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The Influence of Demographics on the Coordination and Assistance of Sugar Industry as perceived by Sugar Cane Growers in Cuddalore District, Tamil Nadu

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Abstract

The survival of the sugar industry is extremely dependant on the relationship of that industry with cane growers of the nearby area as it becomes expensive to transport sugar cane from a far off area. Sugar cane the base raw material from which sugar is obtained is the key member in the value chain network of a sugar industry. Sugar industries need to have a motivated team of farmers who can perpetually continue to supply sugar cane to the industry. hence it becomes imperative to understand the perception of sugar farmers and how demographics has an influence over it. The study was conducted over a forty five day period in May and June 2015 at Panruti area in Cuddalore district of Tamil Nadu and included 105 respondents. This study should help the sugar industries to understand the significance of demographics in the way their role is perceived by the sugar cane farmers. The companies can employ a differentiated strategy based on demographics to ensure the mutual benefit of industry and farmers. Future studies can be based on farmers based on other sugar growing areas as also farmers of other crops who sell their produce directly to industries.

keywords: Sugar Industry, Tamilnadu, Survival, Sugar Cane Growers.

Introduction

The survival of the sugar industry is extremely dependant on the relationship of that industry with cane growers of the nearby area as it becomes expensive to transport sugar cane from a far off area. Sugar cane the base raw material from which sugar is obtained is the key member in the value chain network of a sugar industry. Justus & Sunitha (2012) revealed, the company's value chain is embedded in a larger system of activities that include the value chain of suppliers and distribution channels engaged in getting its product out. Hence sugar industries should ensure to have a motivated team of farmers who can perpetually continue to supply sugar cane to the industry. This indicates the importance of demographics and its role in the successful running of sugar industry Gaucher, Soler & Tanguy (1998) indicated that it will be more useful for stakeholders to consider ways of increasing the total value of the chain, rather than engage in altercation over the distribution of the existing value.

Significance of the Study

The sugar industry is dependent on farmers for their supply of sugar cane as the laws do not allow the industry to own sugar cane fields. The Tamil Nadu Land Reforms (Fixation of Ceiling on Land) Act, 1961 fixed the ceiling area for a family consisting of five members had been fixed as 30 standard acres. For every additional member of the family consisting of more than five members, an additional extent of 5 standard acres was allowed in addition to the ceiling area of 30 standard acres, subject to the overall ceiling of 60 standard acres. While sugar companies in countries like Brazil own large farms, the legislative environment makes it compulsory for companies in India to depend on farmers for sugar cane inputs. Hence the success of the sugar industry rests on the relationship the industry manages with the farmers. Sugar cane farmers have the option of diverting their produce to jiggery manufacture.

The interests of the industry and the farmers tend to be juxtaposed as the industry will need cane all through the year whereas the farmer would plan to have the harvest as early as possible in order to have a quick yield. Hence length of harvesting and milling tends to be in conflict which the company has to manage by its relationship with its farmers. As Gaucher (2003) puts it the sugar industry faces such coordination problems especially when a large number of cane suppliers are involved. and millers organize their cane supply to ensure regular mill operations throughout the entire season in accordance with milling capacity which also take into account the variability in cane quality that tends to maximize sugar production. The decisions made by millers impart on the choice growers make regarding their harvest capacities and management. Farmers should get the feel that agriculture is run as agri business rather than subsistence agriculture.

Literature review

Dev (2012) found the share of rural females in agriculture was around 83 per cent in 2004 - 05 as compared to 67% among rural men, showing the importance of women in agriculture in rural areas and insisted that agriculture is becoming increasingly feminized and men are migrating to rural non - farm sector. Thapa and Gaiha (2011) identified that small holdings face new challenges on integration of value chains, liberalization and globalization effects, market volatility and other risks and vulnerability, adaptation of climate change etc. Lipton, (2006) revealed that the role of small farms in development and poverty reduction is well recognized. These reviews identify the importance of industry interface to ensure that people continue to be interested in agriculture and maintain it as a profession as also the importance of women in agriculture.

Method

The objective of this study is to identify the influence of demographics on the assistance provided by sugar industry as perceived by sugar cane growers. The questions were based on various characteristics faced by the farmer while involved in sugar cane harvesting. This scale was developed on a five point scale with 1 anchored as strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree and 5 strongly agree. A focus group study was undertaken with respondents on problems in sugar cane harvesting and the areas of help they expected from sugar industry. The study was conducted over a forty five day period in May and June 2015 at Panruti area in Cuddalore district of Tamil Nadu. A panel initially assessed these for face validity and it was then pilot tested on twenty five respondents. Cronbach's alpha value of 0.88 as a test for internal validity was considered satisfactory. The experiences of the focus group respondents gave an insight into the dimensions of farmer satisfaction as perceived by sugar cane farmers.. The questionnaire was translated into vernacular so as to make it easily understandable for the respondents.

