

## 10. THE NATURAL RUBBER SECTOR: EMERGING ISSUES IN THE 1990s

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### Introduction

One of the crucial issues raised in the debate on the celebrated 'Kerala model of development' is the staggered performance of the state's agricultural sector since the early 1970s. An important dimension of the polemics is the exploration of the underlying factors which triggered its subsequent structural transformation leading to significant changes in the cropping pattern. The major explanatory variables attributed to the observed trends are: historical and structural factors, higher wages, inadequate infrastructural facilities and institutional support, dominance of intermediaries in the primary markets and market orientation. However, the gravity of the emerging trends warrants a comprehensive analysis of the interrelationships and sequencing of the factors, in spite of a plethora of studies on sector- and crop-specific problems. Despite policy initiatives based on official and alternative visions to contain the apparent distortions in the state's agricultural sector, the most discernible trend observed during the last 25 years has been a marked shift in the cropping pattern favouring relatively less labour intensive perennial crops, very often at the expense of annual crops (Table 10.1).<sup>1</sup>

During the period between 1970-71 and 1994-95, the area under seven important perennial crops increased by 44.5 per cent compared to a 3.93 per cent increase in the total cropped area of the state. The increase in the combined share of area under these crops has not been unique, as marginal reversals can be observed in the cases of tea and cardamom. In a relative sense, the sustained growth of area under rubber without any noticeable break has been spectacular and has surpassed the modest gains of other crops, with the notable exception of coffee. The genesis of the dynamic growth of the natural rubber (NR) sector in Kerala is not shrouded in transitory factors; rather it is an outcome of the cumulative effect of explicit factors as reported earlier (George et al., 1988) and implicit factors inherent in the process of change.

Nevertheless, the pivotal position attained by the NR sector over time stems from its relative share of area under cultivation next to coconut and rice; share in the state agricultural SDP (32 per cent in 1995-96); share in agricultural employment (9.70 per cent); and its performance compared to other crops over time (Table 10.2).<sup>2</sup>

Among the four crops, barring coffee, rubber and coconut have exhibited positive growth rates in all the four parameters selected during

**Table 10.1**  
*Area under Important Perennial Crops in Kerala*

Crop	1970-71		1994-95	
	Area (ha)	Share (%)	Area (ha)	Share (%)
Tea	37422	1.28	34745	1.14
Coffee	30183	1.03	82348	2.70
Cardamom	48000	1.64	44237	1.45
Cashewnut	98960	3.37	103451	3.39
Pepper	117540	4.01	186720	6.13
Coconut	719140	24.52	910963	29.88
Rubber	198424	6.76	443300	14.54
Subtotal	1249674	42.61	1805764	59.23
Total cropped area	2933000	-	3048405	-

Sources: 1. Department of Economics and Statistics, *Agricultural Statistics* (relevant issues).

2. State Planning Board, *Economic Review 1996*.

3. Rubber Board, *Indian Rubber Statistics* (relevant issues).

**Table 10.2**  
*Comparative Performance of Selected Perennial Crops in Kerala, 1970-71 to 1995-96*

Crop	Area	Production	Yield	Price
Coconut	1.09*	1.42*	0.33	8.45*
Tea	-0.32*	1.72*	2.01*	8.17*
Rubber	3.89*	6.27*	2.77*	8.15*
Cardamom	-0.34	2.17*	5.06*	7.72*
Coffee*	2.56*	5.21*	2.70*	6.53*

\*Relates to the period 1980-81 to 1995-96.

\*Significant at 5 per cent level.

Note: Growth rates were estimated using the formula  $\log y = a + bt$ .

Source: Same as Table 10.1.

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the 26-year period. The higher growth rates achieved by the NR sector are unique vis-à-vis the performance of all crops, except a marginal difference in the case of price. Although the achievements of the state's NR sector are widely recognised and applauded, emerging trends in the 1990s are indicative of the potential limits to its sustainability. The genesis of the trends is rooted in the growing incompatibility of the production sector to absorb internal shocks and developments affecting the policy environment. The issues confronting the production sector are consequences of its evolutionary dynamics during the last nine decades, whereas constraints on the policy environment are confounded by the growing process of globalisation. The main objective of this chapter is confined to linking up the major implications of the evolutionary dynamics of this sub-sector in Kerala with the changes in the policy environment in the 1990s, so as to draw relevant policy inputs from a long-term perspective.

