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"THE PRICING FACTORS IN AGRIBUSINESS SUPPLY CHAIN MANAGEMENT: A CASE STUDY OF DRY CHILLY FARMERS"

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ABSTRACT

Pricing is one of the important cross functional driver influencing the supply chain performance, necessarily a factor in defining and configuring a supply chain management of dry Chilly. A farmer tries to minimize cost and maximize the profit. His decision to sell dry Chilly in a particular market depends on various factors,where pricing is one of the important factor amongst that. Hence a research was conducted to understand the farmers knowledge and expectations about dry chilly pricing. Factor analysis was used to analyze and it was found out that,Farmers obtains sufficient knowledge to get a best yield, they try to be cost effective during the process, they try to protect the crop from physical and financial loss using measures

Key words: Agribusiness Supply Chain, Dry Chilly Farmers, Cross Functional Driver, Pricing, Factor Analysis.

1. INTRODUCTION

An efficient supply chain moves the right product at the right time, the right place, the right quantity, and the right quality to the right customer, and most importantly, at the right price for everyone in the supply chain network. Hence, it is clear that pricing would be one of the important cross functional drivers of the supply chain. With one's understanding of the supply chain focus, in the trade-off between efficiency and responsiveness in a supply chain structure, price has connotations for both (Mr. V. Chandra Sekhar Rao, Dr. G. V. Kesava Rao, 2014)[1]. Dry Chilly is an indispensable item in the Indian food preparation. It is one of

the highly demanded spices in world as well as in India. Amongst the chilly produced in India, it is majorly consumed in India, except 4% of the export.

2. LITERATURE REVIEW

2.1 Agricultural Supply Chain

Supply chain management is a rapidly evolving area of interest to academics and businessmanagement practitioners alike (Jill E. Hobbs, 1996)[2].The modern supply chain management is witnessing a radical transformation as an effect of competitive strategy (Sanjay Bokade, D.N. Raut, 2013)[3]. Competitive pressure and globalized networks have resulted in complex and dynamic supply chains (SCs) (Zhang etal. , 2003; Christopher etal. , 2006, Manuj and Mentzer, 2008; Creazza et al. , 2010)[4,5,6,7]. However, the focus of supply chain management (SCM) to date has been on the design and optimization of the flows of goods and information (Lee et al.,2000; Childerhouse and Towill, 2003; Disney and Towill, 2003; Bhatnagar and Teo, 2009).[8,9,10,11]

Agricultural products are the necessities of human life and rigid consumer goods, and it is one of the most important social producing. Since the human society entered the modern time, agricultural production has become an industry with more detailed labor division, and most consumers do not need to produce agricultural products, which make production supply and consumption of agricultural products a supply chain (Guoping Nong, Sulin Pang, 2013)[12].

A supply chain in agriculture can be thought of as a " farm to fork " process – from the inputs to production to processing, marketing and the consumer (Sachin Ghai, 2012)[13].

2.2 Pricing

Traditionally, pricing has been considered as a process for dividing profit between two bargaining parties facing each other in negotiations, without considering the opportunity to act collaboratively in price definition in order to develop mutually beneficial relationships (Marco Formentini, Pietro Romano, Thomas Bortolotti, 2011)[14]. Therefore, the traditional pricing approach is usually internally focused to the firm. From this perspective, organizations independently calculate and define their profit objectives on the basis of internal cost structures and lately enter price negotiations with their transaction counterparts (Garda , 1984)[15].

This traditional pricing policy adopts a tactical, short term perspective (Anderson and Narus, 2004)[16] that consequently limits the development of closer business relationships, since the main attention is given to the single transaction. In addition, the main assumption is that what

is gained by the firm is lost by the customer and vice versa, and that pricing is a zero-sum game (Brennan et al., 2007)[17].

