Dynamics of World Natural Rubber Economy

Its Relevance to India

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The major challenges facing the world natural rubber (NR) economy and its responses since 1980s are different from the previous experiences in terms of the net implications. This paper summarises the main features of the changing dimensions of world natural rubber economy and outlines the priorities and strategies relevant to India in the context of the new economic scenario.

ONE of the main objectives of the General Agreement on Tariffs and Trade (GATT) signed in April 1994 is to reform a highly distorted world trade characterised by direct and indirect subsidies resulting in a deceptive comparative advantage and inefficient use of world resources. However, the net effect of the increasing globalisation of economic activity emanating from GATT treaty will vary across countries, regions and different sectors of an economy. One of the crucial factors determining the relative performance is the comparative advantage or efficiency in the production and marketing of crops, products and services. Nevertheless, during 1980s the developing countries which have a comparative advantage in the export of agro-based products were adversely affected by a secular decline in the real price indices in spite of various commodity agreements and price stabilisation schemes [IMF 1990; UNCTAD 1992]. The major contributing factors for the secular decline in the terms of trade of primary commodities *vis-a-vis* manufactures appear to be the organisational and monopoly powers of the factors of production engaged in manufacturing, development of synthetic substitutes, increasing de-materialisation of the production process, direct increase in supply resulting from the entry of new producers and productivity improvements arising from R and D efforts. In this context the GATT treaty assumes significance as one of its professed objectives is to correct the distortions in the world trade of agricultural commodities to promote efficient allocation and use of world resources.

Changing Dimensions of World NR Economy

Natural rubber is one among the ten core commodities covered by the Integrated Programme for Commodities (IPC) under the auspices of UNCTAD for assistance. The case of NR is a classic example illustrating the vulnerability of the developing countries to price fluctuations in the world market. The free market price indices of NR declined to the extent of 40 percentage points in 1990 from its 1980 level [UNCTAD 1990]. However, compared to the other three plantation crops, viz. coffee, tea and cocoa among ten core commodities, NR displayed better resilience in spite of volatile market conditions in the 1980s. Table 1 shows the comparative performance of the four major plantation crops covered under the IPC.

Implicitly, it is plausible to attribute a comparatively better performance of NR to the International Natural Rubber Agreement (INRA) which was the only active commodity pact in the 1980s and the buffer stock operations of the International Natural Rubber Organisation (INRO) since 1980. However, the producing countries are apprehensive about the efficiency of INRA in absorbing steady increases in cost of production and stabilising prices at remunerative levels. The Daily Market Indicator Price (DMIP) of the INRA is considered to be unrealistic as it has emerged as the price signalling point in the world market instead of its determination based on the movements of free market prices. In 1990s the major problems confronting the world NR economy in the context of the increasing globalisation of economic activity are frequent fluctuations in free market prices, dominance and structure of the synthetic rubber (SR) industry, increase in supply of NR mainly due to the entry of new producers and erosion of relative profit margins. Cost escalation on account of steady increases in the prices of material inputs compared to

Table 1: Comparative Performance of Four Major Plantation Crops

Crops	Size of the World Export Market (1989) (Million US$)	Market Share and of Developing Countries (1989) (Per Cent)	Export Volume Index (1984-89)	Export Earnings Index (1984-89)	UN* Instability Index (1982-90)	Trend# (Per Cent)
Coffee	9660	100	109	88	16.8	–10.3
NR	4263	100	120	121	13.2	–4.6
Cocoa beans	2313	100	124	81	15.1	–11.7
Tea	2302	100	109	80	19.1	–8.0

Notes: @ Excluding re-exports and exports of semi-finished products from developed countries.
* Instability is measured as the percentage deviation of the variables concerned from their exponential trend levels for a given period.
\# Growth rate measured in constant US dollars (1980) using the formula Log (P) - a+b(t) where 'P' is the index and 't' is time.

Source: UNCTAD, *Commodity Year Book*, UN, New York, 1991.

Table 2: Expansion of Malaysia's Rubber Goods Manufacturing Sector

Year	Domestic Consumption of NR (000 MT)	Domestic Consumption as a Percentage of Production (Per Cent)	Total Export Earnings from Rubber Products (000 M$)	Share of Latex Products in Export Earnings (Per Cent)
1987	82.4	5.32	571103	65.0
1988	103.4	6.22	1039602	76.0
1989	121.6	8.59	1278938	77.0
1990	183.5	14.21	1669270	80.0
1991	216.0	17.20	2134623	80.5
1992	248.6	21.19	2485188	80.5
1993	268.6	25.00	2989501	77.9

Source: *Rubber Statistical Bulletin*, International Rubber Study Group (various issues) and Malaysian *Rubber Review*, Malaysian Rubber Research and Development Board (various issues).

increases in the productivity of NR aggravated the emerging crisis [Sulieman 1991].