Analysis

A factor analysis was carried out to identify the dimensions based on which the sugar grower perception can be studied.

Table 1 DIMENSION OF CANEGROWER PERCEPTION OF SUGAR INDUSTRY ASSISTANCE

DIMENSION	Components of satisfaction as perceived by sugar cane farmers	Loadings
Facilitation	Action taken to control the activities of inter borer	.956
	Creating awareness for utilizing newer fertilizer variations like Pampurn	.941
	Help in carrying out inter cropping to increase fertility of soil	.933
	Making available the usage of Pressed mud from sugar mill	.930
	Taking care of logistic cost post harvesting	.928
	Help in arranging of manpower to aid harvesting	.913
Technology	Making available Cane planting machinery	.926
	Usage of Organic fertilizer	.913
	Making available harvesting machine for quick cutting of sugar cane	.910
	Allowing the dried leaf to decompose rather than burning it	.898
	Coordinating the Use of tractor to make 5 foot ridge plantation	.889
	Coordination in spraying of micro nutrients	.887

Finance	Company reference for assistance in implementing drip irrigation system	.899
	Reference to farmers in facilitation of bank loan	.898
	Getting remuneration at the appropriate time for the sugar cane supplied	.895
	Being provided half a Kg of sugar per ton of sugar cane supplied	.893
	Fixing the remuneration by mutual dialogue with farmers	.872
	Company aid in arranging education loan to farmers children	.787
Training	Training on drip irrigation practices	.955
	Training on systematic sugar cane intensification (SSI) practices	.937
	Leaflets and study material on cane growth practices	.934
	Symposiums to farmers through the sugar industry training centre	.928
Time	Help during price fluctuation in market	.933
	Help in sugar cane harvest at the right time	.926
	Making available needed manpower at the time of harvest	.924
	Facilitating vehicle for transportation of sugar cane to sugar mills	.902

Source: Primary data computed

The above table indicates that the sugar grower perception can be classified as five dimensions namely facilitation, technology, finance training and time.

Table 4.11 Mean and Standard deviation of cane grower satisfaction based on age of respondents

Cane grower Satisfaction factors	Age	N	Mean	Std. Dev.	F	Sig.
Technology	up to 30	22	4.39	0.71	41.559	<0,001**
	31 - 40	41	3.97	0.93		
	41 - 50	34	2.17	1.02		
	Above 50	8	2.00	0.67		
Finance	up to 30	22	4.26	0.72	88.876	. <0,001**
	31 - 40	41	4.53	0.64		
	41 - 50	34	1.84	0.66		
	Above 50	8	3.79	1.47		
Training	up to 30	22	2.26	0.91	44.291	<0,001**
	31 - 40	41	4.46	0.55		
	41 - 50	34	2.40	1.12		
	Above 50	8	2.69	1.29		
Facilitation	up to 30	22	2.17	0.81	38.035	<0,001**
	31 - 40	41	2.41	1.00		
	41 - 50	34	4.27	0.73		
	Above 50	8	1.77	1.38		
Time	up to 30	22	3.52	1.59	24.909	<0,001**
	31 - 40	41	4.25	0.80		
	41 - 50	34	2.35	1.37		
	Above 50	8	1.19	0.22		

Source: Primary data computed ** Significant at one percent level

From the above table it is inferred that respondents of the up to 30 and 31 – 40 age group have a higher satisfaction towards factors of technology than those from the 41 – 50 and above 50 age group. P value indicates that there is significant difference between respondents of different age group based on factors of technology in cane cultivation

Respondents of the up to 30 and 31 – 40 age groups have a very high satisfaction towards financial factors The mean value of 4.46 indicates that respondents of the 31 -40 age group have a very high satisfaction towards training factors concerning growing of cane. The respondents of 41-50 age group have a higher satisfaction towards facilitation factors compared to respondents of other age group.. There is significant difference at one percent level on facilitation

factors based on age. It is observed that respondents of the 31-40 age group and up to 30 group as indicated by the mean value of 4.25 and 3.52 have a higher satisfaction towards factors of time

Mean and Standard deviation of cane grower satisfaction based on gender of respondents

