of 2,712 ha and Mt. Province from 8,360 metric tons (year 2006) to 17,371 metric tons with a production area of 1,072 ha (DA-BAS, 2008).

Marketing includes all the various post harvest activities in the transformation of commodity sold by the farmers then purchase by buyers. The most obvious aspect of transformation is a change in physical appearance or form (Fred, 2004). Studying market activities allows us to weigh their loss, benefits and flaws more efficiently and effectively. In addition, marketing enables concerned and affected individuals to improve their marketing practices in order to attain the maximum level of income (Salbino, 2006).



Performance measurement fulfills a crucial role in the development of supply chains as it can direct the design and management of the chain towards the required performance. It is the key instrument to discuss and evaluate the effectiveness of (potential) chain partnership. The number of publication on performance measurement has increased significantly in the last decade (eg. Beamon 1999., Lohman *et al.*, 2004 and Gunasekaran *et al.*, 2004). This is mainly because of member of fundamental changes in the business environment especially in agri-food chains. Consumers in Western-European markets have become more demanding in place new demands on attributes of food such as quality (guarantees), integrity, safety, diversity and associated information (Vorst, 2004).

The agribusiness and food chains are transforming from commodity system organized via spot markets towards a vertically coordinated food system. This leads to competition between individual firms (Christopher, 1998; Lambert and Cooper, 2000).

Statement of the Problem

1. What are the performances of the actors in the spot market chain for potato in terms of: product quality satisfaction, flexibility, efficiency and responsiveness?
2. What are the differences in performance among the actors in the spot market chain?

Objectives of the Study

1. To assess the performance of the actors in the spot market chain for potato in terms of: a. product quality satisfaction, b. flexibility, c. efficiency and d. responsiveness.



2. To determine whether there are differences in performance among the actors in the spot market chain for potato.

Importance of the Study

The study would provide the needed information about the performances of actors specifically to determine the efficiency, flexibility, responsiveness and product quality in the spot market of potatoes. To look also for the differences among chain actors in potato spot market.

Scope and Delimitation of the Study

The study focuses on the spot market of potatoes. Specifically on the efficiency, flexibility, responsiveness and product quality satisfaction of chain actors in the spot market of potatoes.

The limitations associated in this primarily relate:

1. The potato spot market or wet market supply chain operations. Institutionally initiated potato supply chains that involved highly organized firms would not considered.
2. The unknown number of target groups of respondents; the multiple functions (especially the traders) in the marketing process and the non-accommodating traders to give information.
3. The chain actors involved in production and market transactions on potato in the region were the major focused of this research and exclude the other actors involved in the type or variety of potato from the other regions.



4. The research locations covered the limited to major production and marketing areas of potato in Cordillera Administrative Region (CAR) and Metro Manila.
5. The analysis focused on the objectives and framework of this research.



REVIEW OF LITERATURE

Background of the Study

Pricing is considered by many to be the key activity (Daplian, 2001) within the free enterprise system. Product price influences wages, rent, interest and profits. That is the price of the product influences the price paid for the factors of production like labor, land, capital and entrepreneurship. Price is the basis regulatory of economic system because it influences the allocation of those factors of production, high cost of wage attracts labor; high interest rates attract capital, and so on. In the allocation of scarce resources price determined would be produced (supply) and who would get the product that was produced (demand).

In the Philippines, losses incurred during shipping, storing and distributing of commodities were extremely high. Scientific packing and refrigeration of fresh vegetable have not been practiced widely despite of many factors which would help in the fast deterioration of fresh vegetable like insects, bacteria, fungi and excessive heat and mechanical injuries with either crush or infect fresh vegetable thereby reducing the market price considering also the transportation facilities and road conditions especially here in the CAR (Buena, 2004). Potato marketing system are composed of eight major types of participants namely (1) potato producers; (2) input suppliers; (3) growers; (4) traders; (5) transporters; (6) processors; (7) institutional buyers; (8) household consumers (FRLD, 1995).

In the frame of this study, supply chain and networks was defined as the interconnected business of individuals, operating independently, but dependent from each other on the supply of goods and services. In essence, the fresh vegetable production and



marketing flow is regarded as a supply chain and this was largely due to the involvement of a number of people or business entities performing different tasks until the product reaches the consumers. The people (individuals, business entities) are the chain actors that undertake different functions from production to assembly to distributions and retailing of vegetables. The business is independently managed with intra- and inter-organizational relationships. In the exchange processes, there involve bi-directional flow of products (materials and services) and information through the interactions of people with either formal or informal relationships. Moreover, these individuals are largely interdependent on the supply of products, thus with assumed coordination mechanisms to facilitate marketing transactions.

The impact of supply chain linkages on operational and business performance has been the subject of a number of empirical studies. These studies have encompassed a variety of supply chain definitions, performance measures and methodologies (Fynes *et al.*, 2005). For instance, Carter and Ellram (1994) found that supplier involvement in product design has a positive impact on product quality using a case study design. Narasimhan and Jayaran (1998) examined relationship between sourcing decisions, manufacturing goals, customer's responsiveness and manufacturing performance using structural equation modelling. They found that integrating supply chain activities involves aligning sourcing decisions to achieve manufacturing goals in terms of dependability, flexibility, cost and quality. Likewise, Carr and Pearson (1999) found that strategically managed long-term relationships with key suppliers can have a positive impact on financial (as distinct from manufacturing) performance. Kaynak and Pagán (2003) using stochastic frontier modelling, found that characteristics internal to the firm



such as top management commitment to purchasing and supply management had a positive effective on production efficiency. Also, Salvador *et al.* (2001) found that when buyers and suppliers interact on issues related to material flows and quality, there are significant effects in terms of speed and delivery punctuality. More recently, Tan *et al.* (2002) develop a comprehensive set of supply chain practice and supply chain performance metrics and found that while some practices had a positive effect on performance, others had an adverse effect.

There would be a common view within a chain with respect to its own behavior, also regarding its impressions of outside expectations. Dominant scientific disciplines describing and explaining behavior of chains are marketing science and economics. Other disciplines that are contributing to the behavioristic view were psychology, law, environmental sciences, ecology, ethics, food safety, sociology, and among others. Research questions refer to e.g. determination and requirements of chain behavior, measurement of behavior e.g. performance, determination of relevant indicators related to the actual circumstances, management tools instrumental in dealing with perceptions, etc.. In practice benchmarking of chains is an important tool for chain analysis (Beers *et al.*, 1998).

A product is created by a set of activities with precedence relations between them executed and directed by organizations within the production chain. The way these activities are organized, managed and controlled among several actors (e.g. companies) were the focus of the institutional approach in chain studies. The linkages between the actors are primary subject of study. The institutional perspective deals with the interaction between organizations in the chain, e.g. the way contracts are managed, the



pricing processes, exchange of information, coordination and control of physical flows etc. Dominant scientific disciplines working within the realm of this perspective are organization and management theory and business economics. Other sciences involved are law, information science, transaction theory, management science, logistics etc.. Scientific issues to be researched were directed towards type of linkages, effectiveness and efficiency of linkages, conditioning of linkages etc. (Beers *et al.*, 1998).

Performance measurement was used to help direct the allocation of resources, assess and communicate progress towards strategic objectives and evaluate managerial performance (Ittner and Larcker, 2003). It helps also the manager to identify good performance, helps to make tradeoffs between profit and investment, provide means to set strategic targets and ensures that managers are aware when to get involved if business were distracting (Nelly *et al.*, 1994).

According to Theodoras *et al.* (2005) despite the importance of measuring performance in obtaining competitive advantage in the supply chain, relatively little research has been undertaken to provide a thorough understanding of measuring and improving performance in the food industry.

A knowledge gap between farmers and processors about e.g. business practices, product supply, quality expectations therefore, farmers and processors pose different questions to improve supply chain performance which leads them to run the risk of miss-specifying each other's decision process (Le Heron, 2001).

Performance measurement as defined by (Nelly *et al.*, 2005) is the process of quantifying the efficiency and effectiveness of an action, a performance indicator is a measure used to quantify the efficiency and effectiveness of an action. According to



Coeli *et al.* (2005) a natural measure of performance is a productivity ratio: the ratio of outputs to inputs, where larger values of this ratio are associated with better performance. While there are many indicators of performance that can be deployed in an organization, there were a relative small number of dimensions which contribute more than proportionally to success or failure in the market, which were Key Performance Indicator (KPI's).

Performance measurement of any activity should be designed to bring about improvement in that activity, highlighting variances over time, and enabling a more efficient allocation of resources (Geanuracos and Meikklejohn, 1994).