### Evolutionary Dynamics

As in the case of other major 'plantation enclaves' developed in European colonies in Asia, the initial structure and organisation of production of the NR plantation industry in Kerala was also characterised by an estate system of export-oriented production backed by British capital and technology and immigrant or indentured labour (George et al., 1988).<sup>3</sup> However, the major features of the demarcation line are the state's near monopoly position in NR production from the very beginning and certain region-specific factors which were catalytic to the subsequent dynamic transformation of the industry.<sup>4</sup> Apart from a conducive geo-physical environment, the process of change was primarily facilitated by a steady growth in the commercialisation of agriculture with its concomitant developments in the organisation of production, market orientation, and credit and infrastructural facilities in the native states of Travancore and Cochin (Varghese, 1970; Raj and Tharakan, 1983).<sup>5</sup> The economic foundation for the dynamism in the native states of Travancore and Cochin was basically built in the framework of peasant proprietorship, and the most progressive and powerful elements emerging from the peasant proprietors were the Syrian Christians of Travancore. The accumulated surplus from agriculture, trading and banking was channelled by the peasants to a relatively new area of enterprise, viz., plantation agriculture, especially rubber. Despite the dominance of British companies and partnership firms in the initial phase

(Anonymous, 1911), the subsequent entry of native capital resulted in a steady dispersion of the ownership pattern, and as early as 1946 about 73 per cent of the area under rubber was controlled by Indian companies and proprietary concerns (Sarma, 1947). This position was in sharp contrast to the prevailing status of the industry in British Malaya and Netherlands East Indies (George, 1996).<sup>6</sup>

Another important difference in the production sector was the relatively smaller share of area under smallholdings in this region (32 per cent) compared to British Malaya (39 per cent) and Netherlands East Indies (57 per cent) during the colonial period (Bauer, 1948). A plausible explanation for the structure could be a relatively higher involvement of the rich peasantry of Travancore and Cochin in opening up large virgin areas adjacent to European estates rather than converting the area under traditional crops in the early phase. This observation is in conjunction with the status of the industry in 1946, as only 34 per cent of the area was under smallholdings (less than 50 acres) with an average operational size of 3.34 acres (Sarma, 1947).

The peasants in this region also proved to be highly responsive to comparatively favourable prices arising from three closely related developments vis-à-vis other producing countries during the pre-independence phase, viz., growth of an indigenous rubber goods manufacturing sector since the 1920s, by-passing of two International Rubber Regulation Agreements (IRRAs) during the inter-war years, and statutory price regulations of natural rubber in India since 1942. One of the unique factors which contributed to the dynamic growth of the NR sector in this region was a steady growth of the rubber products manufacturing sector in India under colonial patronage to cater to increased industrial requirements during the inter-war years (Government of India, 1947). Among the major NR producing countries in Asia, domestic absorption of the crop was the highest in India (McFadyean, 1944), and as early as 1947 domestic consumption outstripped its production in India (Rubber Board, 1991).<sup>7</sup> This marks the graduation of the Indian NR economy from its initial position of a net exporter to the status of a net importer, exhibiting the characteristics of a widening manufacturing base.

India could by-pass two IRRAs operated during the inter-war years mainly due to certain specific historical circumstances, and there was a significant expansion of area under natural rubber despite the controls.<sup>8</sup> The price regulation scheme initiated in 1942 under the Defence of India Rules was the precursor to subsequent market intervention schemes operated by the government in different forms under various historical

contexts. With the establishment of the Indian Rubber Board in April 1947, the NR plantation industry in the region was poised for a dynamic growth hitherto not exhibited.

The post-independence phase has been characterised by a marked shift in priorities and strategies with the main objective of achieving self-sufficiency in production, as India became a net importer of natural rubber. The strategies of the government included increasing productivity in the traditional belt, extensive cultivation in non-traditional areas, financial incentives for replanting, new planting, improved cultural practices, quality upgradation of raw rubber, group marketing and a protected price regime. The necessary institutional framework was created with the establishment of the Rubber Board in 1947 and the Rubber Research Institute of India in 1955. Subsequent government interventions at the levels of cultivation, production, processing and marketing have been actively supplemented by a growing internal market (George et al., 1988).

A major breakthrough in the sphere of productivity improvement was achieved in the 1970s with the indigenous development and propagation of a high yielding planting material with the appropriate package of practices.<sup>9</sup> The potential advantages of adapting the new technology suited to different regions have been propagated by the extension network of the Rubber Board and its regional experiment stations. The cumulative effect of research programmes during the last four decades, supplemented with a well co-ordinated extension scheme, has enabled the region and the country to achieve the highest reported average yield of 1,503 kg/ha during 1996–97.

