



Reforming Agriculture in a Globalising World – The Road Ahead for Kerala

K. N. Nair and Vineetha Menon

NCCR North–South Dialogue, no. 5

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dialogue

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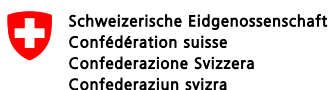
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Background: rubber; middle ground: coconut and mixed tree cultivation; foreground: paddy land being converted into garden land. (Photo: Urs Geiser)

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1 Introduction

Recent discussions on the impact of liberalization of trade in agricultural commodities in India have brought two contradictory lines of argument to the fore: one in favour of trade liberalization and the other against it. Arguments for the former are based on convictions about discrimination faced by the agricultural sector on account of the import substitution regime and neglect of the possible advantages that agriculture could reap through reasonable prices (Ahluwalia, 1996; Brandao and Martin, 1993; Gulati and Sharma, 1997). It is argued that state interventions in agriculture in the past have resulted in inefficient allocation of resources in favour of certain crops and regions, and that the best way to increase efficiency in agriculture would be to set prices by exposing agriculture to international competition. Providing adequate incentives to farmers and to the private sector as a whole by removing agricultural trade restrictions and investing in infrastructure, technology, extension, etc. to augment supply has been advocated as a means to realize potential productivity and growth in agriculture (Rao, 2000). It is hoped that gains in agricultural productivity through such measures will be shared by all segments of the rural population, resulting in a reduction in rural poverty. The arguments against trade liberalization, on the other hand, rest mainly on its negative consequences for food security, stability in agricultural prices, farm income, and employment (Nayyar and Sen, 1994, Patnaik 1996, Storm 1997, Bhalla 1994, 1995).

This divide between two schools of thought has become sharper in recent years owing to the gradual development of the World Trade Organization (WTO), clouding policy reform imperatives. The sharply contradictory positions have arisen partly due to the fact that many analyses have stemmed from an examination of the effects of trade liberalization on specific crops. More importantly, these analyses have been grossly inattentive to the implications of trade and agricultural policies for regional development of agriculture.

The present paper¹ is an attempt to address these limitations with specific reference to Kerala. The case of Kerala is of particular interest due to the fact that the major plantation crops² grown there cater to both domestic and international markets and face intense competition from other producing countries, (especially with trade liberalization), while at the same time the state has to increasingly import food grains and other essential commodities from other states for domestic needs. Moreover, the prices of major

¹This paper resulted from a research project “Coping Strategies in the Western Ghats: Threats and Opportunities of Economic Globalization and State Decentralisation” carried out as part of the NCCR North-South Research Partnerships for Mitigating Syndromes of Global Change. We are grateful to Professors P.R.G. Nair and Chandan Mukherjee and to Mr. Sanjith for comments on an earlier draft, and to Mahesh for research assistance. We are particularly grateful to Dr. Urs Geiser, Department of Geography, University of Zurich, for helpful comments and editorial suggestions on an earlier draft of this paper. However, we are solely responsible for the views expressed.

² Kerala accounts for 46% of the area and 40% of the production of plantation crops in India.

crops grown in Kerala have plummeted in recent years, with signs of recovery only for coconut and rubber, raising concerns about the state's agricultural performance.

Nevertheless, there is a lack of unanimity among scholars regarding the overall performance of agriculture in the state. While one view attributes the decline in the rate of growth for crop output noted in the state during the 1970s to stagnation in the agricultural sector (Kannan and Pushpangadan 1988), another attributes it to the investment-output cycle in an agricultural economy characterized by significant shifts in cropping patterns from annual and seasonal crops to perennial and tree crops¹ (Narayana 1992). Studies have highlighted both price and non-price factors underlying growth in agricultural performance in the state. Some have emphasized the relative profitability of one crop over another as the most significant explanatory variable (Kannan and Pushpangadan 1990) whereas others have highlighted other factors leading to relative profitability², such as technological advances in appropriate crop mix, labour intensity, institutional support, infrastructural developments, market orientation, and value addition (Lekshmi and George 2003).

Although not exhaustive, these highlights of current understanding of the implications of trade liberalization and Kerala's agricultural performance provide an ideal backdrop for our present enquiry into the performance of the state's agriculture (Chapter 2) and the factors shaping it, especially the comparative advantages and disadvantages of its major crops (Chapter 3) in the light of new processes unleashed by economic reforms (Chapter 4). The role of the state in removing some structural constraints and promoting agricultural development will also be examined (Chapter 5). Departing from frequently employed crop-specific analysis, we undertake a region-specific analysis with a crop-specific analysis embedded within it, in order to gain more holistic insights.

¹ Some of the important characteristics of the perennial and plantation crops are that (a) they require a certain number of years after planting for bearing; (b) the yields tend to increase with increase in age up to a certain level and then start to decline; and (c) if yields on the plantations have to be sustained, it is important to have a programme for re-plantation when the economic life of the plantation comes to an end.

² A comparison of stability in agricultural commodity prices and their performance in terms of changes in area, yield and production does not show significant relationships across crops. Therefore, stability in prices cannot be taken as a factor that influences crop shifts. Similarly, growth in revenue per unit area also appears to have no significant relationship with crop shifts. For details, see Lekshmi and George 2003. The observed pattern of crop shift in Kerala favouring perennial crops was explained in terms of agro-climatic factors and product age vis-à-vis labour productivity.

2 Changes in Kerala's Agriculture in Recent Decades

With a population of 31.8 million and a geographical area of 3.8 million ha, Kerala is the most densely populated region in India. Given the high intensity of rainfall and its distribution over much of the year, a variety of crops, seasonal, annual, and perennial, as well as plantation crops such as pepper, coconut, tea and coffee, is grown in the state. Agriculture is characterised by a highly diversified cropping pattern and a predominance of marginal landholdings, with 90% of agricultural holdings consisting of less than one ha.

The state reached the limits of agricultural expansion by the 1960s (Panikkar et al. 1977). Owing to rapid population growth and heavy internal migratory movements of people in search of cultivable lands during the first half of the last century and with less intensity in the subsequent two decades, most cultivable land (including sub-marginal lands) was brought under cultivation. During this expansionary phase, in which migration brought agricultural activity to previously uncultivated areas, food crops came to occupy a dominant place in the cropping pattern, understandably due to the acute scarcity of rice (the staple diet of Keralites) which had forced the state to import rice from other rice-growing countries in Asia, particularly Burma. The former state of Travancore resorted to a system of rationing rice as early as the 1930s. Tapioca, (the main cereal substitute in the region) also found an important place among the food crops grown in the state. During the period immediately following independence, the state launched a Grow More Food Campaign in order to further augment its production of food crops to meet domestic consumption requirements.

In the 1950s and 1960s the government of the state continued its policy of promoting rice cultivation. But since the mid-1950s a gradual shift has taken place in the cropping pattern towards tree crops (especially coconut). This shift in cropping patterns during the four decades since the 1960s has been remarkable; the area under food crops such as rice and tapioca declined, replaced largely by coconut and rubber and, to a limited extent, by food crops of greater value such as banana. By the closing decade of the Twentieth Century, about 70% of the area had come under perennial and tree crops with the rest – annual and seasonal crops – shrinking to less than 30%, notwithstanding state efforts to augment the production of food crops.

Trends in area, production and yield: Against this broad historical background of the development of Kerala's agriculture, the performance of the major crops¹ grown in the

¹ Data on the area of production and yield of crops are estimated on the basis of the following methodology: (a) estimates of area under crops and yields are made either on the basis of sample surveys or using forecasts; (b) output for each crop is estimated by multiplying the estimated area and yield. For plantation crops such as rubber, coffee and cardamom, the estimates are prepared by the respective commodity boards, while for the other crops they are made by the Directorate of Economics and Statistics. The official

state is analysed in relation to the trends in area under cultivation, production, and yield for the period 1964-65 to 2000-2001, comprising three sub-periods. Of all the major crops grown in the state, rubber is the only crop that has recorded significant upward trends in all the three aspects – area, production, and yield – for all the sub-periods (see Table 1). In the case of a number of crops, the annual rate of growth of output was much higher from the mid 1980s than in the earlier periods. In the case of the two most important food crops in the state, namely rice and tapioca, both area and production have shown a sharp decline over time while in the case of banana and plantains, all three indices – area, output, and productivity – have shown an upward trend.