Performance can be characterized cost factor and service factor. In the cost factor the cost of inventory, transportation, facilities and handling cost and information infrastructure and the service factor consider the response time, product variety, product availability and return ability (Hongze Ma, 2005). Performance measurement as a subject involves the development of goals and their related measures, as well as the appropriate mechanisms of feedback. It must therefore reflect the operating assumptions of the organization, in terms of culture, strategy and operational processes. This requires the identification of the pressures, which the organization faces, both internal and external, and should consequently lead to a set of action plans for specific areas of organizations (Hines *et al.*, 2000).

Performance metrics is necessary to confirm that the supply chain is functioning as expected, or that there were problems that must be addressed. There are several measures that can be used that relate to such things as late deliveries, inventory turnover, response time, quality issues, and so on in the retail sector, the fill rate (the percentage of



demand filled from stock on hand) were often very important. Another approach is to use the Supply Chain Operations Reference (SCOR) model. The SCOR model reflects an effort to standardize measurement of supply chain performance.

The performance of the supply chain can refer both to the performance of the industry as well as the individual firm supply chain. Furthermore, performance has three dimensions: effectiveness, efficiency and equity. Since the objectives of efficiency and effectiveness influence make –versus-buy or “outsourcing” decisions of supply chain members, they thus, are influenced by the structure and conduct in that chain. The first dimension of performance is effective, when it meets the demand of its ultimate customers concerning product, price and service outputs (consistent and on-time delivery, continuity and flexibility in supply, assortment and variety, etc.). This also includes the measurement of customer satisfaction. The second dimension of performance is efficiency. Measurement of efficiency of individual supply chain members can be derived from the contribution ratio. The third component of performance is equity. The equity level within a supply chain was indicated by the degree of resemblance between the share of total contribution margin gained and the share of total supply costs bore by each chain members involved in the production and marketing of the product (Sijses, 2004).

Aramyan *et al.* (2006) summarized the different methods to assess supply chain performance, the advantages and disadvantages of each method; and developed a conceptual framework for agri-food supply chain performance indicators. The categories are chosen from the literature review on supply chain performance measures from different sectors and these include efficiency, flexibility, responsiveness and food quality.



Flexibility- indicates the degree to which supply chain can respond to changing environment and extraordinary customer service requests (Aramyam, 2007).

Responsiveness - aims at providing the requested products with a short lead time. Salvador *et al.* (2001) found that when buyers and suppliers interact on issues related to material flows and quality, there are significant effects in terms of speed and delivery punctuality

Product Quality Satisfaction - quality (Luning *et al.*, 2002) consists of product safety and health; the sensory properties and shelf life and; product reliability and convenience.

Efficiency - measures how well the resources were utilized (Lai *et al.*, 2002) which include production costs, profit, return on investment and inventory. Grimsdell (1996) identified the fundamental requirements for efficient supply performance between agricultural growers and consumers as: scale of operation; producer flexibility; continuity of supply; quality control; strategic alliances; and communications.

The literatures implied that there were several methods and models to measure supply chain performance. Performance indicators have been identified summarized and further categorized (figure 1). In these regards, the research would assess the fresh vegetable sector supply chain performance using the quality, flexibility and efficiency indicators. The quality performance shall focus on the perceived satisfaction on the product and service quality. Specifically, the product quality performance would be assess based from the physical products and the service quality would be on related services performed. Moreover, flexibility indicates the degree to which supply chain can respond to changing environment (Aramyam, 2007). The assessment would focus on the



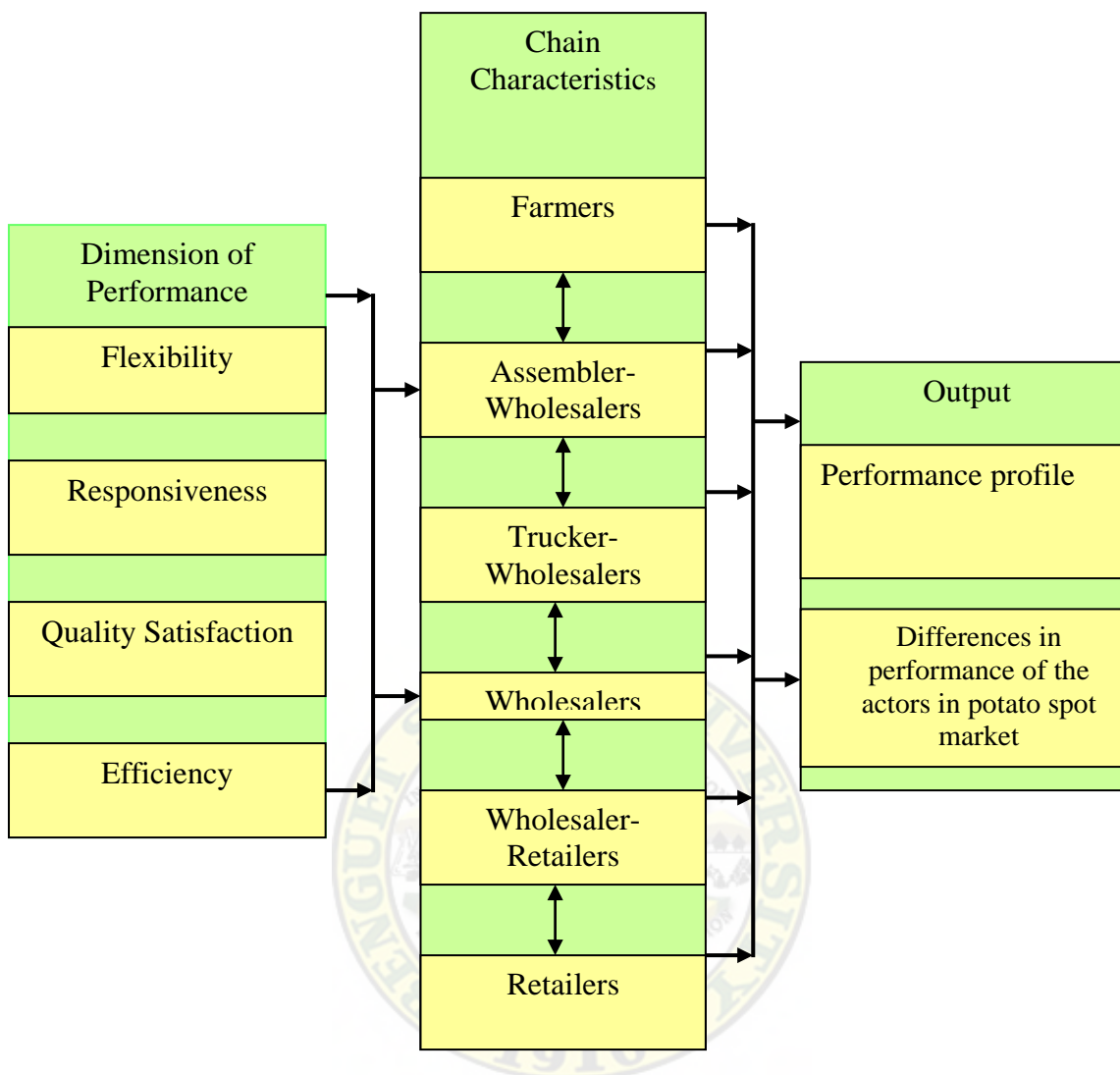


Figure 1. Conceptual framework

degree of flexibility of the chain actors in terms of the volume of production and procurement, the pricing and the alternative buyers. Finally, the performance would be evaluated in terms of efficiency using the costs, profit and the return on investments.

Definition of Terms

Producers or Farmers – the one who produces the commodities.

Wholesaler – refers to middle men who directly sell potato to retailers in wholesale basis.

Assembler-wholesaler – they are the one who assemble the product to make it in large quantity.

Truckers or Viajeros – they are in charge of carrying the product to put it in the spot markets.

Retailers – refers to the individuals who market potato directly to ultimate consumers.

Chain actors – this are the producers, assemblers, distributors and retailers.

Comvoyers- refer to the person especially male who carry vegetables to the trucks.

Spot market – place where the product were being delivered and sold.

Flexibility – this is how to adjust to the changing environment.

Responsiveness – the ability of a system to adjust quickly to a situation and to resume stable operation without undue delay.

Product quality satisfaction - consists of product safety and health; the sensory properties and shell life and; product reliability and convenience.

Quality is the physical description of the product in terms of its size; shape; color; freedom from pests and diseases; purity (in terms of its freedom from chemical contaminants, pathogenic organism and genetically modified plants); maturity of freshness and the manner in which the product was packed.

Efficiency – ability to accomplish a job with a minimum expenditure of time and effort.



METHODOLOGY

Locale and Time of the Study

The research locations followed the geographic flow of fresh semi-temperate vegetables from the major source (production) to the major market assembly and collection, and the geographic distribution markets. However, the research coverage areas were limited to selected production and marketing areas.

Producers group - The farmers was identified and interviewed at La Trinidad Vegetable Trading Post.

The primary markets are the assembly area where the potato are first traded and mostly concentrated in La Trinidad.

