

## CHAPTER 4

# AGRICULTURE

### Introduction

Economic liberalisation - induced demand-based agricultural production necessitates moving away from a stable price support system towards exposure and adjustment to unstable international prices. The decreasing trend in family participation in the farm operation with growing incidence of fragmentation and consequent decline in the average size of land holding and subdued growth in yields and dominance of perennial crops make Kerala agriculture more vulnerable. Being the major cash crop producing state in the country, Kerala is perhaps the most affected by agriculture related trade policies adopted by Government of India. The import of pepper from Sri Lanka under the Indo-Sri Lankan Agreement affecting pepper farmers in the State is an example. Steps have to be taken to improve productivity and quality.

4.2 The rise in international prices of some of the commodities since the second half of 2002 and 2003 was reflected in the domestic prices also. However, long run series of international prices show cyclical movements. The prices have a tendency to rise for 4-5 years and thereafter decline for about same number of years. Such behavior implies that high level of international prices could largely be a part of cyclical behavior. International prices of agricultural commodities are characterised by high volatility, which is the crucial factor for the trade policy and strategy. An appropriate and suitably strengthened mechanism in the state needs to be put in place urgently to influence Trade Policy formulation in the dynamic context.

4.3 The domestic agricultural products have to compete with cheaper imports due to increasing liberalisation of import regulations. Quality standards have several dimensions like adherence to global environmental and health standards and proper certification. A thorough review of adequacy of institutional arrangements in quality control, certification and trading in the agriculture sector should be a state priority to take advantage of global opportunities particularly in spices, marine products, organic agriculture, horticulture prod-

ucts and medicinal plants. The Sanitary and Phytosanitary (SPS) norms are gradually becoming a weapon of trade discrimination. Greater awareness on quality consciousness across the value chain through appropriate extension support, improved post harvest technology and infrastructure support could help increase agricultural exports from the state.

4.4 The Medium Term Export Strategy 2002-07 (MTES) sets out a road map for the export sector which would be co-terminous with the Tenth Five Year Plan period. The MTES aims at increasing India's share in world trade to one per cent by 2006-07 from the present level of 0.67 per cent. The modified EXIM policy would continue to lay focus in the direction of further export facilitation measures already initiated with a view to ensuring increased country's share in world exports.

4.5 Agricultural extension is the key to augment productivity of crops to a great extent and extension should begin to broad base its programmes by utilising a farming systems approach, and suitably address marketing and value addition. Wider use of electronic mass media through optimising the strengths of public-private sectors has to be adopted.

### Farming System

4.6 It is expected that future agricultural growth would largely accrue from improvements in productivity of diversified farming systems with regional specialisation and sustainable management of natural resources, especially land and water. It is important to explore frontiers in technology focusing on evolving location specific and economically viable technologies by capitalising developments in the field of biotechnology, information technology crop and water management. Effective linkages of production system with marketing, agro processing and other value added activities would play an increasingly important role in the diversification of agriculture.

4.7 The major strength of the mixed cropping pattern traditionally followed in Kerala was the high degree of resilience for meeting the adverse conditions emerging from the loss in revenue as a result of the fall in prices of agricultural commodities. Fluctuations in the prices of agricultural commodities normally do not adversely affect a cross section of the commodities concurrently and the mixed cropping system thus acts as a cushion for absorbing the shock through cross subsidisation. However, the extent of coverage under mixed cropping system has become quite low in the state. Eventhough the strategy has been advocated for the last one and a half decades, especially in these Reviews, the adoption rate as well as success stories reported are far below the potential. Mixed cultivation has to become the general pattern in all farms in the state as was the case once.

**4.8 Diversification of agriculture needs to encompass subsidiary farm activities such as apiculture, dairy, agroforestry, piggery, fisheries and poultry and appropriate marketing strategies need to be designed to make these products internationally competitive. Diversified agriculture will need much more complex commercial linkages between the farm and the market.**

4.9 The results of the trials in CPCRI indicate the feasibility of several crop combinations in coconut gardens. The major findings of experimental trials are shown in BOX 4.1. Perennial crops like coconut which occupy the land solely and continuously for several decades neither result in realisation of the full potential of the land nor in protecting the sustainability of the land. More focused attention is needed to promote multi species vegetation not only as an income security strategy in combination with supplementary enterprises, but also to optimise biophysical and socio economic resource use. This strategy is also relevant in the WTO context of reduced protection.

4.10 The experiments conducted at CPCRI in root wilt affected coconut gardens with mixed cultivation also revealed improved performance

of affected palms.

4.11 The diversification of the farming system also offer opportunities to boost nutritional security of the small holders. The introduction of nutritionally rich crops in the farming system could safeguard the nutritional security of the people.

### **Income**

4.12 The trends in agricultural income in Kerala during the last ten years is shown in Table 4.1. Eventhough the sector has recorded positive trend in growth performance in nineties, it has not been consistent. Food crops in general have suffered a set back in area and production despite a sizeable investment. The earlier indication as per the provisional estimate by the Department of Economics and Statistics was that the growth rate in agricultural income would be around 1.70 per cent in 2001-02. However, the final figures indicated a decline of 1.52 per cent in growth and the provisional figure for 2002-03 shows a further decline of 5.54 per cent. The dismal performance could be attributed to decline in crop production coupled with low prices of major agricultural commodities. The deficient rainfall especially SW monsoon in 2002 also had contributed to the decline in crop production. The contribution of agriculture to State income has been on the decline as the other sectors registered higher rates of growth.

### **Rainfall**

4.13 The South West monsoon of 2003 was marked by near normal rainfall over the country in general and the total South West rainfall in India was 102 per cent of its long period average. However, in Kerala, the rainfall was only 2288 mm in 2003 (upto 31 October), against the normal of 2742 mm. in this period, indicating a deviation of 17 per cent from the normal. Highest deviation from normal was recorded in July and shortage of South West Monsoon was to the extent of 24 per cent from the normal (Table-4.2). In Kerala the highest departure from the normal in the last two decades was recorded during the Southwest Monsoon of 2002. This adversely affected agricultural production in the state. However North East Monsoon was above normal (32%) in 2002. The figures are -24 and 4.9 per cent re-

**Box - 4.1****Major Findings of Studies on Farming Systems****A. High Density Multi species Cropping System**

➤ In the coconut based high density multi species cropping system, the coconut yield ranged from 122 nuts/palm/year under 1/4<sup>th</sup> of the recommended fertiliser dose to 144 nuts/palm/year at full dose of the recommended fertiliser - while net returns was the highest with 1/4 recommended dose of fertiliser. Microbial bio mass and enzyme activities were highest in one fourth dose of fertilizer recommendation.

**B. Coconut based farming system under Coastal ecosystem**

➤ The experiment was started in 1999, to study the profitability of coconut based system with fodder, dairy, poultry and pisciculture.  
 ➤ The plant nutrient status indicated improved NPK due to beneficial interaction of palms and improved soil fertility status.

**C. High density multi species cropping system model for coconut root (wilt) affected garden**

➤ Coconut 112 nos. (adult), 152 coconut seedlings, 45 adult nutmeg, 25 nutmeg seedlings, 26 pepper plants in coconut and another 82 pepper in the inter spaces, 500 banana plants, 1920 pineapple, 100 amorphophallus, cassava 75 plants and 100 Vanilla plants in 1 ha. area are included in the system.  
 ➤ Apparently healthy and disease early palms produced higher number of nuts.  
 ➤ Overall there was decrease in the yellowing and necrosis of the Palms indicating improvements in growth character due to management practices.