The price policy initiated in 1942 in the form of monopoly procurement of raw rubber at fixed prices was continued till 1946 by the government. Subsequently the policy was subjected to modifications under different contexts (George and Chandy, 1996). Though the policy pursued in the post-independence phase has been transitory in nature, it was an integral part of the overall policy framework to achieve self-sufficiency in NR production.<sup>10</sup> The policy components consisted of notification of minimum and maximum prices, buffer stocks, exports, and control on imports of natural rubber through tariff and non-tariff barriers over time. Since the 1970s, the government has often been confronted with the conflicting interests of the well-organised rubber planters of Kerala and rubber products manufacturers, mostly located outside the state, on the nature of price support and policy components.<sup>11</sup> Another important dimension of government intervention on the price front was promotion of group marketing through co-operative rubber



marketing societies in Kerala since the 1960s, with the main objective of penetrating the primary market. The two important explicit results of this institutional support were a progressive reduction in the marketing margins of intermediaries (George and Chandy, 1996) and achieving one of the highest reported shares of farm gate prices in the country (Sreekumar et al., 1990).<sup>12</sup> In spite of the intricacies and nuances enveloping the price policy pursued since 1947, it was instrumental in maintaining the tempo of growth in the production sector, as overtly there was an articulated commitment to sustaining the viability of the smallholdings sector.

### The Impact

The major elements apparent in the evolutionary dynamics of the NR sector in the state during the pre-independence phase, crystallised and gathered momentum since 1947, culminating in a steady increase in the exploitation of almost all agro-climatically suitable land without any noticeable break. The fulcrum of the dynamics was built on an enterprising peasantry in the state, institutional support and a captive domestic market. The estimated increase in area under rubber in the state during the last five decades (1946 to 1995–96) is 631 per cent, and in absolute terms it increased from 61,432 to 449,000 ha. An important feature of the institutional support rendered by the government at different levels has been its progressive nature focusing on smallholdings. The major beneficiary of this strategy has been Kerala, as its relative share of area under smallholdings remained proportionately higher than the state's share in area under the crop in the country.<sup>13</sup>

The cumulative effect of the inherent dynamics observed in the state's NR sector embedded into the institutional support has been primarily reflected in the form of significant diffusion in the structure of the industry in the post-independence phase. The process of structural devolution has been accelerated by a host of socio-economic and political factors, viz., land reforms initiated in the state since 1957 exempting all plantation crops from land ceiling; progressive nature of the provisions of the *Plantation Labour Act* (1951); agricultural income tax and plantation land tax; and the prevailing laws of inheritance. Consequently, the relative share of area under smallholdings in the state increased from 34 per cent in 1946 to about 90 per cent in 1995–96. The evolution and subsequent dominance of the smallholdings sector in Kerala is in tandem with the changes observed in other major NR producing countries.<sup>14</sup>

However, the entry of public sector corporations in NR cultivation since the 1960s has resulted in significant changes in the ownership pattern in the estate sector. Despite a major decline in the share of the estate sector (25 per cent) during the period 1960–61 to 1994–95, the relative share of public sector corporations in the total area controlled by the estate sector has increased from 0.10 to 28 per cent. During this period, only the area under public sector corporations has increased both in absolute and relative terms compared to the marginal and significant decline of area in the case of the private corporate sector and proprietary concerns respectively.<sup>15</sup> Apparently, the changes in ownership pattern in the estate sector are basically rooted in the conversion of marginal forest lands into rubber by public sector companies and significant reductions in the operational size of the area under proprietary concerns arising from sub-division and fragmentation over time.

Conversely, the trends observed in the smallholdings sector have a distinct magnitude and content with far reaching policy implications. During the period 1960–61 to 1994–95, the increase in area under smallholdings was 352 per cent and the most glittering element in the process was the steady growth in the relative share of the smallest size group with less than two hectares.<sup>16</sup> The estimated relative share of area under this category in the total area has increased from around 25 per cent in 1955–56 to more than 75 per cent in 1995–96.<sup>17</sup> The average operational size of holdings in this size group is only 0.53 ha, as is evident from a recent survey (Table 10.3) covering 2,575 households in the four major rubber growing regions of the state.<sup>18</sup>

The results are indicative of the broad trends in the smallholdings sector. Though disparate trends observed in the relative share of rubber