Secondary markets are the distribution area where the products are moved. These are the vegetable trading centers (commonly called “bagsakan”) in Metro Manila such as Balintawak and Urdaneta City, Pangasinan.

The tertiary markets are the area where the retailing activities were undertaken, mostly in Metro Manila like Blumentritt, Dapitan, Kamuning, Novaliches, Pasay and Balintawak.

Respondents of the Study

Respondents of the study were the different actors involved in potato trading in the spot market chain. There are 193 intermediaries involved, broken are as follows: 43 producers, 37 assemblers or collectors, 59 distributors and 54 retailers.



Data Gathering Procedure

The research instrument used in the study was interview schedule and observation/interaction with the respondents.

Data Gathered

The data gathered were the performance indicators in spot market chains, particularly the efficiency, flexibility, responsiveness and product quality satisfaction. Also to look for the differences in performance among the chain actors in the potato spot market.

Data Analysis

The data was tabulated in Excel Program, and analyzed using the SPSS Version 16. Frequency counts, averages and percentage were used for descriptive analysis while Kruskal Wallis for statistical test.



RESULTS AND DISCUSSION

Demographic Profile of the Respondents

Table 1 presents the demographic profile of the different classification of the respondents as to their age, gender, marital status, religious affiliation and educational background.

Age. Most of the respondents or actors like farmers have (40%), assembler-wholesalers (32%), trucker-wholesalers (42%) and wholesalers (40%) have an age bracket of 21-30 years old while the financier-assembler-wholesalers (39%) and wholesaler-retailers (38%) has an age bracket of 31-40 years old. The retailers (39%) had the older age among the different group of respondents. Result implies that most of the farmers, assembler-wholesaler, trucker-wholesaler and wholesaler are at the young age while in the retailing business, respondents are middle aged in this kind of business.

Gender. There were an unequal number of males and females. Most of the farmers (91%), assembler-wholesaler (68%) and trucker-wholesaler (67%) are males, while the financier-assembler-wholesalers (72%), wholesalers (60%), wholesaler-retailer (68%) and retailer (83%) are females. Result shows the differences in trading functions or activities performed.

Marital status. Most of the respondents involved in this business are married, followed by lesser number as single, separated or widowed. This implies, that actors involved despite of their marital status, engaged in this business would not just a work but also as source of living.

Religious affiliation. Most of the respondents are all Catholic, followed by Protestants, and only few are affiliated to other religious denomination.



Table 1. Demographic profile of respondents

CHARACTERISTIC	PRODUCTION		ASSEMBLY				DISTRIBUTION				RETAILING			
	F		A-W		F-A-W		T-W		W		W-R		R	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age														
20 and below	4	9	2	11	0	0	0	0	3	30	3	8	2	4
21-30	17	40	6	32	4	22	5	42	4	40	13	35	10	19
31-40	9	21	6	32	7	39	4	33	1	10	14	38	10	19
41-50	9	21	4	21	4	22	2	17	1	1	3	8	21	39
51-60	3	7	1	5	3	17	1	8	1	10	3	8	9	17
60 and above	1	2	0	0	0	0	0	0	0	0	1	3	2	4
TOTAL	43	100	19	100	18	100	12	100	10	100	37	100	54	100
Gender														
Male	39	91	13	68	5	28	8	67	4	40	12	32	9	17
Female	4	9	6	32	13	72	4	33	6	60	25	68	45	83
TOTAL	43	100	19	100	18	100	12	100	10	100	37	100	54	100
Marital status														
Single	14	33	2	11	1	6	5	42	6	60	16	43	10	19
Married	29	67	17	89	16	89	7	58	4	40	20	54	42	78
Separated	0	0	0	0	1	6	0	0	0	0	0	0	1	2
Widower	0	0	0	0	0	0	0	0	0	0	1	3	1	2
TOTAL	43	100	19	100	18	100	12	100	10	100	37	100	54	100
Religious affiliation														
Catholic	32	74	14	74	12	67	12	100	9	90	27	73	47	87
Protestant	6	14	3	16	4	22	0	0	1	10	7	19	6	11
Others	5	12	2	11	2	11	0	0	0	0	3	8	1	2
TOTAL	43	100	19	100	18	100	12	100	10	100	37	100	54	100
Educational background														
Elementary	12	28	1	5	2	11	2	17	1	10	4	11	10	19
High School	18	42	9	47	8	44	4	33	3	30	17	46	31	57
College	13	30	9	47	8	44	6	50	5	50	14	38	11	20
Vocational	0	0	0	0	0	0	0	0	1	10	2	5	2	4
TOTAL	43	100	19	100	18	100	12	100	10	100	37	100	54	100



Educational background. Majority of respondents have finished high school and college. Some of them attended elementary and least number attended vocational particularly in the distribution and retailing group. This implies that educational background is not an important factor to engage into this kind of business.

Number of years engaged in vegetable business

Table 2 indicates the years engaged in business by the different chain actors.

Most of the farmers (37%), assembler-wholesalers (42%), wholesalers (50%) and retailers (28%) are engaged in business for one to five years. Also, wholesaler-retailers (30%) have engaged in vegetable business for six to ten years while few stated that they engaged for 16-20 years. A total of nine respondents from farmers (9%), wholesaler-retailers (8%) and retailers (2%) said that they engaged in business for 31 and above years. The result implies that most of the respondents were new in the vegetable business.

Organizational Affiliation of Respondents

Table 3 presents the different organizational affiliations of respondent, such as farmers association, cooperatives, and other organizations.

Most of the respondents were not affiliated to any organizations. However, the farmers (2%), assembler-wholesalers (11%), financier-assembler-wholesalers (22%), trucker-wholesalers (25%), wholesaler-retailers (16%) and retailers (4%) were member of cooperatives. But, other respondents were affiliated to other type of organization such as farmers association or traders associations. The results implied that the different actors may not appreciate the importance of the organization in the business undertakings.



Table 2. Number of years engaged in vegetable business

YEARS	PRODUCTION		ASSEMBLY				DISTRIBUTION				RETAILING			
	F		A-W		F-A-W		T-W		W		W-R		R	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Below 1 year	0	0	1	5	0	0	0	0	4	40	5	14	2	4
1-5 years	16	37	8	42	6	33	4	33	5	50	10	27	15	28
6-10 years	5	12	6	32	3	17	3	25	1	10	11	30	9	17
11-15 years	5	12	3	16	7	39	4	33	0	0	5	14	5	9
16-20 years	9	21	0	0	0	0	0	0	0	0	1	3	11	20
21-25 years	2	5	1	5	2	11	1	8	0	0	1	3	2	4
26-30 years	2	5	0	0	0	0	0	0	0	0	1	3	9	17
31 and above	4	9	0	0	0	0	0	0	0	0	3	8	1	2
TOTAL	43	100	19	100	18	100	12	100	10	100	37	100	54	100

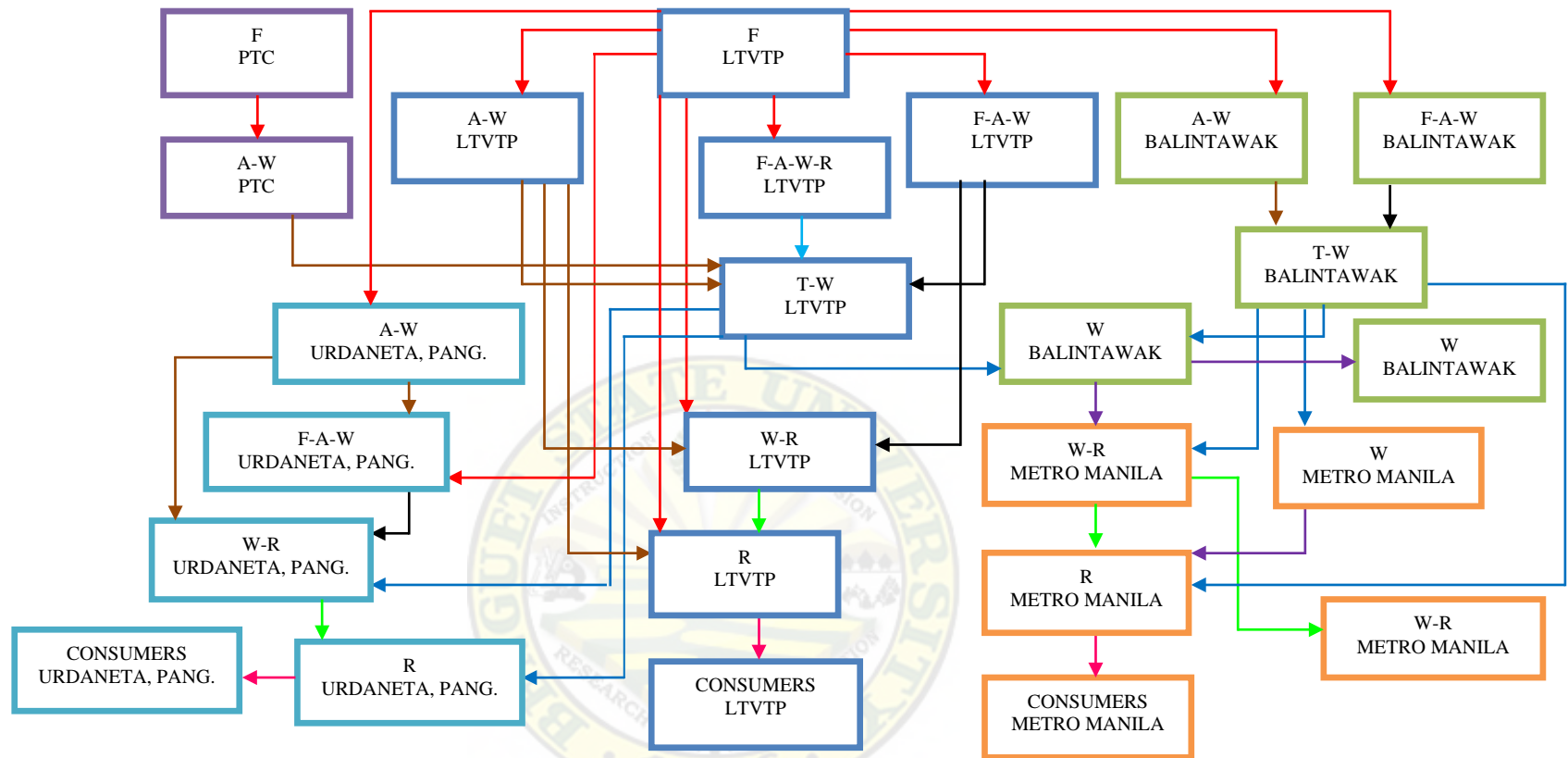
Table 3. Organizational affiliation of respondents