**E. Result of a field Survey**

➤ Result of a field survey in 100 holdings in Kannur district on coconut based farming system showed that the average net income varied from Rs. 20,000 to Rs. 40,000 /ha under rainfed conditions and Rs. 40,000 to Rs. 60,000 /ha under irrigated conditions.

*Source: CPCRI*

**Table 4.1:**  
**Growth of Agricultural Income in Kerala**  
**(at 1993-94 prices )**

Sl. No.	Year	* Agricultural Income (Rs. in crore)	Rate of change over previous year (%)	Percentage contribution to State income
1.	1993-94	6256	-	26.23
2.	1994-95	6897	10.25	26.62
3.	1995-96	6947	0.72	25.78
4.	1996-97	7115	2.42	25.39
5.	1997-98	6777	- 4.75	23.67
6.	1998-99	6900	1.81	22.52
7.	1999-00	7017	1.70	21.45
8.	2000-01	5448	- 22.36	16.23
9.	2001-02	5365	- 1.52	15.38
10.	2002-03	5068	- 5.54	13.72

\*Includes Livestock sector

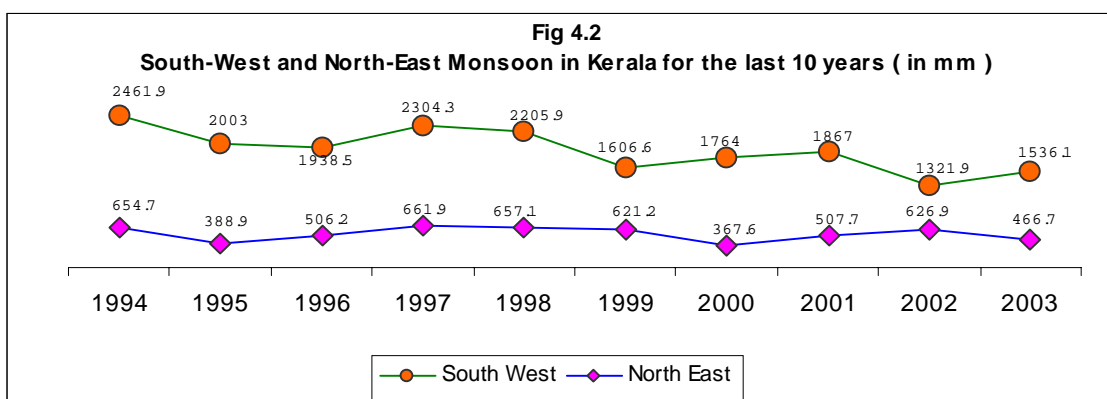
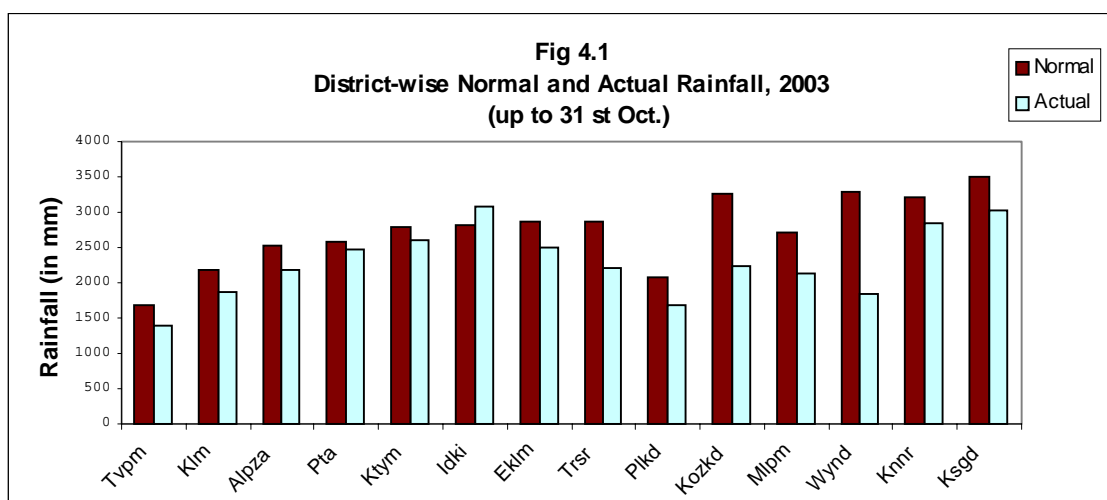
*Source: Directorate of Economics and Statistics*

spectively in 2003. The deviation in rainfall, apart from affecting production and productivity of annual crops, also affects the productivity of perennial crops such as coconut, rubber and pepper in the long run. Spatial and monthly pattern of rainfall and related data are shown in Appendix 4.3,

4.4. and 4.5. Maximum deviation from the normal was observed in Wayanad (-43%) followed by Kozhikode (-32%) during 2003. During the South West Monsoon of 2003, deficient rainfall was recorded in 10 districts.

**Table 4.2:**  
**Percentage Departure of Rainfall from Normal (1990 to 2003)**

Sl.No.	Year	Annual	South West Monsoon	North East Monsoon *
1.	1990	-28	-25	-4
2.	1991	-39	18	-21
3.	1992	-37	15	35
4.	1993	-08	-12	32
5.	1994	11	15	13
6.	1995	-06	-6	-22
7.	1996	-13	-8	2
8.	1997	3	6	31
9.	1998	0	2	30
10	1999	-8	-25	23
11	2000	-21	-18	-27
12	2001	- 6	- 13	0
13	2002	- 14	- 33	32
14	2003 *	- 17	- 24	4.9



## Ground Water Recharge

4.14 Rainfall is the major recharge source of ground water, and the rise in water level in the Phreatic aquifer is directly related to precipitation. A falling trend in the post monsoon months indicates that the rainfall is not sufficient to recharge the aquifer to the required level. The data related to water level recharge and fluctuation levels in the State are shown in BOX 4.2

### Box - 4.2

#### Major Findings of a Study on Water level Fluctuations in Kerala

The data pertaining to 864 National Hydrographic Network Stations were monitored for water level during the month of April, August, November 2001 and January 2002.

- During the year 2001-02, less rainfall was recorded in comparison with 2000-01, for NE and Summer seasons except South West monsoon.
- About 20.5% of NHS have shown fall in water level during January 2002 in comparison with April 2001 which are mostly located in the districts of Malappuram, Wayanad, Ernakulam and Thiruvananthapuram.
- During November 2001, the rise in the water level is predominant in almost all the districts due to higher rainfall received during North East monsoon of the year 2001 in comparison with the corresponding period in 2000.
- The comparison of the water level of 2001-02 with that of mean water level of 1991-2001, indicates that the water level has not changed much and water level fluctuation is confined to the range of +2m to -2m. However in the month of August 2001, fall in water level is more predominant in many districts except in the case of Kasaragod and Kozhikode districts.
- Long term trend of data from 1981-2001, indicates that in 72% of NHS, water level fluctuation is negligible. 10% of NHS showed declining pre monsoon trend in the range of 0.05 to 0.0 m/year.

