Analysing Relationship Dynamics in Cashew Supply Chains

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Abstract

Long term relationship is very crucial for efficiency and sustainability of supply chains. However, early research in agricultural marketing focused mainly on the economics of channels and ignored the structure of social relationship within the chain members. This research study aims at studying the relationship dynamics in supply chain of cashew nut in Garo hills of Meghalaya (India) from small holder's perspective. This study was based on response of small holder cashew growers towards their most important partner (in terms of maximum quantity of transactions) in the study area which happens to be pre-harvest contractors. On the basis of responses from 193 small holder cashew nut growers, about 23 pre harvest contractors dealing in cashew nut marketing in Garo hills of Meghalaya (India), the study finds that good and socially acceptable relationships dynamics among the chain members play an important role in their satisfaction from the chain. Positive variables (socially acceptable) affect the satisfaction of small holders in a positive way and negative variables (socially non acceptable) affects the satisfaction of small holders in a negative way. The opportunistic behaviour and lack of trust leads to dissatisfaction and poor relationship dynamics. The study emphasizes that middlemen of these chains should realize the above dynamics and for long term sustainability of these supply chains (and mutual benefit of members) should play the role of channel manager.

Keywords: Supply Chain Management, Relationship Dynamics, Factor Analysis, Factor Scores, Farmers, Cashew Nut

1. INTRODUCTION

During the last two decades, there has been a shift in focus from transactional to relational exchange in studies related to supply chain and networks (Powel and Smith-Doerr, 1994; Lazzarini et al., 2001). Handfield and Nichols (1999) stated that "the technological and physical transfer elements are understood, and that the issue of relationships is more difficult, less well understood and therefore more fundamentally important". Long term relationship is very crucial for efficiency and sustainability of supply chains.

In agriculture, early research in agricultural marketing focused mainly on the economics of channels and ignored the structure of social relations within the chain members (Masuku, 2003). So, very little empirical information is available on the factors that affect the quality of the relationship between the supply chain players (partners) in the traditional agriculture supply chains. The perishable and seasonal characteristics of agricultural products, inconsistency between quantity and quality, lead-time difference between successive stages etc. calls an additional motive for relational exchange formation (Den Ouden et al., 1996). Thus it becomes very important to attempt a study that tries to analyse relationship aspects of the traditional agriculture supply chains.

Based on the above discussion, an attempt has been made in this paper to analyse the relationship dynamics of cashew supply chains in Garo hills of Meghalaya (India). Originally introduced in India during 16th century by Portuguese, cashew has emerged as an important crop among commercial agricultural commodities. In Garo hills also, it is one the important commercial plantation crops. To make it more meaningful and important to the society in the present situation and years to come, considering there will be an increase in the small holders and decrease in size of holding (ICAR Vision 2030), this study tries to analyse relationship dynamics in cashew nut supply chain from small holders perspective.

2. METHODOLOGY

2.1 Data Collection

When a unit of analysis is extended from dyadic relationship to a supply chain, sampling becomes a problem (Masuku, 2003). Since, a food chain network consists of a number of chains having multiple inter- connected firms/player,

it is almost impossible to deal with all the chains of the network and all the constituent firms/players. Hence, in this study, the cashew supply chain having maximum quantity of disposal was selected. Since, focus of the study was small holders, in this study, relationship dynamics in supply chains were explored from the small holders and their immediate partner's perspective. This study utilized a sample of 270 small holder cashew growers distributed across three districts in Garo hills of Meghalaya (East Garo hills, West Garo hills and South Garo hills). The sample of the smallholder growers were drawn through multistage random sampling technique. The survey was conducted between period of July 2010 to March, 2011 and it involved personal face to face interviews with pre tested questionnaires. A brief description about profile of respondents is given in Table1.

Two major supply chains of cashew nut were found in the study area (Table 2). Most of the cashew nut (about 72.17 percent) was found to be transacted through supply chain 1 (i.e. through producer- pre harvest contractor- whole seller- processor - distant market wholesaler - retailer-consumer). Thus, this supply chain was selected for the purpose of the study.

