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THE INPUT SUBSIDY SCHEME AND ADOPTION OF IMPROVED CULTURAL PRACTICES : A COMPARATIVE ANALYSIS OF RUBBER SMALLHOLDINGS IN KERALA

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The study analysed the differences in the cultural practices between the member growers attached to the Rubber Producers' Societies, availing of the benefits of the input subsidy scheme introduced by the Rubber Board in 1986-87 and non-member growers. The study was based on a multi-stage random sample survey conducted during 1993-94 covering five regions and 375 growers (250 members and 125 non-members). The adoption of major cultural practices was comparable between the two categories during the pre-scheme period except in the application of fungicides and rainguarding. During the post-scheme period the member growers exhibted better adoption of cultural practices such as cover crop establishment, soil and leaf analysis, straight fertilizer application, rainguarding and processing of graded sheets having the net effect of cost saving or income enhancement. One of the explicit gains of the scheme was a statistically significant annual average yield difference of 151 kg per ha. The results of the study underlined the need for supplementing the scheme with extension work providing guidelines on the potential gains from improved cultural practices.

INTRODUCTION

The important policy elements which have been influening natural rubber (NR) cultivation in India since independence are the various forms of subsidy and protected prices. The major policy components consisted of financial incentives for extensive cultivation, improving cultural practices and a favourable price policy. An important feature of rubber cultivation in India is the dominance of smallholdings accounting for 86 per cent of the total production. Among the various schemes introduced by the government for the benefit of the smallholdings, the input subsidy scheme was the latest one deserving attention due to its well defined objectives, mode of implementation and the institutional framework conceived.

The input subsidy scheme was introduced by the Rubber Board in 1986-87 with the short-term objective of increasing the yield in smallholdings by modifying the prevailing cultural practices. The Board adopted a two-pronged strategy of creating an awareness about the potential advantages of improving cultural practices and offering financial incentives in the form of input subsidies. The newly promoted Rubber Producers' Societies (RPS) provided the institutional framework at the micro level and were assumed to be self contained with the least government interference. Under the scheme, the Board procured relevant inputs which were distributed through the RPS at different rates of subsidy. Implicitly, the Board introduced the scheme based on the assumptions that (1) all the relevant inputs subsidised were size-neutral and not resource neutral and (2) in the long run, net gains from the scientific application of inputs will prompt the growers to modernise prevailing cultural practices without subsidy, provided the

input-output price ratio is favourable. The objectives and achievements during the first phase of the scheme were already evaluated and reported (George, 1992). The earlier study has identified the pattern of changes in cultural practices and the constraints in the application of subsidised inputs. It was also reported that the input subsidy scheme has generated 34.19 additional mandays per ha in 1988-89 and the estimated subsidy was Rs. 681.87 per ha.

OBJECTIVES

The main objectives of the present study were: (1) to understand the differences in the salient features, cultural practices, processing of raw rubber and marketing of processed rubber between the member growers attached to RPS and the non-members, (2) to analyse the status of the adoption of selected cultural practices during the pre-scheme and post-scheme periods between the two groups across five regions, and (3) to assess the net gains and prospects of the scheme from a policy angle.

METHODOLOGY

The study was based on a multi-stage random sample survey conducted during the year 1993-94 in five selected traditional rubber growing regions, *viz.*, Changanacherry, Kottayam, Pala, Kanjirappally and Thodupuzha, all belonging to the same agro- climatic zone. Among the 375 households covered, 250 were member growers attached to RPS and 125 were non-members. Only growers having mature area were covered in both the categories and in the case of member growers, only those availing subsidy since 1986-87 were selected. The analysis was also extended to the pre-scheme period to understand the status of adoption of cultural practices among the sample holdings. The comparative analysis was focussed on the major cultural practices, including the use of high yielding clones, fertilizer application, establishment of cover crops and intercrops, application of fungicides, tapping systems, processing of raw rubber and marketing of processed rubber. The net explicit gain was examined by comparing the annual average yield of both the categories based on the age-wise yield profile of the sample holdings.

RESULTS AND DISCUSSION

Analysis of the salient features of the sample holdings showed differences between the two groups and inter-regional variation in terms of the size of the holdings, share of replanted area, generation of plantations and growers availing of planting subsidy (Table 1). The average size of holdings showed statistically significant difference between member growers (1.58 ha) and non-members (0.96 ha) at 1 per cent level. The size of holdings among the member growers was the largest in Pala (1.98 ha) and smallest in Kottayam (1.30 ha) whereas it varied from 1.27 ha in Thodupuzha to 0.69 ha in Kottayam among the non-members. The share of replanted area to total area also varied between the two categories as it was 80 per cent for members and 72 per cent for non-members. In the member category,85 per cent of the holdings belonged to the second generation and above, while it was only 70 per cent in the non-member category.