Source: CGWB, 2003

4.15 The fall in water level could be due to the failure of monsoon and due to enhanced development of ground water. Most of the NHS which showed declining pre monsoon water level have a steady post monsoon water level trend. However, some of the NHS in the district of Malappuram, Palakkad and Pathanamthitta have shown falling trend in water level during pre-monsoon as well as post monsoon periods which need attention. Further shortfall of rainfall in the State would affect the water levels in more districts.

#### Need for Micro Irrigation

4.16 In the context of water stress and scarcity, adoption of modern irrigation technologies such as micro irrigation systems which save water and improve efficiency assume paramount importance. The recent drought brings into sharp focus the need for conservation of water resources. The Government of India appointed a Task Force on micro irrigation under the Chairmanship of the Chief Minister of Andhra Pradesh to recommend measures needed to expand the coverage of area under such irrigation. The major recommendations of the task force are shown in the BOX 4.3

### Box - 4.3

#### Major Recommendations of Task Force on Micro Irrigation

- Rate of taxes on components of micro irrigation systems to be reduced to 2% from the existing range of 4-8%
- Reasonable assistance of 50% cost to be extended to all categories of farmers.
- Micro irrigation should be made compulsory in the Command areas of new irrigation projects.
- Extend coverage to 2 million ha which requires an investment to the tune of Rs. 9000 crores.
- Purchase of micro irrigation systems are also to be considered as part of agricultural loan for enabling farmers to derive the benefits of low interest rates.
- In order to reduce high initial investment needed, technological interventions like crop geometry modification etc. has to be adopted.
- Promote demonstration units.
- Feasibility of low cost drip to be explored.

Source: Ministry of Agriculture, 2003

4.17 Micro irrigation comprising of drip and sprinkler become a pivotal element of integrated water use system with many agroecological, socio economic and environmental advantages. Though the hectareage under micro irrigation in the country rose from a meager 1500 hectares in 1980s to near 5 lakh hectares in 2000, the technology adoption is confined to only few selected areas. In Kerala also the scheme on popularization of drip and sprinkler irrigation is under implementation. But the coverage is very low. More focussed attention is needed to popularize micro irrigation in the State. The salient find-

ings of an evaluation study on sprinkler irrigation in Kasaragod district conducted by NABARD are shown in BOX. 4.4. Apparently there is no constraint in adoption of micro irrigation except the high initial investment which could be addressed through credit.

**4.18 The experiments conducted at CPCRI have demonstrated the possibility of reduction of 50 per cent of fertilizer dose for coconut through drip irrigation. Detailed action plan has to be prepared for popularizing micro irrigation in the state.**

#### Box - 4.4

##### Major Findings of an Evaluation Study on Sprinkler Irrigation in Arecanut Gardens in Kasaragod District of Kerala

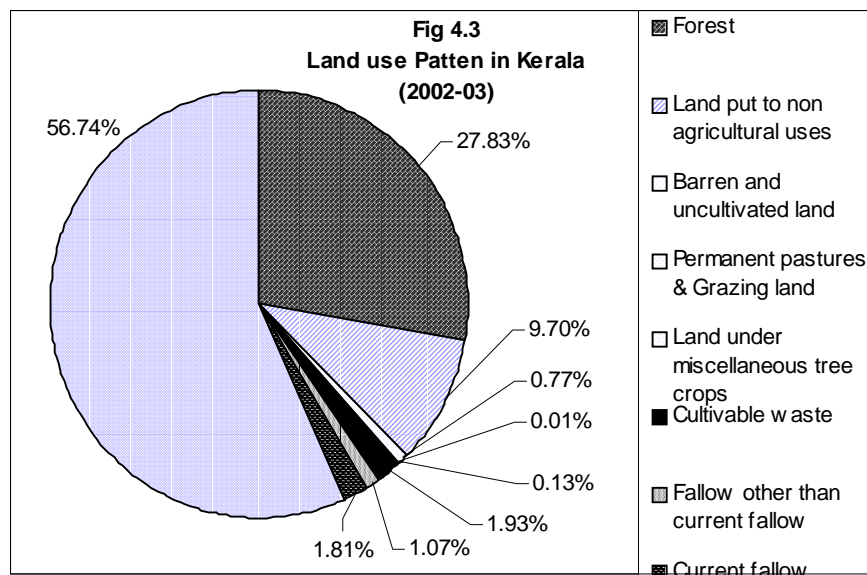
- A sample of 50 beneficiaries was randomly selected from each of the identified schemes financed by RRB and PCARDB. Further, a control sample of 15 farmers (non-beneficiaries) was also selected for comparison purposes. All the costs and benefits were valued at the reference year prices of 1999-2000.
- The cost of maintenance per acre ranged between Rs. 21841/- and Rs. 29132/- while that of control (for irrigation) was above Rs. 64109/- the higher cost per acre for control samples was on account of high cost of irrigation using manual labour. Thus the main advantage of the installation of sprinkler irrigation in arecanut gardens was from the substantial reduction in labour cost. The financial rate of return for all the models worked out to be more than 50 per cent.
- Sixty percent of the respondents of RRB were small farmers while it was 24 percent in the case of PCARDB.
- Erratic power supply was a major constraint in operating the sprinkler system. Hence the farmers had to resort to keeping stand by diesel/kerosene pump.
- The sprinkler systems installed in the beneficiaries' gardens were functional in all the cases.
- The major source of water for irrigation was streams. Scarcity of water was reported during summer months.
- Though the scheme envisaged shifting type of sprinkler sets, the farmers installed fixed type sprinkler sets, as the installation of sprinkler was intended to save labour.
- The repayment performance of the beneficiaries were found to be satisfactory. Only 20 percent of the beneficiaries from RRB and 8 percent from PCARDB reported overdues. All defaults were wilful.

Source: NABARD, 2002

4.19 Data on land use pattern of Kerala for the year 2002-03 is given in Table 4.3. Out of a total geographical area of 38.85 lakh ha. net sown area is about 57 per cent. Forest occupies around 28 per cent. Agriculture and forest sectors together account for over 85 per cent of the land area (see Fig. 4.3).

There was no perceptible improvement in the extent of land use for agriculture. Land under non-agricultural uses was 9.10 percent in 1999-2000 and has increased to 9.70 per cent in 2002-03. There was decline in the area under current fallows (8772 ha) and an increase in the area under fallow other than current fallow (7431 ha). during 2002-03 over 2001-02. The area under cultivable waste also increased by 11239 ha. and barren and uncultivated land by 50 ha.

4.20 In the light of the newly introduced ordinance on promotion of tree growth in non-forest areas, more focussed action plan is needed to promote farm forestry to utilise the homesteads and other available land for the promotion of tree growth.