CHARACTERISTICS	PRODUCTION		ASSEMBLY				DISTRIBUTION				RETAILING			
	Farmer		A-W		F-A-W		T-W		W		W-R		Retailer	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Farmer's Organization	0	0	0	0	0	0	0	0	2	20	0	0	0	0
Cooperative	1	2	2	11	4	22	3	25	0	0	6	16	2	4
Others	3	7	3	16	3	17	4	33	0	0	3	8	5	9
None	39	91	14	74	11	61	5	42	8	80	28	76	47	87
TOTAL	43	100	19	100	18	100	12	100	10	100	37	100	54	100

Spot market chain and location for potato. Figure 2 present the different buyer of the potato from the producer to the end user. It shows the distribution of the vegetable to the different chain actors.

Most of the farmers sell their potato in La Trinidad Vegetable Trading Post (LTVLP). This is where most of the chain actors meet and it is the trading market of farmers in Benguet, Mountain Province and Ifugao. Chain actors come here to buy different vegetable at low price then distribute it to the different markets of Metro Manila and Urdaneta City, Pangasinan with high price. Trucker-wholesalers are the one who were in-charge in delivering of product from LTVP down to lowland areas. Majority of





LEGEND:

- F (Farmer)
- F-A-W-R (Financier-Assembler-Wholesaler-Retailer)
- W (Wholesaler)
- LTVTP (La Trinidad Vegetable Trading Post)
- PTC (Private Trading Center)
- Urdaneta, Pangasinan
- A-W (Assembler-Wholesaler)
- W-R (Wholesaler-Retailer)
- Metro Manila
- Balintawak
- F-A-W (Financier- Assembler-Wholesaler)
- T-W (Trucker-Wholesaler)
- R (Retailer)

Figure 2. Spot market chain and location for potato



the buyer of potato are the assembler-wholesalers where in they buy large quantity of potato then sold it to the other chain actors like wholesalers, trucker-wholesalers and wholesaler-retailers through wholesale basis. Most of the wholesaler-retailers sold their potato in Balintawak followed by Nepa Q-Mart. Balintawak are one of the trading markets in Metro Manila where other actors buy vegetables here and sell it to the other market like Blumentritt, Dapitan, Kamunig, Novaliches and Pasay. Almost all of the retailers in Metro Manila buy potato to the wholesale-retailers in Balintawak for the reason that the price is lower than to the other markets and consider also the location of their markets. Consumers buy potato from retailers, they buy only what they can consumed in one to three days for vegetable are easily being damage due to hot temperature. Even if the consumers want to buy many to avail discount but they can't for this reason: lack of cold storage equipment like refrigerator/freezer.

Performance of Chain Actors

Performance measurement as cited by Vorst, 2004, fulfills a crucial role in the development of supply chains as it can direct the design and management of the chain towards the required performance.

It was the key instrument to discuss and evaluate the effectiveness of (potential) chain partnership. The categories were chosen from the literature review on supply chain performance measures from different sectors and these include efficiency, flexibility, responsiveness and food quality (Aramyan *et al.*, 2006).



a. Product Quality Satisfaction

Product quality satisfaction is the level of achieving desired goals with respect to physical quality.

Table 4a present the product quality satisfaction of actors. As to meeting the quality satisfactions, majority of the farmers (53%) and assembler-wholesalers (68%) moderately agree of achieving satisfaction upon the quality of potato. According with the quality of potato meets the buyer's requirements, majority of the farmers, assembler-wholesalers, financier-assembler-wholesalers, trucker-wholesalers, wholesale-retailers and retailers moderately agree while wholesalers were undecided with it. However, there was an extreme response (moderately agree and strongly agree) of wholesale-retailers (38%) while farmers, assembler-wholesalers, financier-assembler-wholesalers, trucker-wholesalers and retailers moderately agree on their satisfaction with the volume of potato produced/procured/sold to the buyers. As to achieving the production/procurement/delivery targets, farmers (60%) and financier-assembler-wholesalers (44%) never considered/undecided while trucker-wholesalers (42%) strongly agree on the said statement. Assembler-wholesalers, wholesale-retailers and retailers also moderately agree on achieving quality satisfaction of potato. Moreover, the satisfaction to fulfill the orders and deliveries of potatoes when needed; the farmers (30%) give an extreme response (undecided and moderately agree); assembler-wholesalers, financier-assembler-wholesalers, trucker-wholesalers, wholesalers and wholesale-retailers strongly agree; and retailers moderately agree upon their satisfaction on product quality. Furthermore, some of the assembler-wholesalers (47%) never considered while retailers (30%) strongly disagree on their satisfaction to sell potatoes to buyers on credit



Table 4a. Performance of chain actors according to product quality satisfaction

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
FARMER											
1. The quality of potatoes I produce/procure/sold meets my expectation.	0	0	2	5	11	26	23	53	7	16	4
2. The quality of potatoes delivered meets the buyer's requirements.	0	0	4	9	14	33	20	47	5	12	4
3. I am satisfied with the volume I produce/procure or sold to the buyer.	1	2	5	12	7	16	20	47	10	23	4
4. I always achieve my production/procurement/delivery targets.	1	2	3	7	26	60	9	21	4	9	3
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	3	7	8	19	13	30	13	30	6	14	3
6. I am satisfied selling potatoes to buyers on credit arrangement.	11	26	7	17	16	37	6	14	3	7	2
7. The quality of potatoes I supplied in the market is reliable.	0	0	4	9	10	23	22	51	7	16	4
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	0	0	1	2	20	47	18	42	4	3	4
ASSEMBLER-WHOLESALE											
1. The quality of potatoes I produce/procure/sold meets my expectation.	0	0	0	0	3	16	13	68	3	16	4
2. The quality of potatoes delivered meets the buyer's requirements.	0	0	0	0	4	21	11	58	4	21	4
3. I am satisfied with the volume I produce/procure or sold to the buyer.	0	0	0	0	3	16	10	53	6	32	4
4. I always achieve my production/procurement/delivery targets.	1	5	1	5	2	11	9	47	6	32	4
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	0	0	1	5	5	26	4	21	9	47	4
6. I am satisfied selling potatoes to buyers on credit arrangement.	0	0	9	47	6	32	3	16	1	5	3
7. The quality of potatoes I supplied in the market is reliable.	0	0	0	0	3	16	11	58	5	26	4
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	0	0	0	0	7	37	7	37	5	26	4

Numerical Value and Descriptive Equivalent
Mean range

1 = (1-1.8) - strongly disagree
2 = (1.9-2.6) - moderately disagree
3 = (2.7-3.4) - undecided/never considered

4 = (3.5-4.2) - moderately agree
5 = (4.3-5) - strongly agree



Table 4a. Continued...