It has been found that out of 270 small holders growing cashew nut (total study sample for cashew nut growers), in channel 1 (as selected relationship study) 193 small holder cashew nut growers used to market through 23 pre harvest contractors of cashew nut in the study area (Table 3). Thus, relationship study in cashew nut supply chain was based on responses from 193 small holder cashew nut growers about 23 pre harvest contractors dealing in cashew nut marketing in Garo hills of Meghalaya (India).

2.2 Data Analysis

Relationships among the chain members play an important role in their satisfaction from the chain partners. To identify the principal factors expressing relationships in cashew supply chain factor analysis and regression analysis was conducted. In the first instance, one the basis of various literatures and preliminary surveys, a number of core relational factors (52) affecting the smooth functioning of agriculture supply chain were developed. Satisfaction variables were taken as dependent variables and rest of the variables were assumed as independent variables. After that factor analysis and regression analysis was conducted.

(i) Factor analysis

Factor analysis addresses the problem of analyzing the structure of the interrelationships (correlations) among a large number of variables (X) by defining a set of common underlying dimensions, known as factors (Hair et al., 1998). In the present study, factor analysis has been applied to a set of 45 independent variables with the basic objective of reducing these variables to a few factors. Since there are normally fewer factors than observed variables and because factor scores are nearly uncorrelated, use of factor scores in other analyses may be very helpful (Tabachnick and Fidell 2001).

Table 1: Profile of Small Holders Cashew Nut Growers

Sl. No	***Particulars***	***Cashew nut farmers***
1	No of farmers	270
2	Average area (Acre)	3.65
3	Average marketed surplus per farmer (kg)	1869.56
4	Average age of respondents (years)	47.2
5	Average family size (numbers)	4.89
6	Average education level (years of formal education)	7.78

Table 2: Cashew Nut Supply Chains in Garo Hills of Meghalaya

Chain No	***Supply chains***	***Percent of quantity transacted***
1	Producer- Pre harvest contractor- Whole seller- Processor - Distant market wholesaler - Retailer- Consumer	72.17
2	Producer – Commission agent - Whole seller- Processor - Distant market wholesaler - Retailer- Consumer	27.83

Table 3: Disposal Pattern of Cashew Nut by Small Holder Cashew Nut Growers

Sl. No	*Agencies*	*No. of agencies*	*No of farmers selling product to these agencies*	*Average marketed surplus per farmer for respective agencies (Kg)*	*Total quantity sold (Kg)*	*Percent*
1	Pre harvest contractor	23	193	**1887.65**	**364316.80**	**72.17**
2	Commission agent	21	77	1824.23	140465.46	27.83
	Total		270	1855.94	504782.26	100.00

The factor analysis model based on Field (2005) was used algebraically as follows.

$$Y_i = b_1X_1 + b_2X_2 + \ldots + b_nX_n + \varepsilon_i \quad (1)$$

Where,

'X' refers to variables under study (independent relationship constructs),

'Y" refers to factors,

'*b*'s in the equation represent factor loadings

Factor analysis was conducted through the following three main steps:

Step 1: Calculation of initial factor loadings (by principal component method)

Step 2: Factor rotation (by 'varimax rotation')

Step 3: Calculation of factor scores (based on Sarma, 2003).

(ii) Multiple regression analysis

The score values (FS) of the selected factors (relationship constructs) were considered as independent variables and satisfaction of small holder growers from pre- harvest contractor were considered as dependent variables for the purpose of the analysis. The regression equation is presented as

$$SF = \alpha + \beta_1FS_1 + \beta_2FS_2 + \ldots\ldots\ldots + e \quad (2)$$

Where, 'α' is the regression constant, 'β_1' and 'β_2' are the regression coefficient of factor scores (FS) and 'e' is the error term of the regression model. Regression coefficients were tested by using *t* test. Determination coefficient (R^2) was used as predictive success criteria for regression model (Draper and Smith, 1998).