Table 1: Annual compound growth rates for production, area and yield of major crops

Crop	Area			Production			Yield		
	1964-65 to 1974-75	1975-76 to 1986-87	1987-88 to 2000-01	1964-65 to 1974-75	1975-76 to 1986-87	1987-88 to 2000-01	1964-65 to 1974-75	1975-76 to 1986-87	1987-88 to 2000-01
Rice	1.09	-0.30	-4.58	2.58	-1.04	-3.19	1.47	1.28	1.46
Coconut	3.19	0.24	1.15	1.76	-0.32	2.83	-1.38	-0.55	1.66
Rubber	3.56	4.92	2.27	11.51	3.86	8.15	7.68	-0.98	5.74
Tea	-0.65	-0.54	0.61	1.34	0.86	1.51	2.01	1.42	0.87
Coffee	5.17	4.25	1.04	6.3	3.28	11.39	1.09	-0.95	8.99
Arecanut	3.32	-1.77	2.41	3.22	-0.12	3.86	-0.09	1.09	6.22
Pepper	0.18	1.61	1.83	0.64	1.44	1.95	0.47	-0.17	0.03
Banana & plantain	-0.22	3.16	3.87	-0.19	10.68	8.09	0.03	7.29	4.06
Cashew	2.00	1.64	-2.85	1.98	-2.13	-4.77	-0.03	-3.71	-1.98
Tapioca	3.63	-4.66	-2.89	7.73	-3.75	-1.29	3.96	0.95	1.64
Cardamom	4.32	1.25	-3.91	0.26	6.79	10.50	-3.86	5.48	15.01
Ginger	0.08	3.24	-2.49	11.84	4.26	-0.85	11.75	0.99	1.69
Sugarcane	-0.40	1.25	-2.90	0.17	1.87	-0.28	0.57	0.61	2.70

Source: Computed from various issues of *Kerala Economic Review*.

data published at times exhibit discrepancies: for instance, the data on banana for certain years are combined with other plantains. For the present study, we have cleaned up the data from such errors and discrepancies. The prices used to estimate the value of crop output were the farm harvest prices for the state during the year 1980-81.

Table 2: Value of Crop Production (in Rs lakhs) and Percentage Share of each Crop (1964-65 - 2000-01) at 1980-81 Prices

Crop	Base year (1964-1965)		(1975-1976)				(1986-1987)				(2000-2001)			
	Value of production	Share of contribution (%)	Value of production	Share of contribution (%)	Change in value of production	Percentage change in value of production	Value of production	Share of contribution (%)	Change in value of production	Percentage change in value of production	Value of production	Share of contribution (%)	Change in value of production	Percentage change in value of production
Rice	12,746	12.8	15,520	12.1	2,774	9.8	12,894	9.6	148	0.4	8,542	3.4	-4,203	-2.8
Coconuts	41,640	41.8	43,698	34.1	2,058	7.2	42,898	32.1	1,258	3.7	69,809	28.1	28,169	18.9
Coffee	936	0.9	1,905	1.5	969	3.4	3,593	2.7	2,657	7.8	7,676	3.1	6,740	4.5
Rubber	5,654	5.7	18,147	14.2	12,493	43.9	28,496	21.3	22,842	67.1	81,752	32.9	76,098	51.1
Tea	5,532	5.6	6,018	4.7	486	1.7	6,439	4.8	907	2.7	9,080	3.7	3,548	2.4
Pepper	2,646	2.7	3,007	2.3	361	1.3	3,729	2.8	1,083	3.2	7,314	2.9	4,668	3.1
Ginger	620	0.6	1,635	1.3	1,015	3.6	2,480	1.9	1,860	5.5	2,405	1.0	1,784	1.2
Arecanuts	34	0.0	40	0.0	7	0.0	45	0.0	11	0.0	74	0.0	40	0.0
Cardamom	1,736	1.7	2,170	1.7	434	1.5	3,255	2.4	1,519	4.5	8,247	3.3	6,511	4.4
Tapioca	11,256	11.3	22,174	17.3	10,919	38.4	13,543	10.1	2,287	6.7	10,642	4.3	-614	-0.4
Banana & plantain	9,458	9.5	4,454	3.5	-5,004	-17.6	9,492	7.1	34	0.1	38,296	15.4	28,838	19.4
Cashew	7,274	7.3	9,219	7.2	1,945	6.8	6,686	5.0	-588	-1.7	4,677	1.9	-2,597	-1.7
Sugarcane	86	0.1	82	0.1	-4	0.0	113	0.1	27	0.1	113	0.0	27	0.0
All crops	99,619	100.0	128,070	100.0	28,451	100.0	133,664	100.0	34,044	100.0	248,626	100.0	149,007	100.0

Source: Computed from *Kerala Economic Review*, Various Issues

Value of crop output: By estimating the value of crop output at constant prices in order to understand the relative importance of the contributions of various crops to the growth of agricultural output, we found that in the mid-1960s, coconut accounted for 40%, rice 12%, and tapioca 11% of the total value of crop output in the state. By 2000-2001, however, the share of coconut declined to 28% and that of rubber showed a sharp increase, accounting for 33% of the value of output (see Table 2). It was also observed that in incremental crop output, rubber accounted for slightly more than one half in the recent period, followed by coconut accounting for another one-fifth. The share of banana and plantains also showed a significant increase in contribution to incremental crop output. Thus, the predominance of rubber and coconut, and more recently of banana and plantains, stands out clearly in the agricultural economy of the state.

Trends in agricultural outputs: We made an assessment of the trends in the value of crop output from the mid 1960s. The analysis was carried out separately for all crops, perennial, annual and seasonal. The trends in output, given in Figures 1 to 4, clearly reveal the following: 1) trends in overall crop output and of perennial crops follow the same pattern; 2) the output of annual crops shows no clear trend; and 3) the output of seasonal crops shows a decline from the mid 1970s.

Estimated annual compound growth rates in agricultural output for the three sub-periods are given in Table 3. Since the output of annual crops showed erratic behaviour over time, we did not estimate growth rates for this. The estimated growth rates for other categories showed a revival of agricultural growth in the state from the mid-1980s that has been very sharp in the case of perennial crops.

These trends clearly indicate the predominant influence of perennial crops on the state's agriculture.

Table 3: Annual compound rates of growth of agricultural output in Kerala

Period	Perennial	Seasonal	All
1964-1965 to 1974-1975	3.02	5.43	3.39
1975-1976 to 1987-1988	1.22	-2.26	0.79
1988-1989 to 2000-2001	4.43	-2.26	3.34

Source: Computed from various issues of *Kerala Economic Review*.

