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**ARTICLES**

# Price Risk Management and Access to Finance for Rubber Growers: The Case of Price Stabilisation Fund in Kerala

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## I

## INTRODUCTION

With the abandonment of the protectionist trade policies by India since the start of Liberalisation, Globalisation and Privatisation (LPG) era in 1990s, price volatility and market uncertainties of primary commodities have been a recurring phenomena. While primary commodity producers in developed countries could afford to discount the price fall through escalated budgetary provisions, it is the farmers in developing countries who suffer from the disastrous effects (Pillai, 2004). Rubber, an important crop in the agricultural economy of India particularly Kerala, suffered huge unprecedented price crash in the period between 1997 to 2002 due to changes in the world economy. To add to the woes, the price volatility in natural rubber got increased during post-reforms period due to convergence of markets (Mohankumar and Chandy, 2005). The problem of price fluctuation is a double edged sword impacting upon cash flow along with investment decision. Expected commodity prices act as a major determinant of investment decision. The plummeting of natural rubber prices in the late 1990s had left notable changes in agro-management practices in the crop with farmers resorting to cost-saving measures such as reduction in the application of chemical fertilisers as well as organic and bio-fertilisers, curtailment of weeding practices in rubber holdings and near total stoppage of other cultural practices such as spraying fungicides and pesticides and rainguarding (Mohankumar and Chandy, 2005). Fluctuating prices affect borrowers' ability to repay and lending agencies find the existing situation highly risky that they evade the responsibility of advancing credit (Basu, 2006). Appropriate risk management instruments assure lending agencies about loan repayment allaying their hesitation in advancing credit along with improving confidence of farmers in taking up loans for investment purposes. Linking price risk management measure with access to credit is one of the important policy options for investment intensive crops like rubber (Rangachary, 2006). Internationally a number of initiatives have been taken up from time to time to manage the price risk (Appendix I). The Government of India introduced Price Stabilisation Fund in April 2003 to alleviate the hardships faced by tea, rubber, coffee and tobacco growers due to low prices. Kerala is the major traditional rubber growing

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region and has been commanding first position in the area and production in India and has important bearing on the state's economy. It is therefore, important to understand the implication of liberalisation on risk and the performance of Price Stabilisation Fund (PSF) in mitigating the same and in enhancing the access to credit by the farmers. Therefore, the study was taken up with the following objectives (i) to study the rubber economy of India; (ii) to assess the performance of Price Stabilisation Fund (PSF) as a risk management programme; and (iii) to assess the impact of PSF and access to credit on rubber cultivators and to devise strategies for mitigating the risk.

## II

## DATA AND METHODOLOGY

Secondary data was collected on rubber prices, area, production and productivity for the period 1976 to 2007-08 from *Indian Rubber Statistics* (various volumes), The Rubber Board; *District Handbook of Kerala*, Department of Information and Public Relations, Kottayam, Government of Kerala; and *Agricultural Statistics*, Department of Economics and Statistics, Government of Kerala. For analysing the effect of liberalisation on the rubber economy the study period is divided into two; pre-liberalisation phase (1976-1990) and the post-liberalisation phase (1991-2008). The study also employed primary data collected using multistage random sampling technique from Kaduthuruthy and Pampady blocks of Kottayam district of Kerala. A total of 120 farmers consisting of 60 Price Stabilisation Fund (PSF) beneficiaries and 60 PSF non-beneficiaries, with and without access to finance, were surveyed. The 120 sample farmers comprised 45 loanee and 75 non-loanee farmers. The instability in area, production, and productivity of natural rubber is computed using Cuddy-Della Valle index which is given by $II=CV*(1-R^2)^{0.5}$; where II=Instability index (per cent); CV=co-efficient of variation (per cent); $R^2$ = Co-efficient of determination of trend regression. The Cuddy-Della Valle index automatically detrends the data so that the Instability index so obtained is not affected due to the growth of the factor for which instability is being computed. The logit model is used to measure the effect on access to finance of various demographic and economic variables, i.e., membership of the PSF scheme, age of the head of households, family size, operational holding, education level of the head of household, off-farm income, etc. The costs and returns for different age groups of rubber were calculated for the four categories of farmers; (i) PSF beneficiaries with access to finance (PSF-A), (ii) PSF beneficiaries with no access to finance (PSF-NA), (iii) PSF non-beneficiaries with access to finance (NPSF-A), (iv) PSF non-beneficiaries without access to finance (NPSF-NA). The annual cost of cultivation for rubber (Cost C) is estimated by adding together the annual establishment cost (amortized) and annual maintenance cost. The Cobb-Douglas form of production function is used to determine the resource use efficiency of the rubber crop with respect to PSF beneficiaries and PSF non- beneficiaries. The

Cobb-Douglas production function was used because it gave a better fit to the data compared to other forms of production functions and also because the coefficients of dependent variable directly gives the elasticity of production. Financial analysis techniques namely Net Present Worth (NPW), Benefit Cost ratio (BC ratio), and Internal Rate of Returns (IRR) were used to estimate the feasibility of rubber cultivation. The constraints faced by rubber growers in adoption of PSF and in access to finance was analysed using Garrett's ranking technique which is given by; Percent position = $100*(R_{ij}-0.5)/N_j$ ; where $R_{ij}$ = rank given for i-th factor by j-th individual; $N_j$ = number of factors ranked by the j-th individual. The Garrett's ranking technique arranges the constraints based on their importance from the point of view of respondents. Hence, the same number of response on two or more constraints may have been given different rank.

## III

## RESULTS AND DISCUSSION

### *Rubber Economy in India*

#### *The Supply of Rubber*

India is the fourth largest producer of rubber in the world next to Thailand, Indonesia and Malaysia. It has the highest average productivity of 1298.9 kg per hectare. This is made possible with the sustained research and development activities being carried out by the Rubber Board coupled with extension and advisory services and transfer of technology to the fields (Rangachary, 2006).

The State of Kerala and adjoining Kanyakumari district of Tamil Nadu are the traditional and major rubber growing areas of the country accounting for 94 per cent of the total production (Table 1). However, there has been a shift in the geographical composition of area over the years due to the Rubber Board's policies and programmes implemented during the Sixth and Seventh Five Year Plans for the introduction and promotion of rubber cultivation in non-traditional regions, especially in the North-East (Rangachary, 2006). Currently over 6.35 lakh hectares of area spread over 15 States and one Union territory of the country is under rubber plantations, dominated by small holdings (less than 0.5 ha) that account for 91 per cent of the production and 88 per cent of area. There are nearly 1 million producers and about 0.7 million people engaged in the plantation sector as workforce either directly or indirectly (Mohankumar and Chandy, 2005; and Rangachary, 2006).