The generation of plantations was also characterised by inter-regional variations. In Kanjirappally, 98 per cent of the member growers and 84 per cent of the non-member growers belonged to the second generation and above compared to Changanacherry where the relative shares were 66 per cent and 56 per cent respectively. Among the member growers, 78per cent had availed of subsidy either for new planting or replanting and the relative share in the non-member category was only 52 per cent. Marked inter-regional variation in the coverage of planting subsidy could also be observed between the categories. Among the member growers its coverage was the highest in Pala (90 %)

Table 1. Salient features of the sample holdings

Region/ Category	No. of holdings	Average holding size (ha)	Replanted area (%)	Generation (%)			Coverage of planting subsidy (% share)
				1	2	3	
Pala							
M	50	1.98	84	8	82	10	90
NM	25	1.01	73	16	78	3	48
Changanacherry							
M	50	1.40	74	34	60	6	62
NM	25	0.77	60	44	52	4	48
Kottayam							
M	50	1.30	76	16	76	8	82
NM	25	0.69	80	36	64	0	44
Kanjirappally							
M	50	1.64	95	2	76	22	86
NM	25	1.08	82	16	80	4	68
Thodupuzha							
M	50	1.57	69	16	72	12	68
NM	25	1.27	66	36	64	0	50
Average							
M	50	1.58	80	15	73	12	78
NM	25	0.96	72	30	67	3	52

M = Members of RPS; NM = Non-members

and the lowest in Changanacherry (62 %) and among the non-members it was in Kanjirappally (68 %) and Kottayam (44 %) respectively.

The popularity of high yielding varieties of planting materials and density of planting showed comparable trends (Table 2). The entire area under the two categories was planted with modern high yielding varieties of planting materials and in both the categories 62 percent of the fields were planted with RRII 105. Among the member growers 71.09 per cent of the entire rubber area was planted with RRII 105 and it was 71.54 per cent for the non-members (the trend was comparable as the mean difference was insignificant). Only 38 per cent of the fields were planted with other planting materials in which mixed planting with RRII 105 was popular in both the categories. Region-wise analysis of adoption of high yielding varieties of planting materials showed that the share of RRII 105 was the highest in Pala (73 %) and lowest in Changanacherry (54 %). The mean difference in the density of planting between members (387) and non-members (380) was found to be statistically insignificant. The density of planting showed region-wise differences and it was the highest in Kottayam for both members and non-members (425 and 413).

The practice of cover crop establishment was more popular among the member growers (90 %) compared to non-members (69%) though the differences among the regions and growers were insignificant except in the case of Pala and Thodupuzha (Table 3). It was found that *Pueraria phaseoloides* was more popular among members (86 %) and non-members (95 %), compared to *Mucuna bracteata* (14 % and 5 %). The relative popularity of the two cover crops also varied across the regions and the two groups.

Table 2. Adoption of planting materials and planting density

Region/ Category	Relative share of major planting materials (%)					Stand per ha
	RRII 105	RRIM 600	PB clones	mixed	others	
Pala						
M	73	8	2	13	4	376
NM	73	4	0	15	8	353
Changanacherry						
M	54	6	2	28	10	367
NM	48	10	6	21	15	395
Kottayam						
M	62	8	2	25	3	425
NM	75	0	0	22	3	413
Kanjirappally						
M	60	7	8	24	1	387
NM	52	10	4	33	1	359
Thodupuzha						
M	60	8	6	26	0	378
NM	58	2	17	18	5	382
Average						
M	62	7	4	23	4	387
NM	62	5	5	22	6	380

M = Members of RPS NM = Non-members

Table 3. Popularity of cover crops and intercrops

Region/ Category	% of growers having cover crops	(%) share of		% of growers having intercrops
		Pueraria	*Mucuna*	
Pala				
M	92	89	11	56
NM	60	100	0	72
Changanacherry				
M	88	89	11	70
NM	76	100	0	76
Kottayam				
M	84	79	21	84
NM	76	89	11	84
Kanjirappally				
M	96	75	25	86
NM	76	84	16	88
Thodupuzha				
M	92	100	0	70
NM	56	100	0	53
Average				
M	90	86	14	73
NM	69	95	5	75

M = Members of RPS; NM = Non-members

The practice of intercropping was more popular among non-members (75 %) compared to the members (73 %) and significant differences between the two groups were observed in Pala and Thodupuzha regions. Banana, tapioca, ginger and pineapple were the popular intercrops planted in these regions.