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
FINANCIER-ASSEMBLER-WHOLESALER											
1. The quality of potatoes I produce/procure/sold meets my expectation.	0	0	0	0	2	11	7	39	9	50	5
2. The quality of potatoes delivered meets the buyer's requirements.	0	0	1	6	2	11	9	50	6	33	4
3. I am satisfied with the volume I produce/procure or sold to the buyer.	0	0	0	0	1	6	9	50	8	44	5
4. I always achieve my production/procurement/delivery targets.	0	0	1	6	8	44	5	28	4	22	3
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	0	0	2	11	2	11	6	33	8	44	4
6. I am satisfied selling potatoes to buyers on credit arrangement.	4	22	5	28	5	28	3	17	1	6	2
7. The quality of potatoes I supplied in the market is reliable.	0	0	0	0	2	11	10	56	6	33	4
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	0	0	1	6	4	22	10	56	3	17	4
TRUCKER-WHOLESALER											
1. The quality of potatoes I produce/procure/sold meets my expectation.	0	0	0	0	5	42	2	17	5	42	4
2. The quality of potatoes delivered meets the buyer's requirements.	0	0	0	0	4	33	6	50	2	17	4
3. I am satisfied with the volume I produce/procure or sold to the buyer.	0	0	0	0	0	0	7	58	5	42	5
4. I always achieve my production/procurement/delivery targets.	0	0	2	17	1	8	4	33	5	42	4
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	0	0	1	8	1	8	3	25	7	58	5
6. I am satisfied selling potatoes to buyers on credit arrangement.	2	17	3	25	5	42	1	8	1	8	2
7. The quality of potatoes I supplied in the market is reliable.	0	0	0	0	0	0	9	75	3	25	4
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	0	0	0	0	4	33	5	42	3	25	4
WHOLESALER											
1. The quality of potatoes I produce/procure/sold meets my expectation.	1	10	0	0	5	50	3	30	1	10	3
2. The quality of potatoes delivered meets the buyer's requirements.	0	0	1	10	4	40	3	30	2	20	4
3. I am satisfied with the volume I produce/procure or sold to the buyer.	0	0	1	10	4	40	2	20	3	30	4
4. I always achieve my production/procurement/delivery targets.	0	0	2	20	4	40	2	20	2	20	3



Table 4a. Continued...

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	0	0	2	20	1	10	3	30	4	40	4
6. I am satisfied selling potatoes to buyers on credit arrangement.	1	10	2	20	5	50	1	10	1	10	3
7. The quality of potatoes I supplied in the market is reliable.	0	0	0	0	3	30	5	50	2	20	4
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	0	0	0	0	4	40	3	30	3	30	4
WHOLESALE-RETAILER											
1. The quality of potatoes I produce/procure/sold meets my expectation.	0	0	1	3	7	19	20	54	9	24	4
2. The quality of potatoes delivered meets the buyer's requirements.	0	0	2	5	7	19	23	62	5	14	4
3. I am satisfied with the volume I produce/procure or sold to the buyer.	0	0	1	3	8	22	14	38	14	38	4
4. I always achieve my production/procurement/delivery targets.	0	0	4	11	8	22	17	46	8	22	4
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	0	0	2	5	11	30	10	27	14	38	4
6. I am satisfied selling potatoes to buyers on credit arrangement.	2	5	6	16	11	30	13	35	5	14	3
7. The quality of potatoes I supplied in the market is reliable.	0	0	1	3	6	16	19	51	11	30	4
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	0	0	1	3	11	30	18	49	7	19	4
RETAILER											
1. The quality of potatoes I produce/procure/sold meets my expectation.	1	2	2	4	13	24	27	50	11	20	4
2. The quality of potatoes delivered meets the buyer's requirements.	3	6	1	2	17	31	28	52	5	9	4
3. I am satisfied with the volume I produce/procure or sold to the buyer.	2	4	5	9	9	17	24	44	14	26	4
4. I always achieve my production/procurement/delivery targets.	8	15	5	9	15	28	18	33	8	15	3
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	9	17	6	11	9	17	16	30	14	26	3
6. I am satisfied selling potatoes to buyers on credit arrangement.	16	30	6	11	19	35	13	24	0	0	2
7. The quality of potatoes I supplied in the market is reliable.	1	2	3	6	10	19	28	52	12	22	4
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	1	2	1	2	19	35	19	35	14	26	4



arrangements. Financier-assembler-wholesalers also give an extreme response (undecided and moderately agree) on the product quality satisfaction statement number six. Majority of the farmers, assembler-wholesalers, financier-assembler-wholesalers, trucker-wholesalers, wholesalers and retailers moderately agree on the reliability of the quality of potatoes that were supplied in the markets. Nevertheless; assembler-wholesalers (37%); retailers (35%) give an extreme response (never consider and moderately agree) also with wholesalers (30%) moderately agree and strongly agree that buyers were always satisfied to the variety, price, and quality/quantity of potato.

The averages implies that majority of the production, assembly, distribution and retailing group moderately agree on the statements related to product quality satisfaction. Besides of agreeing on other statements related to product quality satisfaction; farmers, financier-assembler-wholesalers, trucker-wholesalers and retailers moderately agree while assembler-wholesalers, wholesalers and wholesale-retailers never considered selling potatoes on credit arrangement.

The result confirms the findings of Le Heron, (2001) on the knowledge gap between farmers and processors about e.g. business practices, product supply, quality expectations therefore; farmers and processors pose different questions to improve supply chain performance which leads them to run the risk of miss-specifying each other's decision process.

Descriptive and test statistics was done to confirm the differences of each actor and ranked (chi-square) the statements according to the most and the least important as perceived by the actors.



Table 4b presents the descriptive and test statistics result on product quality satisfaction. The weighted average/mean implies that most of the chain actors moderately agree on the statements related to product quality satisfaction except on statement number six where they never considered/undecided with it. The production, assembly, distribution and retailing group focused more on orders and deliveries of potatoes when needed while satisfaction as to variety of product, price and quality/quantity of potato was the least. However, test statistics further implies that there are highly significant difference on the responses of chain actors on their achievement to production/procurement/delivery targets and the delivery of potatoes when needed (having an asymptotic significance of 0.005 and 0.000 respectively). There are also significant differences (0.046) of chain actors on their responses on the reliability of potatoes supplied in the market while there are no significant differences on their responses on: the quality of potatoes produced/procured/sold meets their expectation, the quality of potatoes delivered meets the buyer's requirements, on their satisfaction with the volume produced/procured or sold to the buyer, on their satisfaction selling potatoes

Table 4b. Descriptive and test statistics

Statement	Mean	chi-square	df	asymptotic significance
1. The quality of potatoes I produce/procure/sold meets my expectation.	3.91	6.12	3	0.106
2. The quality of potatoes delivered meets the buyer's requirements.	3.74	7.75	3	0.051
3. I am satisfied with the volume I produce/procure or sold to the buyer.	3.95	7.67	3	0.053
4. I always achieve my production/procurement/delivery targets.	3.54	12.68	3	0.005**
5. I am satisfied to fulfill the orders and deliveries of potatoes when needed.	3.64	21.51	3	0.000**
6. I am satisfied selling potatoes to buyers on credit arrangement.	2.82	6.87	3	0.076
7. The quality of potatoes I supplied in the market is reliable.	3.95	8.01	3	0.046*
8. The buyers are always satisfied as to variety of product, price, and quality/quantity.	3.78	3.71	3	0.292

Legend: significant*
highly significant**



to buyers on credit arrangement, and the buyers are always satisfied as to variety of product, price, and quality/quantity. Result implies that buyers are dependent on physical quality supplied in the market.

b. Flexibility Performance

Aramyam, (2007) defines flexibility as the degree to which supply chain can respond to changing environment and extraordinary customer service requests.

Table 5a showed the indicators to measure the flexibility performance of the actors in the spot market chains for potato.

As to the desired volume of potato produced/procured when buyers need it, some of the farmers (47%) and wholesalers (40%) never considered while assembler-wholesalers (32%) give multiple same response (undecided, moderately agree and strongly agree). However, retailers (28%) has an extreme response (undecided and moderately agree) on flexibility performance number one. According to the exert of effort to produced/procured the desired volume and quality when buyers demand it, some of the farmers (44%), assembler-wholesalers (42%), wholesaler-retailers (49%) and retailers (41%) moderately agree while most of the trucker-wholesalers (58%) strongly agree on it. Moreover, farmers (42%), assembler-wholesalers (53%), financier-assembler-wholesalers (39%), trucker-wholesalers (50%), wholesalers (40%) and retailers (43%) moderately agree on the flexibility of buyers to buy potatoes regardless of the quality/quantity. Nevertheless, as to buyer and seller has little conflict in their business transactions, some of the farmers (7%), assembler-wholesalers (5%), financier-assembler-wholesalers (33%), trucker-wholesalers (8%), wholesale-retailers (5%) and retailers (15%) strongly disagreed. In addition to that, there were an extreme response of



farmers (35%), financier-assembler-wholesalers (33%), wholesalers (30%) and retailers (38%) while mostly of the trucker-wholesalers (58%) moderately agree on buyers and sellers have little conflict related to their business transactions.