In the pre-liberalisation period (1976-1990) higher growth rate in area, production and productivity of rubber was recorded than that in post-liberalisation period (1991-2007) and is accompanied with comparable instability (Table 2). The factors that have explicitly contributed to the sustained growth of the rubber sector are comparatively stable and remunerative price and a higher net farm income vis-à-

TABLE 1. STATEWISE AREA, PRODUCTION AND PRODUCTIVITY OF RUBBER

| Region/State | 2000-01* | | | 2007-08 | | | Per cent change | | |
|---|---|---|---|---|---|---|---|---|---|
| | Area (ha) | Production (tonnes) | Yield (kg/ha) | Area (ha) | Production (tonnes) | Yield (kg/ha) | Area (ha) | Production (tonnes) | Yield (t/ha) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| (A) Traditional region | | | | | | | | | |
| Kerala | 4,75,039 | 5,80,350 | 1222 | 5,12,045 | 7,53,135 | 1471 | 7.8 | 29.8 | 20.4 |
| Tamil Nadu | 18,704 | 21,631 | 1157 | 19,410 | 23,820 | 1227 | 3.8 | 10.1 | 6.1 |
| Sub total | 4,93,743 | 6,01,981 | 1219 | 5,31,455 | 7,76,955 | 1462 | 7.6 | 29.1 | 19.9 |
| | (87.1) | (95.3) | | (83.6) | (94.1) | | | | |
| (B) Non traditional region | | | | | | | | | |
| (a) North Eastern Region | | | | | | | | | |
| Tripura | 27,947 | 10,304 | 369 | 41,165 | 20,299 | 493 | 47.3 | 97.0 | 33.7 |
| Assam | 12,806 | 1,755 | 137 | 18,225 | 5,108 | 280 | 42.3 | 191.1 | 104.5 |
| Meghalaya | 4,354 | 2,378 | 546 | 6,830 | 4,199 | 615 | 56.9 | 76.6 | 12.6 |
| Nagaland | 2,024 | 393 | 194 | 2,697 | 769 | 285 | 33.3 | 95.7 | 46.8 |
| Manipur | 1,698 | 198 | 117 | 1,914 | 364 | 190 | 12.7 | 83.8 | 63.1 |
| Mizoram | 619 | 63 | 102 | 551 | 110 | 199 | -11.0 | 74.6 | 96.2 |
| Arunachal Pradesh | 323 | 42 | 130 | 458 | 121 | 264 | 41.8 | 188.1 | 103.2 |
| Sub-total | 49,771 | 15,133 | 304 | 71,840 | 30,970 | 431 | 44.3 | 104.7 | 41.8 |
| | (8.8) | (2.4) | | (11.3) | (3.8) | | | | |
| (b) Other states | | | | | | | | | |
| Karnataka | 20,017 | 13,465 | 673 | 28,830 | 16,450 | 571 | 44.0 | 22.2 | -15.2 |
| A& N Islands | 960 | 397 | 414 | 729 | 218 | 299 | -24.1 | -45.1 | -27.7 |
| Goa | 843 | 314 | 373 | 986 | 323 | 328 | 17.0 | 2.9 | -12.1 |
| Maharashtra | 165 | 47 | 285 | 373 | 82 | 220 | 126.1 | 74.5 | -22.8 |
| Orissa | 517 | 26 | 50 | 528 | 114 | 216 | 2.1 | 338.5 | 329.3 |
| West Bengal | 430 | 36 | 84 | 548 | 197 | 360 | 27.4 | 447.2 | 329.4 |
| Andhra Pradesh | 109 | 1 | 9 | 111 | 36 | 324 | 1.8 | 3,500.0 | 3435.1 |
| Sub-total | 23,044 | 14,286 | 620 | 32,105 | 17,420 | 543 | 39.3 | 21.9 | -12.5 |
| | (4.1) | (2.3) | | (5.1) | (2.1) | | | | |
| Grand total | 5,66,558 | 6,31,400 | 1,114 | 6,35,400 | 8,25,345 | 1,299 | 12.2 | 30.7 | 16.6 |

*Source*: Government of India, *Indian Rubber Statistics*, Rubber Board, Ministry of Commerce and Industry, (various issues),

*Note:* * Detailed data by states are available from 2000-01 from the source.

TABLE 2. GROWTH IN AREA, PRODUCTION AND PRODUCTIVITY OF RUBBER IN KERALA

| (1) | Area ('000 ha) (2) | Production ('000 tonnes) (3) | Productivity (kg/ha) (4) |
|---|---|---|---|
| 1976-1990 | | | |
| TE 1978 | 220.51 | 132.98 | 754.67 |
| TE 1990 | 395.95 | 273.77 | 1023.67 |
| CAGR (per cent) | 5.14 | 6.14 | 2.60 |
| Instability Index (per cent) | 6.42 | 22.24 | 38.27 |
| 1991-2007 | | | |
| TE 1993 | 428.39 | 373.36 | 1215.33 |
| TE 2007 | 502.86 | 758.55 | 1900.33 |
| CAGR (per cent) | 1.07 | 4.80 | 2.90 |
| Instability Index (per cent) | 3.70 | 18.69 | 33.10 |

vis other crops in Kerala (George *et al.*, 1988; Lekshmi and George, 2003; and Chandy *et al.*, 2010). However, in post-liberalisation period the growth in rubber production is mainly attributable to productivity growth (2.9 per cent) and to a lesser extent to growth in area (1.07 per cent).

The growth and instability of new planted and re-planted area of rubber is presented in Figure 1. The low growth with high instability in new planted and re-planted area of rubber is observed during the post-reform phase compared to that in pre-reform phase (Figure 1). The decision to go for new plantation and re-plantation is guided by the future price expectation and profitability of the rubber crop. The farm level investments also get adversely affected by price related risks. While during downswings, there are clear constraints on farm investments due to liquidity crunch, during upswings, farmers tend to keep away from investments in their holdings, as they have to meet the debts incurred by them during the downswing phase (Rangachary, 2006). It is also observed that commodity boards have a long-established system of paying subsidies for re-planting and new planting activities, however, these subsidies are not adequate to the cash flow positions of growers (Damodaran, 1999). Suitable policy intervention is called for otherwise continuance of the trend over long term period would have implication on the productivity of rubber plantations in future.

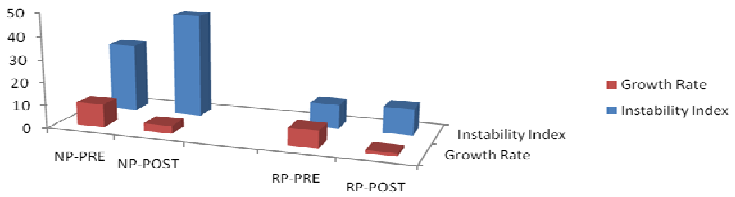



Figure 1. Growth and Instability in New Planted (NP) and Replanted (RP) Area under Rubber in Pre-Reforms and Post-Reforms Phase

*The Demand Perspective of Rubber*

The consumption of rubber has increased from 8.64 lakh tonnes to 12.42 lakh tonnes during the period 2001 to 2009, recording a growth rate of 5.5 per cent per annum. The natural rubber accounts for a major share of total rubber produced and consumed in the country. Among the various forms of natural rubber produced, it is the Ribbed Smoked Sheets (RSS) grade of natural rubber which accounts for major share and is also growing at a relatively faster rate (5.0 per cent). On the consumption side though the RSS grade of natural rubber accounts for major share but it is the Latex Concentrate Dry Rubber Content (DRC) which is recording a higher growth rate (11.3 per cent). In India the production sector is dominated by sheet grades and there also exists a captive domestic market.

The synthetic rubber is showing higher growth rate both in production (7.2 per cent) and consumption (5.9 per cent) compared to that of other forms of rubber, i.e., natural rubber and reclaimed rubber. The synthetic rubber manufacturing industry occupies a pivotal position in world rubber market in terms of its unique advantage of both backward and forward integration with petrochemical and automotive tyre manufacturing industries, respectively (George and Sethuraj, 1996). The natural rubber has fierce competition from synthetic rubber, which has largely replaced it in many areas. Continued high prices along with technological innovations may therefore, encourage an even more vigorous shift to the synthetic variety.