The status and trends in the pattern of fertilizer application and the allied practice of soil and leaf analysis showed significant variation between the two groups and across the regions (Table 4).

There was a remarkable change in the pattern of fertilizer application in the post-scheme period, supplemented by the growth in the popularity of soil and leaf analysis (SLA) among the member growers. In the post-scheme period, 77 per cent of the holdings in the member category availed of SLA facility compared to 22 per cent in the other category. In 1993-94, 54 percent of the members applied straight fer-

Table 4. Status of soil and leaf analysis (SLA) and fertilizer application

Region/ Category	Growers availing SLA (%)		Pre-Scheme			Post- Scheme		
			Percentage of growers adopting					
	Pre-scheme	Post-scheme	Mixture	S.F.	Both	Mixture	S.F.	Both
Pala								
M	4	74	68	20	12	8	54	38
NM	0	20	72	16	12	56	24	20
Changanacherry								
M	22	70	76	16	8	18	50	32
NM	0	20	84	12	4	40	8	52
Kottayam								
M	2	94	76	22	2	6	58	36
NM	0	24	68	25	7	44	16	40
Kanjirappally								
M	6	76	72	20	8	0	46	54
NM	0	16	84	12	4	40	8	52
Thodupuzha								
M	14	72	70	22	8	10	62	28
NM	0	28	68	28	4	40	32	28
Average								
M	10	77	72	20	8	8	54	38
NM	0	22	75	18	7	44	18	38

M = Members of RPS; NM = Non-members; S.F. = Straight fertilizer

tilizers compared to 20 per cent in the pre-scheme period while the relative share of non-members who applied only straight fertilizers remained 18 per cent both in the pre-scheme and post- scheme periods. Regionwise analysis showed that the popularity of straight fertilizers was the highest in Thodupuzha.

Analysis of the status and pattern of fungicide consumption during the pre-scheme and post-scheme periods between the two categories of growers showed declining popularity of the practice (Table 5). The percentage share of growers applying fungicides declined from 82 to 70 among the member growers and from 60 to 32 in the case of the non-members and the decline was more significant in the case of non-members. This trend appeared to be positively related to the coverage of RRII 105 and the growers perception of a relatively higher tolerance of RRII 105 to abnormal leaf fall. Inter-regional variations were significant among both the categories as 92 per cent of the member growers in Kanjirappally applied fungicides, whereas it was only 40 percent in Pala. Among the non-members it was the highest in Changanacherry (48 %) and lowest in Pala (10 %). In both the phases, application of Bordeaux mixture was more popular and even during the post-scheme period, copper oxychloride (COC) was applied by only 38 per cent of the member growers.

Analysis of adoption of cultural practices related to exploitation of rubber (Table 6) showed an increase in alternate daily tapping among members (91 %) and non-members (85 %). There was a steady growth in rainguarded tapping during the post-scheme period and it was more popular among member growers (70 %) compared to non-member growers (39 %).

Table 5: Status of fungicides application

Region/ Category	Share of growers who applied fungicides (%)		Growers who applied COC (%)
	Pre	Post	(Post)
Pala			
M	84	40	10
NM	56	10	0
Changanacherry			
M	74	72	25
NM	60	48	0
Kottayam			
M	84	76	32
NM	64	28	0
Kanjirappally			
M	94	92	58
NM	68	44	0
Thodupuzha			
M	74	72	47
NM	52	28	0
Average			
M	82	70	38
NM	60	32	0

M = Members of RPS; NM = Non-members
Pre = Pre-scheme ; Post = Post-scheme

During 1993-94, the member growers reported 43 additional tapping days as a result of rainguarding. Among the different types of rainguards used, the share of polythene sheet was 88 per cent among the member growers. Regional variation in the adoption of rainguarding was significant as it was the highest in Thodupuzha for both the categories. The use of plastic cups was encouraged to increase the proportion of latex in the total yield and the adoption percentage increased from 9 to 71 among the members. The status of the practice of tapping rest was similar between the two categories and the average number of days of tapping rest was 45 in both the cases.