Majority of the farmers, assembler-wholesalers, trucker-wholesalers, financier-assembler-wholesalers, wholesalers, wholesale-retailers and retailers moderately agree that they can respond to changing environment. Moreover, trucker-wholesalers and wholesalers strongly agree on exerting effort to produced/procured the desired volume and quality when buyers demand it.

Table 5a. Performance of chain actors according to flexibility

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
FARMER											
1. I can produce/procure the desired volume when buyers needed it.	1	2	9	21	20	47	10	23	3	7	3
2. I exert effort to produce/procure the desired volume and quality when buyers demand it.	1	2	2	5	10	23	19	44	11	26	4
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	0	0	3	7	14	33	18	42	8	19	4
4. The buyer and seller have little conflict in the business transaction.	3	7	7	16	15	35	15	35	3	7	3
ASSEMBLER-WHOLESALE											
1. I can produce/procure the desired volume when buyers needed it.	0	0	1	5	6	32	6	32	6	32	4
2. I exert effort to produce/procure the desired volume and quality when buyers demand it.	0	0	0	0	6	32	8	42	5	26	4
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	0	0	0	0	5	26	10	53	4	21	4
4. The buyer and seller have little conflict in the business transaction.	1	5	2	11	5	26	10	53	1	5	3
FINANCIER-ASSEMBLER-WHOLESALE											
1. I can produce/procure the desired volume when buyers needed it.	0	0	1	6	4	22	7	39	6	33	4
2. I exert effort to produce/procure the desired volume and quality when buyers demand it.	0	0	1	6	1	6	8	44	8	44	4



Table 5a. Continued...

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	1	6	0	0	4	22	7	39	6	33	4
4. The buyer and seller have little conflict in the business transaction.	1	6	0	0	6	33	6	33	5	28	4
TRUCKER-WHOLESALE											
1. I can produce/procure the desired volume when buyers needed it.	1	8	1	8	2	17	3	25	5	42	4
2. I exert effort to produce/procure the desired volume and quality when buyers demand it.	0	0	1	8	1	8	3	25	7	58	5
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	0	0	0	0	3	25	6	50	3	25	4
4. The buyer and seller have little conflict in the business transaction.	1	8	0	0	2	17	7	58	2	17	4
WHOLESALE											
1. I can produce/procure the desired volume when buyers needed it.	0	0	0	0	4	40	3	30	3	30	4
2. I exert effort to produce/procure the desired volume and quality when buyers demand it.	0	0	0	0	2	20	3	30	5	50	5
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	0	0	0	0	3	30	4	40	3	30	4
4. The buyer and seller have little conflict in the business transaction.	0	0	2	20	3	30	3	30	2	20	4
WHOLESALE-RETAILER											
1. I can produce/procure the desired volume when buyers needed it.	1	3	3	8	9	24	11	30	13	35	4
2. I exert effort to produce/procure the desired volume and quality when buyers demand it.	1	3	0	0	3	8	18	49	15	41	4
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	0	0	1	3	11	30	16	43	9	24	4
4. The buyer and seller have little conflict in the business transaction.	2	5	3	8	11	30	16	43	5	14	4
RETAILER											
1. I can produce/procure the desired volume when buyers needed it.	3	6	9	17	15	28	15	28	12	22	3
2. I exert effort to produce the desired volume and quality when buyers demand it.	3	6	5	9	10	19	22	41	14	26	4
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	4	7	7	13	11	20	23	43	9	17	3
4. The buyer and seller have little conflict in the business transaction.	8	15	5	9	19	35	20	37	2	4	3



Table 5b presents the descriptive and test statistics according to flexibility performance. The mean implies that most of the chain actors moderately agree on; the desired volume of potato produced/procured when buyers needed it, exerting effort to produce the desired volume and quality when buyers demand it, and the buyer is flexible to buy potatoes regardless of quantity and quality while they never considered/undecided on the buyer and seller have little conflict in the business transaction. The production, assembly, distribution and retailing group focused more on the production and procurement of the desired volume of potato (15.192) when buyers needed it while flexibility of buyers to buy potatoes regardless of quality and quantity was the least (7.123). Furthermore, chain actors differ significantly on their understanding on the desired volume of potato produced/procured when buyers needed it (0.002), exerting effort to produce the desired volume and quality when buyers demand it (0.026), and buyer and seller have little conflict in the business transaction (0.031).

Table 5b. Descriptive and test statistics

Statement	Mean	chi-square	df	asymptotic significance
1. I can produce/procure the desired volume when buyers needed it.	3.60	15.192	3	0.002**
2. I exert effort to produce the desired volume and quality when buyers demand it.	4.00	9.300	3	0.026*
3. The buyer is flexible to buy potatoes regardless of quantity and quality.	3.75	7.123	3	0.068
4. The buyer and seller have little conflict in the business transaction.	3.35	8.873	3	0.031*

*

**



c. Efficiency Performance

As cited by Lai *et al.*, 2002 efficiency measures how well the resources were utilized this include the production costs, profit, return on investment and inventory.

Table 6a presents the efficiency performance of the actors. Some of the farmers (27%) and trucker-wholesalers (50%) strongly agree while assembler-wholesalers (47%), wholesale-retailers (49%) and retailers (44%) moderately agree on their happiness to produce the desired volume out of their limited resources. In addition to that, financier-assembler-wholesaler (28%) and wholesalers (30%) has multiple equal responses (undecided, moderately agree and strongly agree) on the said statement. Moreover, as to the income received is adequately rewarding; farmers (2%) and retailers (3%) strongly disagree for the reason that they maybe were not rewarded. However, majority of the financier-assembler-wholesalers (61%) moderately agree while half of the trucker-wholesalers (50%) also moderately agree on the efficiency statement number two. Moreover, farmers (40%) and assembler-wholesaler-retailers (47%) moderately agree while financier-assembler-wholesalers (44%), wholesalers (50%), wholesale-retailers (51%) and retailers (43%) strongly agree that they exert effort to reduce the cost of production. In addition to statement number three, trucker-wholesalers (42%) has an extreme response with it. (moderately agree and strongly disagree). Nevertheless, as to the satisfaction with the rate of return to their investment; farmers (42%) never considered, most of the assembler-wholesalers (63%), trucker-wholesalers (58%) moderately agree and wholesalers (60%) also moderately agree.

Majority of the chain actors moderately agree on the statements related to efficiency performance but there are some like farmer who never considered/undecided that they were satisfied with the rate of return to their investment while there were some



also like trucker-wholesalers and wholesaler-retailers who strongly agree on exerting effort to reduce their cost of procurement.

Table 6a. Performance of chain actors according to efficiency

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
FARMER											
1. I am happy to produce the desired volume out of my limited resources.	1	2	2	5	11	26	13	30	16	37	4
2. The income I received is adequately rewarding.	1	2	4	9	14	33	16	37	8	19	4
3. I exert effort to reduce the cost of production.	0	0	3	7	10	23	17	40	13	30	4
4. I am satisfied with the rate of return to my investment.	0	0	7	16	18	42	10	23	8	19	3
ASSEMBLER-WHOLESALER											
1. I am happy to produce the desired volume out of my limited resources.	0	0	0	0	7	37	9	47	3	16	4
2. The income I received is adequately rewarding.	0	0	0	0	6	32	8	42	5	26	4
3. I exert effort to reduce the cost of production.	0	0	0	0	4	21	9	47	6	32	4
4. I am satisfied with the rate of return to my investment.	0	0	1	5	2	11	12	63	4	21	4
FINANCIER-ASSEMBLER-WHOLESALER											
1. I am happy to produce the desired volume out of my limited resources.	2	11	0	0	5	28	5	28	5	28	3
2. The income I received is adequately rewarding.	0	0	0	0	2	11	11	61	5	28	4
3. I exert effort to reduce the cost of production.	0	0	0	0	4	22	6	33	8	44	4
4. I am satisfied with the rate of return to my investment.	0	0	0	0	4	22	8	44	6	33	4
TRUCKER-WHOLESALER											
1. I am happy to produce the desired volume out of my limited resources.	0	0	1	8	1	8	4	33	6	50	5
2. The income I received is adequately rewarding.	0	0	0	0	3	25	6	50	3	25	4
3. I exert effort to reduce the cost of production.	0	0	0	0	2	17	5	42	5	42	5
4. I am satisfied with the rate of return to my investment.	0	0	0	0	2	17	7	58	3	25	4
WHOLESALER											
1. I am happy to produce the desired volume out of my limited resources.	0	0	1	10	3	30	3	30	3	30	4
2. The income I received is adequately rewarding.	0	0	3	30	1	10	5	50	1	10	3



Table 6a. Continued...