Though the response to the uncertainty confronting the NR sector varied across the producing countries it is unique in terms of its net effect by instilling an element of dynamism among the producers which was hitherto not so explicit. The major sub-sectors of NR economy undergoing internal adjustments and structural changes in response to the changing economic scenario are the production, processing, consumption and the by-products sectors. In spite of the differences in the extent of inter and intra-sectoral adjustments among the major NR producing countries a common feature is efforts to capitalise available opportunities for squeezing unit cost of production and exploring potential outlets for increasing the net income per unit area.

In this context, the developments in Malaysia is more illustrative compared to other major NR producers. Till 1991 Malaysia was the leading producer and exporter of NR and in 1990 the share of NR in its total export earnings declined to 3.8 per cent from 55 per cent in 1960. Major changes in the 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 the processing sector, emphasis is on the development, production and exports of value added forms of rubber and commercialisation of processing wastes. Recently, Malaysian imports of raw rubber from low cost producing countries like Vietnam is increasing and the imported rubber is being processed into higher grades of NR. The estimated net value added in this process is in the range of 20-25 per cent of the imported value [Sulieman 1991]. Since the late 1980s domestic consumption of NR in Malaysia registered steady increases fully utilising the locational advantages in the manufacturing of NR latex based products such as gloves, elastic rubber thread and catheters. Table 2 illustrates the expansion of domestic rubber goods manufacturing sector.

Malaysia is also successful in the commercial exploitation of the by-products, especially rubber wood. In 1992, the country's export earnings from finished products based on rubber wood was US $ 157 million [ANRPC 1993]. Although the extent of commercial exploitation of the by-products vary among the producing countries, earnest attempts are underway to tap ancillary sources of income from the rubber plantations.

At a micro level considerable differences exist among the major NR producing countries in terms of the priorities attached to net income augmenting measures and cost saving mechanisms. To a large extent, the survival strategies adopted by the NR producers varied depending mainly on the natural resource endowments, size of the domestic market, level of technology and the extent of R and D support. At a macro level, world NR economy is constrained by a well defined structure of its production and consumption sectors. The two cardinal features of world NR production are a high degree of regional and structural concentration. Geographically, NR production shows a very high degree of concentration and sectorwise concentration is characterised by the dominance of rubber smallholdings. Table 3 shows the major characteristics of the NR production sector.

An important feature of the structure and pattern of world rubber consumption is a very high degree of concentration. The structure of world rubber consumption is characterised by the dominance of synthetic rubber (SR) and in 1992 the relative share of SR was 62.3 per cent [IRSG 1993]. Since 1960s SR has systematically replaced NR in the world rubber market and the relative share of SR reached its peak level in 1974 (70.6 per cent). Although its share has declined to 62.3 per cent in 1992, the SR manufacturing industry occupies a pivotal position in the world rubber market in terms of its unique advantage of both backward and forward integration with petrochemical and automotive tyre manufacturing industries, respectively. The world chemical, petrochemical and tyre industries are reported to be dominated by less than ten firms which together account for around 80 per cent of SR production capacity [Carr et al 1988].

The pattern of world rubber consumption and NR consumption is dominated by the tyre and tyre products manufacturing sector as evident from the data available for the

Table 5: Relative Shares of Major Regions/Countries in Rubber Consumption (1991)
(Per Cent)

Region/ Country	Share in Total World Rubber Consumption	Share in Total World NR Consumption
US	17.5	14.4
EEC	17.5	15.6
CIS	14.3	1.5
Japan	12.6	13.2
Five major NR producing countries	14.2	27.2
	76.1	71.9

Source: Same as Table 4

Table 6: Statewise Area under Rubber and Relative Shares (1992-93)

States	Rubber Planted Area (ha)	Relative Share (Per Cent)
Kerala	4,28,864	86
Tamil Nadu	17,260	3
Karnataka	14,650	3
Tripura	18,250	4
Assam	9,885	2
Meghalaya	4,350	1
Others	6,115	1
Total	4,99,374	100

Source: Same as Table 4

Table 3: Major Characteristics of the NR Production Sector (1993)

Country	NR Production (000 MT)	Relative Share in World NR Production (Per Cent)	Estimated Relative Share of Small Holdings (Per Cent)	Domestic Consumption as a Percentage of Production (Per Cent)
Thailand	1569.8	28.5	95.0	8.6
Indonesia	1301.3	23.7	74.0	9.0
Malaysia	1074.3	19.5	73.0	25.0
Sub total	3945.4	71.7	82.0	13.2
Other Asia	1196.5	21.8	NA	106.8
Asia total	5141.9	93.5	NA	35.0
Others	358.1	6.5	NA	NA
Grand total	5500.0	100.0	75.0	NA

Source: *Rubber Statistical Bulletin*, IRSG, 48(12), 1994.