The number of rubber manufacturing firms has been declining gradually over the period 2000-08. Many of the small scale industries (SSI)/tiny units have closed down as they could not survive the highly competitive environment and the high cost of raw materials (Mathew, 2011). It is also revealed that the large size firms are consolidating their position. The structural change in the manufacturing firms will have adverse implications on the natural rubber producers as the large size firms are more dependent on synthetic rubber. The major share of total consumption of rubber is used for manufacture of auto tyres and tubes and is growing at faster rate (9.4 per cent). With trade liberalisation and the reduction in import duty the auto tyres and tubes sector is witnessing the re-entry of foreign MNCs either independently or in collaboration with Indian capital (Mohankumar and George, 2001). The MNCs have been targeting the emerging radial tyre segment of all categories of tyre. The competitiveness of the MNCs in quality and price are based on a very large capital base and global marketing network constantly animated by a huge R and D set up. The Indian tyre companies are inward market-oriented and have weaker R and D support.

*International Trade of Natural Rubber*

The country has been following the domestic demand-oriented growth of rubber sector with the focus on self-sufficiency in natural rubber production. The objective

was to insulate domestic prices from fluctuations of the world market, stabilising at remunerative levels and achieve self-sufficiency in natural rubber production (George *et al.*, 2002). It comprised protection to rubber processing industry and the rubber plantation sector, and incentive to export. Post-liberalisation these policies were slightly relaxed to generate competition and bring in more efficiency in the production system (Lekshmi and George, 2003). Some of the major policy initiatives are: (1) reduction in import duty of natural rubber from 20 per cent to 7.5 per cent and to permit import of 1 lakh tonne of rubber; and (2) withdrawal of port restrictions for importing Natural Rubber (NR) only through Kolkata and Vishakhapatnam for enforcing strict quality control. However, natural rubber is included on the negative list of Free Trade Agreement with ASEAN owing to its strategic significance as an agricultural crop.

The policy imperatives underlining the value added exports with competitiveness in cost and quality have been the priorities in the liberalised trade policy regime. An important consequence of this policy change has been synchronisation of NR price in the international and domestic market prices since 1992. Another major trend has been surge in imports of NR. Even the role of statutory minimum prices in influencing the domestic price is questionable as the price received by the growers are more in conformity with the price reported by rubber dealers which gets influenced by the prevailing international price (George *et al.*, 2002).

India also exports natural rubber but accounts for about 0.55 per cent of total export in the world. It recorded an annual growth rate of 33.95 per cent per annum. The country also imports natural rubber mainly to meet the demands of processing industries. The import is growing at a compound annual growth rate of 11.56 per cent. It is revealed that the balance of payment of rubber sector has always been favourable for the country with export earnings from rubber and its products has been higher than the imports in most of the years (Figure 2). It is also observed that both the imports and exports have recorded a rapid surge during the last decade. The cause of concern is that in recent years the exports earnings from rubber and its products have taken a dip, while imports are showing a growing trend. The competitiveness of natural rubber of India has been low during the 1990s and is showing a steep rise since 2000 (Figure 3). However, the competitiveness is observed to be showing a declining trend in recent years. From a long term policy angle, the possibilities of promoting the production of only technically specified forms of NR may have to be investigated in conjunction with the building up of adequate infrastructure facilities to monitor the prescribed quality standards for both domestic and imported rubber. This will ensure the export promotion of value added rubber products. Thus, the long term policy has to be a comprehensive package of mutually reinforcing and transparent scheme to promote mandatory quality upgradation and value added exports.

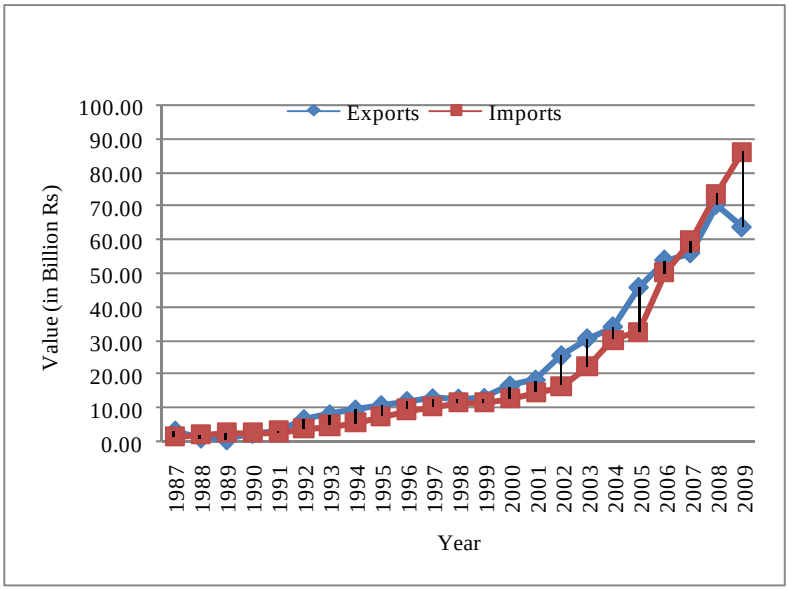
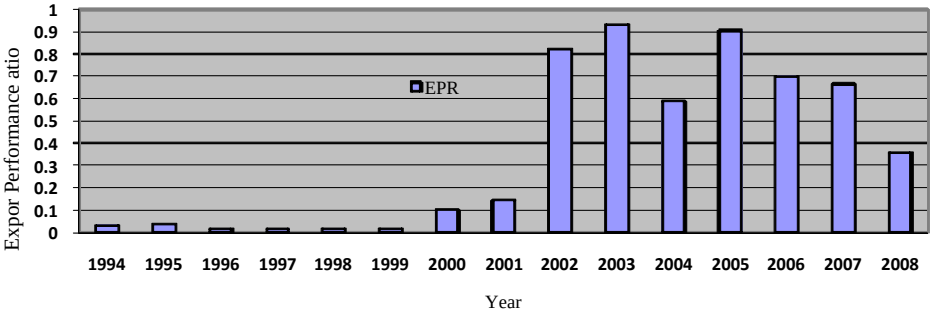



Figure 2. International Trade of Rubber and Its Products




*Source:* faostat.fao.org

Figure 3. Export Performance Ratio of Rubber

Even though India's presence in the international market is negligible, it is highly essential to differentiate our product's quality to retain the market share. An important step in this direction is done by branding of natural rubber for export. "Indian Natural Rubber" is the brand owned and promoted by the Rubber Board and registered under Section 30 of Indian Trade Mark Act. The brand "Indian Natural Rubber" is promoted with a view of differentiating the natural rubber exported from the country on its consistent quality parameters in line with international standards. The Indian NR has been included as the 147th item in the Market Linked Focus Product Scheme (MLFPS). The Indian branded NR exported to Malaysia, China, Turkey, Brazil, Belgium, Italy, Spain, Germany, Sri Lanka, Bulgaria, Austria, Korea,

Mexico, Israel, Singapore, Indonesia, Portugal, Argentina, Australia and the US will be incentivised at 2 per cent of the Free On Board (FoB) value of the exports. The credit scrip would be permitted for the payment of excise duty in domestic procurement. This would give a big boost to the export of Indian rubber (Government of India, 2011).