**Table 4.3:**  
**Land Use Pattern in Kerala** (in Ha)

Sl. No.	Classification of Land	2000-01	2001-02	2002-03		Change in Area between 2001-02 & 2002-03	
				Actual	% of Geo. Area	Actual	%
1	Total Geographical Area	3885497	3885497	3885497	-	-	-
2	Forest	1081509	1081509	1081509	27.83	0	0
3	Land put to non agricultural uses	381873	392352	376751	9.70	- 15601	- 3.98
4	Barren and uncultivated land	29318	29728	29778	0.77	50	0.17
5	Permanent pastures & Grazing land	164	233	451	0.01	218	93.56
6	Land under miscellaneous tree crops	15409	13613	5186	0.13	- 8427	- 61.90
7	Cultivable waste	59257	63771	75010	1.93	11239	17.62
8	Fallow other than current fallow	33988	34331	41762	1.07	7431	21.65
9	Current fallow	77853	79270	70498	1.81	- 8772	- 11.07
10	Net area sown	2206126	2190690	2204552	56.74	13862	0.63
11	Area sown more than once	815556	801562	823671	21.19	22109	2.75
12	Total cropped area	3021682	2992252	3028223	77.94	35971	1.20
13	Cropping intensity	137	137	137			

Source: Directorate of Economics & Statistics

### Trend in Area, Production and Productivity of Crops

4.21 Data regarding the area, production and productivity of important crops grown in Kerala are shown in Table 4.4 and Appendix 4.6. Out of a gross cropped area of 30.3 lakh.ha. in 2002-03, food crops comprising rice, pulses, minor millets and tapioca occupy only 15 per cent. Kerala state which had a low base in food production is facing serious challenges in retaining even this meagre area. Kerala agricultural economy is undergoing structural transformation from the mid seventies by switching over a large proportion of its traditional crop area which was devoted to subsistence crops like rice and tapioca to more remunerative crops like coconut and rubber.

4.22 The area under rice has come down from 3.22 lakh ha. in 2001-02 to 3.11 lakh ha. in 2002-03. In the case of tapioca also the area has declined from 1.11 lakh ha. to 1.10 lakh ha during this period. The area

under commercial crops in general and rubber in particular has increased considerably during the last two decades. The trend seems to have slowed down recently. During Ninth plan average annual increase in area under rubber was 1951 ha while during 2002-03 the increase was only 1008 ha. compared to previous year. The low price of rubber that prevailed during the last two years might have influenced the slow rate of area expansion.

4.23 In the case of coconut area was at its peak during 2000-01. During the year 2002-03 area declined by 20300 ha. from 2000-01 and by 236 ha over 2001-02. The low price of coconut coupled with the widespread incidence of mandari pest might have influenced the decline in area. Major commercial crops which had recorded expansion of area during 2002-03 from previous year include cardamom (2900 ha) banana and plantain ( 1163 ha). The major crops with consider-

**Table 4.4:**  
**Area, Production and Productivity of Principal Crops**

Sl. No	Crops	Area ( Ha )		Production ( MT )		Productivity ( Kg/ha )	
		2001-02	2002-03	2001-02	2002-03	2001-02	2002-03
1	Rice	322368	310521	703504	688859	2182	2218
2	Pulses	8191	7357	6281	5548	767	754
3	Pepper	203956	201037	58240	59744	286	297
4	Ginger	10706	10365	40181	39886	3753	3848
5	Turmeric	3558	3388	7895	7598	2219	2243
6	Cardamom	41336	44237	8380	6480	203	146
7	Areca nut	93193	92589	84681	92039	909	994
8	Banana	50871	51805	375903	379884	7389	7333
9	Other Plantains	55183	55412	393182	408649	7125	7375
10	Cashewnut	89718	86623	65867	63287	734	731
11	Tapioca	111189	110297	2455880	2504391	22087	22706
12	Coconut *	905718	905482	5479	5338	6049	5895
13	Coffee	84795	84139	66690	64425	786	766
14	Tea	36899	36821	66090	65800	1791	1787
15	Rubber	475039	476047	580350	594917	1222	1250

\*Production in million nuts & Productivity in nuts/ha

Source : Directorate of Economics and Statistics & UPASI

able loss in area apart from coconut include cashewnut (3095 ha) ginger (341 ha) and turmeric (170 ha). Pepper (2919 ha), Arecanut (604 ha), Tapioca (892 ha), coffee (656 ha) and tea (78 ha).

4.24 With respect to productivity, the tendency of different categories of crops is just the opposite of the trend in respect of area coverage. The major crops with positive growth in productivity levels are ginger 95 kg, rice 36 Kg, Pepper 11 Kg, turmeric 24 kg, Plantain 250 kg, Tapioca 619 kg and Rubber 28 kg. The productivity declined in respect of coffee (-20 kg) and tea (-4 kg), coconut (-154 nuts), and Banana (-57)

4.25 Crops which have failed to sustain the production level of 2002-03 as in the previous year include rice (-14645 MT), cashewnut (-2580 MT), ginger (-295 MT), turmeric (-297 MT), coffee (-2265 MT), coconut (-141 m. nuts), cardamom (-1900 MT), Tea (-290 MT). Increase in production reported during this period include banana (3981 MT) and rubber (14567 MT), Pepper (1504 MT), Arecanut (7358 MT), lantains (15467 MT) and Tapioca (48511 MT).

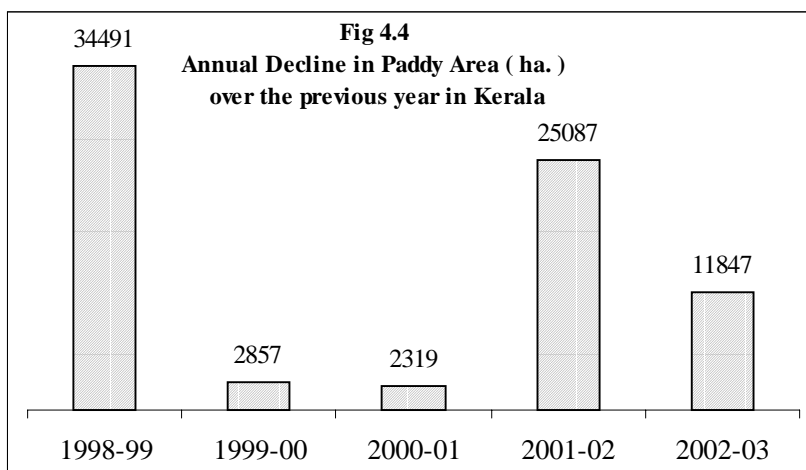
### Crop wise analysis

#### Rice

4.26 The area and production of rice which was steadily increasing till the mid seventies had to succumb to economic pressure emanating from other remunerative crops like banana and coconut and the growth of the construction sector. This resulted in the decline of more than 5 lakh ha of area under paddy cultivation during the last two decades. The twenty five year period from the mid seventies witnessed large scale shift in area under the crop. Rice production touched its peak level of around 14 lakh MT in mid seventies with a coverage of 8.81 lakh ha. The gap in meeting

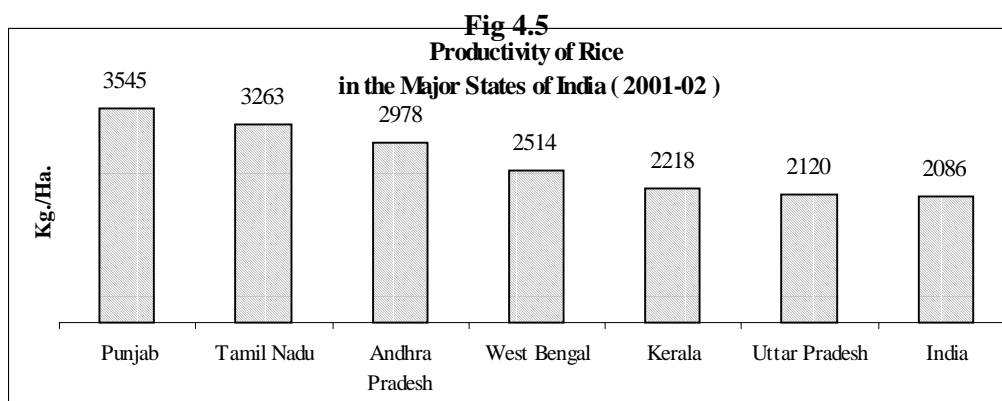
the internal demand of food grains was estimated to be around 50 percent during that period. The increasing cost of cultivation and the disproportionately small rise in price has acted as a deterrent in rice production.