3. Results and Discussion

3.1 Relationship Variables

On the basis of various literatures and preliminary surveys, 45 core independent relational constructs affecting satisfaction of small holder cahsew growers (i.e. matching of what they have expected) from pre- harvest contractors were identified and listed. A brief outline of these relational factors is given in Table 4. Most of the scales used were adopted from Morgan and Hunt (1994), Heide and John (1990), Dwyer et al. (1987), Masuku (2003) and Batt (2004). However, they were modified to suit the specific purpose of this study. The relative strengths of the assumed relational factors are shown in terms of mean and standard deviation. VAR00043 (trader take advantage of the farmers ignorance) has the highest mean among all the relational factors and VAR00020 (trader cheat farmer(R)) has the least mean. VAR00023 (trading partner is trustworthy) has shown highest deviation from the mean value.

Reliability analysis: The reliability of scale was tested with Cronbach's alpha (α). Generally it is believed that a value of 0.7- 0.8 is an acceptable value for Cronbach's alpha (α). The Cronbach's alpha (α) was found as 0.742, and is certainly in the above region, so this probably indicates good reliability.

Sampling adequacy: The Kaiser- Meyer- Olkin measure of sampling adequacy (KMO) measure and the Bartlett's test of sphericity of sample adequacy were highly significant for the data- set under study. The KMO measure is 0.908 (Table 5), which fulfils the basic requirement of factor analysis. Similarly, Bartlett's test of sphericity was also highly significant ($p< 0.001$). As such factor analysis was considered appropriate.

Table 4: Items Used to Measure Relationships in the Selected Supply Chains

Code	*Relational factors*	*Mean*	*SD*	*Code*	*Relational factors*	*Mean*	*SD*
Dependent variables (satisfaction)				***Independent variables***			
VAR 00001	Best price offered*	2.373	.781	VAR 00013	Preferred trading partner has best offer relative to alternatives [R]	2.689	.922
VAR 00002	Time gap in payment after commodity has been delivered	3.705	.835	VAR 00014	Trader has all the power*	4.544	.612
VAR 00003	Business support	1.705	.764	VAR 00015	Trading partner controls all the information	4.259	.718
VAR 00004	Matched expectations	2.595	.855	VAR 00016	Must adhere to partners demand	4.368	.572
VAR 00005	Fair and equitable treatment*	3.321	1.061	VAR 00017	Caring treatment to farmers	2.187	.858
VAR 00006	Swiftness to handle complaints	3.036	1.017	VAR 00018	Existence of mutual understanding between trader and farmer	2.362	.818
VAR 00007	Adequately rewarded	2.088	.923	VAR 00019	Trader sometime withhold some information that may be useful for farmer[R]	2.020	.749
Independent variables				VAR 00020	Trader cheats on farmer [R]	1.082	.276
VAR 00008	Farmers being controlled	4.316	.796	VAR 00021	Must verify traders information [R]	1.845	.517
VAR 00009	Farmers take whatever trading partner says because they do not have any bargaining power	4.332	.844	VAR 00022	Trading partner always considers best interest	1.440	.644
VAR 00010	Farmers can influence the price of commodity offered in the industry	4.285	.827	VAR 00023	Trading partner is trustworthy*	1.798	1.023
VAR 00011	If the trader opts out, you would be forced to go out of business	3.254	.579	VAR 00024	Trading partner is always honest	2.279	.997
VAR 00012	Farmer can sell their commodity only to this trader	3.466	.764	VAR 00025	Trading partner always keep promises	3.067	.804
VAR 00026	Well coordination with trader	2.865	.656	VAR 00040	Loans provided by trader to farmer*	1.259	.625
VAR 00027	Production (harvesting) and delivery schedules set together	3.016	.851	VAR 00041	Assistance provided during emergency*	1.378	.846
VAR 00028	Farmers concern taken seriously	1.860	.827	VAR 00042	Training support provided*	1.399	.885
VAR 00029	Trader is very much cooperative	2.746	.862	VAR 00043	Trader takes advantage of the farmers ignorance	4.845	.441
VAR 00030	Risk taken together	1.114	.319	VAR 00044	Trader is concerned with maximizing his own profit	4.611	.612
VAR 00031	Close personal friendship	1.736	.635	VAR 00045	Trader cheats while assigning grades to commodity of classifying commodity on the basis of quality	4.310	.839
VAR 00032	Solves problems together*	1.632	.886	VAR 00046	Farmers regard conflict of opinion between trader and farmer as way of doing business [R]	3.440	.763
VAR 00033	Change of trader if given an option [R]	1.383	.728	VAR 00047	Opportunistic behaviour discourages to be in business	4.751	.500