*Price Risk in Rubber*

The rubber producing nations are price takers. They are dependent on the international price of rubber, therefore, it is important to compare the behaviour of domestic and international price. Among various processed forms of rubber, sheet form is the most marketed form (74.7 per cent) and RSS-4 (Ribbed Smoked Sheet-4) is the market leader. The price of domestic rubber (RSS-4) is comparable with price of RSS-3 in the international market. It is observed that both international (RSS-3) and domestic prices (RSS-4) are highly unstable in the post-reforms phase recording higher instability indices of 34.50 and 31.26 respectively as compared to that in pre-reforms period (Table 3).

It is observed that the growth rate of domestic prices (RSS-4) is well above that of the international price (RSS-3) in the pre-reforms phase, while in the post-reforms phase growth rate of domestic price of rubber was lower than that of international prices. The reason for the domestic price remaining above the international price is the effective supply management by the government using the instruments like Quantitative Restrictions prior to April 2001. The growth rate in both the international and domestic rubber prices during post-reforms phase was much closer indicating convergence in the markets. The effect of lower rubber prices and high volatility manifests itself in the form of reduction in cultivated area, reduced expenditure on agro-management practices, reduced tapping days and consequent reduction in yield (Mohankumar and Chandy, 2005). Price also plays a significant role in the determination of new planted and replanted rubber area (Kurian, 2004).

Thus considering these facts that there are few policy instruments to protect the domestic rubber industry. The domestic NR price moving in tandem with international price, the rubber growers are confronted with the volatility of international prices. It is the risk management policy instruments like Price Stabilisation Fund (PSF) which has the potential to insulate the farmers from price risk and to continue with the increase in the rubber sector to enhance productivity and production. It is in this purview that understanding the performance of PSF scheme is important. It is also important to understand the impact it has on the farm economy.

## IV

## PERFORMANCE OF PRICE STABILISATION FUND (PSF) SCHEME

The PSF scheme which was introduced in the year 2003 received a welcome response but this did not last for long and it became lukewarm response later on. This

TABLE 3. INSTABILITY AND GROWTH IN THE INTERNATIONAL AND DOMESTIC PRICES OF STANDARD FORMS OF NATURAL RUBBER USED FOR PRICE SPECTRUM BAND CALCULATION

(*Rs/qtl*)

| Year | Pre-reform Phase | | Ratio of Domestic price to International Price | Kottayam Price in real terms (Deflated with NSDP implicit deflator) | Year | Pre-reform Phase | | Ratio of Domestic price to International Price | Kottayam Price in real terms (Deflated with NSDP implicit deflator) |
|---|---|---|---|---|---|---|---|---|---|
| | International Price of RSS-3 | Domestic Price of RSS-4 | | | | International Price of RSS-3 | Domestic Price of RSS-4 | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| 1976 | 674 | 620 | 1.09 | | 1991 | 1796 | 2128 | 1.18 | 98.88 |
| 1977 | 692 | 630 | 1.10 | | 1992 | 2457 | 2463 | 1.00 | 106.75 |
| 1978 | 789 | 885 | 1.12 | | 1993 | 2538 | 2546 | 1.00 | 100.00 |
| 1979 | 1011 | 1024 | 1.01 | | 1994 | 3455 | 3107 | 0.90 | 112.35 |
| 1980 | 1083 | 1154 | 1.07 | 75.25 | 1995 | 5030 | 5059 | 1.01 | 175.87 |
| 1981 | 872 | 1423 | 1.63 | 93.97 | 1996 | 4764 | 5122 | 1.08 | 171.21 |
| 1982 | 739 | 1473 | 1.99 | 94.91 | 1997 | 3614 | 3988 | 1.10 | 130.48 |
| 1983 | 1042 | 1672 | 1.60 | 112.29 | 1998 | 2884 | 3013 | 1.04 | 92.23 |
| 1984 | 1040 | 1689 | 1.62 | 106.81 | 1999 | 2644 | 2997 | 1.13 | 85.64 |
| 1985 | 890 | 1694 | 1.90 | 103.35 | 2000 | 3007 | 3125 | 1.04 | 87.09 |
| 1986 | 988 | 1670 | 1.69 | 104.26 | 2001 | 2732 | 3109 | 1.14 | 82.53 |
| 1987 | 1217 | 1766 | 1.45 | 105.68 | 2002 | 3696 | 3621 | 0.98 | 89.56 |
| 1988 | 1600 | 1811 | 1.13 | 98.49 | 2003 | 5101 | 4814 | 0.97 | 111.82 |
| 1989 | 1482 | 2040 | 1.38 | 103.96 | 2004 | 5833 | 5571 | 0.96 | 118.27 |
| 1990 | 1425 | 2147 | 1.51 | 101.72 | 2005 | 6573 | 6068 | 0.92 | 115.79 |
| | - | | | | 2006 | 9510 | 8783 | 0.92 | 151.17 |
| | - | | | | 2007 | 9449 | 9006 | 0.95 | 140.43 |
| | - | | | | 2008 | 11255 | 10775 | 0.96 | 128.57 |
| II | 15.62 | 12.82 | | | II | 34.5 | 31.26 | | |
| CAGR | 5.23 | 8.55 | | | CAGR | 8.33 | 7.57 | | |

happened mainly because of the soaring rubber prices in the following years as a result of which the scheme started losing its significance. It is observed that at the all-India level among those proposed to be covered, only 9.56 per cent of them could be brought under the scheme up to 2009 (Table 4). The maximum number of beneficiaries were from Kerala, which accounts for maximum area and production, while maximum percentage of actual coverage to the proposed coverage was from Tamil Nadu. About 88.54 per cent of the total enrollees to the scheme upto recent years had joined the scheme in the first year of the programme itself. While during the rest of the study period of 2004-2009 the number of enrollees recorded a meager growth of 12.94 per cent. The proposed contribution of rubber growers to PSF corpus fund of Rs. 500 crore was Rs. 9,87,30,500/- whereas in actual only Rs. 94,57,500/- was paid.

TABLE 4. STATEWISE COVERAGE OF RUBBER GROWERS UNDER THE PSF SCHEME

| State | Proposed no. of rubber small growers to be covered | No. of small growers covered as on 31st March 2004 | No. of small growers covered as on 31st October 2009 | Per cent of total growers covered in the first year | Per cent growth in the number of growers covered | Per cent of growers covered to proposed |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Karnataka | 7124 | 306 | 664 | 46.08 | 116.99 | 9.3 |
| Kerala | 165875 | 14860 | 16254 | 91.42 | 9.38 | 9.79 |
| Tamil Nadu | 6897 | 680 | 706 | 96.32 | 3.82 | 10.24 |
| North East | 17565 | 881 | 1267 | 69.53 | 43.81 | 7.21 |
| Total | 197461 | 16727 | 18891 | 88.54 | 12.94 | 9.56 |
| Proposed contribution by rubber growers to PSF corpus if all 197461 growers were covered | | | | Rs. 9,87,30,500/- (197461 *500) | | |
| Actual amount remitted to PSF trust to form corpus fund | | | | Rs. 94,57,800/- (18915 * Rs. 500) | | |

Since in all the years following 2003, domestic prices were well above seven years moving average of international price plus 20 per cent, they were declared as boom years for rubber (Table 5). With the prices on the rising trend for all the years and with no compulsion and contribution from the government, the growers who paid all the subsequent premiums got reduced in number. At the all India level only 22.35 per cent of rubber growers who joined the scheme in the first year continued paying up to the final instalment. The per cent of defaulters with respect to the final installment was above 60 per cent in majority of cases. At the national level the defaulters were 76.56 per cent. It is also observed that the real return by way of accrued interest on balances in saving banks account has also been negative due to inflation rates been higher than the interest rates. This has naturally limited the enthusiasm of the farmers as well as that of the banking sector since there is a time lag notice between assistance available to members of the plantation community and loss suffered due to price decline (Rangachary, 2006).