Thus, pricing is perceived as a distribution parameter rather than being considered a collaborative process (Voeth and Herbst, 2006)[18]. Moreover, traditional pricing considers exclusively the buyer-seller dyad, without extending the investigation of the influence of other supply chain counterparts in the pricing process. The interaction could be limitedly extended to get external information to be used in price definition: in this case, the interaction with customers aims to understand the perceived value adopting "value-based pricing" methods (Hinterhuber, 2004)[19], while on the other hand suppliers are an information source of the cost of purchased items and perform "cost-based" or "cost-plus pricing" (Brennan et al., 2007)[17] methods.

The agricultural producing is influenced by the natural conditions, and the yield is uncertain. While agricultural products is rigid demand goods, the fluctuations of yield cause greater volatility of prices(Guoping Nong, Sulin Pang, 2013)[20]. Kazaz, 2004 consider the random yield characteristics in the process of agricultural production, production planning and pricing decision problem under the background of random output. However, in Supply Chain Management literature the main focus on pricing is limited to the interaction withother logistic variables within the Supply Chain Coordination research stream (Arshinder et. al., 2008)[21]. Voeth and Herbst (2006)[22] offer a first contribution to investigate pricing from a supply chain point of view. They developed for the first time the conceptual model of "Supply Chain Pricing", intended as a collaborative tool to increase the joint profits within the supply network.

3. NEED OF THE STUDY

Scholars across different research areas agree that the pricing process still remains an under-investigated topic, thus deserving more in-depth research.Lancioni (2005)[23], Dohrup (2006)[24] and Brennan et al. (2007)[25], pricing has paradoxically received little Attention.Therefore, it is necessary to understand the farmers knowledge and expectations about dry Chilly pricing.

4. RESEARCH METHODOLOGY

4.1 Data Collection

We used Descriptive research design in the research. Convenience and judgmentalsampling (non-probability sampling) was used for selecting the respondents i.e., dry Chilly farmers. The survey instrumentstructured questionnaire (in Kannada language as farmers were

comfortable only in regional language of Karnataka in India), was used to administer the personal interview, survey and schedule methodfor data collection.

The sample size determined was 596 dry chilly farmers who are the actual respondents, growing and selling dry chillies in Byadagi, Hubballi and Gadag APMC's in Karnataka state representing highest ranking in terms of trading. As a general rule researcher must obtain observations five times greater than the number of variables to be analyzed (Hair et al, 2012)[26].

4.2 Measures

Existing Likert's five point rating scale used in various research studies were used in this study. Respondents were asked to rate the prevalence factor on a 1- 5 Point scale [1= strongly dis agree, 2=dis agree, 3=neither agree nor disagree, 4=agree, 5=strongly agree].

4.3 Convergent Validity and Reliability test

We carried the exploratory factor analysis to check the factor score and loading values. The cross-loaded factors were removed from the analysis. The factors loading values are reasonably high on their respective factors i.e. always greater than 0.40, which indicates desirable convergent validity in the measures (Narkhede, Nehete & Mahajan, 2012)[27]. Factor loadings in matrix are with no cross loadings indicating good amount of discriminant validity. The KMO values resulted higher than 0.5 indicating the sampling adequacy (Kaizer, 1974)[28]. MSA (Measurement for sampling adequacy) for each variable was also checked which resulted higher than 0.5. Bartlett's test of sphericity was favorable indicating the existence correlation among the variables. All the constructs had Nomological validity, as the scales used for the study were existing scales withsufficient literature support (Hair et al, 2012)[27].

5. DATA ANALYSIS AND INTERPRETATION

5.1 Reliability

Reliability was assessed using reliability coefficient Cronbach alpha. Cronbach alpha assesses the consistency of the entire scale. In exploratory studies, the suggested Cronbach alpha is a minimum of 0.60(Kaizer, 1974, Hair et al, 2012)[27,28]. Thedata analysis for reliability test resulted in Cronbach alpha was 0.820 indicating significant reliability of measures.

Table 1 : Case Processing Summary

		N	%
Cases	Valid	596	100.0
	Excluded[a]	0	0.0
	Total	596	100.0
a. List wise deletion based on all variables in the procedure.			