VAR 00034	Huge capital investment in business	2.005	.832	VAR 00048	Trading behaviour impels to change partner	4.559	.618
VAR 00035	Commitment of quantity honored	2.818	.624	VAR 00049	Farmers are assured of a market	3.968	.478
VAR 00036	Always try to satisfy commitment	3.876	.415	VAR 00050	Farmers know in advance the price at which the commodity will be bought	1.134	.357
VAR 00037	Commitments are not bothered till profits made [R]	1.549	.728	VAR 00051	Plans to continue business in future*	4.342	.839
VAR 00038	There are no hassles looking for a market	4.326	.830	VAR 00052	Believe long term relationship are good	4.389	.847
VAR 00039	Subsidized transport by the trader*	1.114	.429				

Note: SD: Standard devialtion

A. Most of the scales used were adopted from Morgan and Hunt (1994), Heide and John (1990), Dwyer et al. (1987), Masuku (2003) and Batt (2004). However, they were modified to suit the specific purpose of this study.

B. ***** These factors have been included based on pilot survey.

C. These factors were measured based on a five point scale as: 1: Not at all satisfied to 5: Extremely satisfied

D. 'R' means the scores are reversed for analysis

Table 5: KMO and Bartlett's test

	Kaiser-Meyer-Olkin measure of sampling adequacy	.908
Bartlett's test of sphericity	Approx. Chi-square	9597.605
	df	990
	Sig.	.000

3.2 Identification of Principal Relationship Factors in Cashew Nut Supply Chain

Factor Extraction: Table 6 lists the Eigen values associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, factor 1 explains 39.383 percent of total variance and factor 2 explains 8.935 percent of total variance. All factors having Eigen values greater than 1 are extracted and this provides nine factors. These are presented in extraction sum of squared loadings part of the table. They explain nearly 76 % of the variability in the original 45 variables, so the complexity of the data set can be considerably reduced by using these components, with only a 24% loss of information. In the final part of the table i.e. in rotation sum of squared loadings, the Eigen values of the factors after rotation are displayed. Rotation has the effect of optimizing the factor structure and one consequence for these data is that the relative importance of the two factors is equalized. Before rotation, factor 1 accounted for considerably more variance than the remaining four (39.38% compared to 8.93, 7.04, 4.85, 4.22, 3.42, 3.13, 2.94 and 2.54. However after extraction it accounts for only 15.55% of variance (compared to13.99, 8.79, 8.70, 7.78, 7.38, 5.29, 4.98 and 3.97 % respectively).

Extraction Method: Principal component analysis

Factor rotation (Varimax): Table 7 shows the rotated component matrix which is a matrix of the factor loadings for each variable onto each factor. In the table factor loadings less than 0.4 have not been displayed because while analyzing these loadings were asked to be suppressed (based on Steven, 1992).

As seen from the Table 7, the studied data set reveals specific characteristics in transforming the 45 available variables into 9 mutually reduced factor components. Based on above, the principal dependent factors affecting satisfaction of small holder growers in cashew nut supply chain are presented in Table 8. For more clarity in understanding these reduced factor components, they have been assigned suitable labels.

Identification of significant factors affecting relationship satisfaction of cashew nut small holders

Based on the above tables (Table 4 and Table 8), following variables (Table 9) were selected as dependent and independent variables to understand the relationship dynamics between small holder cashew nut growers and pre- harvest contractors.