TABLE 5. BOOM/DISTRESS/NORMAL YEARS OF RUBBER BASED ON PRICE SPECTRUM BAND

| Year (1) | International price moving average (Rs./kg) (2) | Lower band (Rs./kg) (3) | Upper band (Rs./kg) (4) | Domestic price (Rs./kg) (5) | Boom/ Distress /Normal year (6) |
|---|---|---|---|---|---|
| 1990 | 12.35 | 9.88 | 14.82 | 21.47 | B |
| 1991 | 13.43 | 10.74 | 16.12 | 21.28 | B |
| 1992 | 15.66 | 12.53 | 18.79 | 24.63 | B |
| 1993 | 17.88 | 14.30 | 21.46 | 25.46 | B |
| 1994 | 21.09 | 16.87 | 25.31 | 31.07 | B |
| 1995 | 25.99 | 20.79 | 31.19 | 50.59 | B |
| 1996 | 30.68 | 24.54 | 36.82 | 51.22 | B |
| 1997 | 33.81 | 27.05 | 40.57 | 39.88 | N |
| 1998 | 35.36 | 28.29 | 42.43 | 30.13 | N |
| 1999 | 35.63 | 28.50 | 42.76 | 29.94 | N |
| 2000 | 36.30 | 29.04 | 34.85 | 31.25 | N |
| 2001 | 35.25 | (28.2)32.1 | 42.30 | 31.09 | D |
| 2002 | 33.34 | (26.67)32.1 | 40.01 | 36.21 | N |
| 2003 | 33.83 | (27.06) 32.1 | 40.59 | 48.14 | B |
| 2004 | 36.99 | (29.59) 32.1 | 44.39 | 55.71 | B |
| 2005 | 42.27 | 33.82 | 50.72 | 60.68 | B |
| 2006 | 52.07 | 41.66 | 62.48 | 87.83 | B |
| 2007 | 61.28 | 49.02 | 73.54 | 90.06 | B |
| 2008 | 73.45 | 58.76 | 70.51 | 107.75 | B |

*Note:**32.09 is the SMP for RSS-4 grade rubber (since 12th September 2001), lower band limit kept as 32.10/-).

## V

## IMPACT OF PRICE STABILISATION FUND SCHEME (PSF) ON FARM ECONOMY

### *Access to Finance Between PSF Beneficiaries and PSF Non-Beneficiaries*

The linkage between PSF scheme and access to credit was observed to be weak. Among the PSF beneficiary and PSF non-beneficiary farmers very little variation in the interest rate charged, transaction cost and the required collateral for the loans was observed. There wasn't any significant variation in the average amount of loan taken in both short-term and medium-term loan among the two categories of rubber growers (Table 6). The Task Force on plantation sector felt that the lending to the plantation sector should be made available at the interest rate at which NABARD

TABLE 6. ACCESS TO FINANCE BY BENEFICIARY AND NON-BENEFICIARY RUBBER GROWERS

| Type of farmer (1) | Type of loan (2) | No. of farmers taken loan (3) | Average no. of loan taken by each farmer (4) | Average amount of loan taken (Rs. lakh) (5) | Interest rate (per cent) (6) | Transaction cost* (per cent) (7) |
|---|---|---|---|---|---|---|
| PSF | Short term | 13 | 2.76 | 0.34 | 7 | 1 |
| Beneficiary | Medium term | 3 | 1 | 3.33 | 12 | 2 |
| PSF non- | Short term | 22 | 2.33 | 0.31 | 7 | 1 |
| beneficiary | Medium term | 4 | 1 | 3.25 | 12 | 2 |

*It includes opportunity cost of time spent by the borrowers in formalities associated with sanctioning of loan and the cost of various documentation/service charges involved in availing credit from banks.

refinances the banks plus 0.5 per cent on it. Since the plantation sector is export-oriented and a large portion of its products goes to the international market where there is intense competition, it is absolutely necessary that the cost of capital to this sector is reduced to the maximum extent possible (Rangachary, 2006).

The logit model was used to assess the various demographic and economic factors influencing access to finance (Table 7). The age and off-farm income showed negative co-efficient of estimates indicating that with increase in either of them, odds ratio i.e., probability of availing loan to not availing loan declined drastically. Education and operational holding size showed positive but insignificant relationship. Family size recorded negative co-efficient of estimates, probably because the presence of greater number of earning members in the family would decrease the need for borrowed credit. PSF membership which was included as a categorical independent variable even though insignificant was positive, revealing its weak connection with access to finance.

TABLE 7. FACTORS AFFECTING THE ACCESS TO FINANCE

| Explanatory Variables (1) | Maximum-Likelihood Estimate (2) | Standard Error (3) | Odds-ratio (4) |
|---|---|---|---|
| Age of the head of household (years) | -.2986*** | 0.1069 | 0.742 |
| Family size (No.) | -2.5201** | 1.0941 | 0.080 |
| Operational holding (ha) | 1.2191 | 1.4287 | 3.384 |
| Education of head of households (above secondary level=1; otherwise=0) | 0.8365 | 0.8413 | 2.308 |
| Off-farm income | -0.1340*** | 0.0444 | 0.875 |
| PSF beneficiary (Member=1; otherwise=0) | 0.3751 | 0.9708 | 1.455 |
| No. of observations | 120 | - | - |
| Likelihood ratio | 141.1985*** | - | - |

*Note:* Model convergence criterion (GCONV=IE-8) satisfied.

The issue of access to credit has become more important because of weakening of the channels of advances to labourers (tappers), the traditional practice that existed earlier wherein the farmer was receiving advances from the traders and in turn was made available to the tappers (Mohankumar and Chandy, 2005). The access to credit is also important to take up development activity on the rubber plantation to sustain the increased productivity. Therefore, policies need to be devised to link the PSF scheme with access to credit.

*Cost of Cultivation, Profitability and Feasibility of Rubber Cultivation*

The major sub-sectors of NR economy undergoing internal adjustments and structural changes in response to the changing economic scenario are the production, processing, and the consumption sectors. Among the NR producing countries a common feature is efforts to capitalise the available opportunities for squeezing the unit cost of production and exploring the potential outlets for increasing the net income per unit area. This is clearly observable in Malaysia wherein till 1991 it was

the leading producer and exporter of NR and in 1991 the share of NR in its total export earnings declined to 32.50 per cent from 55 per cent in 1960. Major changes in its NR production sector consisted of switching over to relatively more profitable and less labour-intensive crops like oil palm and introduction of labour saving mechanisms at different stages of NR production. In recent years it is increasingly importing natural rubber from low cost producing country, Vitetnam and is focusing on processing it into high grades of NR (Sulaiman 1991; and George and Sethuraj, 1996). It is therefore pertinent to assess the feasibility of the rubber cultivation in Indian condition. Rubber is a perennial plantation crop which has six years of immature phase during which high investment is made and mature phase starting from seventh year onwards. The rubber holdings were categorized based on age groups of plantation for the purpose of computation of costs and returns. The distribution of sample holdings of the farmers according to age of rubber trees is given in Table 8**.** It is observed that about 33 per cent of the holdings have older age plantation and need replanting effort so as to sustain the productivity. It being capital intensive, demands support in terms of subsidy and availability of credit.