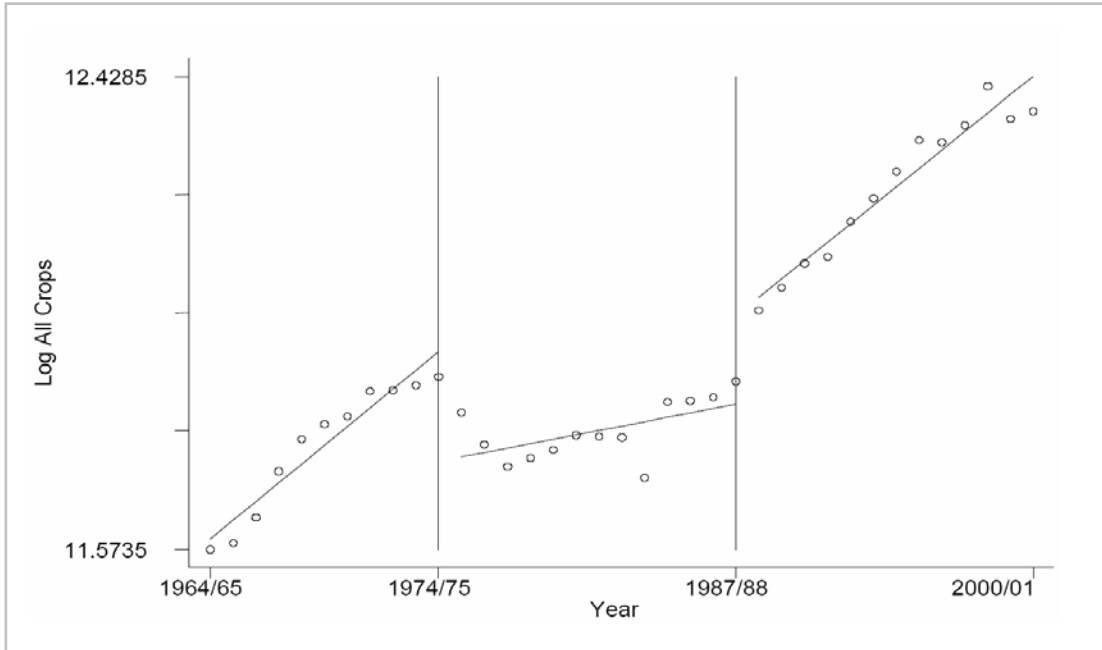


Figure 1: Output for all crops

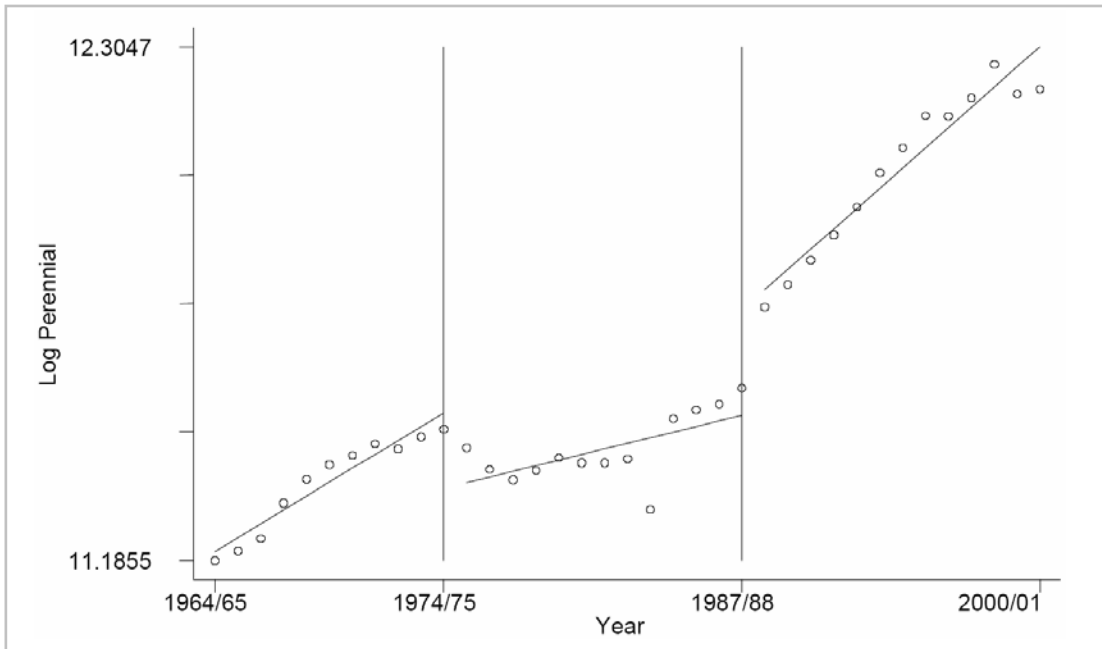


Figure 2: Output for perennial crops

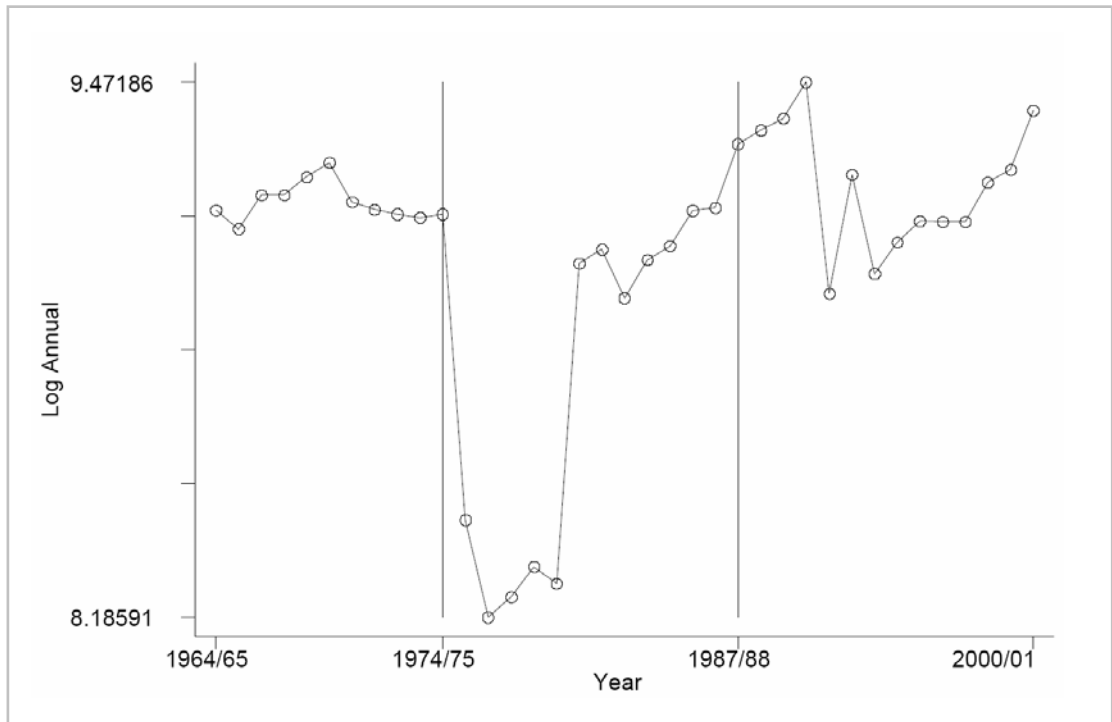


Figure 3: Annual output for all crops

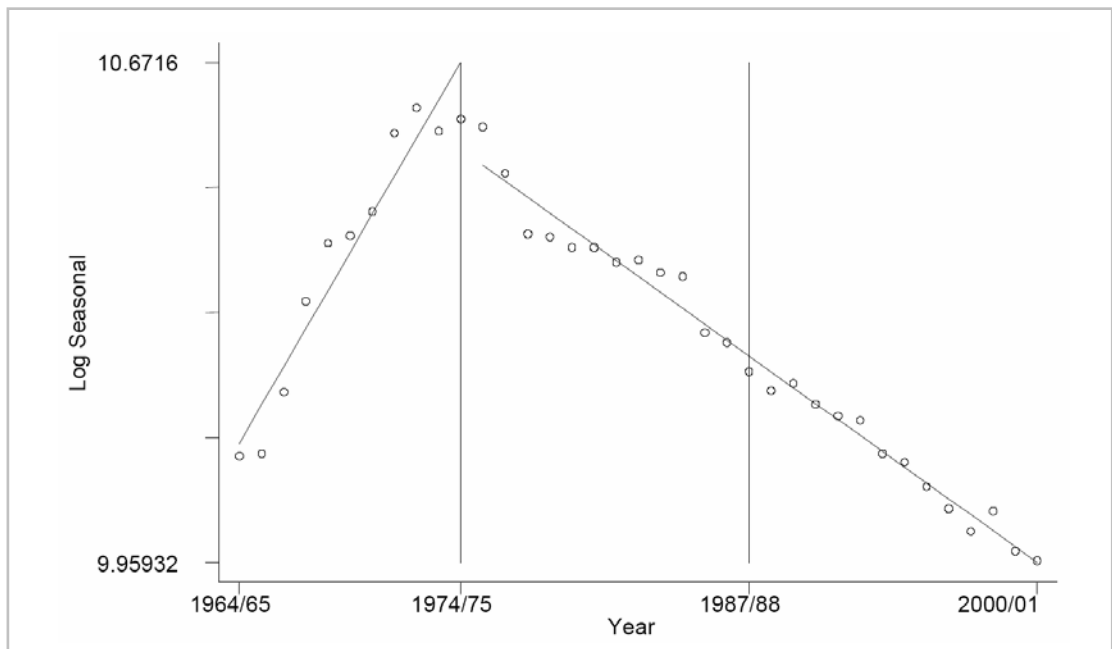


Figure 4: Output for all seasonal crops

Sources of growth: Following the methodology developed by Dharam Narain (1998), we estimated the sources of growth in agriculture by disaggregating the index of productivity into its component elements: cropping pattern, yield, and the interaction effects¹. We clearly observed that during the period prior to the mid 1970s yield effect was the main contributing factor to productivity growth. But from the mid 1970s to the mid 1980s, cropping pattern effect was strong but was reduced by the negative yield effect. From the mid 1980s the bulk of the contribution to growth in productivity came from rise in yield though cropping effect, while interaction effects were also positive (Table 4).

¹ Decomposition of growth of productivity

Index of productivity is decomposed as 1+ crop effect + yield effect + interaction effect.

Crop effect – change in productivity due to change in crop pattern.

Yield effect – change in productivity due to change in yield.

Interaction effect – change in productivity that is not explained by change in crop pattern or change in yield, under the assumption that the effects are additive.

$$\begin{aligned} \text{Index of Productivity (Ip)} &= \frac{\sum (A_{it} / \sum A_{it}) Y_{it} P_{i0}}{\sum (A_{i0} / \sum A_{i0}) Y_{i0} P_{i0}} \\ &= \frac{\sum C_{it} Y_{it} P_{i0}}{\sum C_{i0} Y_{i0} P_{i0}} \end{aligned}$$

$$\text{where } C_{it} = \frac{A_{it}}{\sum A_{it}}$$

$$C_{i0} = \frac{A_{i0}}{\sum A_{i0}}$$

A_{i0} = area under i^{th} crop in the base period, A_{it} = area under i^{th} crop in the current period, Y_{i0} = yield of i^{th} crop in the base period, Y_{it} = yield of i^{th} crop in the current period, P_{i0} = price of i^{th} crop produce in the base period

Thus it can be shown that

$$\begin{aligned} \text{(Ip)} &= \frac{\sum C_{it} Y_{it} P_{i0}}{\sum C_{i0} Y_{i0} P_{i0}} \\ &= 1 + \frac{\sum (C_{it} - C_{i0}) Y_{i0} P_{i0}}{\sum C_{i0} Y_{i0} P_{i0}} \\ &\quad + \frac{\sum C_{i0} (Y_{it} - Y_{i0}) P_{i0}}{\sum C_{i0} Y_{i0} P_{i0}} \\ &\quad + \frac{\sum [(C_{it} - C_{i0}) (Y_{it} - Y_{i0})] P_{i0}}{\sum C_{i0} Y_{i0} P_{i0}} \\ &= 1 + \text{cropping effect} + \text{yield effect} + \text{interaction effect} \end{aligned}$$

Table 4: Decomposition of the growth of productivity for different periods

Period	Total Growth	Cropping effect	Yield effect	Interaction effect
1985/1986 – 1999/2000	1.680	0.103	0.503	0.074
1975/1976 – 1984/1985	1.031	0.059	-0.005	-0.023
1964/1965 – 1974/1975	1.101	0.019	0.079	0.003

Source: Computed from various issues of *Kerala Economic Review*.