Table 4: Relative Share of Tyre and Tyre Products Sector (1991)

Country	Total Rubber Consumption (000 MT)	Share of Tyres and Tyre Products Sector (Per Cent)	Total NR Consumption (000 MT)	Share of Tyres and Tyre Products (Per Cent)
US	2523.9	57.6	755.8	78.2
Japan	1808.0	57.8	689.5	82.1
Germany	712.7	42.6	210.7	71.7
France	525.0	59.1	183.0	87.3
Italy	425.0	37.9	120.0	57.9
UK	320.0	50.0	119.0	75.3

Source: *Rubber Statistical Bulletin*, 48(3), IRSG, London, December 1993.

major consuming countries. Table 4 illustrates the point.

Another important dimension of the consumption sector is the geographical concentration in the consumption of rubber. Table 5 shows relative shares of major consuming regions/countries.

An important development having positive implications on the NR production sector is the steady increases in the consumption of NR in major producing countries, especially China, India and Malaysia. The rise in consumption is mainly propelled by the boom in the manufacturing of latex based products and growing relocation of manufacturing activities to south east Asia since mid-1980s and the inherent locational advantages for the NR producing countries. The dominance of the major NR importing countries in the total rubber consumption is structurally rooted with the pivotal position in the control on the production of automotive tyres and allied products. However, in the context of growing integration of world rubber economy, the comparative advantages associated with the raw material and labour costs in the production of rubber products will have an important bearing on the prospects of NR producers.

TABLE 7: PRODUCTION OF NATURAL RUBBER

Year	Total Area ('000 ha)	Tapped Area ('000 ha)	Yield (kg/ha)	Production (MT)
1950-51	75	56	284	15830
1960-61	144	70	365	25697
1970-71	217	141	653	92171
1980-81	284	194	788	153100
1990-91	475	306	1076	329615
1991-92	489	325	1130	366745
1992-93	499	341	1154	393490
1993-94(E)	510	358	1215	435000
1994-95(P)	520	374	1270	475000
2000-01(P)				650000

E = estimate P = projection
Source: Rubber Board.

TABLE 8: CONSUMPTION OF NATURAL RUBBER

Year	Consumption (MT)	Growth (Per Cent)
1950-51	19854	
1960-61	48148	142.5
1970-71	87237	81.2
1980-81	173630	99.0
1990-91	364310	109.8
1991-92	380150	4.3
1992-93	414105	8.9
1993-94(E)	450000	8.2
1994-95(P)	485000	8.2
2000-01(P)	700000	-

E= esumate P= projection
Source: Rubber Board.

TABLE 9: STRUCTURE OF RUBBER PRODUCTS EXPORTED FROM INDIA (1992-93)

Products	Value of Exports (Rs mn)	Relative Share (Per Cent)
Auto tyres and allied products	4815.70	71.68
Beltings	252.00	3.75
Cycle tyres and tubes	620.00	9.23
Hoses	57.60	0.86
Rubber footwear	32.80	0.49
Rubber soled footwear with canvas upper	152.70	2.27
Rubber sheetings	115.20	1.71
Hygienic, medical and surgical articles of rubber including gloves	351.10	5.23
Others	321.40	4.78
Total	6718.50	100.00

Source: *Directory of Rubber Goods Manufacturers in India* (1993-94), Rubber Board, 1993.

Table 6 illustrates the point.

One of the main features of NR cultivation in India is the dominance of smallholdings sector as its share in area under cultivation and production is about 85 per cent. The dynamic growth of the industry during the last four decades and projections for 1994-95 and 2000-01 are summarised in Table 7.

Compared to the three major NR producing countries, viz. Thailand, Indonesia and Malaysia, India is having the unique advantage of a captive market arising from a well developed rubber goods manufacturing sector. India has been a net importer of NR since 1948 and at present India is ranked 8th among the major rubber products manufacturing countries. The trends in NR consumption are furnished in Table 8.