Table 2 : Reliability Statistics

Cronbach's Alpha	N of Items
0.820	19

5.2 Exploratory Factor Analysis

Factor analysis is a data reduction statistical technique that allows simplifying the correlational relationships between a numbers of continuous variables. Exploratory factor analysis is used in order to identify constructs and investigate relationships among key interval scaled questions regarding preferences given by farmers to make right decisions.

The factor analysis carried out by this study was focusing on identifying the hidden dimensions of supply chain driver *Pricing* from the farmer's point of view, for making efficient decisions. Several views of pricing of farmer were taken to identify the hidden dimensions. The factors obtained through major component analysis, for extracting factor with eigenvalue over 1 as standard, then selected appropriate numbers in accordance with the requirement of the study, followed by orthogonal rotation with the maximum variation, in order to make structure of each factor to be more explicit.

5.3 Empirical Analysis and Interpretation

The factor analysis was carried out for the items: KMO and Bartlett's test, Communalities, Total variance explained and Factors developed matrix table based on Rotated component matrix, are obtained as a result of factor analysis. The details of the analysis are presented below**.**

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.786
Bartlett's Test of Sphericity	Approx. Chi-Square	2948.506
	df	136
	Sig.	0.00

Factor analysis was used in an objective to find the factorability of items using the Kaiser criterion with Eigen value as 1. Kaise- Meyer-Olkin measure of sampling adequacy was .786 which is above the recommended value of 0.5, and Bartlett's test of Sphericity was significant (χ^2 = 2948.506, p<.05). The results from both the test showed the presence of sample adequacy and relation among the selected variables respectively.

5.4 Communalities, Total variance explained & Rotated Component Matrix

5.4.1 Communalities

Communalities explains the variance of each of the variables explained by the extracted factors. Principal component analysis works on the initial assumption that all variance is common; therefore, before extracted communalities are all 1. Communalities are in terms of the proportion of variance explained by the underlying factors. After extraction some of the factors are discarded and some information is lost. So, the amount of variance in each variable that can be explained by the retained factors is represented by the communalities in the table number 4

5.4.2 Total Variance Explained

The eigenvalues above 1 have generated four factors (4.15, 2.42, 1.77, 1.33) which obtained after rotation. Rotation has the effect of optimizing the factor structure and one consequence for these data is that the relative importance of the data items generate equalized factors.

Total Variance explains the % of extraction by each factor representing common interest of items belongs to the factor. Total variance of 4 factors abstracts the % of variance explained by each factor (15.92%, 15.61%, 12.89%, 12.43%) respectively shown in the table number 4.

5.4.3 Rotated Component Matrix

The rotated component matrix (also called as rotated factor matrix in factor analysis) which is a matrix of the Factor loading for each variables onto each factor. This matrix contains the same information as the component Matrix except that it is calculated after rotation. Before rotation, most variables loaded highly onto the first factor and the remaining factors didn't really get a look in, however rotation of the factor structure has clarified things considerably.