Table 6: Total Variance Explained

Com-ponent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	17.722	39.383	39.383	17.722	39.383	39.383	6.998	15.551	15.551
2	4.021	8.935	48.318	4.021	8.935	48.318	6.296	13.990	29.542
3	3.171	7.047	55.365	3.171	7.047	55.365	3.959	8.798	38.340
4	2.183	4.852	60.218	2.183	4.852	60.218	3.919	8.708	47.048
5	1.901	4.225	64.443	1.901	4.225	64.443	3.503	7.785	54.833
6	1.538	3.418	67.861	1.538	3.418	67.861	3.324	7.386	62.219
7	1.409	3.132	70.993	1.409	3.132	70.993	2.381	5.292	67.512
8	1.324	2.942	73.934	1.324	2.942	73.934	2.245	4.988	72.500
9	1.144	2.541	76.476	1.144	2.541	76.476	1.789	3.976	76.476
10	.952	2.115	78.591						
11	.841	1.868	80.459						
12	.741	1.647	82.106						
13	.708	1.574	83.680						
14	.665	1.477	85.158						
15	.586	1.302	86.460						
16	.535	1.188	87.648						
17	.472	1.048	88.697						
18	.445	.989	89.685						
19	.436	.969	90.654						
20	.394	.876	91.530						
21	.366	.813	92.342						
22	.342	.760	93.102						
23	.326	.724	93.826						
24	.304	.676	94.502						
25	.293	.652	95.154						
26	.271	.602	95.756						
27	.226	.502	96.257						
28	.223	.495	96.753						
29	.202	.449	97.201						
30	.184	.408	97.609						
31	.154	.341	97.950						
32	.140	.311	98.261						
33	.126	.281	98.542						
34	.114	.253	98.795						
35	.094	.210	99.004						
36	.075	.166	99.171						
37	.070	.156	99.326						
38	.064	.143	99.470						
39	.056	.125	99.595						
40	.051	.114	99.709						
41	.049	.110	99.818						
42	.042	.093	99.911						
43	.017	.038	99.949						
44	.014	.032	99.981						
45	.009	.019	100.00						

Table 7: Rotated Component Matrix

Variable	Component								
	1	2	3	4	5	6	7	8	9
VAR00026	.805								
VAR00029	.797								
VAR00035	.715								
VAR00027	.689								
VAR00024	.663								
VAR00025	.648								
VAR00028	.641	.475							
VAR00023	.604	.444							
VAR00031	.600								
VAR00022	.594								
VAR00049	.558	.411							
VAR00011	-.509						.455		
VAR00039		.844							
VAR00020		.820							
VAR00030		.812							
VAR00040		.692							
VAR00041		.683							
VAR00042		.655							
VAR00050		.601							
VAR00021		.533							
VAR00051			.990						
VAR00052			.976						
VAR00010			.971						
VAR00038			.970						
VAR00017				.859					
VAR00019				.846					
VAR00018				.843					
VAR00034				.654					
VAR00014					-.737				
VAR00009					-.691				
VAR00045					-.689				
VAR00008	-.434				-.684				
VAR00013					.669				
VAR00043						.803			
VAR00047						.783			
VAR00048						.740			
VAR00044						.738			
VAR00032									
VAR00046							.921		
VAR00012							.906		
VAR00037								.855	
VAR00033								.843	
VAR00036									
VAR00016									.875
VAR00015									.797

Extraction Method: Principal component analysis
Rotation Method: Varimax with Kaiser normalization
Rotation converged in 7 iterations.