TABLE 8. DISTRIBUTION OF RUBBER HOLDINGS UNDER DIFFERENT AGE GROUPS

| Age of rubber trees (years) | No: of holdings in different age groups | | Per cent distribution of holdings in different age groups |
|---|---|---|---|
| | Holding of PSF beneficiaries | Holding of PSF non-beneficiaries | |
| (1) | (2) | (3) | (4) |
| 1-6 | 0 | 7 | 5.83 |
| 7-12 | 15 | 17 | 27.5 |
| 13-18 | 25 | 15 | 33.33 |
| 19-24 | 15 | 14 | 20.83 |
| 25-28 | 5 | 7 | 12.5 |

A lifetime matrix was constructed for each sample unit on all parameters by generating future and past data on the variables under study and thus a complete information on the total lifespan of rubber crop for all categories of rubber growers namely PSF beneficiaries with access to finance (PSF-A), PSF beneficiaries without access to finance (PSF-NA), PSF non-beneficiaries with access to finance (NPSF-A), PSF non-beneficiaries without access to finance (NPSF-NA) was obtained. Annual cost of cultivation was found out by adding up annual amortised establishment cost and annual maintenance cost involved during the immature and mature phase of the plantation respectively. The cost and returns calculation revealed that PSF beneficiaries and PSF non- beneficiaries with access to finance had incurred more cost and reaped more net returns in comparison with growers in both categories without access to finance on per hectare basis (Table 9).

TABLE 9. COST OF CULTIVATION OF RUBBER IN KERALA

| Particulars | PSF-A | PSF-NA | NPSF-A | NPSF-NA |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| Terracing (including silt pits and contour bunds) | 1,500 | 1,500 | 1,550 | 1,275 |
| Manuring and fertiliser application | 4,280 | 3,818 | 4,463 | 3,937 |
| Weeding and mulching | 4,698 | 4,350 | 4,463 | 4,560 |
| Plant protection | 1,200 | 1,263 | 1,225 | 1,313 |
| Drainage and miscellaneous | 250 | 250 | 250 | 250 |
| Boundary protection and footpath | 938 | 750 | 913 | 675 |
| Tools and implements | 103 | 103 | 103 | 103 |
| Rainguarding | 4,700 | 3,875 | 5,000 | 3,925 |
| Interest on working capital | 4,775 | 4,650 | 4,725 | 4,675 |
| PSF premium | 1,000 | 1,000 | 0 | 0 |
| Cost of tapping | 47,565 | 43,470 | 47,723 | 45,360 |
| Rent on owned land | 850 | 850 | 850 | 850 |
| Total maintenance cost | 71,857 | 65,878 | 71,263 | 66,922 |
| Amortised establishment cost | 15,752 | 14,417 | 15,221 | 14,515 |
| Total cost | 87,609 | 80,295 | 86,484 | 81,437 |

It was observed that the growers, both the beneficiaries and non-beneficiaries, who had access to finance, were having less off-farm income and were more dependent on agriculture for their livelihood. Thus, these types of growers might have devoted more attention to the management of the crop and were able to get the added benefits. Net returns for PSF beneficiaries with access to finance significantly exceeded that of PSF beneficiaries without access to finance by an amount of Rs.15582.55/- which was 15.55 percent higher. Similarly for PSF non-beneficiaries with access to finance, the net return was significantly higher (14.2 per cent) than that of PSF non-beneficiaries without access to finance (Rs.14347.64/-). Financial evaluation measures gave similar results for all categories of growers (Table 10). Thus it could be inferred that the cultivation of rubber is profitable and B:C ratio analysis reveals that it gives a return of Rs. 2 per rupee of investment on an average basis. The rubber crop also gives an IRR of 18 per cent on an average basis which is higher than the opportunity cost of capital. The returns are higher for PSF beneficiaries especially when the premium amount is excluded from the cost of cultivation as it is in fact a saving. The higher profitability is observable because of risk mitigation feature of the scheme. The farmers are able to use more of labour and other inputs to realise higher production. If the risk mitigation feature of the scheme is enhanced it would serve a great deal in enhancing the profitability of the PSF beneficiaries. The access to finance serves dual purpose of enhancing the access to improved and good quality inputs and also aids higher investment which the rubber growers can take. This leads to increase in income and also mitigates the production risk to certain extent. Therefore higher profitability is clearly discernible between those with access to finance and without access to finance. Therefore it is construed that the PSF scheme should be tied with access to finance to make the scheme more attractive and to have resultant higher impact on the rubber growers.

TABLE 10. PROFITABILITY AND FEASIBILITY OF RUBBER CULTIVATION

| Particulars (1) | Annual cost of cultivation (Cost C) (2) | Annual total returns (3) | Net Income (4) | BC Ratio (5) | NPW (Rs.) (6) | IRR (per cent) (7) |
|---|---|---|---|---|---|---|
| PSF-A | 87608.81 | 203378.1 | 115769.29 | 2.11 | 554128.0 | 19 |
| PSF-NA | 80294.66 | 180481.4 | 100186.73 | 2.07 | 489415.9 | 18 |
| NPSF-A | 86484.05 | 202031.3 | 115547.25 | 2.10 | 545415.3 | 18 |
| NPSF-NA | 81436.64 | 182636.3 | 101199.61 | 2.05 | 489886.0 | 18 |

*Resource Use Efficiency for PSF Beneficiaries and PSF-Non Beneficiaries*

The multiple regression analysis was carried out for the two categories of farmers, i.e., PSF beneficiaries and PSF non-beneficiaries using Cobb-Douglas production function to estimate the resource use efficiency of various inputs (Table 11).

TABLE 11. ELASTICITY OF PRODUCTION FOR VARIOUS INPUTS USED IN RUBBER CULTIVATION

| Particulars (1) | Coefficients | |
|---|---|---|
| | PSF Beneficiaries (2) | PSF non-beneficiaries (3) |
| Constant | -0.317 | -0.248 |
| | (0.072) | (1.483) |
| Labour used for tapping (Rs.) | 1.312*** | 1.533*** |
| | (0.147) | (0.205) |
| Fertiliser (Rs.) | 0.154 | 0.076 |
| | (0.120) | (0.312) |
| Weeding (Rs.) | -0.186 | -0.948*** |
| | (0.225) | (0.233) |
| Rain guarding (Rs.) | 0.034 | 0.415*** |
| | (0.212) | (0.144) |
| Plant protection (Rs.) | 0.146*** | 0.008 |
| | (0.45) | (0.099) |
| Access to finance | 0.045** | 0.105** |
| (Dummy variable) | (0.022) | (0.045) |
| Coefficient of determination $R^2$ | 0.955 | 0.986 |
| No. of observations | 60 | 60 |

Access to finance turned out to be significant variable revealing the importance of credit to enhance the efficiency of rubber cultivation. Similarly tapping labour cost which accounts for about 50 per cent of cost of cultivation of rubber also emerged to be significant variable. The rubber growers could further invest on tapping labourers and enhance the rubber production. Marginal Value Product (MVP) of all significant inputs revealed in-efficiency in most of the cases for both the categories of farmers (Table 12).