In sum: The changes in cropping pattern from the lower-valued food crops to the higher-valued perennial and tree crops, and the increase in the yield rates for a number of crops have thus been the main contributing elements to agricultural growth in Kerala in recent years. Since the scope for bringing new area under cultivation is limited, the cropping pattern changes took place through crop shifts.

The shift to perennial and tree crops in the state has introduced greater rigidity in patterns of agricultural growth since it limits the options for farmers to change their crops in response to short-term fluctuations in prices. It should be noted that these crops have a long lifespan with a certain gestation lag to yield and require considerable investment.

Such specificities of plantation crops must be taken into account in policy planning for agricultural development. Given this background, in order to understand the scope and potential for sustaining the sources of productivity growth in agriculture, an analysis of price and non-price factors is in order.

3 The Role of the Price Factor

The factors underlying the behaviour of agricultural commodity prices in the state are complex and vary from commodity to commodity, depending on domestic demand and supply (within Kerala and the country as a whole), the global import demand for specific commodities, supply from competing countries, and state interventions in the commodity markets.

A brief review of these complex factors in relation to the major crops grown in the state is presented below.

Rice and tapioca: State intervention has played a significant role in the determination of rice prices in Kerala. The public distribution system (PDS) was designed to make rice available at affordable prices in the 1950s and the 1960s when the state's efforts to augment rice production failed to meet its growing requirements. The state was thus driven to import rice from other regions. By the 1970s, the PDS had attained universal coverage, significantly influencing the availability and prices of rice. Studies have shown that the open market prices of rice in Kerala during the 1970s and the 1980s were highly dependent on the issue price of rice in the PDS (Nair 1993). However, liberalization of the food grains trade in the 1990s contributed to a rapid expansion of private trade in the country, resulting in considerable increase in the availability of rice from other states through private trade¹.

A gradual reduction of food subsidies by the central government and a consequent increase in the procurement and issue prices of food grains in the meantime helped to increase the prices of rice supplied through the public distribution system. This price increase, combined with the fact that the quality of PDS rice was generally inferior to that available on the open market, contributed to a shift in household purchases of rice from the PDS to private trade (Nair 2000). The overall effects of this process have been an erosion of the PDS and an upward trend in the price of rice. Thus the effective working of the PDS in the 1970s and 1980s and the expansion of private trade in the 1990s appear to have been significant influences on the price of rice. The depression in the price of rice in the 1970s and the 1980s also depressed the price of tapioca, on account of its substitution effect. However, in recent years there has been an upward trend in tapioca prices owing to a significant decline in production.

Ensuring food security thus remains a major concern of the state in the era of trade liberalization. The state's increasing dependence on imports of food grains from other states, coupled with the volume of its exports of commercial crops to the national and international market, has made it highly vulnerable in terms of food security, as the prices of crops exported from the state (at the aggregate level) have shown a generally

¹ The withdrawal of restrictions on the inter-state movement of food grains is an important factor that facilitated the development of private trade in food grains in the state.

downward trend while food grain prices (especially for rice) have shown an upward trend in recent years¹. The increasing export of rice from India (which may continue if India can take advantage of the post-WTO trade environment) also drives up the price of rice in deficit states such as Kerala. Even if an increase in prices stimulated some improvement in production, the gap between supply and demand would remain a serious problem. In order to bridge this gap, the state would have to resort to imports.

The role of the PDS in ameliorating this problem has been very complex and is far from clear. Its influence on food security has declined in recent years under the weight of economic reforms, especially due to the withdrawal of implicit and explicit public subsidies for food security. Nevertheless, if commercial and plantation crops traded with other regions of the country and on the international market could bring incomes that compensated for the increase in food prices, one might expect that the situation would become qualitatively different from what existed previously, since it would be economically feasible to import food grains into Kerala. In this context it becomes vital to understand the comparative advantage of Kerala in relation to other regions where its major crops are concerned.

Coconuts: Coconut prices are determined largely by the demand for coconut oil. On account of the persistent gap between domestic supply and demand, large amounts of edible oil are imported. Palm oil, which is much cheaper than coconut oil and a close substitute to coconut oil used in cooking and extensively in the vegetable oil industry, is also imported in large quantities. Increased importation of palm oil is bound to have a dampening effect on the market for coconut oil. Imports of both oils are under the direct control of the central government. Imports of coconut oil, although small in quantity, had a psychological effect on domestic prices.

However, the most important factor cited in the decline of coconut oil prices has been the import of palm oil. The international supply of palm oil, both crude and refined, is dominated by Indonesia and Malaysia, which are vying with each other to get a hold on the Indian market by granting concessions to their exporters (especially exemption from export duty) in order to offset the effect of import duties levied by India. India's import policy has served only to discourage both household and industrial consumption of coconut oil, with low import duties for palm oil. As imports were cheap, the quantity imported often exceeded the demand deficit in the country. As a result, the consumption of palm oil by both household and industrial users increased, with a simultaneous reduction in the demand for coconut oil. Taking into account the dampening effect of palm oil on coconut oil prices, the central government has adjusted the import duty on palm oil from time to time. However, increases in import duty were more than offset by a drop in international prices, and hence there has been no deterrent effect on the im-

¹ There is no recent estimate of the external terms of trade for Kerala. Judging from an earlier study by Isaac and Reddy, which shows that the terms of trade became unfavourable to the state in the 1970s and 1980s, and the fact that imports appear to be increasing at a higher rate in terms of volume and value than exports, it can be concluded that the terms of trade have been operating against the state in recent years.

port of palm oil. Imports are closely linked to price trends in the international market and to reduction in prices, which is being planned by the exporting countries.

Mitigation of this crisis is a difficult process. On the one hand, it is necessary to keep the prices of edible oil low from the point of view of the consumers in the country, especially because of the demand-supply gap in edible oil, which gives rise to imports. On the other hand, imports have to be regulated so as not to adversely affect domestic producer prices.

Besides import of coconut oil and palm oil, another set of external factors to be considered in understanding the recent crisis is the trend in coconut cultivation, i.e. the factors relating to the production of coconut in other states in India and in other countries. Kerala currently accounts for about 50% of the area under coconut and 40% of country-wide production. The state had a virtual monopoly on the production of this crop until two decades ago, when its cultivation expanded rapidly in the states of Tamil Nadu and Karnataka. The share of Kerala in all-India production declined from 51% in 1980-81 to 42% by 1998-99. On the other hand, the share of production of both Tamil Nadu and Karnataka has increased significantly over time. The productivity of coconut in the neighbouring states (especially in Tamil Nadu) has also been steadily increasing over time. It should be noted that production in the neighbouring states may continue to increase due to the fact that unlike in Kerala, where coconut is cultivated as a home-stead crop, in other countries it is cultivated on large holdings under improved management conditions. The Indian share in world production has improved over time; so also, have the Indian yields.

Table 5: Annual growth rates for area, production and yield of coconut from 1980 – 2001 for major producing countries

	India	Indonesia	Philippines	Sri Lanka
Area	2.89	1.96	0.51	0.31
Production	4.68	2.81	2.37	1.23
Yield	1.75	0.83	1.86	0.93

Source: Computed from FAO data available from the Coconut Development Board, Cochin.

Though the Indian performance is satisfactory from an international perspective, it should be noted that the organization of production in India differs significantly from that in other countries and that the cost of production in other countries is lower than in India. While production in India is aimed at meeting domestic demand, in other countries it is aimed primarily at trade in the international market. The consumption of coconut oil for cooking is confined largely to Kerala. With increased coconut production¹

¹ In 2003-04 there was an unprecedented decline in coconut production in all three south-Indian states. Consequently, the prices of coconut and coconut oil have shot up. According to press reports, the crash in coconut prices in recent years has prompted to search for diversified uses of coconut, and this appears to be

in the country, supply has exceeded demand in normal years and unless the use of coconut is diversified, prices will remain unremunerative.

Natural rubber: In the case of natural rubber, prices showed an upward trend until the 1990s. This was due to demand exceeding supply in the domestic market, which had remained more or less insulated from the international market. Imports of small quantities of natural and synthetic rubber under government control were adopted to narrow the demand-supply gap. With the gradual unfolding of import liberalization since the early 1980s, Indian industries began importing rubber from other countries. In the 1980s, imports were allowed only under certain conditions such as shortage of rubber in the domestic market. Between 1984-85 and 1995-96 rubber imports increased from 37,461 tonnes to 51,635 tonnes. In addition, large-scale imports of synthetic rubber and polyurethane, another substitute for natural rubber, aggravated the crisis. For instance, in 1991, India's production of synthetic rubber was 57,293 tonnes, whereas imports were 51,715 tonnes. By 1996-97, synthetic rubber production rose to 64,563 tonnes and imports increased by nearly 50% to 79,640 tonnes. The production of synthetic rubber was about 70,000 tonnes in 2001-2002 while imports were 110,000 tonnes. These imports have had a significant impact on rubber prices.