Table 4: Communalities, Total Variance Explained, Rotated Component Matrix

Rotated Component Matrix[a]					**Communalities**
	Component				
	1	**2**	**3**	**4**	
I know that dry Chilly production gives my return on investment.	**0.831**	0.014	0.088	0.071	0.704
Instead of single grading, I prefer multiple grading to get more profit.	**0.787**	0.036	0.008	0.151	0.644
I feel that dry Chilly is risky crop compared to other crops.	**0.781**	0.138	0.2	0.042	0.671
I expect government should take strong initiation to announce Minimum support price	**0.475**	0.17	0.168	0.112	0.296
I am aware of market support prices for my dry Chilly	-0.119	**0.717**	0.039	0.102	0.54
I grow dry Chilly because, it is always a high demanded food produce.	0.075	**0.70**	-0.05	0.077	0.504
I am satisfied with the price I got as per the grade of my dry Chilly.	0.109	**0.663**	-0.042	0.172	0.484
Price of dry Chilly is based on market	0.314	**0.61**	-	-	0.524
Commission Agent helps in anticipating	-	**0.591**	0.278	0.103	0.439
Because of e-tendering process, I am able to get good market price for dry Chilly.	0.283	**0.566**	-0.009	-0.005	0.4
Crop Insurance protects me from various losses of dry Chilly production.	-0.03	0.085	**0.778**	0.062	0.618
To assess the market price of dry Chilly, I refer NCDEX online commodity market price.	0.183	-0.235	**0.729**	-0.002	0.62
I am satisfied with government financial support for dry Chilly production.	0.159	0.01	**0.668**	0.292	0.558
Commission agents provide advance financial support during cultivation and harvesting.	0.43	0.108	**0.595**	0.11	0.562
The cost of loading and unloading of dry	-	0.134	0.163	**0.813**	0.71
The cost of spreading and cleaning of dry	0.199	0.082	0.087	**0.811**	0.712
The cost of packing dry Chilly is high.	0.242	0.143	0.091	**0.77**	0.68
Eigen Value	4.15	2.42	1.77	1.33	
TVE	15.92	15.61	12.89	12.43	
Extraction Method: Principal Component Analysis.					
Rotation Method: Varimax with Kaiser Normalization.					

Factor analysis on pricing resulted in extraction of four factors. The first factor has four items I know that dry Chilly production gives my return on investment, Instead of single grading, I prefer multiple grading to get more profit, I feel that dry Chilly is risky crop compared to other crops and I expect government should take strong initiation to announce Minimum support price for dry Chilly with loadings as 0.831, 0.787, 0.781 and 0.475. The factor was termed as "Knowledge about crop and trading".

Items like I am aware of market support prices for my dry Chilly, I grow dry Chilly because, it is always a high demanded food produce, I am satisfied with the price I got as per the grade of my dry Chilly, Price of dry Chilly is based on market demand, Commission Agent helps in anticipating market price and Because of e-tendering process, I am able to get good market price for dry Chilly had loadings as 0.717, 0.700, 0.663, 0.610, 0.591 and 0.566. Factor2 is represented as "Awareness & anticipation about good pricing".

Factor3 termed as "Security and Financial services" had four items with loadings as Crop Insurance protects me from various losses of dry Chilly production, To assess the market price of dry Chilly, I refer NCDEX online commodity market price, I am satisfied with government financial support for dry Chilly production and Commission agents provide advance financial support during cultivation and harvesting is high with loadings 0.778, 0.729, 0.668, 0.595.

The final factor had three items. The cost of loading and unloading of dry Chilly is high, The cost of spreading and cleaning of dry Chilly is high and The cost of packing dry Chilly is high with loadings on the factor as 0.813, 0.811 and 0.770. This factor is termed as "Cost of Labor services"

5.4.4 Consolidated Factor Analysis

The summarized factor analysis is shown in below table. The factor loading was drawn by checking the potentiality(high loadings) from rotated component matrix, which help to identify key items showing common behavior of farmers towards development of factors, they are as shown in below table.

Table 5: Consolidated Factor Analysis Of Driver Facilities

Factor	Factor variance explained	Loading	Variables included in the factors
Knowledge about crop and trading	Factor explains 15.92% of variance	**0.831**	I know that dry Chilly production gives my return on
		0.787	Instead of single grading, I prefer multiple grading to
		0.781	I feel that dry Chilly is risky crop compared to other
		0.475	I expect government should take strong initiation to announce Minimum support price for dry Chilly.
Awareness & anticipation about good pricing	Factor explains 15.61% of variance	**0.717**	I am aware of market support prices for my dry Chilly.
		0.70	I grow dry Chilly because, it is always a high demanded food produce.
		0.663	I am satisfied with the price I got as per the grade of my dry Chilly.
		0.61	Price of dry Chilly is based on market demand.
		0.591	Commission Agent helps in anticipating market price.
		0.566	Because of e-tendering process, I am able to get good market price for dry Chilly.
Security and Financial services	This factor explains 12.89% of variance	**0.778**	Crop Insurance protects me from various losses of dry Chilly production.
		0.729	To assess the market price of dry Chilly, I refer NCDEX online commodity market price.
		0.668	I am satisfied with government financial support for dry Chilly production.
		0.595	Commission agents provide advance financial support during cultivation and harvesting.
Cost of Labor services	This factor explains 12.43% of variance	**0.813**	The cost of loading and unloading of dry Chilly is high.
		0.811	The cost of spreading and cleaning of dry Chilly is high.
		0.77	The cost of packing dry Chilly is high.