TABLE 12. MARGINAL VALUE PRODUCT OF VARIOUS INPUTS USED IN RUBBER CULTIVATION

| Respondent (1) | Labour used for tapping ($X_1$) (in Rs.) (2) | Weeding ($X_3$) (in Rs.) (3) | Rain guarding ($X_4$) (in Rs.) (4) | Plant Protection ($X_5$) (in Rs.) (5) | Amortised est. cost ($X_6$) (in Rs.) (6) |
|---|---|---|---|---|---|
| PSF | 6.32 | - | - | 25.4 | 3.34 |
| NPSF | 7.2 | -41.35 | 19.54 | - | 2.2 |

The importance of PSF and its linkage to access to finance is important as it has been experienced in the past that with the falling price of rubber the farmers cut down the expenditure on the agricultural operations in rubber plantation, and also do not undertake long-term investment in rubber cultivation resulting in stagnation in productivity of natural rubber. The emerging market uncertainties of natural rubber also affects the labour relations which constitutes interest free advance payment of wages; employment opportunities for tapping labourers after tapping hours; and duration of service under a single farmer (Mohankumar and Chandy, 2005). Therefore, a strategy need to be devised to link the PSF scheme and the accessibility to credit and make the rubber cultivation more efficient so that the reduction in unit cost of rubber production could be realised and enable the rubber sector to become more competitive.

*Constraints Faced by Rubber Growers*

The constraints were ranked and converted into per cent using the Garrett's table, mean score for each constraint was calculated and finally constraints were arranged in the descending order of mean scores as given in Table 13. The beneficiaries expressed the constraints they face in the cultivation of rubber and also in the constraints to accessing credit. One of the major problems the farmers were facing was that they had been continuously paying the instalment amount and were not receiving any contribution from the PSF trust.

The scheme does not enable the growers to withdraw the amount if it wishes so. The scheme offers low interest rate payable on the deposit amount. Further the real return by way of accrued interest on balances in saving banks account has also been negative as the inflation rates have been higher than the interest rates. This has naturally limited the enthusiasm of the farmers as well as that of the banking sector since there is a time lag notice between assistance available to PSF beneficiaries and loss suffered due to price decline (Rangachary, 2006). To make the PSF more relevant and realistic these constraining factors need to be addressed.

The PSF scheme could be made attractive by linking it with the access to credit. The beneficiaries should be given incentive in seeking credit by way of lesser paper work, lower interest rate, advancing credit without collateral, etc. The non-beneficiary rubber growers did not find it attractive enough to join the scheme. The continuously rising rubber prices, absence of credit linkage, little contribution from the PSF during the scheme period, limit imposed on non-withdrawal of amount are some of the important constraints expressed by the non beneficiaries as well.

Rubber board officials and bank officials were also interviewed besides the rubber growers to know about the constraints they face in the implementation of the scheme. Bank officials complained that with the number of defaulters increasing every year, merely keeping of PSB accounts add to their physical work of keeping records.

TABLE 13. CONSTRAINTS FACED IN RUBBER CULTIVATION TO THE CONTINUATION OF PSF SCHEME

| Sl. No. (1) | Constraints (2) | Garret's mean score (3) | Rank (4) |
|---|---|---|---|
| | Continuation of PSF scheme | | |
| 1. | Farmer remaining the sole contributor to the account | 74.33 | 1 |
| 2. | Restriction on withdrawal of amount | 64.36 | 2 |
| 3. | Low rate of interest on PSF account | 63.52 | 3 |
| 4. | Absence of credit linkage | 57.15 | 4 |
| 5. | Low amount of compensation and contribution not linked to holding size | 54.67 | 5 |
| 6. | Lack of monitoring on timely payment of annual contribution | 48.97 | 6 |
| 7. | Lack of acceptability of PSF membership as security for credit | 36.27 | 7 |
| 8. | Low insurance value of attached accidental insurance scheme | 27.13 | 8 |
| 9. | Lack of enthusiasm on the part of bank officials | 25.6 | 9 |
| | Weak linkage between PSF and access to finance | | |
| 1. | Absence of credit linkage | 80.29 | 1 |
| 2. | PSF membership proof not accepted as security | 65.18 | 2 |
| 3. | Same interest rate being charged to both PSF beneficiary and to non-beneficiary | 62.46 | 3 |
| 4. | No leniency in repayment date of loan | 54.33 | 4 |
| 5. | No provision to withdraw amount when the need arises | 49.56 | 5 |
| 6. | Transaction charges on loans not lower whether a PSF member or not | 48.17 | 6 |
| 7. | PSF savings account interest(real) very low making the accumulated amount very less | 35.86 | 7 |
| 8. | Government contribution low and so account balance is also low making banks reluctant to advance loans on deposit basis | 31.86 | 8 |
| 9. | Lack of interest in maintain accounts by financial agencies | 25.21 | 9 |
| | Adoption of PSF scheme | | |
| 1. | Rising prices of rubber, but insignificant amount of PSF money with no contribution from government | 68.09 | 1 |
| 2. | Absence of credit linkage | 66.32 | 2 |
| 3. | Contribution not on land area basis | 57.59 | 3 |
| 4. | Limit on amount that can be withdrawn/yr | 54.91 | 4 |
| 5. | Interest rate on PSF account very low | 53.26 | 5 |
| 6. | Requirement of land registration in own name and land ownership | 50 | 6 |
| 7. | Banks not available nearby | 30.74 | 7 |
| 8. | Lack of motivation from officials(RB) | 24 | 8 |

The scheme needs to be revamped in order to make it more attractive to both beneficiary and non-beneficiary rubber growers so that they could also join the scheme. The banking system need to be geared up to take such additional responsibility with full zeal. The PSF scheme should be tied with insurance and credit and be implemented as a package.

*Experience of Other Major Rubber Producing Countries*

It is important to understand the policies and approach to the rubber sector of major producing countries to learn from their experience. Therefore, the major policy of the major rubber producing countries, Thailand, Indonesia, and Malaysia is dealt with in this section.

Thailand has maintained a strong public policy to support the rubber sector for over 50 years. The main instrument of this policy is the creation of Office of Rubber Replanting Aid Fund (ORRAF) in 1960 by the government to promote the use of selected clones that currently cover 80 per cent of the total rubber planted area. In the mid-1990s, the Thai authorities decided to withdraw from the pricing agreement concluded between producing countries to set a floor price (Besson, 2002). This measure was implemented with a price guarantee system at two levels. At the local level, the Centre Rubber Market (CRMs) have the capability to purchase and store rubber in the event of fall in prices. At the national level, ORRAF has a mandate to purchase and store rubber produced in Thailand when prices fall below the floor price. These measures clearly improved the financial situation of growers (Besson, 2002). As a result of these measures the replanting with clonal planting material became widespread and was accompanied by the spread of common farming practices and the gradual adoption of increasingly productive innovations by the growers. The development led to five fold increase in yield and reduced the immature period of one to two years. Support was also offered by ORRAF to the development of village-level processing and the organisation of short marketing channels also increased the share of value added received by smallholders.