4.27 The average annual decline in area under rice during the Eighth Five year Plan was around 22000 ha,



whereas it has come down to an average of 13000 ha. during the Ninth Plan period. During 2002-03, the reduction was to the tune of 12000 ha. from 3.22 lakh ha. in 2001-02 to 3.10 lakh ha and rice production declined from 7.04 lakh MT 6.89 lakh MT (Fig. 4.4).

4.28 The average productivity is stagnant at around 2.2 MT /ha.(Table-4.4) Rice productivity at current level is sub optimal. Although the average productivity is higher than the national average of 1874 kg/ha, it is lower than the levels achieved by the major rice producing states of Punjab, West Bengal and Tamil Nadu (Fig 4.5). The consistent failure of the crop to rise to the expectations has raised series of questions about the policy to sustain rice production at any cost. The enormous increase in the prices of fertilizers and wages and non-availability of labour in peak seasons



in certain locations, the failure of the irrigation system to serve the areas to the extent desired etc. are problems to be tackled to sustain this crop. The future of rice production in the state lies in improving productivity through promotion of high yielding varieties under scientific management. Strengthening of group farming samithies with the required facilities and gradually raising them to the level of self supporting institutions is perhaps one way to circumvent these problems. However past experience with the group farming programme suggests that neither input subsidies nor infrastructure support *per se* can bring about substantial change in area and production. Instead of pumping in more money by way of additional incentives, appropriate institutional arrangements for organising common services coupled with participatory irrigation management, local water resources development and selective mechanisation could improve the situation. Applied research on emerging technologies and participatory technology development are also equally important.

4.29 Concerted efforts are needed to promote scented rice cultivation in Wayanad, organic rice production in Pokkali lands and medicinal rice in identified potential panchayats with necessary brand promotion and marketing support in association with LSGs. Value added products from medicinal rice could also be promoted on SHG basis in collaboration with ayurvedic industry.

#### Season wise performance

4.30 Season wise data on the performance of rice during the last three years is shown in Appendix 4.8. Data shows decline in area in all three seasons with

relatively less reduction in Mundakan season. There was 3.5 per cent reduction in area during Virippu season in 2002-03 compared to previous year and 6.3 per cent reduction in Punja season. Area under Virippu is gradually shrinking and about 45000 ha out of double cropped land are remaining fallow during Virippu season. Group farming samithies should concentrate their efforts in such areas with a view to bringing such areas under double cropping. Mundakan season accounts for highest share in production with 50 per cent followed by 34 per cent in Virippu and 16 per cent in Punja season. However productivity recorded in Punja is the highest with 2723 kg. per ha. which was 14 per cent higher than that in 2001-02.

#### High Yielding Varieties

4.31 The coverage of high yielding variety is given season wise in Appendix.4.9. In spite of sharp decline in the area under rice, the coverage under high yielding varieties remains steady and is increasing. The coverage which was stagnating in the range of 1.65 to 1.77 lakh ha during the last decade, has registered marked improvement in the last four years. It increased from 1.77 lakh ha in 1998-99 to 2.51 lakh ha in 2002-03. Maximum high yielding variety coverage was in Punja season with 98 percent. followed by Virippu (88%) Mundakan (72%) and overall coverage was 81 percent. (Appendix-4.9). The average productivity of high yielding varieties during 2002-03 was 2342 kg/ha. This implies that the high yielding varieties are not receiving the needed attention for scientific management for securing optimal productivity as there still exists a wide gap between potential yields as established in experimental farms and those actually realised under field condition.

**Table 4.5:**  
**Area, Production and Productivity of Rice in Kerala and India**

Sl. No.	Year	Area('000 Ha)		Production('000MT)		Productivity(Kg/ha)	
		Kerala	India	Kerala	India	Kerala	India
1	2	3	4	5	6	7	8
1.	1998-99	353	44598	727	85995	2061	1930
2.	1999-00	350	44972	771	89680	2203	1994
3.	2000-01	347	44710	751	84980	2162	1901
4.	2001-02	322	44620	704	93080	2182	2086
5.	2002-03	311	40410*	689	75720*	2218	1874

Source: Directorate of Economics and Statistics, Kerala, Ministry of Agriculture

\* Advance Estimates as on 01-07-2003

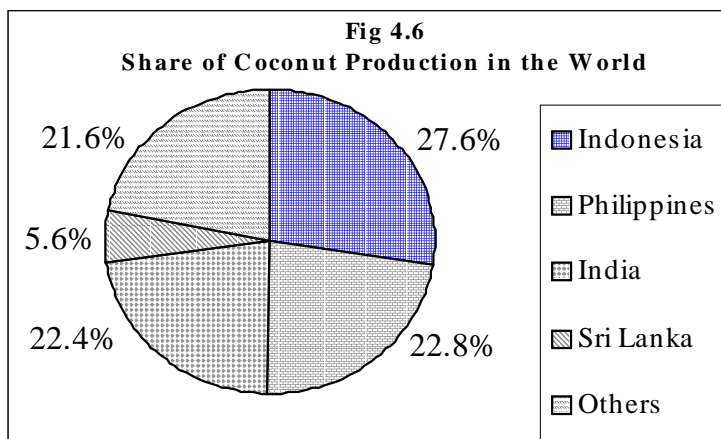
4.32 Eventhough Mundakan season accounts for the largest share in coverage of area under rice its share in high yielding varieties is lower compared to Virippu season. This is mainly because of inadequate research support to evolve varieties with multiple disease resistance suitable for cultivation in different localities in Kerala during Mundakan season.

**Coconut**

4.33 Coconut is cultivated in 12.8 million hectares world wide with a production of 10.9 million tonnes of copra equivalent. Coconut is grown in over 93 countries. Indonesia is the largest producer (28%) followed by Philippines (23%) and India's share in world production is 2 per cent , fourth being Sri Lanka with 6 per cent share. Countries of the Asia-Pacific region

2 per cent growth in eighties. Despite the deceleration in the growth of yields, production of coconuts in the country has increased by about 5 percent per annum due to substantial area expansion at the rate of 3 per cent per annum in Kerala and Karnataka and by 6 per cent per annum in Andhra Pradesh and Orissa and by 5 per cent in Tamil Nadu and 10 per cent in Maharashtra during the nineties.