The most liked marketing elements by retailers are located with the help of factor analysis; the questions loaded range of 0.5 and above on each factor shows common interest for which we need to give new name. Hence, four factors are obtained from factor analysis, which explains the behavior of farmers towards the decision making related to pricing.

6. FINDINGS

Farmers grow dry chilly because they know it a highly demanded commercial agriculture produce, they know that pricing of dry chilly is based on market demand, they are satisfied with the price quoted for their Chilly based on the grading made. They feel that they could able to get good market price because of e-tendering process, to this they are obtaining help from commission agents. Farmers are aware of market support prices for their dry chilly.

Farmers demand crop Insurance as it protects them from various losses of dry Chilly production. To assess the market price of dry Chilly, farmers refer NCDEX online commodity market price. They are satisfied with government financial support for dry Chilly production. Farmers obtain financial support from commission agents during cultivation and harvesting. Farmers feel that the cost of spreading, cleaning, packing, loading and unloading of dry Chilly is high.

Farmers know that dry Chilly production gives their return on investment. Instead of single grading, farmers prefer multiple grading to get more profit. They feel that dry Chilly is risky crop compared to other crops in getting good price therefore, they expect government should take strong initiation towards Minimum support price for dry Chilly.

7. CONCLUSIONS

It can be concluded from the research that farmers need good knowledge about crop and trading. They should have awareness about the good pricing which they can get and should have to anticipate the future prices. Farmers make necessary arrangement for the security of dry Chilly and money required to grow crop. Farmers would like to cut down labor cost at the various stages like spreading, cleaning, packing and loading.

8. SCOPE FOR FURTHER RESEARCH

Pricing as a driver is less researched in the agriculture supply chain management, hence in-depth research related to pricing is needed like, impact of pricing on the value chain, price transmission for dry Chilly supply chain management and etc.Supply chain drivers other than pricing can also be taken for further research.

REFERENCE

1. Mr. V. Chandra Sekhar Rao, Dr. G. V. Kesava Rao, (2014), "An insight into Chilly cultivation and risk management procedures with special reference to Karnataka & Andhra Pradesh." *International Journal of Business and Administration Research Review, 2(3),* pp.33-35.
2. Jill E. Hobbs, (1996), "A transaction cost approach to supply chain management", *Supply Chain Management, Vol.1 No.2,* pp. 15–27
3. Sanjay Bokade, D.N.Raut, (2013), "Cost Effectiveness and Flexibility of Reverse Logistics for Consumables and Raw Material: An Empirical Investigation", *International Journal of Supply Chain Management, 2(3),*pp.41-46
4. Zhang, Q., Vonderembse, M.A. and Lim, J.S. (2003), "Manufacturing flexibility: defining and analyzing relationships among competence, capability and customer satisfaction", *Journal of Operations Management, 21(2),* pp. 173-191.