**Table 10.3**  
*Average Operational Size of Rubber Holdings, 1995*  
(In hectares)

Size-class	Area	Number of Households	Average Size of Area under Households	Average Size of Area under Rubber	5 as Percentage of 4
1	2	3	4	5	6
Below 2	1614	2032	0.79	0.53	67
2 to 4	1062	408	2.60	1.57	60
Above 4	882	135	6.53	4.19	73
Total	3558	2575	1.38	0.89	64

Source: Reconnaissance survey of 2,575 households, Rubber Research Institute of India.

area across the three size groups do not highlight any significant relationship between size of holding and the extent of interplanting of other tree crops with rubber, the emerging trends are indicative of the limits to monoculture and its attendant problems. Despite a conjectural validity of the postulate, the unbridled growth in area in the smallholdings sector, basically entangled in the inherent process of diffusion and large-scale conversion of marginal lands cultivated with traditional crops, since the 1960s bear the seeds of potential agro-management issues. The agro-management issues surfacing in the 1990s, confounded by the uncertainty encompassing the policy environment, raise serious questions on the sustainability of the NR production sector in Kerala.

### Emerging Issues

Theoretically, the consolidation and developmental experience of the rubber smallholdings sector in the state has reaffirmed the iconoclasm on the relative superiority of large estates based on the complementarity between new technology and scale economies, notwithstanding the contextually-specific discursive forms. Adoption of new technology by smallholdings, especially high yielding planting materials, though constrained by monoclonal planting has resulted in a comparable or even higher yield/ha over time.<sup>19</sup> Despite an array of achievements, the three specific issues increasingly confronting the sustainability of the smallholdings sector are steady increases in the share of part-time farmers (Table 10.4), growing trend towards homestead farms and increasing dependence on hired labour.<sup>20</sup>

The phenomenon of increasing number of part-time farmers in the smallholdings sector is basically the outcome of the inherent dynamics

**Table 10.4**  
*Relative Share of Part-time Farmers, 1995* (Percentage)

Region	Size-class (ha)			Total
	Below 2	2 to 4	Above 4	
South Kerala	71	86	100	78
Central Kerala	55	55	29	52
North Kerala	19	21	54	24
All Kerala	49	55	51	51

Source: Sample survey of 338 households, Rubber Research Institute of India.



built upon the diversification of sources of income of households over three generations of rubber cultivation, in spite of region-specific differences due to various historical and socio-economic factors.<sup>21</sup> The observed transmutation process also has its premise in the sub-division and fragmentation of smallholdings with consequential effects culminating in the emergence of homestead farms. In spite of region-wise and size-wise differences, the trend has been acquiring more clout with specific consequences over time compared to the pioneers motivated by a 'vent for surplus' situation.<sup>22</sup> The phenomenon of homestead farms is relatively more evident among the smallest size-group, including the agricultural labour class in central Kerala with its salient feature of interplanting a variety of tree crops contrary to the monoculture of rubber. Though the apparent implications of these two developments are different, both have strong bearings on future agro-management issues and ultimately the viability of NR production in the smallholdings sector. One of the important consequences of part-time farming is increasing dependence on hired labour (Table 10.5), which is implicitly reaching a saturation point set by the emerging features of Kerala's agricultural labour market in recent times.<sup>23</sup>

Tapping operations account for more than 70 per cent of the labour requirements in mature rubber plantations. The major policy implication of the positive relationship observed between extent of part-time farming and dependence on hired labour would be the operational level constraints in the adaption of the prescribed package of cultural practices across regions and various size-groups. The issue assumes relevance in the context of an estimated region-wise difference in realised productivity levels to the extent of 35 per cent (George and Mohanakumar, 1997).

The issues confronting the production sector are apparently aggravated by developments associated with the growing process of market

**Table 10.5**  
*Region-wise Dependence of Smallholdings on Hired Labour in Kerala, 1995*

Size-class (ha)	Relative Share of Hired Labour in Tapping (%)			
	South Kerala	Central Kerala	North Kerala	All Kerala
0-2	92	82	35	72
2-4	96	92	37	82
Above 4	100	100	92	97
All classes	94	87	44	78

*Source:* Sample survey of 338 households, Rubber Research Institute of India.