Table 8: Principal Factors

Sl. no	*Factors*	*Initial activities*	*Factor loadings*
1	Component 1: Coordination and honesty by pre-harvest contractor	VAR00026: Well coordination with trader	.805
		VAR00029: Trader is very much cooperative	.797
		VAR00035: Commitment of quantity honored	.715
		VAR00027: Production (harvesting) and delivery schedules set together	.689
		VAR00024: Trading partner is always honest	.663
		VAR00025: Trading partner always keep promises	.648
		VAR00028: Farmers concern taken seriously	.641
		VAR00023: Trading partner is trustworthy*	.604
		VAR00031: Close personal friendship	.600
		VAR00022: Trading partner always considers best interest	.594
		VAR00049: Farmers are assured of a market	.558
		VAR00011: If the trader opts out, you would be forced to go out of business	-.509
2	Component 2: Assistance & Support by pre- harvest contractor	VAR00039: Subsidized transport by the trader*	.844
		VAR00020: Trader cheats on farmer [R]	.820
		VAR00030: Risk taken together	.812
		VAR00040: Loans provided by trader to farmer*	.692
		VAR00041: Assistance provided during emergency*	.683
		VAR00042: Training support provided*	.655
		VAR00050: Farmers know in advance the price at which the commodity will be bought	.601
		VAR00021: Must verify traders information [R]	.533
3	Component 3: Intention of long term relationships	VAR00051: Plans to continue business in future*	.990
		VAR00052: Believe long term relationship are good	.976
		VAR00010: Farmers can influence the price of commodity offered in the industry	.971
		VAR00038: There are no hassles looking for a market	.970
4	Component 4: Pre- harvest contractors caring attitude towards farmer	VAR00017: Caring treatment to farmers	.859
		VAR00019: Trader sometime withhold some information that may be useful for farmer[R]	.846
		VAR00018: Existence of mutual understanding between trader and farmer	.843
		VAR00034: Huge capital investment in business	.654
5	Component 5: Poor bargaining capacity of farmers	VAR00014: Trader has all the power*	-.737
		VAR00009: Farmers take whatever trading partner says because they do not have any bargaining power	-.691
		VAR00045: Trader cheats while assigning grades to commodity of classifying commodity on the basis of quality	-.689
		VAR00008: Farmers being controlled	-.684
		VAR00013: Preferred trading partner has best offer relative to alternatives [R]	.669
6	Component 6: Opportunistic behavior of the pre-harvest contractor	VAR00043: Trader takes advantage of the farmers ignorance	.803
		VAR00047: Opportunistic behaviour discourages to be in business	.783
		VAR00048: Trading behaviour impels to change partner	.740
		VAR00044: Trader is concerned with maximizing his own profit	.738

7	Component 7: Non-synchronization between farmer and pre-harvest contractor	VAR00046: Farmers regard conflict of opinion between trader and farmer as way of doing business [R]	.921
		VAR00012: Farmer can sell their commodity only to this trader	.906
8	Component 8: Commitment towards business	VAR00037: Commitments are not bothered till profits made [R]	.855
		VAR00033: Change of trader if given an option [R]	.843
9	Component 9: Dependence of farmer on pre-harvest contractor	VAR00016: Must adhere to partners demand	.875
		VAR00015: Trading partner controls all the information	.797
10	Rejected Factors (<0.04)	VAR00032: Solves problems together*	
		VAR00036: Always try to satisfy commitment	

Table 9: Dependent and Independent Variables

Dependent variables (Satisfaction variables)			Independent variables (Relationship constructs)		
Variable	Mean	Standard Deviation	Variable	Mean	Standard Deviation
Best price offered	2.373	.781	Coordination and honesty by pre-harvest contractor (FS1)	2.582	.577
Time gap in payment after commodity has been delivered	3.705	.835	Assistance & Support by pre- harvest contractor (FS2)	1.239	.413
Business support	1.705	.764	Intention of long term relationships (FS3)	4.335	.819
Matched expectations	2.595	.855	Pre- harvest contractors caring attitude towards farmer (FS4)	2.159	.736
Fair and equitable treatment	3.321	1.061	Poor bargaining capacity of farmers (FS5)	4.067	.505
Swiftness to handle complaints	3.036	1.017	Opportunistic behavior of the pre- harvest contractor (FS6)	4.699	.468
Adequately rewarded	2.088	.923	Non-synchronization between farmer and pre-harvest contractor (FS7)	3.453	.759
			Commitment towards business (FS8)	1.468	.702
			Dependence of farmer on pre- harvest contractor (FS9)	4.319	.594