An important feature of rubber consumption in India is a relatively higher share of dry rubber products manufacturing sector accounting for about 86 per cent in 1991-92. Indian rubber goods manufacturing sector is basically inward oriented catering to the internal market. The pattern of exports of rubber products from India appears to be a horizontal extension of its existing industrial structure. Table 9 shows the structure of rubber products exports from India during 1922-93. More than 90 per cent of India's export earnings consists of dry rubber products and the relative share of automotive tyres and allied products alone is 71.68 per cent. India had been enjoying a favourable balance of trade in the foreign trade of rubber products since 1971-72 to 1992-93 without any significant change in the structure of

NATURAL RUBBER ECONOMY OF INDIA

India is the fourth largest producer of NR and its productivity is reported to be the highest in the world. In 1993-94 its total production was 4,35,160 mt. During the year the total area under cultivation has increased to 5,10,000 ha. An important characteristic of NR cultivation in India is a very high degree of geographical concentration.

exports [Mohanakumar et al 1994] However, in the emerging economic scenario characterised by increasing integration of world market the existing pattern of exports cannot be sustained mainly due to the changing global market structure of the major products exported. Therefore, it is necessary to outline the priorities and strategies for the NR production sector and the rubber products manufacturing sector to face the challenges arising in the post-GATT era.

Priorities and Strategies

The basis for any scientific approach in equipping the NR economy of India has to emphasise steps for optimising the operational efficiency of the production sector for three reasons, viz, the existence of a captive domestic market, exploiting the potential for exports of processed rubber and the rubber products with specific locational advantage. Two critical aspects in exploiting the emerging opportunities are: cost competitiveness and quality. At present, the net income augmenting measures are more popular in India compared to cost saving methods. Adequate availability of labour, absence of relatively more profitable alternative crops in the rubber growing areas and a protected market for NR appear to be the major factors. One of the important components in ensuring competitiveness in the industry is raw material cost and attempts to contain unit cost of production is becoming increasingly relevant in the new context. Efficiency in NR production can be achieved by using high-yielding modern planting materials, by adopting low frequency tapping systems, judicious selection of areas for expansion of cultivation and by introducing the concept of productivity linked wage structure.

Based on the documented data, the net effect of an increased productivity per unit of area on operational cost, investment cost and area required for NR production has been worked out to outline potential areas for exploitation.

Table 10 shows the reduction in unit operational cost at various yield levels. In view of the growing demand for NR the country has to extend rubber cultivation to non-traditional areas. The potential productivity in such areas selected should be of primary concern as optimisation of the unit operational cost is the major component in the criteria for selection. Table 11 shows the case of gross area required and investment cost to be incurred to achieve a production target of seven lakh mt of NR at different assumed yield levels.

Similariy, significant reduction in operational costs can be achieved by increased tapping task and by introducing suitable low frequency tapping sytems [Sethuraj 1994]. The cost competitiveness arising from reduction in the operational costs is expected to form the basis for the emergence and sustained growth of an internationally competitive rubber goods manufacturing sector in India. Another potential area for exploitation in the production sector is the commercialisation of the by-products. In India, commercialisation of by-products such as rubber wood, rubber seed and rubber honey is not up to the desired extent [Toms and George 1994]. In the rubber goods manufacturing sector, the need for a specific export policy is highlighted [Mohanakumar 1994] to exploit the locational advantage in the production of latex based products and by restructuring the destination of exports.

Table 11: Area and Investment Required under Varying Yield Levels
(Production target = 700000 MT)

Yield (Kg/ha)	Area Required (ha)	Investment Required (Rs lakh)
750	933333	466667
1000	700000	350000
1250	560000	280000
1500	466667	233333
1750	400000	200000
2000	350000	175000
2250	311111	155556
2500	280000	140000

Investment cost = Rs 50000/ha.
Source: Sethuraj (1994).

Table 10: Operational Costs at Various Yield Levels

Yield (Kg/ha)	Total Cost (Rs/ha)	Additional Yield (Kg/ha)	Additional Processing Cost (Rs/ha)	Average Cost Cost (Rs/kg)
800	13837	–	0	16.7
1000	14437	200	600	14.4
1200	15037	200	600	12.5
1400	15637	200	600	11.2
1600	16237	200	600	10.1
1800	16837	200	600	9.4
2000	17437	200	600	8.7
2200	18037	200	600	8.2
2400	18637	200	600	7.8
2600	19237	200	600	7.4

Source: Sethuraj (1994).

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