Analysis of natural rubber prices (for the RSS variety) since the 1990s reveals that there was a general rise in prices from Rs. 25.50 per kg in 1992-93 to Rs. 52.40 in 1995-96. However, prices fell to Rs.35 in 1997-98, to Rs. 29 in 1998-99, and to even lower levels until 2002. The reason for the decline in prices during 1996-98 could have been the South-East Asian economic crisis and consequent devaluation of currencies that made imports uncompetitive and hence weakened the demand for tyres in the automobile industry. Increases in imports of both natural and synthetic rubber and domestic supply outstripping domestic demand caused a decline in prices in subsequent years¹. Natural rubber prices in India have always remained at a higher level than in other producing countries, which were able to export the bulk of their natural rubber and other rubber-based manufactured goods through international markets due to the comparative advantages they enjoyed.

Kerala accounts for more than 90% of the area under production and of the total production of rubber in India, which is the world's third largest producer of rubber after Indonesia and Thailand, followed by Malaysia. In Malaysia, both the area of production and total production of rubber have been declining. The production of rubber has increased in all countries except Malaysia and Sri Lanka. India showed a sharp and steady increase in yield throughout the period and overtook the position of Thailand by

causing a small decline in the availability of coconut for copra and the extraction of coconut oil. For details, see the report in the *Business Express* of 12 November 2003 by V.K. Krishnakumar.

¹ Natural rubber prices have shown a remarkable recovery in recent months owing to decline in domestic production.

the end of the 1990s. In countries other than India, Indonesia and Thailand, yield levels declined.

Table 6: Growth rates for area, production and yield of rubber from 1980–2001 for major producing countries

	India	Indonesia	Malaysia	Sri Lanka	Thailand
Area	4.11	2.31	-0.73	-1.88	0.89
Production	3.78	0.67	-3.05	-0.16	7.64
Yield	8.03	3.00	-3.75	-2.00	8.62

Source: Computed from FAO data.

The organization of production in Kerala is significantly different from that in other countries. Unlike other countries, in Kerala most production takes place on small-holdings rather than on large estates. Such differences in the organization of production have important implications for trade. It is possible for other producing countries to compete more effectively in the international market, taking advantage of the economies of scale in production and keeping production costs at low levels.

The prices of another group of commodities (mostly spices) were determined by the level of domestic production, international demand, and the conditions of supply in other producing countries.

Pepper: India had a virtual monopoly in the international market for pepper until a few decades ago. But with the expansion of cultivation in other producing countries, Indian exports now face competition from countries such as Indonesia, Brazil and Malaysia, the other traditional exporters of pepper. In recent years, pepper cultivation has picked up rapidly in Vietnam as well. India leads in terms of area under pepper cultivation, and its position has been strengthening over the past two decades. India's production of pepper has also been increasing in comparison with other countries; however, the yield levels in India are much lower than in other countries, where cultivation is on large plantations and production costs are low. Nevertheless, the quality of pepper grown in Kerala is much superior to that of other countries. Production of this commodity has shown significant fluctuations in all producing countries because of weather and other factors. A decline in production in one country usually affects the conditions of supply on the international market, with an immediate impact on price. It is interesting to note that the domestic and international prices of pepper have been moving more or less in parallel.

A significant change in trade in this commodity during the post-liberalization period has been the import of pepper in the name of re-exports¹. Pepper imported from Vi-

¹ The bilateral agreement with Sri Lanka had led to a considerable increase in the import of pepper. Under the agreement, duty-free import of pepper is allowed into the country from Sri Lanka. This has resulted in

etnam, alleged to be of inferior quality, is mixed with Indian pepper, traditionally known for quality, leading to adverse consequences for exports. It has also been pointed out that the imported pepper sold on the Indian market is having a dampening effect on domestic prices.

Table 7: Growth rates for area, production and yields of pepper from 1980 – 2001 for major producing countries

	Brazil	India	Indonesia	Malaysia	Thailand
Area	-2.03	3.69	2.69	0.26	-2.74
Production	-2.77	5.16	2.15	-1.18	2.18
Yield	-0.25	1.42	-0.53	-1.43	5.06

Source: Computed from FAO data.

Cardamom: In the case of cardamom, India’s major competitor in the international market is Guatemala. India produces around 50% of the world’s output of cardamom. Indian yields, however, are much lower than those of Guatemala. As in the case of pepper, Indian cardamom is also of superior quality and enjoys a high price on the world market. Production in Guatemala, where large agribusiness corporations own the plantations, is organized quite differently from production in India. Such differences in production structure and differentials in yields show the comparative advantage of Guatemala in production costs. It was India’s sizable domestic market for cardamom that helped to prevent a steep fall in its prices during years characterised by peak output.

Coffee: Coffee prices have been undergoing significant changes in recent years. Until 1992-93, the Coffee Board had practised monopoly procurement of coffee by guaranteeing prices to the growers. The Board had been controlling the marketing and trade of coffee, including exports. However, in 1992-93 coffee marketing was completely deregulated, with the Coffee Board withdrawing completely from marketing and trade. Thus the growers have moved from a regime of protected prices to an environment in which prices are determined by the market. The new situation has offered scope for the growers to realize higher incomes during periods characterised by upswings in international prices; but it has also introduced a high degree of risk during downswings in prices. Though the country has a sizeable domestic market for coffee, 80% of the output is exported. Therefore, prices are heavily influenced by the conditions of supply on the international market. Brazil, Colombia, and to a certain extent Vietnam, are the major countries to reckon with in the international coffee market. As far as India is concerned, Vietnam is important because it is the largest producer of robusta coffee. Unlike in other countries, small growers dominate coffee cultivation in India, where coffee plantations are owned by large growers. In the case of Kerala, to be specific,

substantial increase in the import of pepper. It was noted that other countries such as Vietnam and Indonesia export pepper to India through Sri Lanka to take advantage of the duty concession.

area, production and yield of the coffee crop have increased over time. Most of the coffee cultivated in the state is of the robusta variety and is primarily for export. The practice of intercropping, primarily with pepper, was followed on most coffee plantations; with increasing uncertainty in prices, the practice of intercropping on coffee plantations has increased.

Table 8: Growth rates for area, production and yield of coffee from 1980 – 2002 for major producing countries

	Brazil	India	Indonesia	Vietnam
Area	-0.79	2.25	2.86	21.60
Production	1.01	3.87	2.10	29.89
Yield	1.79	1.58	-0.77	6.73

Source: Computed from FAO data

Tea: In the case of tea, most of the growing area is under the estate sector, with corporate sectors having an important influence on production and prices. Prices are determined by both domestic and international demand. Kerala accounts for about one-third of the tea produced in South India, but productivity on the tea plantations in the state is low due to the great age of the plants.

Other crops: A number of other crops (small in terms of cultivated area, but important for specific locations) grown in the state, such as nutmeg, coco, turmeric, and ginger, which are in demand in the Indian market, have also been subject to fluctuations in international market conditions as they can be imported from other countries since the coming of trade liberalization.

Conclusion

- (a) Prices for certain commodities (especially rice) are determined by the conditions of supply in other states, the central policy on procurement and regulations on internal trade, and the effectiveness of the public distribution system.
- (b) Prices for certain commodities (including close substitutes) are influenced by the import policies of the Central Government.
- (c) Prices for certain commodities are shaped to a large extent by the conditions of supply in other competing countries.

Liberalization of agricultural trade is naturally bound to have varying impacts on different commodities at different points in time, depending not only on the agricultural and trade policies pursued by the central and state governments, but also on the advantages and disadvantages of Kerala in comparison with other states within and outside India competing with Kerala in the national and international markets.

However, the difficulties of cutting across such specificities for different commodities by enhancing productivity and efficiency stand out as a glaring handicap in state agricultural policy. It follows that ensuring trade security for Kerala requires overcoming this handicap by considerably enhancing the efficiency of its agriculture. This cannot be achieved solely by setting prices right. It calls for effective resolution of several other constraints, the most pressing and pervasive of which is the influence of the WTO on agriculture in Kerala.

4 Influence of the WTO

Kerala's agriculture has been related to the wider world for many centuries. However, the emergence of the WTO regime has added a new and accelerated dynamics to these relations.

There is a lack of clarity about the parameters within which countries must operate in the WTO trade regime, as WTO negotiations remain fluid at the moment. Nevertheless, some logical conjectures about the implications of the WTO for agriculture in Kerala are possible based on the outlines that have emerged so far. As of April 1, 2001, India had to withdraw quantitative restrictions¹ on the import of agricultural commodities, with the result that the state's crops which had enjoyed a protected Indian market became vulnerable to competition from imports.