4.35 Kerala's share in area as well as production of coconut in the country is declining over a period. The share of area declined from 56 per cent in 1991-92 to 48 per cent in 2001-02 with a corresponding decline in share of production from 46 per cent to 43 per cent, while share of area in Karnataka and Tamil Nadu together increased from 29 per cent in 1992-93 to 38 per cent in 2001-02. ( Fig 4.7)

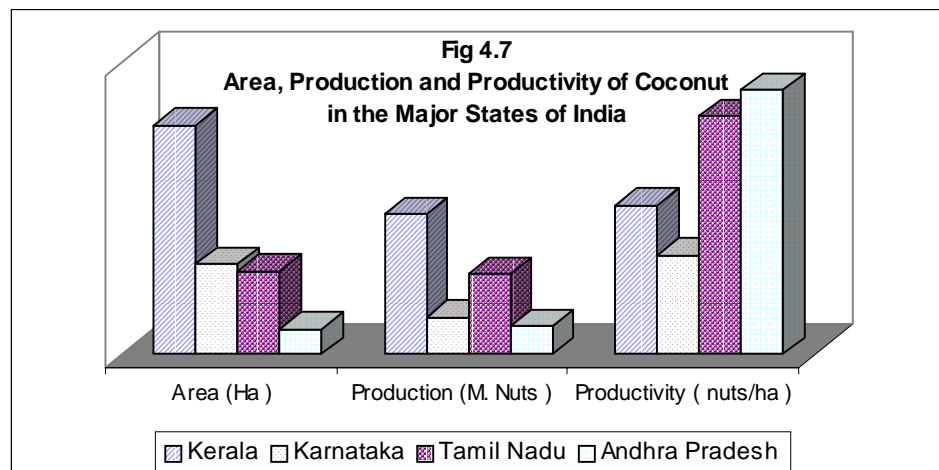


4.36 With a coverage of 9 lakh ha, coconut occupies 41 per cent of the net cropped area and provides livelihood for over 3.5 million families in Kerala. Production declined by 2.6 percent in 2002-03 compared to the previous year. The widespread attack of Mandari pest could perhaps be the factor responsible for the decline in production. A recent survey has reported the incidence of mite at 55 per cent in Kerala, 37 per cent in Karnataka, 44 per cent in Tamil Nadu and 22 per cent in Pondicherry. The pest incidence

produce 86 per cent of the coconut in the world. The major producers and exporters of copra in the world are Philippines, Indonesia and Sri Lanka. Although the share of India in world production of coconut is 22 percent, the production of milling copra is around 12 per cent of the world output, while Philippines accounts for 42 per cent and Indonesia 24 per cent.

has also been reported from many other coconut producing countries. The chemical control though effective needs repeated applications making it not cost effective and eco-friendly. Biological control methods seem effective, however further studies are needed to

4.34 In India, coconut is grown in an area of 1.89 million ha. producing 12822 million nuts with a per hectare productivity of 6776 nuts. (Table 4.6) During the nineties, all India yield growth decelerated significantly to about 1 per cent per annum as compared to about



develop a low cost biological control method in combination with other management practices. The average productivity has slightly declined in 2002-03 by 2.5 per cent to 5895 nuts/ha compared to 2001-02. (Table 4.6) The productivity levels in Kerala are also lower than other major producing states.

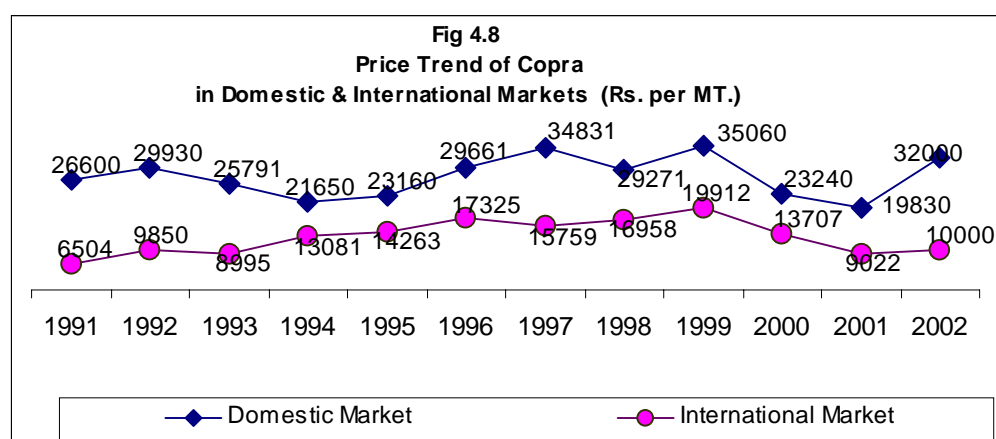
4.37 Apart from sizeable percentage of senile and unproductive palms and the higher incidence of root wilt affected palms, the share of younger non-bearing palms is around 25 per cent as reported in the survey of Department of Economics and Statistics. Over population of palms in holdings (231 Nos. per ha) is another reason for low productivity of palms.

4.38 The International price of coconut oil (Philippines) declined from \$ 737.08 per MT in 1999 to \$ 318.08 in 2001 which recovered to \$421.00 in 2002 and further improved to \$ 451 in 2003. The international price of palm oil reached a peak in 1998 with \$671.08 per MT; it declined to \$ 285.67 in 2001, improved to \$ 390.25 in 2002 and

further moved to \$ 430.60 in 2003. The recovery of international prices of oils seems to have a positive effect on the domestic price of coconut also. The price of coconut in the state has started increasing from the latter half of 2002. The International prices of vegetable oils firmed up in the first half of 2003 as global

stocks of oils and fats declined for the third consecutive year on account of production shortfall caused by weather. Palm oil imports rose sharply following the reduction in customs duty. The import of edible oils by India shot up from 1.06 million MT with a value of Rs. 2260 crores in 1995-96 to 40 lakh MT with a value of Rs. 6465 crores in 2001-02.

4.39 Though India is among the leading producers of coconut in the world, its relative share in the international trade of value added products is insignificant as compared to other major producing countries like Philippines, Indonesia and Sri Lanka. The value of coconut products exported from Philippines was US\$ 1028 million, followed by Indonesia (US\$ 525 million) and Sri Lanka US \$ 121 million) in 2001. Apart from the



traditional products, technologies are available with different institutions for desiccated coconut, coconut cream, spray dried milk powder, pastured tender coconut water etc. More concerted efforts are needed to promote value addition in coconut. Promotion of Hitech ventures in cooperative sector as well as micro

**Table – 4. 6:**  
**Area, Production and Productivity of Coconut in Kerala and India**

Sl. no.	Year	Area ('000 ha)		Production (Million nuts)		Productivity (nuts/ha)	
		Kerala	India	Kerala	India	Kerala	India
1	2	3	4	5	6	7	8
1.	1998-99	882	1755	5132	12536	5817	7145
2.	1999-00	925	1768	5680	12129	6140	6860
3.	2000-01	926	1840	5536	12597	5980	6847
4.	2001-02	906	1890	5479	12822	6049	6776
5.	2002-03	905	NA	5338	NA	5895	NA

*Source: Directorate of Economics and Statistics & Ministry of Agriculture*

enterprises offer scope in the state.