5. Christopher, M., Peck, H. and Towill, D. (2006), "A taxonomy for selecting global supply chain strategies", *International Journal of Logistics Management , 2(2),* pp. 277-287.
6. Manuj, I. and Mentzer, J.T. (2008), "Global supply chain risk management", *Journal of Business Logistics, 29(1),* pp. 133-155.
7. Creazza, A., Dallari, F. and Melacini, M. (2010), "Evaluating logistics network configurations for a global supply chain", *Supply Chain Management: An International Journal , Vol. 15 No. 2,* pp. 54-164.
8. Lee, H.L., So, K.C. and Tang, C.S., (2000), "The value of information sharing in a two-level supply chain", *Management Science, 46(5),* pp. 626-643.
9. Childerhouse, P. and Towill, D. (2003), "Simplified material flow holds the key to supply chain integration", *Omega , Vol. 31 No. 1,* pp. 17-27.
10. Disney, S.M. and Towill, D.R. (2003), "The effect of vendor managed inventory (VMI) dynamics on the bullwhip effect in supply chains", *International Journal of Production Economics , Vol. 85 No. 2,* pp. 199-215.
11. Bhatnagar, R. and Teo, C.-C. (2009), "Role of logistics in enhancing competitive advantage: a value chain framework for global supply chains", *International Journal of Physical Distribution & Logistics Management , Vol. 39 No. 3,* pp. 202-226.
12. Guoping Nong, , Sulin Pang, (2013), "Coordination of Agricultural Products Supply Chain with Stochastic Yield by Price Compensation",*IERI Procedia,* Vol.5, pp. 118 – 125
13. Sachin Ghai, (2012), "Value Chain Financing: Strategy towards augmenting growth in agriculture sector in India", *Journal of Economics and Sustainable Development,3(10),* pp.184-191
14. Marco Formentini, Pietro Romano, Thomas Bortolotti, (2011), "Managing pricing in a supply chain perspective", POMS 22nd Annual conference Reno, Nevada, U.S.A. April 29 to May2, 2011.
15. Garda, R.A., (1984),"Industrial pricing: Strategy vs. tactics",*The McKinsey Quarterly, winter,* pp.49-63.
16. Anderson, J.C., Narus, J.A., (2004),*Business Market management: Understanding, creating, and delivering value. Upper Saddle River*: Pearson Prentice Hall., pp.170-174
17. Brennan, R., Canning, L., McDowell, R., (2007),"Price -setting in business-to-business markets",*The Marketing Review, 7 (3),* pp.207-234.

18. Voeth M., Herbst, U., (2006),"Supply-chain pricing - A new perspective on pricing in industrial markets", *Industrial Marketing Management, 35(1),* pp. 83-90.
19. Hinterhuber, A., (2004), "Towards value-based pricing – An integrative framework for decision making",*Industrial Marketing Management, 33(8),* pp.765-778.
20. Guoping Nong, , Sulin Pang, (2013), "Coordination of Agricultural Products Supply Chain with Stochastic Yield by Price Compensation",*IERI Procedia,* Vol.5, pp. 118 – 125
21. Anderson, J.C., Narus, J.A., (2004),*Business Market management: Understanding, creating, and delivering value. Upper Saddle River*: Pearson Prentice Hall., pp.170-174
22. Voeth and Herbst, (2006), "Supply-chain Pricing- A new perspective on pricing in industrial markets", *Industrial Marketing Management, 35(1),*pp.83-90
23. Lancioni, R.A., (2005),"A strategic approach to industrial product pricing: The pricing plan". *Industrial Marketing Management, 34(2),* pp.177-183.
24. Dohrup, M., (2006),"Industrial Pricing Process from a network perspective",*22nd IMP Conference, Milan, Italy,* impgroup.org.
25. Brennan, R., Canning, L., McDowell, R., (2007),"Price -setting in business-to-business markets",*The Marketing Review, 7 (3),* pp.207-234.
26. Hair et al, (2012),*Multivariate Data Analysis* Dorling Kindersley (India) Pvt. Ltd. Pearson.
27. Narkhede, Nehete & Mahajan, (2012). "Exploring linkages between manufacturing Functions, operations priorities and plant Performance in manufacturing SMEs in Mumbai", *International Journal for Quality Research, 6(1),* pp.9-22.
28. Kaizer, (1974), An Index of Factorial Simplicity, 39.*Psychometrika* , pp.31-36.