The chief instrument by which imports can be restricted is the imposition of import duties at relatively high levels. Since the bound rates – the maximum duty that can be imposed – for the commodities grown in the state are fixed at high levels except for natural rubber², imposing higher import duties is possible. In the case of plantation crops, significant increase has not taken place in the quantity imported into the country. In assessing the quantities of imports and their implications for the state's domestic crops, it is relevant to bear in mind that imports of plantation crops to India are due in part to bilateral agreements (especially with Sri Lanka) that allow Indian exporters to import commodities at low tariff rates (around 10%) for value addition and re-export. Under the cover of such agreements, commodities from other countries with which no such agreements exist are also brought into the country. For example, Vietnam pepper and Guatemalan cardamom are brought in through Sri Lanka. Because of difficulties in identifying the point of origin, it is not possible to ban such imports³.

Although the quantity of imports as a percentage of domestic production is relatively low, imports can affect domestic prices if (a) they are used in such a way as to provide flexibility for the major domestic players to stay out of the market during periods characterised by peak market arrivals or prices; (b) the imported stock is released to domestic consumers; and (c) imported commodities that are often of poor quality are mixed with good quality Indian products, thereby adversely affecting the reputation of Indian

¹ Lifting of quantitative restrictions would affect different commodities differently. For a discussion of the implications of removal of quantitative restrictions on plantation crops, see Damodaran, 2000.

² In the agreement on agriculture, natural rubber has been taken as an industrial raw material. Rubber is a tree crop and is practically grown as a smallholder crop. The growers tap the trees, collect the latex, get it dried as sheets, and sell it in the market. There is no manufacturing process involved as far as the growers are concerned, and the entire operation is agricultural. In fact, the entire income from natural rubber in sheet form is treated as agricultural income under the Indian constitution and is taxed according to the Agricultural Income Tax Act of the respective state governments. In these circumstances, there is no justification for excluding natural rubber from the purview of agriculture.

³ For a series of suggestions on the policy changes made for the plantations in the wake of WTO, see UPASI 2001.

exporters and products¹. Due to the effects of imports and the interactions of other supply-demand factors, the prices of major plantation crops have fallen sharply in recent years.

Preventing the movement towards such unstable agriculture would require regulation of imports, taking into account the domestic demand-supply situation. This is possible only through the judicious use of import tariffs. As we noted earlier, bound rates are fixed for most of the commodities at reasonable rates, thereby providing the scope for tariffs as an instrument to create disincentives for imports². There are also two related issues: (i) review of bilateral agreements to ensure that they do not result in imports having undesirable effects on domestic producers; (ii) ensuring that imports are used by exporters to depress domestic prices and that the quality of the exports is not adversely affected by putting in place appropriate mechanisms for quality control.

The imperative for effective implementation of such improvements to regulate trade is dictated by a number of circumstances. For instance, there are states within the country that would benefit from low import tariffs. Therefore, these states may object to fixing traffic at higher levels. The industrial and trade lobbies may apply pressure to fix tariffs at low levels if this helps provide raw materials at low costs and helps them realize high profits through exports or domestic trade. The extent to which such pressures exerted by various interest groups can be effectively negotiated by the state and the central governments is an important question to be addressed. In national policy-making, agriculture in Kerala may not be considered important since it accounts for only a small fraction of the agriculture of the country. Therefore, the specific problems that Kerala faces might not capture much attention in the national decision-making process. There is also the question whether the farmers in Kerala are politically powerful enough to pressurize the state and the central governments to make effective use of the safeguard provisions. The issues here are complex, since agriculture is a state responsibility and foreign trade and commerce are vested with the central government. Unfortunately, state governments are seldom consulted in formulating policies and approaches in WTO negotiations and in formulating trade policies relating to agriculture, with the result that the regional specificities and interests are not accommodated in policy formulation and settlement of disputes.

¹ Tea is a telling example of how bilateral agreements affect domestic prices. As per the Indo-Sri Lankan accord, tea can be imported from Sri Lanka with a duty of 7.5%, whereas for other countries, the import duty is around 100%. The total incidence works out to 108%. During the last few years, imports have risen significantly from the low level of around 1 million kg in 2000 to 22 million kg in 2002. However, if one looks at the major importers of tea into India, it will be noted that Vietnam and Indonesia contribute more than Sri Lanka. It can also be noted that 95% of the tea imported into the country is for re-export and not for domestic consumption. The problem here is twofold: (a) an additional quantity of tea is entering into the share of exports, adding excess quantity in the domestic market; (b) re-exports take place in the name of India, which in turn ruins the brand image of Indian tea.

² This is the official approach formulated by the Commission on Agricultural Costs and Prices of the Government of India to manage imports of agricultural commodities. Bhattacharyya (2003) has highlighted a number of limitations to this approach.

Designing public policies in response to the emerging national and international environment requires building an adequate knowledge base that can facilitate not only an informed decision-making process, but also protect the wealth of biodiversity and the patenting of products based on the special qualities of crops grown. In this context, it is important for the state to define the boundaries and contents of policy and operationalise a concrete action plan. Such an action plan and its strategic elements are available in the report of the State WTO Commission (Government of Kerala 2003).

What is the road ahead for Kerala's agriculture? In general, we agree with the state WTO Commission's recommendation, that "a vision of how to address the crisis in the spheres of employment and production in Kerala and to exploit the opportunities that the new trade regime might offer to a state so heavily dependent on domestic and export markets must necessarily draw on the special resources with which the state is endowed. (...) A new phase of economic development must take advantage of these special resources, namely, a rich and varied natural resource base, basic land reform, an educated, skilled and politically conscious work force, and unique achievements in the areas of health and education." The report also mentions key conditions essential for building a sustainable agricultural trade system, among them (i) a pro-active state policy; (ii) productivity enhancement; (iii) quality improvement; and (iv) profitability enhancement.

However, the Commission's report did not sufficiently articulate the need and urgency for state-level reforms in certain key areas. This concern is discussed in the next chapter, which emphasises the required productivity enhancement.

5 Structural Constraints and the Role of the State

Since the scope for extending the area under cultivation in Kerala is practically nil, increasing productivity is crucial for growth in agricultural output. The average productivity of most crops, except rubber, is below the optimal state level or levels reported from elsewhere in India. In the case of a few crops, some farmers have reported yield levels much higher than the officially estimated average productivity, indicative of the considerable scope for increasing the state's crop productivity. The major stumbling blocks in realizing this potential productivity can be traced to a chain of developments in the state's agricultural policy, stemming largely from land reforms. The re-emergence of tenancy, the emergence of the land-lease market, labour becoming one of the most limiting production factors, the proliferation of small and marginal holdings, valuation of land as a speculative asset rather than as a vital factor in production, and the impacts of emigration, mostly to the Middle East, both on land and labour, are all interlinked in this respect. We briefly sketch some of these inter-linkages below.

Land reforms: The state's well-known land reforms (Raj and Tharakan 1983) succeeded in conferring ownership rights to land on erstwhile tenants; the ceiling provisions were enforced rather effectively, with exemptions granted to tea, coffee, cardamom, cashew and rubber estates, but they failed to usher in a system of egalitarian land distribution. The consequences of proliferation of small and marginal holdings were unanticipated. Moreover, legally abolished tenancy has re-emerged in recent years (Nair et al., 1989; Padhi and Nair, 1992). There has also been a tremendous increase in land values, with the result that people began to view land as a speculative asset and not as a factor in production. While the proliferation of small and marginal holdings has been largely due to subdivision and fragmentation of holdings arising from demographic pressure, the factors contributing to the re-emergence of tenancy and the valuation of land as a speculative asset are forces at work at supra-local levels, which calls for some explanation.

Tenancy: The re-emergence of tenancy is a reflection of the mismatch between those who have land but do not have the necessary labour force and those who have the labour but practically no land of their own for cultivation. This situation is significantly different from that in other agriculturally prosperous regions in the country, where large landholders have been leasing land from small and marginal holders. During the past few decades there has been considerable diversification in occupation and in the sources of income of households in the state. Those who moved from agriculture to other sectors of the economy still retain their land. Moreover, starting in the 1970s, Kerala witnessed considerable emigration to the Middle East; emigrants have also retained their landed interests. No state-wide estimates of the proportion of cultivated land owned by such households exist, but micro-level studies report its incidence to be very high. The cultivation of lands owned by such households either requires family labour to carry out independent agricultural operations (or to supervise the hired la-

bour) or an adequate supply of hired labour to compensate for the lack of family labour. The younger generation in both cultivating households and agricultural labour households, aspiring to upward social mobility through education, looks for employment outside the agricultural sector and is reluctant to take up agriculture as an occupation, even when in dire need of employment. This situation helped to reduce the supply of both family and hired labour in the agricultural sector. Paradoxically, while the Kerala's unemployment rates are the highest in the country, there is acute labour scarcity in the agricultural sector. In migration of labour from other states provides some relief for the scarcity of manual labour in Kerala's agricultural and non-agricultural activities. The situation has been further aggravated by the large-scale migration of unskilled labour to the Middle East. The already high agricultural wage rates in Kerala due to unionised wage bargaining by agricultural workers in the 1960s and 1970s have been pushed even higher by shortages in the supply of labour, with the consequence that from the point of view of both availability and cost, labour has become one of the most limiting factors in agricultural development (Mahesh 1999).