4.40 However it should be recognised that mere diversification and value addition will not make the Indian coconut economy internationally competitive, unless the cost of production of coconut is contained and brought down in real terms over time. For this the primary task is to raise the yield of coconuts. In a survey conducted by CPCRI, it was revealed that basin opening and application of organic manures are widely adopted while plant protection, spacing for optimum plant density and cultivation of high yielding varieties were the items with low level of adoption. The present level of adoption suggests the need for further intervention to enhance technology adoption. Generation of technologies for different agro ecologic situations may improve the level of adoption. Integrated farming system with due emphasis on multi tier cropping systems needs to be promoted in different agro ecological situations.

### Pepper

4.41 India is the largest producer of pepper in the world with 25 per cent in share of production followed by Vietnam with 23 per cent and Indonesia with 16 per cent in 2002 and the world production was 3.24 lakh MT. World pepper production had registered a six per cent growth during 2002. In 1991, Vietnam was in seventh position with a share of just 3.8 per cent of world production. The projections for world pepper production place Vietnam as the leading producer with 80,000 MT followed by India with 65000 MT for 2003. There is concurrent increase in area, production and productivity in Vietnam over the period and productivity in Vietnam is around 1.3 MT/ha.

4.42 The state continues to enjoy a near monopoly in area and production of pepper, accounting for 95 per cent each in the country. The productivity achieved its peak level of 376 kg. per ha during 1998-99. The productivity of pepper recorded during 2002-03 was only 297 kg. per ha. The production increased from 58240 MT during 2001-02 to 59744 MT in 2002-03. Pepper produced in Kerala fetches a premium price in international market in view of its intrinsic quality. However consequent to the liberalisation of imports, there are reports of low quality pepper arriving from other producing countries. The import of pepper has increased from 4028 MT in 2000-01 to 15750 MT in 2002-03 affecting the interests of pepper farmers of the State. The Indo Sri Lankan Free Trade Agreement allowing free import of pepper has to be modified to safeguard the interests of Kerala farmers. Government of India is now negotiating with Sri Lanka for a comprehensive Economic partnership Agreement and the issue needs to be addressed in the proposed new agreement. The country wise import of pepper into India is shown in Table 4.7.

4.43 India could export 42803 MT of pepper in 1999-2000, which declined to 24000 MT in 2001-02. Export performance dissipated further and quantum of exports declined to 20,000 MT in 2002-03. The value realization was also lower at Rs. 166.10 crores compared to Rs. 211.93 crores in 2001-02 and unit value realization declined from Rs. 88.30 per kg to Rs. 83.05 per kg. in the corresponding period. The unit value realisation has slightly improved to Rs. 88.85 in April to July 2003 USA is the major export market for India accounting for 45 per cent followed by Canada (11%) in 2002-03. Vietnam is the leading exporter with 31 per cent followed by Indonesia with 22 per cent, Bra-

**Table 4.7:**  
**Country-wise Import of Pepper into India**  
(Quantity in MT and Value in lakh Rs)

Sl. No.	Country	2000-01		2001-02		2002-03	
		Quantity	Value	Quantity	Value	Quantity	Value
1.	Sri Lanka	1759.31	2790.66	1240.54	1605.08	6373.61	5888.10
2.	Vietnam	666.90	689.88	2658.00	2197.92	7425.61	5090.41
3.	Indonesia	1188.76	1673.87	2010.35	1474.80	1631.73	1332.35
4.	Others	412.78	528.85	419.27	358.46	319.05	210.57
	Total	4027.75	5683.26	6328.16	5636.26	15750.00	12521.43

Source: Spices Board

zila 20 per cent and India 13 per cent. Vietnam exports around 83 per cent of its production, while Indian exports account for only 32 per cent of its production. The worsening export performance continued during April-July 2003 also.

4.44 Government of India could build in adequate safety mechanism and monitoring system to see that the issue of certification of origin and the condition relating to origin of the goods are not violated. A quantitative limit has to be prescribed in respect of import under the concessional duty route similar to the one fixed for tea under the same agreement. Similarly in respect of import for re-export of pepper which enjoys duty free status, a minimum value addition needs to be prescribed.

4.45 Price of pepper moved consistently upwards from early nineties and reached a peak level in 1999-00 with Rs. 205 per kg. Since then declined to Rs. 125 per kg. in 2000-01, further down to Rs. 69 per kg. in 2001-02 and slightly improved to Rs. 78/kg. in 2002-03. Pepper prices continued its declining trend since 2000.

**4.46 The state has to bestow specialised attention for upgrading the productivity through an organised replanting programme. The productivity in India is the lowest among the major producing countries. It is the highest in Thailand with 4.3 MT/ha. followed by Malaysia with 2 MT/ha in 2001. Application of soil conditioners, plant nutrients including micronutrients and biofertilizers under a frame-**

**work of yield targeting in combination with plant growth promoting bacteria and Trichoderma as demonstrated by Indian Institute of Spices Research (IISR) could be adopted for enhancing productivity of pepper. The major findings of research at IISR is shown in Box.4.5:**

4.47 The varietal selection and improvement through genetic upgradation is also important for stabilizing and retaining its lead share in global trade.

4.48 The quality issues reported in consignments exported from India include presence of pesticide residues, mycotoxins and microbial contaminations. In the liberalised policy regime, exporters with the status of trading house, star trading house or with in process quality control system can export spices without pre-shipment inspection and certification. Quality control is very important in the post WTO context to retain the market share and the SPS norms are gradually becoming a weapon to discriminate trade, and the role of Spices Board assumes crucial, in enforcing quality control norms. Spices Board may take further initiatives to fix maximum pesticide limits at the codex level.

4.49 The pattern of global demand for the crop is undergoing changes. The consumer preference is for value added form of pepper such as white pepper, pepper in brine, oleoresin etc. Kerala could not take full advantage of the emerging opportunities for want of raw material of desired quality.

4.50 Emerging trends and market potential indicate

#### Box - 4.5

##### **Integrated Plant Nutrient Management Strategy (IPNS) and Plant Growth Promoting Rhizobacteria for Pepper**

- To attain a target yield of 3 kg/vine from Wayanad, the nutrient requirement based on soil test value, yield and nutrient uptake of the berry was N:P205:K20 as 128:206:136 kg/ha.
- Adoption of IPNS reduced phytophthora disease incidence by 2%.
- IISR has also isolated a Plant growth promoting rhizobacteria compatible with biocontrol agent Trichoderma. When inoculated together about 40% enhanced growth in black pepper was recorded.

*Source: IISR, 2003*

that both supply and demand for organic spices are growing throughout the world. India has developed the national standards for organic production and prescribed the guidelines for production of organic spices. Accreditation criteria for inspection and certification agencies are stipulated. Production programmes for promotion of organic spices in collaboration with Spices Board can go a long way in exploiting the world organic spice market. A major portion of Wayanad and Idukki could be brought under organic production of pepper.