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
3. I exert effort to reduce the cost of production.	0	0	2	20	2	20	1	10	5	50	4
4. I am satisfied with the rate of return to my investment.	0	0	1	10	1	10	6	60	2	20	4
WHOLESALE-RETAILER											
1. I am happy to produce the desired volume out of my limited resources.	0	0	0	0	5	14	18	49	14	38	4
2. The income I received is adequately rewarding.	0	0	1	3	7	19	17	46	12	32	4
3. I exert effort to reduce the cost of production.	0	0	1	3	5	14	12	32	19	51	5
4. I am satisfied with the rate of return to my investment.	1	3	2	5	9	24	15	41	10	27	4
RETAILER											
1. I am happy to produce the desired volume out of my limited resources.	2	4	3	6	12	22	24	44	13	24	4
2. The income I received is adequately rewarding.	1	2	1	2	11	20	25	46	16	30	4
3. I exert effort to reduce the cost of production.	1	2	3	6	9	17	18	33	23	43	4
4. I am satisfied with the rate of return to my investment.	1	2	0	0	11	20	27	50	15	28	4

Table 6b shows the descriptive and test statistics of chain actors according efficiency performance. Chain actors moderately agree on all of the efficiency statements. According to the chain actors, satisfaction with the rate of return to their investment was the first indicator to measure efficiency performance or they focused more on the said statement while exerting effort to reduce the cost of production were the least. Moreover, test statistics findings shows (0.005) shows that chain actors significantly differ of their responses on their satisfaction with the rate of return to their investment. Respondents also had common understanding or they had no significant difference on their responses with the efficiency statements one, two and three (having an asymptotic significance of 0.225, 0.145 and 0.464 respectively).



Table 6b. Descriptive and test statistics

Statement	Mean	chi-square	df	asymptotic significance
1. I am happy to produce the desired volume out of my limited resources.	3.94	4.365	3	0.225
2. The income I received is adequately rewarding.	3.93	5.402	3	0.145
3. I exert effort to reduce the cost of production.	4.10	2.563	3	0.464
4. I am satisfied with the rate of return to my investment.	3.89	12.97	3	0.005**

**

d. Responsiveness Performance

Salvador *et al.* told that responsiveness aims to provide the requested products with a short lead time.

Table 7a the indicator to measure the responsiveness performance of actors in the spot market chain for potato. Some of the farmers (7%), assembler-wholesalers (5%), wholesaler-retailers (10%), and retailers (13%) strongly disagree that they can supply the market with desired quality/quantity when needed. However, financier-assembler-wholesalers (39%) and trucker-wholesalers (58%) moderately agree while multiple same response rated by wholesale-retailers (30%) on the statement number one. As to the scheduling of deliveries to meet the time in the market, some of the farmers (9%) and retailers (26%) strongly agree of it. Some farmers strongly disagree for the reason that they don't schedule their deliveries but rather, their harvest depends on the maturity and market prevailing price of potato in the market. Also with retailers, some of them strongly disagree for the reason that their customers are the one who go with them in the market. Moreover, assembler-wholesalers (42%), trucker-wholesalers (58%), and wholesalers (40%) strongly agree while there was an extreme response (undecided and strongly disagree) of financier-assembler-wholesalers (33%) on scheduling of deliveries to meet the time in the market. According to finding time to deliver potatoes when



customer/market needs it some of the farmers (12%), financier-assembler-wholesalers (6%), trucker-wholesalers (8%), wholesalers (10%), wholesaler-retailers (14%) and retailers (19%) strongly disagree while assembler-wholesalers (42%) strongly agree on it. Nevertheless, there was an extreme response (undecided and strongly agree) of financier-assembler-wholesalers (39%) also with trucker-wholesalers (moderately agree and strongly agree) on acting to the demand/complaints of buyers related to quality/ quantity of potato.

The average implies that most of the chain actors moderately agree that they can supply/provide the requested product with a short lead time.

Result findings has a similarity with the findings of Salvador *et al.* (2001), that when buyers and suppliers interact on issues related to material flows and quality, there were significant effects in terms of speed and delivery punctuality.

Table 7a. Performance of chain actors according to responsiveness

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
FARMER											
1. I can supply the market with desired quality/quantity when needed.	3	7	17	40	14	33	6	14	3	7	3
2. I always schedule my deliveries to meet the time in the market.	4	9	11	26	13	30	8	19	7	16	3
3. I always find time to deliver potatoes when customers/market needs it.	5	12	12	28	13	30	9	21	4	9	3
4. I always act on the demand/complaints of buyers related to quality/quantity.	3	7	7	16	17	40	11	26	5	12	3
ASSEMBLER-WHOLEALER											
1. I can supply the market with desired quality/quantity when needed.	1	5	0	0	2	11	10	53	6	32	4
2. I always schedule my deliveries to meet the time in the market.	0	0	2	11	6	32	3	16	8	42	4
3. I always find time to deliver vegetables when customers/market needs it.	0	0	2	11	3	16	6	32	8	42	4
4. I always act on the demand/complaints of buyers related to quality/quantity.	0	0	1	5	5	26	8	42	5	26	4



Table 7a. Continued...

Statement	1		2		3		4		5		Ave.
	N	%	N	%	N	%	N	%	N	%	
FINANCIER-ASSEMBLER-WHOLESALER											
1. I can supply the market with desired quality/quantity when needed.	0	0	0	0	5	28	7	39	6	33	4
2. I always schedule my deliveries to meet the time in the market.	1	6	0	0	6	33	5	28	6	33	4
3. I always find time to deliver potatoes when customers/market needs it.	1	6	0	0	4	22	8	44	5	28	4
4. I always act on the demand/complaints of buyers related to quality/quantity.	0	0	0	0	7	39	4	22	7	39	4
TRUCKER-WHOLESALER											
1. I can supply the market with desired quality/quantity when needed.	0	0	0	0	2	17	7	58	3	25	4
2. I always schedule my deliveries to meet the time in the market.	0	0	1	8	3	25	1	8	7	58	4
3. I always find time to deliver potatoes when customers/market needs it.	1	8	0	0	2	17	5	42	4	33	4
4. I always act on the demand/complaints of buyers related to quality/quantity.	0	0	0	0	2	17	5	42	5	42	5
WHOLESALER											
1. I can supply the market with desired quality/quantity when needed.	1	10	1	10	5	50	2	20	1	10	3
2. I always schedule my deliveries to meet the time in the market.	0	0	3	30	1	10	2	20	4	40	4
3. I always find time to deliver potatoes when customers/market needs it.	1	10	1	10	2	20	3	30	3	30	4
4. I always act on the demand/complaints of buyers related to quality/quantity.	0	0	0	0	4	40	3	30	3	30	4
WHOLESALER-RETAILER											
1. I can supply the market with desired quality/quantity when needed.	0	0	4	11	11	30	11	30	11	30	4
2. I always schedule my deliveries to meet the time in the market.	6	16	5	14	4	11	16	43	6	16	3
3. I always find time to deliver potatoes when customers/market needs it.	5	14	4	11	6	16	12	32	10	27	3
4. I always act on the demand/complaints of buyers related to quality/quantity.	1	3	1	3	4	11	21	57	10	27	4
RETAILER											
1. I can supply the market with desired quality/quantity when needed.	7	13	11	20	15	28	14	26	7	13	3
2. I always schedule my deliveries to meet the time in the market.	14	26	8	15	13	24	10	19	9	17	3
3. I always find time to deliver potatoes when customers/market needs it.	10	19	10	19	13	24	11	20	10	19	3
4. I always act on the demand/complaints of buyers related to quality/quantity.	1	2	9	17	19	35	16	30	9	17	3



Table 7b presents the descriptive and test statistics according to responsiveness performance of actors in the spot market chains for potato. Respondents focused more on always acting on the demand/complaints of buyers related to quality/quantity for as long as to the improvement of their service while always scheduling their deliveries to meet the time in the market was the least. Result shows that all the responsiveness statements are important to measure performance as shown by their computed chi-squares. Test statistics findings also shows that chain actors significantly differ from each other on responses on all the statements related to responsiveness performance as follows: I can supply the market with desired quality/quantity when needed, I always schedule my deliveries to meet the time in the market, I always find time to deliver potatoes when customers/market needs it and I always act on the demand/complaints of buyers related to quality/quantity.

Table 7b. Descriptive and test statistics

Statement	Mean	chi-square	df	asymptotic significance
1. I can supply the market with desired quality/quantity when needed.	3.42	0.000	3	**0.000
2. I always schedule my deliveries to meet the time in the market.	3.32	0.002	3	**0.002
3. I always find time to deliver potatoes when customers/market needs it.	3.34	0.000	3	**0.000
4. I always act on the demand/complaints of buyers related to quality/quantity.	3.66	0.000	3	**0.000

**



SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

Mostly of the chain actors are: ranging from age (21-30); female except in farming, Assemble-Wholesaling and Trucker-Wholesaling where male were high in number; married; catholic; attain high school and college level; one to five years engaged in vegetable business and no organizational affiliation.