integration in the 1990s and its impact on price. The critical issue altering the prevailing equations in the price determination process is the liberalisation of procedural formalities related to the import of natural rubber and rubber products into the country. A major departure from the policy pursued hitherto has been the simplification and dilution of tariff and non-tariff barriers for natural rubber imports into the country since 1992, raising serious questions on the functional dimension of a protected price regime in future. A substantial reduction in the import duty of natural rubber from 65 per cent, which prevailed during the 1980s, to the current rate of 25 per cent and changes in the channel of imports in the 1990s are the two major aspects of the modified price policy. Since 1991–92, channelised imports through the State Trading Corporation of India (STC) have not only been dropped, around 96 per cent of the total quantity of 112,622 tonnes imported between 1991–92 and 1995–96 was exempted from import duty under the Value Based Advance Licence Scheme and the Public Notification Scheme.<sup>24</sup> Despite the survival of a positive price policy during the last five decades, certain important dimensions of the trends in prices since the 1970s are relatively under reported (Lekshmi et al., 1996). Even though NR prices in the country grew at a rate of 7.6 per cent during the 27 year period between 1968–69 and 1994–95, the growth has been at a decreasing rate. In the process, the ratio between world and Indian NR prices has narrowed down to the extent of 1:1.01 in 1995. Notwithstanding a relatively higher instability of world NR prices, it grew at a higher rate (8.44 per cent) compared to Indian prices (8.08 per cent) in the case of comparable grades of sheet rubber during the period 1976–95.

Another important dimension of the policy changes in the 1990s with far reaching implications on the state's NR production is liberalisation of procedures for import of rubber products into the country. Historically, Kerala's NR production sector has been depending on a basically inward-oriented rubber products manufacturing industry, dominated by the automotive tyre and allied products sector, located in the industrially advanced regions of the country due to certain specific factors.<sup>25</sup> The rubber-based industrial structure which has evolved in the state over time is dominated by the primary rubber processing sector and small-scale units manufacturing products with higher NR content to cater to the domestic market. Consequently, the rubber-based industry that has emerged is characterised by lower levels of value-addition, weaker inter-industry linkages and higher vulnerability to NR price fluctuations.<sup>26</sup> An important implication of the weaker linkage effects

inherent in this industrial structure is the perpetual stagnation of the state as a raw-material base for the rubber products manufacturing sector in the country (George and Joseph, 1992). The state's experience in commercial exploitation of the most important by-product of rubber plantations, viz., rubberwood, is also similar with its stigmatic concentration on the primary processing of rubberwood, devoid of any inherent stimuli to harness the vast potential in downstream manufacturing.

Against this backdrop, it is plausible to surmise that the pressures on the Indian rubber products manufacturing industry arising from globalisation will have their impact on the sustainability of the state's NR sector. The persistence of the status of the Indian rubber products manufacturing industry as a supplementary segment, mainly catering to the requirements of a large industrial base, is an important structural impediment which looms large in the context of globalisation. This situation is in sharp contrast to the locationally advantageous and export-oriented rubber products manufacturing base built in Malaysia since the early 1980s. Despite a large captive internal market and the prevalence of protectionist policies, major industry groups, especially the tyre sector, are on the verge of significant shake-ups consequent to export-import policy changes since 1992.<sup>27</sup> In the process, the characteristic focus of the industry on the captive internal market is being impaired with severe repercussions on Kerala's NR production sector, as is evident from wide and frequent fluctuations in prices since 1994. The trends crystallised since the 1990s are indicative of the incompatibility of pursuing a protectionist policy regime and a pointer to re-prioritise policy options.

## Conclusion

The current position of the natural rubber crop in Kerala indicates well defined limits for further expansion from an agro-climatic angle. The major guideline from the evolutionary dynamics of the NR production sector is the structural devolution, with an obvious trend of disengagement from monoculture and estrangement from an authentic peasant self-hood due to certain historical factors specific to Kerala. The concept of an integrated farming approach appears to be a feasible policy option for the future, as the third generation of plantations are constrained by increasing share of part-time farmers, homestead farms and dependence on hired labour. The contingencies arising from globalisation and internal contradictions highlight the limits on sustaining a protected price regime and the need for value-addition by embarking on a long-term

comprehensive policy. One of the important sources of value-addition hitherto ignored has been the by-products of the NR sector, especially rubberwood. The estimated value-addition forgone per annum from this by-product is around Rs. 25,000 million (George and Joseph, 1997). The NR sector in Kerala during the last nine decades has displayed a resilience which is a unique developmental experience. However, its sustenance will invariably depend on policy inputs exploring value-addition through locationally advantageous rubber products and by-products.