Indonesia is the second largest producer of natural rubber (NR) in the world and has the highest acreage under rubber cultivation. Over 84 per cent of the cultivation is in smallholdings. However, low productivity levels have kept rubber cultivation vulnerable to over-exploitation, when prices are high, and abandonment, when price are low. The reason for low productivity are; low spread of clonal planting material, failure to halt spread of low yielding local seedlings and unselected clonal seedlings; proliferation of poor taping practices which reduces the tapping lifespan by around 10 years, i.e., 50 per cent. There is absence of village or even district level financing mechanism for smallholders. This has resulted in smallholders' inability to obtain a better share of price. On an average although the processors pay around 80-85 per cent of FOB for raw material, less than 50 per cent often as little as 30 per cent goes down to the actual producer (Peramune and Budiman, 2007).

In Malaysia, labour shortage has been plaguing the rubber plantation industry and some of the smallholdings were even abandoned due to this problem. The main competitive edge of Malaysia's integrated rubber industry vis-à-vis other producing countries is the comprehensive R&D and technical back-up as well as the several incentives offered by the government to all sectors of the industry. This has largely enhanced Malaysia's productivity in terms of output per unit of land, labour and capital.

The rubber producing countries could be classified into two those producing natural rubber for export purpose and the others who are also the major consumers of rubber. The top three producers of natural rubber fall under the first category and are therefore more affected by the fluctuations in the international price of natural rubber. They have been collaborating with each other to stabilise the international prices of

natural rubber and prevent it from falling (Appendix I). Initially they were operating under the purview of International Natural Rubber Organization (INRO) which is the association of exporting, importing and European community. The efforts of INRO could not check the fall in international price of natural rubber as a result the INRO was terminated in the year 1999. The international Tripartite Rubber Organization was established by the three top rubber producers, i.e., Indonesia, Malaysia, and Thailand to manage rubber production and to guarantee a minimum price to their domestic producers. The International Natural Rubber Company Ltd was also established under the framework of ITRO to assist the member nations in operating joint supply management scheme. The Euro crisis has already affected the Asian economies through weak trade, volatile commodity markets and cautious investors. To overcome the crisis the three major producers are considering introduction of minimum price for natural rubber to avert a further decline in the commodity's price. The three nations are planning for supply management, agree on export quantities and reduce tapping frequency in order to overcome the crisis.

## VI

## CONCLUSION

The structural changes in rubber processing industry are observable. The small manufacturing firms need to be supported by appropriate policies, considering the fact that they primarily deal with natural rubber. It is important for the Indian manufacturing sector to focus on quality. This would demand creation of infrastructure to monitor the quality and to effectively manage the imports and exports of rubber. The country should develop strategies to restrain the import to that of less value added rubber products and stimulate export of more and more of value added products of rubber.

The rubber sector in India is quite different from that of the other major producing countries like Indonesia, Malaysia and Thailand who mainly export natural rubber. India apart from being the major producer is also the major consumer of natural rubber. Therefore, the country should work closely with the major producers and also with major consumers and adopted suitable policies so as to achieve the twin objective of making available cheap raw material to the domestic industry and on the other hand fair price is receivable by the rubber growers. One of the latest policies of launching of "Indian Natural Rubber" logo is in right direction which would differentiate Indian product from that of other countries. This would have impact on the demand for Indian natural rubber and also on prices receivable.

The multipronged approach needs to be adopted to mitigate the price risk in rubber. The PSF scheme which got a humble beginning with its implementation, did not take-off to a higher level. To make the scheme more attractive the government should contribute some proportion of matching amount every year. The contribution to the price stabilisation savings bank (PSB) account should be based on the holding

size of farmers. The calculation of price spectrum band should be made by considering the moving average of domestic prices adjusted for inflation. The interest rate payable on the deposits in PSB account needs to be revised upward to make the scheme attractive. The beneficiaries should be provided with transferable bonds in lieu of the their deposits in the PSB account which can be kept as security for accessing credit, thus, it would have the same utility as that of warehouse receipts.

The income of the PSF beneficiaries with access to finance was higher than that of PSF beneficiaries without access to finance. One major motivation for the rubber growers for joining the price stabilization fund (PSF) scheme would have been the presence of credit linkage. Therefore, to make the scheme more attractive strong linkage between risk management scheme and loan should be established. The access to credit needs to be enhanced both to the rubber growers and the tappers this would ensure investment in the rubber plantations and also maintain the socio-economic relationship between the two. The PSF scheme should be redesigned in such a way that the banks provision loan to the beneficiary farmers at low rate of interest. The PSF scheme should be tied with insurance and credit and be implemented as a package.

In view of the importance of price volatility and its overarching impact on the rubber growers it is important to strengthen the price stabilisation fund scheme. It needs to be made the focal point for formulation and implementation of programmes related to price stabilisation, insurance and credit. The PSF programme should be made mandatory or redsigned in such a manner that it is adopted by large number of farmers. This could be done by linking credit, insurance, subsidies for replanting/new planting, etc., with PSF.

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APPENDIX I

INTERNATIONAL INITIATIVE TO MITIGATE PRICE RISK IN RUBBER

| (1) | (2) |
|---|---|
| 1979 | Ist International Natural Rubber Agreement was signed in 1979 under the auspices of UNCTAD. Members included 7 exporting countries, 25 importing countries and the European community. Objective was to reduce excessive price fluctuations around the trend in rubber market prices. Buffer stock of a minimum size of 5,50,000 tons (4,00,00 tons for a buffer stock and 1,50,000 tons of contingency buffer) was used as the sole instrument of market intervention for price stabilisation (it excluded export quota or production controls). It entailed purchase or selling of buffer stock when actual NR quotations Daily Market Intervention price (DMIP) were outside upper and lower price bands in relation to a reference price. The reference price was initially set at 210 Malaysian/ Singapore cents per kilo. Buffer stock was financed by direct cash contributions by governments. The agreement was managed by International Natural Rubber Organisation (INRO), headquatered in Kuala Lumpur, Malaysia. |
| 1987 | The reference price on entry into force was set at 210.66 Malaysian/Singapore cents per kilo |
| 1995 | The reference price on entry into force was set at 206.68 Malaysian/Singapore cents per kilo |
| 1998 | Exporting member countries of INRO asked for an increase of reference price with 5 per cent in relation to the economic/currency crisis in South-East Asia. The importing member countries rejected the proposal. |
| 1999 | Malaysia, Thailand and Sri Lanka withdrew, following which Council of INRO decided to terminate the third International Natural Rubber Agreement (INRA) and INRO was liquidated in December. |
| 2001 | International Tripartite Rubber Organisation (ITRO) was established (constitutes Indonesia, Malaysia and Thailand; Vietnam was later added) to manage rubber production to maintain orderly market growth and guarantee a minimum price to their domestic producers. To support NR prices members agreed to reduce production by 4 per cent and exports by 10 per cent. |
| October 2003 | International Rubber Company Ltd. (IRCo.) was launched. It was meant to pool the resources of member countries. It would step in to buy rubber when prices declined. Members-Indonesia, Malaysia, Thailand. Other invited countries are India, Sri Lanka, Papua New Guinea, Singapore. It is a joint supply management scheme. It has not been used due to growth in market. |