Farmers' responses, both short-term and long-term, to the changes taking place in the rural labour market have in turn had negative consequences on labourers. The short-term response of farmers has been to cut down on labour in cultivation, keeping land fallow or leasing it out, keeping agricultural operations to a minimum, and resorting to partial mechanisation. The long-term response has been largely to shift land use from labour-intensive crops to crops that require low labour inputs and diversion to non-agricultural purposes. Thus both types of responses resulted in a decline in the number of days of employment for agricultural labourers. Given the seasonal nature of agricultural employment and the declining number of days of employment per agricultural labourer, some labour households have been adopting lease cultivation as a strategy to sustain their livelihoods. Studies on the land-lease market in the state indicate that it is mainly agricultural labourers or sub-marginal farmers who lease land for cultivation, while it is mainly owners of land with other occupations or who are unable to cultivate their land due to disability, old age, etc. who lease out land (Cherian, 2003). Such leasing arrangements are by and large confined to wetlands or garden lands, mainly for cultivation of crops such as banana, vegetables and betel vines that require continuous labour inputs for cultivation and monitoring of crop production. The lease duration is short (one or two seasons) and payment is in cash. In the recent past, commercial lease cultivation of pineapple has been expanding in Kerala, undertaken by persons skilful and knowledgeable in the cultivation of the crop. The picture that emerges is that although scarcity of labour has been affecting agriculture, those with their own labour supply have been taking up lease cultivation for livelihood.

Land ownership: In the prevailing land ownership pattern, people with non-agricultural interests have a significant share of the cultivated land (Nair and Santhakumar, 1999). Available evidence suggests that the land owned by 'gentlemen farmers' is managed poorly. Part of the reason for such people retaining land could be the considerable appreciation in land values since the 1970s. Large-scale remittances from the Middle East and the construction boom that followed have created an unprecedented

increase in the demand for land for housing, pushing up land values. It is in this situation that land has increasingly become valued as a speculative asset rather than as a crucial factor in production. The increase in land values has led to large-scale conversion of paddy lands into housing plots. The rise in land values may have accentuated the process of sub-division and fragmentation of holdings as well. Although legal prohibition of paddy land conversion is in place, the rules are hardly enforced. Paddy land conversions have been contributing to serious ecological problems, including the drying up of water sources.

Water management: Consolidation of land and effective water management are essential steps in rectifying productivity problems in Kerala's agriculture that are not only due to the ecological consequences of poor land management. A look at the state's irrigation scenario also supports this conclusion. Driven by the policy of enhancing food security (mostly rice), the state has invested heavily in large-scale canal irrigation projects with the objective of bringing new areas under cultivation and intensifying cropping. The design and construction of the canal system, mostly during the 25 years immediately following the formation of the state, was largely intended to irrigate low-lying paddy lands. As the area under rice has been declining, the irrigation potential created could not be utilised; moreover, there was an unintended consequence of water logging in many areas. Since the design of the systems did not envisage irrigation of non-paddy lands, the irrigation potential created could benefit other crops only to a limited extent. To irrigate such crops, small-scale irrigation projects, including well irrigation, need to be developed. Although the Command Area Development Authority has been functioning in a few selected irrigation projects, it has not succeeded in bringing about notable changes in the water management and agricultural practices of farmers. The prospects for such irrigation are also becoming limited due to the depletion of underground water and deterioration of river systems and the increasing claim on water for non-agricultural uses.

There is a widespread consensus now that emphasis should be given to integrated management of land and water by adopting a watershed-based approach to development. Such an approach, however, is fraught with several institutional constraints arising from the prevailing pattern of ownership and distribution of land and emerging interest groups focusing on land.

Consolidation of landholdings: The consolidation of landholdings is an important requirement for effective management of land and water, and thus increased land productivity. There are constraints to such an organizational change due to the presence of heterogeneous interest groups and the highly fragmented nature of landholdings. Since the number of land owners who derive their main source of income from non-agricultural activities (not only in the bottom but also the higher size groups), has increased significantly over time, it is difficult to work out arrangements for sharing the costs and benefits of any land development activities and thus also for mobilising them to cooperate in any such activity. Integrated watershed development envisaged as a major component in the decentralized planning process in Kerala is a typical case in

point. In an agricultural economy dominated by perennial and plantation crops, there is considerable scope for increasing output per unit of land by adopting inter- and multiple cropping. However, effective land and water management is a pre-requisite to achieve this goal. The crucial role of the state in this effort is beyond dispute. The integrated development of water resources in the overall context of emerging agricultural and non-agricultural uses of water and the developing private water market warrants examination of existing water laws and the rights of the various claimants.

A first assessment in-between: From present land ownership patterns and the land-lease market, it is clear that land has to be made available to those who prefer to engage in agriculture as their source of livelihood. Repealing the existing tenancy laws and legally validating tenancy contracts may considerably enhance the access to agricultural land by those who intend to take up agriculture as a source of livelihood. Developing agriculture as a commercial proposition and attracting private investment will be possible only by raising the ceiling on landholding. However, institutional arrangements to free the land market should not facilitate the entry of international agri-business corporations through contract farming; experience in the past in other regions has only resulted in the exploitation of local farmers rather than ensuring their long-term livelihood security. Appropriate measures to discourage people from keeping land for speculative purposes are also necessary. Legislation is just one step; there is also the need to modify land utilization rules to make their implementation administratively feasible. The scope for reform in the agricultural labour market (excluding plantations) is limited due to the scarcity of labour. However, developing appropriate labour-saving mechanisation and promoting it without adversely affecting the employment and livelihood security of the existing labour force are important in formulating a policy for agricultural mechanization. In the case of plantations, the collapse of prices in recent years has brought into sharp focus the need to link the wages of workers with commodity prices. This question is significant as it is often assumed that high wages created the crisis in the plantation sector.

Technology, inputs, and markets: The state's role in technology development, knowledge dissemination, and organizational support for inputs and marketing also has important implications for productivity. If we consider how the state has fared in developing seed/plant varieties, the performance leaves much to be desired. The Kerala Agricultural University released a number of high-yielding varieties (HYV) of rice which had been widely adopted, but the levels of productivity realized from these varieties under farm conditions have been much below their potential¹.

¹ This aspect has been brought out in the evaluation studies on the adoption of High Yielding Varieties of rice in the state by the State Planning Board and the Kerala Agricultural University. There are also studies that examined the socio-economic factors influencing the adoption of HYVs. For a review, see Nair and Santhakumar (1999).

The varieties developed by the research system were not found suitable to local ecological and environmental conditions, and hence their performance was limited. In the case of coconut, the development of HYVs has been very slow; however, the research stations have developed several agricultural practices and cropping systems that could increase the productivity of coconut gardens and increase income per unit of land. The adoption of such practices at the farm level has not been very encouraging. In trying to deal with this, research so far has not succeeded in offering a solution to the root-wilt disease that has been a catastrophe for coconut production in the state (Narayana et al., 1991). Control of the many pests and diseases that have played havoc with the productivity and yield of the state's other major crops presents a similar problem. Nor have technological developments in value addition risen to the desired levels. Efforts to develop value-added products out of coconut have made little progress. In the case of crops like pepper and cardamom, there have been some achievements in the development of HYVs, but the failure to develop effective remedies for pests and diseases offsets these achievements (George et al., 1989). Rubber is perhaps the sole crop in the state for which HYVs have been able to contribute to a significant increase in productivity (Lekshmi and George 2003). In short, the contribution of the research system in developing seed/plant varieties suitable to agro-ecological conditions and evolving cultural practices that could sustain yield levels has been unimpressive (Varghese, 1999).

Dissemination of the little knowledge produced by the research system has also fallen short of the mark. The state's previous innovations in making the agricultural extension system responsive to farmers' needs through programmes like the Training and Visit System, the *Krishi Bhavans* at the *panchayat* level, the Group-Farming initiative, etc. have all fallen short of producing the desired results. The extension system remains weak as a link between the farming community and the agricultural research system.

Another role of the state that has significant bearing on the performance of agriculture is the input supply to production and the marketing of agricultural commodities. Although the state has established a network of seed farms to supply quality seedlings to farmers, the bulk of the supply of seeds and planting materials comes from the private sector with no quality control mechanism in place. Inputs like fertilizer and pesticides are also supplied by the private sector indiscriminately, frequently and unscrupulously, with dire consequences for the environment and the health of the population. Direct subsidies, when provided for the inputs, are administered by the concerned line departments through the *Krishi Bhavans*. Many of these programmes and policies for input supply are crop-specific and have not been effective in contributing to productivity growth.

The public sector will have to play the lead role in technology development and diffusion. Privatisation of agricultural research and extension may not be feasible or acceptable, since there is a lurking danger of cultivators losing access to knowledge. Privatisation is advisable for highly valued cash crops, in the case of which farmers have the ability to pay for the technology, provided it is under state guidance and regulation.

From the point of view of equity, small and marginal farmers would need to be exempted from paying for the services. In making the agricultural extension system more effective and accountable, devolving the powers and responsibility of running the extension system on the *panchayats* would be an important step forward, given the experience of the HYVs that failed under local ecological and farm conditions and in view of the need for local control over integrated watershed development. The present situation of extension personnel being over-burdened with administrative responsibilities requires urgent rectification if they are to perform their expected role effectively.