Dimensions	Gender	N	Mean	Std. Dev.	t-test for Equality of Means		
					t	df	Sig.
Technology	Female	37	2.62	1.24	-4.317	103	<0,001**
	Male	68	3.72	1.23			
Finance	Female	37	2.96	1.45	-3.348	103	.001**
	Male	68	3.87	1.28			
Training	Female	37	2.89	1.41	-1.758	103	.082
	Male	68	3.37	1.31			
Facilitation	Female	37	3.55	1.27	3.910	103	<0,001**
	Male	68	2.57	1.22			
Time	Female	37	2.75	1.63	-2.509	103	.014*
	Male	68	3.52	1.42			

Source: Primary data computed * Significant at five percent level ** Significant at one percent level

From the above table it is inferred that male respondents have a higher satisfaction towards factors of technology than female respondents. P value indicates that there is significant difference between male and female respondents based on factors of technology in cane cultivation. Male Respondents have a higher satisfaction towards financial factors as indicated by the mean value of 3.87 which is because the company makes prompt payment within fourteen days of supply of sugar cane. The mean value of 3.37 indicates that male respondents have a moderate satisfaction towards training factors concerning growing of cane. The female respondents have a higher satisfaction towards facilitation factors compared to male respondents. male respondents as indicated by the mean value of 3.52 have a higher satisfaction towards factors of time

Mean and Standard deviation of cane grower satisfaction based on job nature of respondents

Cane grower Satisfaction factors	Nature of Profession	N	Mean	Std. Dev.	t-test for Equality of Means		
					t	df	Sig.
Technology	Part time agriculture	37	2.52	1.37	-5.102	103	<0,001**
	Fulltime agriculture	68	3.76	1.09			
Finance	Part time agriculture	37	2.55	1.20	-6.285	103	<0,001**
	Fulltime agriculture	68	4.09	1.21			
Training	Part time agriculture	37	2.52	1.14	-4.041	103	<0,001**
	Fulltime agriculture	68	3.57	1.33			
Facilitation	Part time agriculture	37	3.15	1.50	1.348	103	.181
	Fulltime agriculture	68	2.79	1.20			
Time	Part time agriculture	37	2.64	1.60	-3.138	103	.002**
	Fulltime agriculture	68	3.58	1.41			

Source: Primary data computed ** Significant at one percent level

It is inferred that respondents involved in full time agriculture have a higher satisfaction towards factors of technology and P value indicates that there is significant difference between full and part time agriculture respondents based on factors of technology in cane cultivation. Full time agriculture respondents have a higher satisfaction towards financial, time and training factors as indicated by the mean value of 4.09, 3.58 and 3.57 respectively whereas Part time agriculture respondents have a higher satisfaction towards facilitation factors

Mean and Standard deviation of cane grower satisfaction based on acreage of land owned by respondents

Dimensions	Size of land in acres	N	Mean	Std. Dev.	F	Sig.
Technology	Up to 5 Acre	33	3.68	1.29	9.352	<0,001**
	5.1 - 10 Acre	36	3.59	1.20		
	more than 10 Acre	36	2.74	1.32		
Finance	Up to 5 Acre	105	4.01	1.07	12.736	<0,001**
	5.1 - 10 Acre	33	3.95	1.29		
	more than 10 Acre	36	2.72	1.45		
Training	Up to 5 Acre	36	2.95	1.44	2.921	.058
	5.1 - 10 Acre	105	4.16	0.88		
	more than 10 Acre	33	2.46	1.12		
Facilitation	Up to 5 Acre	36	2.55	1.31	10.075	<0,001**
	5.1 - 10 Acre	36	2.71	1.20		
	more than 10 Acre	105	3.46	1.29		
Time	Up to 5 Acre	33	3.43	1.63	2.676	.074
	5.1 - 10 Acre	36	3.67	1.23		
	more than 10 Acre	36	2.66	1.59		

Source: Primary data computed ** Significant at one percent level

From the above table it is inferred that respondents of up to 5 acre holdings and 5.1 – 10 acre holdings have a higher satisfaction towards factors of technology than those from the above 10 acre holding group. P value indicates that there is significant difference on factors of technology in cane cultivation between respondents of different holding size. Respondents of up to 5 acre holding and 5.1 – 10 acre holdings have a high satisfaction towards financial factors whereas the mean value of 4.16 and 3.67 respectively indicates that respondents of the 5.1 – 10 acre holdings have a high satisfaction towards training and time factors. The respondents of more than 10 acre holding have a higher satisfaction towards facilitation factors.