### Notes

1. The decline in the relative share of area under paddy in the total cropped area from 29.83 per cent in 1970-71 to 16.51 per cent in 1994-95 is the most important change, though conversion of paddy lands for natural rubber cultivation is insignificant due to specific agro-climatic factors.
2. The estimated total value of NR production in the state was around Rs. 24,000 million in 1995-96. The share in employment is based on the estimate of the Association of Planters of Kerala (1996).
3. Though experimental efforts to grow natural rubber on a commercial scale in India were initiated since 1873 in different regions, the first commercial rubber plantation was established at Thattakadu in 1902 in Travancore by the Periyar Syndicate.
4. Even though Kerala's share in total area under natural rubber in the country has declined from 96 per cent in 1946 to 86 per cent in 1995-96, the state still accounts for about 94 per cent of the production.
5. The state of Kerala was formed in 1956 by merging the native states of Travancore and Cochin and the Malabar region of the Madras Presidency.
6. During the pre-independence phase, control of NR production in Malaysia and Indonesia by European companies was relatively higher (Knorr, 1945; Drabble, 1991).
7. For the first time, in 1947, the total NR production in the country (14,681 tonnes) exceeded consumption (17,272 tonnes).
8. India was not a signatory to the Stevenson Scheme (1922-28) and as a result of the outbreak of hostilities between Japan and Allied forces, the controls on expansion of rubber cultivation were practically nullified as per the IRRA (1934-44). Consequently, the largest areas new planted were in 1926 (23,379.24 acres), 1927 (12,653.27 acres) and 1943 (12,244.68 acres).
9. The realised and potential yield of RR II 105 is rated as one of the highest in the world.
10. The policy components varied frequently since 1968 as a result of major changes in the price policy.
11. Incidentally, this period also coincides with the entry of Indian capital in a big way into the dominant automotive tyre manufacturing sector.
12. The farm gate price of sheet rubber expressed as a percentage of terminal market price is 92 per cent.
13. Kerala's share in total area under smallholdings in the country is around 92 per cent compared to the state's share of 86 per cent in total area under the crop in the country.
14. The estimated relative shares of the rubber smallholdings sector in Thailand, Indonesia and Malaysia are 95 per cent, 84 per cent and 85 per cent respectively.

15. The relative shares of the corporate group and proprietary concerns declined by 6 and 23 percentage points respectively.
16. From the analytical and policy angles, rubber smallholdings in India are classified into three groups, viz., below 2 ha, 2 to 4 ha, and above 4 ha up to 20.24 ha.
17. Estimates based on *Indian Rubber Statistics* (various issues), Rubber Board.
18. Unpublished results of the forthcoming report on 'Operational Efficiency of Rubber Plantations under Different Levels of Management', Rubber Research Institute of India, Kottayam.
19. The extent of adoption of HYV planting materials in the estate and smallholdings sectors is comparable in Kerala. However, a relatively higher dependence of the latter on RR1105 is one of the factors for comparable productivity.
20. Part-time farmers are those who have not only equally important alternative sources of income but also depend on hired labour for tapping. Homestead farms are characterised by a relatively smaller size of holdings combined with interplanting of other tree crop species.
21. Among part-time farmers in the traditional regions of south and central Kerala, it is observed that a large number of households have channelled the surplus generated either into investments on human capital or in the service sector, with the characteristic feature of self-employment.
22. A detailed discussion on the theoretical basis of the concept is dealt in Findlay and Lundahl (1994).
23. An important feature of Kerala's agricultural labour market in the emerging scenario is an increasing detachment from traditional routine type farm operations across major crops in spite of higher levels of unemployment in rural areas. The main reason appears to be a higher reserve price for rural labour set in by occasional off-farm employment with higher earnings.
24. The import of natural rubber under the Value Based Advance Licence Scheme is an incentive for increasing exports of rubber products and hence is exempt from duty. However, imposition of duty under the Public Notification Scheme is discretionary depending on the supply-demand position of natural rubber in the country.
25. The state's share in total NR consumption in the country is only 15 per cent. For a detailed discussion on the underlying historical and structural factors, see George and Joseph (1992).
26. The relative position of Kerala in the Indian rubber products manufacturing industry is insignificant compared to its share in NR production, as is evident from the state's estimated share in fixed capital (6.16 per cent) and value of output (11.79 per cent).
27. The Indian rubber products manufacturing industry is the seventh largest in the world with an estimated invested capital of more than Rs. 50,000 million and sales turnover of Rs. 85,000 million. The major sub-sectors affected by policy changes are the truck and bus tyre segments due to a reduction in import duty and the latex products sector on account of liberalised import of polyurethanes.

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