Table 10: Results of Multiple Regression Analysis

Dependent	*Best price offered*		*Time gap in payment after commodity has been delivered*		*Business support*		*Matched expectations*		*Fair and equitable treatment*		*Swiftness to handle complaints*		*Adequately rewarded*	
Independent	***Coefficients***	***t Stat***	***Coefficients***	***t Stat***	***Coefficients***	***t Stat***	***Coefficients***	***t Stat***	***Coefficients***	***t Stat***	***Coefficients***	***t Stat***	***Coefficients***	***t Stat***
Intercept	4.815	4.579	2.059	1.809	0.949	0.902	3.591	2.878	2.979	2.080	0.519	0.383	3.651	2.634
Coordination and honesty by pre-harvest contractor	0.012	0.097	0.156	1.205	-0.060	-0.506	0.484	3.420**	0.109	0.672	0.045	0.289	0.507	3.219**
Assistance & Support by pre- harvest contractor	0.454	2.911**	0.294	1.742	0.764	4.895**	0.137	0.743	-0.122	-0.576	0.092	0.457	-0.277	-1.347
Intention of long term relationships	-0.044	-0.852	0.122	2.209**	-0.050	-0.987	-0.014	-0.235	0.015	0.222	0.139	2.114**	-0.020	-0.302
Pre- harvest contractors caring attitude towards farmer	0.022	0.307	0.489	6.182**	0.331	4.526**	0.002	0.026	0.787	7.907**	0.853	9.041**	-0.043	-0.449
Poor bargaining capacity of farmers	-0.569	-4.586**	-0.344	-2.561**	-0.106	-0.853	-0.306	-2.078**	-0.075	-0.443	-0.166	-1.039	-0.355	-2.168**
Opportunistic behavior of the pre-harvest contractor	-0.073	-0.633	0.119	0.953	0.097	0.843	-0.153	-1.119	0.021	0.132	0.013	0.086	-0.132	-0.865
Non-synchronization between farmer and pre-harvest contractor	0.009	0.151	0.034	0.509	0.024	0.392	0.0159	0.217	-0.376	-4.476**	-0.038	-0.481	-0.037	-0.448
Commitment towards business	0.179	2.650**	-0.035	-0.474	0.049	0.724	0.079	0.991	-0.036	-0.393	0.065	0.743	0.341	3.839**
Dependence of farmer on pre- harvest contractor	-0.122	-1.519	0.0152	0.174	-0.165	-2.045**	-0.131	-1.368	0.001	0.011	0.115	1.107	-0.152	-1.435
R2	0.493		0.481		0.471		0.405		0.490		0.503		0.369	
Adjusted R2	0.468		0.456		0.445		0.375		0.465		0.478		0.338	
Standard Error	0.569		0.617		0.569		0.676		0.776		0.735		0.751	
F	19.784		18.869		18.085		13.851		19.554		20.556		11.885	

** Significant at 0.05 level

3.3 Regression Analysis

The results of multiple regression analysis between the various satisfaction variables and independent variables are presented in the above tables. It has been found that Coordination and honesty by pre-harvest contractor leads to the satisfaction of small holders in a positive way (especially feeing of matched expectations and adequately rewarded). Assistance & support by pre- harvest contractor also affects the satisfaction of small holders in a positive way (Best price offered and business support). Intention of having long term relationships also affects satisfaction of small holders in a positive way (time gap in payment after commodity has been delivered and Swiftness to handle complaints). Pre- harvest contractors caring attitude towards farmer also affects satisfaction in a positive way (time gap in payment after commodity has been delivered, business support, fair and equitable treatment and swiftness to handle complaints). Poor bargaining capacity of farmers found to be negatively affecting the satisfaction of smallholders from their supply chain partners (especially to variables like best price offered, time gap in payment after commodity has been delivered, matched expectations and adequately rewarded).

The above table also shows that non-synchronization between farmer and pre-harvest contractor negatively affects satisfaction of small holders (especially variables like fair and equitable treatment). Commitment towards business is found to be significantly affecting the satisfaction of small holders in a positive way (especially to the variables related to best price offered as well as fair and equitable treatment). Dependence of farmer on pre-harvest contractor leads to dissatisfaction of small holders (significantly dissatisfied for business support).

4. Conclusion

The above findings clearly show that in cashew supply chain, good and socially acceptable relationships dynamics among the chain members play an important role in their satisfaction from the chain. It has been found that positive variables (socially acceptable) affect the satisfaction of small holders in a positive way and negative variables (socially non acceptable) affects the satisfaction of small holders in a negative way. Thus, it can be concluded that in cashew supply chains and possibly in similar supply chains, trust, commitment and cooperation etc. are very important relationship satisfaction. The opportunistic behaviour and lack of trust leads to dissatisfaction and poor relationship dynamics. Thus, middlemen have to play the role of channel manager with intention of mutual benefit.

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