Mean and Standard deviation of cane grower satisfaction based on marital status of respondents

Cane grower Satisfaction factors	Marital status	N	Mean	Std. Dev.	t-test for Equality of Means		
					t	df	Sig.
Technology	Un married	19	3.96	1.02	2.339	103	.021*
	Married	86	3.18	1.35			
Finance	Un married	19	4.30	0.82	2.644	103	.009**
	Married	86	3.38	1.46			
Training	Un married	19	4.04	1.28	3.109	103	.002**
	Married	86	3.01	1.31			
Facilitation	Un married	19	2.26	0.96	-2.433	103	.017*
	Married	86	3.06	1.35			
Time	Un married	19	4.14	1.08	2.910	103	.004**
	Married	86	3.05	1.56			

Source: Primary data computed * Significant at Five percent level ** Significant at one percent level

it is inferred that unmarried respondents have a higher satisfaction towards factors of technology as the technology transfer from lab to land is effectively implemented by cane extension wing of industry. Unmarried respondents have a higher satisfaction towards financial, training and time factors as indicated by the mean value of 4.30, 4.04and 4.14 respectively. Married respondents have a higher satisfaction towards facilitation factors.

Mean and Standard deviation of cane grower satisfaction based on education qualification of respondents

Cane Grower Satisfaction Factors	Education Level	N	Mean	Std. Dev.	F	Sig.
Technology	School level	65	3.45	1.26	4.031	.021*
	Under graduate	26	2.74	1.32		
	Post graduation	14	3.82	1.39		
Finance	School level	65	4.14	1.18	33.666	<0,001**
	Under graduate	26	2.04	0.89		
	Post graduation	14	3.58	1.09		
Training	School level	65	3.60	1.28	9.028	<0,001**
	Under graduate	26	2.70	1.45		
	Post graduation	14	2.27	0.67		
Facilitation	School level	65	2.62	1.18	9.820	<0,001**
	Under graduate	26	3.83	1.16		
	Post graduation	14	2.57	1.50		
Time	School level	65	3.42	1.53	1.127	.328
	Under graduate	26	2.99	1.55		
	Post graduation	14	2.91	1.51		

Source: Primary data computed * Significant at Five percent level ** Significant at one percent level

Respondents with post graduation degrees are more satisfied with factors of technology in cane cultivation. The mean value of 4.14, 3.60 and 3.42 indicates that respondents with school level education have a higher satisfaction towards factors of finance, training and time respectively in cane cultivation. However Respondents with undergraduate education have a high satisfaction towards facilitation factors.

Findings

Respondents of 31-40 age group have a higher satisfaction towards the finance, training and time dimensions of cane growing whereas respondents of up to 30 age group have a higher satisfaction towards the technology dimension of cane growing. The 41 - 50 age group respondents have a higher satisfaction towards the facility dimension of sugar cane handling process.

Male respondents have a higher satisfaction towards the technology, time, training and finance dimensions of cane growing whereas female respondents have a higher satisfaction towards the facilitation dimension of cane growing

Full time agriculture respondents have a higher satisfaction towards the technology, time, training and finance dimensions of cane growing whereas part time agriculture respondents have a higher satisfaction towards the facilitation dimension of cane growing.

Respondents of the 5.1 – 10 acre holding size have a higher satisfaction towards the finance, training and time dimensions of cane growing whereas respondents of the up to 5 acre ownership group have a higher satisfaction towards the technology dimension of cane growing. The more than 10 acre group respondents have a higher satisfaction towards the facilitation factor of cane processing.

Unmarried respondents have a higher satisfaction towards the technology, time, training and finance dimensions of cane growing whereas married respondents have a higher satisfaction towards the facilitation dimension of cane growing.

Respondents with school level education have a high satisfaction towards technology, training, time and finance factors, whereas respondents with under graduation degree have a high satisfaction towards facilitation factors.

Suggestion

- The companies should conduct specialized training for women farmers to acquire farming skills as also in managing funds
- The companies should help in arranging bank credit to farmers and coordinate in the acquisition of technical and financial expertise for installing drip irrigation
- The companies should help farmers in intercropping practices as it increases the fertility of the soil
- Sugar companies should coordinate the supply of pressed mud from sugar industry to cane farms
- Help in the supply of adequate labor at the time of harvesting
- Industries can also target their corporate social responsibilities towards the small and marginal farmers

Conclusion

This study should help the sugar industries to understand the significance of demographics in the way their role is perceived by the sugar cane farmers. The companies can employ a differentiated strategy based on demographics to ensure the mutual benefit of industry and farmers. Future studies can be based on farmers based on other sugar growing areas as also farmers of other crops who sell their produce directly to industries.

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