The state has developed a wide network of credit and marketing co-operatives. In the case of agricultural credit from co-operative and commercial banking institutions, although the absorption of agricultural credit per acre of cultivated land is estimated to be much higher than in other states, there has been considerable mis-utilization, with the effect that the great success observed in the case of the milk co-operatives has not been repeated in the case of the agricultural co-operatives. In the agricultural commodity markets, the prices received by small and marginal farmers for most of the cash crops have remained lower than those received by middle and large farmers. Marketing margins are also generally very high and traders and exporters have a decisive influence in deciding the price, as state interventions in the agricultural commodity markets have failed to contribute to stabilization of prices or to making the market efficient.

The regulatory role of the state in the agricultural commodity market is an important area of concern. Market failures in the commodity markets often do not arise from demand-supply mismatch, but from distortions stemming from the very organization of the markets. It is important to eliminate such distortions that vary from commodity to commodity, depending on the nature of organization of the specific market. A related issue is the instability in commodity prices that would arise with trade liberalization. Increase in price instability would significantly influence farmers' decision-making processes regarding choice of crops, levels of management, and the application of inputs. The instability in output will be one of the factors that may adversely affect the ability of the domestic producers and exporters to compete in the international market.

Public investment in agriculture, especially in infrastructure, capable of stimulating private investment needs to be stepped up. The aggregate support given to crops grown in Kerala at present is practically negligible. State investment and even subsidy of agriculture is justified both from the livelihood and the environmental point of view. The usual subsidies given to Indian agriculture (minimum support price, fertilizer, irrigation, etc.) are of very little advantage for farmers in Kerala. Since the state has moved largely into a pattern of tree/perennial crop agriculture, the subsidies available here should help stabilize and sustain the output of these crops. One of the major constraints in this respect is the low rate of re-plantation of the old trees. National and state policies will have to be re-oriented to accommodate such crop-specific problems.

In the absence of realization of the potential productivity and efficiency of the state's agriculture, attempts to expand cultivation would naturally appear to be the only other

option. In a situation in which there is little cultivable land for further use, sub-marginal areas and forestlands are being exploited for cultivation. Over and above this expansionary process, crop shifts, conversion of land from one use to another, etc. are taking place, resulting in much environmental degradation. The pace of environmental degradation may accentuate with increased risks, uncertainties and vulnerabilities in the agricultural sector, generated by the growing economic liberalization process, unless countervailing proactive steps are taken.

6 Conclusion

Against the backdrop of anxieties and optimistic anticipations about the impact of trade liberalization on agriculture in India in general and the state of Kerala in particular, this paper has examined the growth performance of Kerala's agriculture and the underlying factors relating to the comparative advantages and disadvantages of major agricultural commodities in the state, price fluctuations, and the implications of trade liberalization for the state's agriculture. The role of the state in ensuring food security and sustainability through various measures to improve agricultural productivity and ensure price and product advantages, and in putting a check on environmental degradation, is perceived as both onerous and crucial – despite the general impression that with globalisation and liberalization the state recedes into insignificance.

It is contended that in order to face the challenges outlined in this paper, the state's commanding role is indispensable, and that a series of reforms is inevitable. Although the task of working out the details of a reform agenda does not fall within the purview of this paper, we have tried to highlight some of the important elements in such an agenda as they emerged from our analysis of agriculture in Kerala. As indicated at the outset, this paper departs from the usual crop-specific analyses, and has instead highlighted the importance of an integrated regional perspective on agriculture, embedding a crop-specific analysis within it.

7 References

- Ahluwalia MS. 1996. New economic policy and agriculture: Some reflections. *Indian Journal of Agricultural Economics* 51(3):412-426.
- Bhalla GS, editor. 1994. *Economic Liberalisation and Indian Agriculture*. New Delhi, India: Institute for Studies in Industrial Development (ISID).
- Bhalla GS. 1995. Globalization and agricultural policy in India. *Indian Journal of Agricultural Economics* 50(1):7- 26.
- Bhattacharyya B. 2003. Trade liberalization and agricultural price policy in India since reforms. *Indian Journal of Agricultural Economics* 58(3).
- Brandao A, Martin W. 1993. *Implications of Agricultural Trade Liberalisation for the Developing Countries*. Working Paper No. 1116, Washington DC: World Bank.
- Cherian O. 2003. *Changes in the Mode of Labour Due to Shift in the Land Use Pattern*. Report prepared for Kerala Research Programme for Local Level Development. Trivandrum, India: Centre for Development Studies (CDS).
- Damodaran A. 2000. *WTO Agreement on Agriculture and Plantation Commodities – Implications and Response Strategies: Synoptic View*. Paper submitted to UPASI. Bangalore, India: Indian Institute of Plantation Management.
- George PS, Nair KN, Pushpangadan K. 1989. *The Pepper Economy of India*. New Delhi, India: Oxford and IBH.
- Government of Kerala. 2003. *Report of the Commission on WTO Concerns in Agriculture: Building a Sustainable Agricultural Trade Security for Kerala*. Trivandrum, India: Centre for Development Studies (CDS).
- Gulati A, Sharma A. 1997. Freeing trade in agriculture: implications for resource use efficiency and cropping pattern changes. *Economic and Political Weekly* 25(3):A155-164.
- Kannan KP, Pushpangadan K. 1988. Agricultural stagnation in Kerala: An exploratory analysis. *Economic and Political Weekly* 24(19).
- Kannan KP, Pushpangadan K. 1990. *Dissecting Agricultural Stagnation in Kerala: An Analysis of Cross Crops, Seasons and Regions*. Working Paper No. 238. Trivandrum, India: Centre for Development Studies (CDS).
- Lekshmi S, George T. 2003. Expansion of natural rubber cultivation in Kerala: An exploratory analysis. *Indian Journal of Agricultural Economics* 58(2): 218-233.
- Mahesh R. 1999. *Causes and Consequences of Change in Cropping Pattern: A Location-Specific Study*. Discussion Paper No. 11, Kerala Research Programme for Local Level Development. Trivandrum, India: Centre for Development Studies (CDS).
- Nair KN, Narayana D, Sivanandan P. 1989. *Ecology or Economics in Cardamom Development*. New Delhi, India: Oxford and IBH.
- Nair KN, Santhakumar V. 1999. *Kerala's Agriculture by the End of the Twentieth Century: An Interpretation*. Trivandrum, India: Centre for Development Studies (CDS).
- Nair KN. 2000. Food security and the public distribution system. In: Krishnaji N, Krishnan TN, editors. *Public Support for Food Security: The Public Distribution System in India*. New Delhi, India: Sage, pp. 313-332.
- Nair LR. 1993. *Grain Supply in a Chronically Food Deficit State: The Case of Kerala*. Unpublished M.Phil Thesis. Trivandrum, India: Centre for Development Studies (CDS).
- Narain Dharam 1998. *Studies on Indian Agriculture*. New Delhi, India: Oxford University Press.

- Narayana D, Nair KN, Sivanandan P, Shanta N, Rao GN. 1991. *Coconut Development in Kerala: Ex-post Evaluation*. Trivandrum, India: Centre for Development Studies (CDS).
- Narayana D. 1992. *Interaction of Price and Technology in the Presence of Structural Specificities: An Analysis of Crop Production in Kerala*. Unpublished Ph.D. Thesis. Indian Statistical Institute: Calcutta.
- Nayyar D, Sen A. 1994. International trade and the agricultural sector in India. In: Bhalla GS, editor. *Economic Liberalisation and Indian Agriculture*. New Delhi: Institute for Studies in Industrial Development (ISID).
- Padhi S.P, Nair KN. 1992. *Dynamics of Land Distribution: An Alternative Approach and Analysis with Reference to Kerala*. Working Paper No. 245. Trivandrum, India: Centre for Development Studies (CDS).
- Panikkar PGK, Krishnan TN, Krishnaji N. 1977. *Population Growth and Agricultural Development: A Case Study of Kerala*. Trivandrum, India: Centre for Development Studies (CDS).
- Patnaik U. 1996. Export oriented agriculture and food security in developing countries and India. *Economic and Political Weekly* 31 (35, 36 and 37).
- Raj KN, Tharakan M. 1983. Agrarian reforms in Kerala and their impact on the rural economy: A preliminary assessment. In: Ghose A.K. (ed.). *Agrarian Reform in Contemporary Developing Countries*. London, UK, and Canberra, Australia: Croom Helm, pp. 31-90.
- Rao KYV. 2000. Agriculture under WTO and new economic policy. In: Singh RP, editor. *Implications of GATT / WTO on Agriculture and Rural Development*. Hyderabad, India: National Institute of Rural Development.
- Storm S. 1997. Agriculture under trade policy reforms: A quantitative assessment of India. *World Development* 25(3):425-436.
- Varghese S. 1999. *Agricultural Research and Agricultural Performance in Kerala*. Unpublished M. Phil thesis. Kerala, India: Centre for Development Studies (CDS).

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