Most of the respondents moderately agreed on product quality satisfaction of potato especially on the reliability regarding on quality of potatoes supplied in the market. Moreover the researcher found out that majority of the chain actors strongly agreed that they are satisfied to fulfill the orders and deliveries of potatoes when needed. Although, respondents are agreed on other statement related to product quality satisfaction, average shows that chain actors (farmers, financier-assembler-wholesalers, trucker-wholesalers and retailers) moderately disagree while assembler-wholesalers, wholesalers and wholesale-retailers never considered/undecided selling potato on credit arrangement. The mean/weighted average result showed that chain actors moderately agree mostly on the statements related to product quality satisfaction. Most of the chain actors have common understanding or had no significant difference on responses in the product quality satisfaction statements one, two, three, six and eight but they significantly differ of responses on the product quality satisfaction statements four, five and seven.

Majority of the respondents: the production, assembly, distribution and retailing group moderately agreed that buyers are flexible to buy potatoes regardless to quality/quantity. However, farmers and retailers has an extreme response (undecided and moderately agreed) on having little conflict by buyers and sellers to their business



transaction. The test statistics finding implies that respondents have a common understanding on buyers was flexible to buy potatoes regardless to quality/quantity while they significantly differ on understanding on flexibility performance statements one, two and four.

Regarding to efficiency performance; chain actors revealed that they are generating income in vegetable business and the rate of returns to their investment is satisfying while financier-assembler-wholesalers, trucker-wholesalers, wholesaler-retailers and retailers strongly agree on exerting effort to reduce the cost of production/procurement. Furthermore, test statistics validated that they have common understanding to the stated statements on efficiency.

As to the responsiveness performance, trucker wholesalers strongly agreed on scheduling of their deliveries to meet the time in the market, they deliver potato everyday at the spot markets while retailers strongly disagreed for the reason that they don't schedule their deliveries but rather their customers are regular or not were the one to go with them at the market. Chain actors have significant differences, which mean that they differ on understanding related to responsiveness performance.

Conclusion

Based on the findings of the study on product quality satisfaction the researcher found out that chain actors focused much on their satisfaction in fulfill the orders and deliveries of potatoes when needed while the satisfaction of buyers as to variety of product, price, and quality /quantity was the least. However, respondents have common understandings on the responses in product quality statements one, two, three, six and eight while they significantly differ on responses on product quality satisfaction



statements four, five and seven. Moreover, descriptive statistics on flexibility performance shows that buyers and sellers have little conflict and this was truly happening. All of the statements on efficiency are important to measure performance of chain actors as validated by their responses. Nevertheless, farmers strongly disagreed that they are responsible to supply the market with the desired volume and quality when needed while the assembly group moderately agreed that they can.

Recommendation

In order to have a good performance, chain actors must reclassify the potato to meet product quality satisfaction. Establishment of business to business relationship especially trust must be observed and there should be communication to have a good bonding of each actor to avoid opportunistic creditors. As to the flexibility, buyers must have an advanced notice in accordance with the quality and volume to be procured to give an ample time to suppliers in order for them to supply what they want. The chain actors must possess the right attitude in order to satisfy the requirements or needs of the buyers and to minimize conflicts between them. Moreover, chain actor's responsibility to deliver potato must be always on time. Chain actors must also act on demand/complaints of buyers related to quality/quantity for the improvement of business transaction.



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APPENDIX A

Communication Letter

November, 2010

Sir/Madam,

Warm greetings!

I am a graduating student of Benguet State University taking up Bachelor of Science in Agribusiness major in Enterprise Management. As part of the course requirement, I am presently conducting an undergraduate research study entitled “MEASURING PERFORMANCE OF ACTORS IN THE SPOT MARKET CHAINS FOR POTATO”.

In connection with this, may I ask you to fill up or answer the questionnaire made for this purpose? Rest assured that all the information you would provide would be treated with utmost confidentiality. Your favorable approval was highly appreciated.

Thank you for your kindness and cooperation. May God bless you!

Sincerely yours,

DANTE T. FRANCIS
Researcher

Noted by:

LEOPOLDO N. TAGARINO
Adviser



APPENDIX B

Interview Schedule

This research aims to investigate the potato supply networks. All information solicited would be treated with confidentiality. Please answer the questions honestly by putting (/) mark in the appropriate space provided for.

Thank you very much!

Respondent's Name: (Optional) _____ No. _____

Respondent's Group:

- 1. Production Group: Farmers
- 2. Assembly (Collection) Group: Assembler-Wholesaler
 Financier-Assembler-Wholesaler
 Disposer
- 3. Distribution Group: Trucker-Wholesaler
 Wholesale
 Wholesale-Retailer
- 4. Retailing Group: Retailer

A. SOCIO-ECONOMIC PROFILE

- 1. Age: _____
- 2. Gender: Male Female
- 3. Marital status: Single Married Separated Widowed
- 4. Religion: Catholic Protestant Others, specify _____
- 5. Educational background: Elementary High School College Vocational
- 6. Number of years engage in vegetable farming business: _____
- 10. Organizational affiliation: Farmers' Association Cooperatives
 others specify _____

B. Who were the buyers of the potato you produced/procured/? (Please identify)

- Assembler-Wholesalers; Financier-Assembler-Wholesalers;
- Trucker-Wholesalers; Wholesalers; Wholesaler-Retailers; Retailers

C. Where do you sell the potato produced/procured?

- La Trinidad Potato Trading Post; Baguio Hangar Market
- Private Trading Center in La Trinidad Metro Manila (Specify) _____
- Other Market: Please specify _____

D. PERFORMANCE (Operations): Assess the performance of the supply network operation using the following metrics.

D.1 Product Quality Satisfaction - consists of product safety and health; the sensory properties and shell life and; product reliability and convenience.

- a. The quality of potato I produce/procure/
sold meets my expectation. 1 2 3 4 5
Strongly Disagree Strongly Agree
- b. The quality of potato delivered meets
the buyer's requirements. Strongly Disagree Strongly Agree



- | | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|-------------------|----------------|
| c. I am satisfied with the volume I produce/procure or sold to the buyer. | | | | | Strongly Disagree | Strongly Agree |
| d. I always achieve my production/procurement/delivery targets. | | | | | Strongly Disagree | Strongly Agree |
| e. I am satisfied to fulfill the orders and deliveries of potato when needed. | | | | | Strongly Disagree | Strongly Agree |
| f. I am satisfied selling potato to buyers on credit arrangement. | | | | | Strongly Disagree | Strongly Agree |
| g. The quality of potato I supplied in the market is reliable. | | | | | Strongly Disagree | Strongly Agree |
| h. The buyers are always satisfied as to variety of product, price, and quality/quantity. | | | | | Strongly Disagree | Strongly Agree |

D.2 Flexibility - indicates the degree to which supply chain can respond to changing environment and extraordinary customer service requests

- | | | | | | | |
|--|--|--|--|--|-------------------|----------------|
| a. I can produce/procure the desired volume when buyers needed it. | | | | | Strongly Disagree | Strongly Agree |
| b. I exert effort to produce/procure the desired volume and quality when buyers demand it. | | | | | Strongly Disagree | Strongly Agree |
| c. The buyer is flexible to buy potato regardless of volume and quality. | | | | | Strongly Disagree | Strongly Agree |
| d. The buyer and seller have little conflict in their business transaction. | | | | | Strongly Disagree | Strongly Agree |

D.3 Efficiency - measures how well the resources were utilized which include production costs, profit, return on investment and inventory.

- | | | | | | | |
|--|--|--|--|--|-------------------|----------------|
| a. I am happy to produce/procure the desired volume out of my limited resources. | | | | | Strongly Disagree | Strongly Agree |
| b. The income I received is adequately rewarding. | | | | | Strongly Disagree | Strongly Agree |
| c. I exert effort to reduce the cost of production/procurement. | | | | | Strongly Disagree | Strongly Agree |
| d. I am satisfied with the rate of return to my investment. | | | | | Strongly Disagree | Strongly Agree |

D.4 Responsiveness - aims at providing the requested products with a short lead time

- | | | | | | | |
|---|--|--|--|--|-------------------|----------------|
| a. I can supply the market with desired quality/ quantity when needed. | | | | | Strongly Disagree | Strongly Agree |
| b. I always schedule my deliveries to meet the time in the market. | | | | | Strongly Disagree | Strongly Agree |
| c. I always find time to deliver potato when customer/ market need it. | | | | | Strongly Disagree | Strongly Agree |
| d. I always act on the demand/ complaints of buyers related to quality/ quantity. | | | | | Strongly Disagree | Strongly Agree |