The status of raw rubber processing between the two groups (Table 7) showed that sheet rubber was the major form of processed rubber and it was significantly higher in the case of non-members (96 %). The relative share of member growers selling the produce in the form of latex was 38 per cent compared to 4 per cent among non-members. The extension services through RPS have improved the quality of sheet rubber as the member growers sold 72 per cent of the sheet rubber as graded sheets whereas the relative share in the case of non-members was only 49 per cent. Analysis of the status of processing clearly indicated inter-regional differences as the share of graded sheets was 98 per cent in Thodupuzha, compared to 48 per cent in Changanacherry among the member growers.

Analysis of the channels of marketing indicated comparable trends as sheet rubber was sold mainly through private dealers among member growers (79 %) and non-members (89 %) (Table 8). The main channel of disposal of field latex was RPS for both members and non-members.

CONCLUSION

The study showed that the status of adoption of major cultural practices between members and non-members were comparable during the pre-scheme period except in the case of fungicides consumption (82% and 60%) and rainguarding (14% and 4%). The input subsidy scheme, introduced in 1986-87 had two short-term components *viz.*, an explicit set, intended to raise the yield per ha and an implicit set, having the effect of either cost saving or increasing net income per unit area. The institutional framework conceived in the form of RPS was effective for the distribution of subsidised inputs. The explicit gain was evident from a statistically significant (at 5% level) annual average yield difference between the two categories. The reported annual average yield of RRII 105 in the case of member growers during post-scheme period was 1902 kg/ha compared to 1751 kg/ha for non-member growers.

Table 6. Status of exploitation practices

Region/ Category	Share of growers adopting (%)							
	S/2 D/2		Rainguard		Pl.cups		Hired labour (post)	Tapping rest (post)
	Pre	Post	Pre	Post	Pre	Post		
Pala								
M	59	92	16	80	2	64	88	84
NM	75	92	4	56	0	20	36	76
Changanacherry								
M	61	88	16	74	2	66	96	72
NM	47	76	0	28	0	20	72	92
Kottayam								
M	47	82	8	52	4	64	96	82
NM	55	72	4	16	4	28	88	68
Kanjirappally								
M	92	98	8	50	14	70	88	58
NM	83	96	4	28	10	16	84	68
Thodupuzha								
M	90	96	22	94	24	90	90	88
NM	82	90	8	68	0	24	84	84
Average								
M	70	91	14	70	9	71	92	77
NM	68	85	4	39	3	22	73	78

M = Members of RPS; NM = Non-members
Pre = Pre-scheme ; Post = Post-scheme

Table 7. Status of raw rubber processing

Region/ Category	Growers selling		Composition of sheet rubber processed (%)		
	Field latex(%)	Sheet rubber(%)	RSS 4	RSS 5	Ungraded
Pala					
M	40	60	73	3	24
NM	4	96	58	4	38
Changanacherry					
M	42	58	48	0	52
NM	0	100	36	4	60
Kottayam					
M	52	48	50	0	50
NM	8	92	26	0	74
Kanjirappally					
M	28	72	91	0	9
NM	4	96	52	0	48
Thodupuzha					
M	26	74	95	3	2
NM	4	96	61	4	35
Average					
M	38	62	71	1	28
NM	4	96	47	2	51

M = Members of RPS; NM = Non-members

Table: 8. Marketing channels of processed rubber

Region/ Category	Sheet rubber (%)			Field latex (%)		
	Pvt.	Co-op.	RPS	Pvt.	Co-op.	RPS
Pala						
M	83	7	10	5	5	90
NM	96	4	0	0	0	100
Changanacherry						
M	86	14	0	0	0	100
NM	92	8	0	0	0	0
Kottayam						
M	100	0	0	4	4	92
NM	100	0	0	0	0	100
Kanjirappally						
M	78	22	0	14	0	86
NM	91	9	0	0	100	0
Thodupuzha						
M	57	3	40	23	0	77
NM	65	4	31	0	0	100
Average						
M	79	10	11	8	2	90
NM	89	5	6	29	0	71

M = Members of RPS; NM = Non- members
Pvt. = Private dealers; Co-op. = Co-operative societies

The scheme was also found to be instrumental in popularising the implicit gains as was evident from the analysis. The member growers exhibited a better adoption of cultural practices such as cover crop establishment, soil and leaf analysis and application of straight fertilizers, leading to cost saving. A relatively higher share of rainguarded tapping and production of graded sheets might have contributed to increased net income of the member growers. The results of the comparative analysis in terms of the explicit and implicit gains in the backdrop of a gradual reduction in the rate of subsidy offered by the Rubber Board to various inputs, underline the need for actively supplementing the scheme with extension work, providing guidelines on the potential gains from improved cultural practices.

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