**Cashew**

4.51 India is the largest producer and exporter of cashew in the world. India's share in world production is 30 per cent with a production of 4.6 lakh MT in 2002. (Table 4.8)

4.52 Area under the crop in Kerala, has been declin-

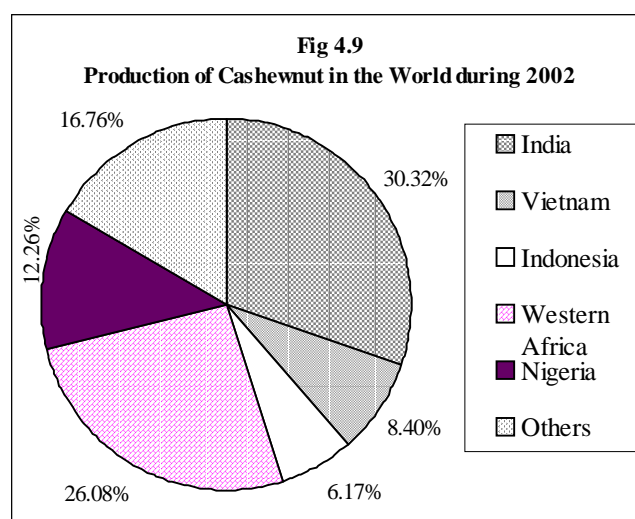
**Table 4.8**  
**Production of Cashewnuts**  
**in different Countries during 2002**

Sl.No	Country	Production (in Lakh MT)
1.	India	4.60
2.	Vietnam	1.27
3.	Indonesia	0.94
4.	Western Africa	3.96
5.	Nigeria	1.86
6.	Others	2.54
<b>World</b>		<b>15.17</b>

Source: CEPC

ing steadily from 1.25 lakh ha. in 1988-89 to 0.87 lakh ha. in 2002-03 and the production declined from 1.08 lakh MT to 0.63 lakh MT during the period. The share of Kerala in the area under cashew in the country has come down from 23 per cent in 1987-88 to 11 per cent in 2002-03 and the corresponding decline in share of production from 31 per cent to 12 per cent. Area and production are increasing steadily in other producing states in the country. Maharashtra is the leading producer with 22 percent share in production during 2002-03, whose share was only 10 per cent in 1990-91. Area increase in Maharashtra was to the tune of 549 per cent during this period.

4.53 In spite of operating special schemes for expansion of area under cashew, the coverage has been steadily declining during the last two decades. The decline in area from 1980-81 to 2002-03 was to the



**Table – 4. 9:**  
**Area, Production and Productivity of Cashew in Kerala and India**

Sl. No.	Year	Area ('000 Ha)		Production ('000 MT)		Productivity (Kg / ha)	
		Kerala	India	Kerala	India	Kerala	India
1.	1998-99	91.3	732.0	51.3	460.0	562	628
2.	1999-00	89.4	686.0	65.5	520.0	733	758
3.	2000-01	92.1	720.0	66.2	450.0	718	625
4.	2001-02	89.7	750.0	65.8	470.0	734	710
5.	2002-03	86.62	770.0	63.29	500.0	731	760

Source: Directorate of Economics and Statistics & Directorate of Cashewnut

tune of 51500 ha. Productivity of the crop, which was around 900 kg. per ha. during late eighties has also started declining from 1995-96 onwards, reaching 562 kg. per ha. during 1998-99 which improved to 734 kg. per ha. during 2001-02 ( Table 4.4). and to 731 kg/ha during 2002-03.

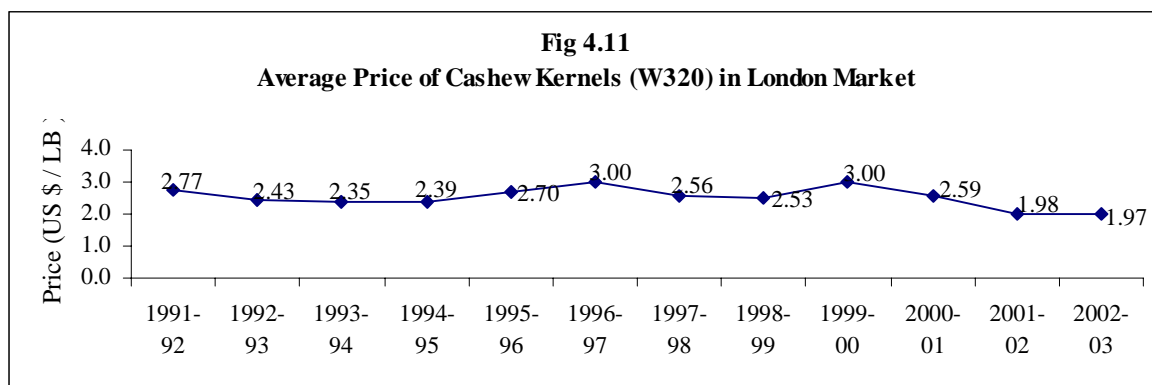
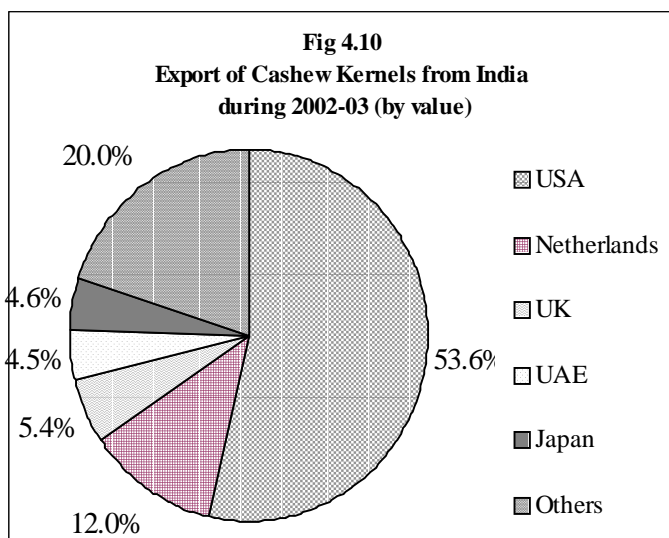
4.54 India exported cashew kernels worth Rs. 2006.40 crore during 2002-03 and imported raw nuts worth Rs. 1230.64 crore resulting in a net foreign exchange earning of Rs. 775.76 crore indicating 12.17 per cent increase in rupee terms and 11.53 per cent increase in dollar terms compared to 2001-02. U.S.A. is the major export market with 55 per cent export share followed by Netherlands (12%). The unit export price of cashew kernels went down during the year 2002-03 by 13.42 per cent compared to 2001-02. The total raw nuts imported into India during 2002-03 was 4.01 lakh MT. Around 22 per cent of total raw nuts imported is from ivory cost followed by Tanzania (19%). Indonesia has emerged as a major supplier of raw cashew nuts with a share of 16 per cent of total imports. Out of imported nuts 54 per cent of imported raw nuts is bought to Kerala during 2001-02 which was 46 per cent in

1998-99. Cashew processing industry is finding it extremely difficult even to maintain the present level of capacity utilization because of the lower availability of local raw cashew nuts. Concerted efforts are needed to nurture this crop in the state with programmes to promote high density planting with high yielding cashew grafts. The recent decision of Government to include cashew in the list of plantation crops will help in area expansion under this crop.

**Organic Agriculture**

4.55 The size of global organic market is estimated at US\$11 billion, the equivalent of 2 per cent of the total food market. The most important organic product groups in the EU market are vegetables, fruit, potatoes, beverages, spices, milk products and cereals. While the demand for organic foods is increasing, supply continues to lag behind. Around 70 percent of organic food sold in the UK is imported. Organic produce imported by the EU originates from atleast 60 countries. In 2000, agricultural land under certified organic agriculture averaged 2.4 percent of total agricultural land in Western Europe, 1.7 percent in Australia, 0.25 per cent in Canada and 0.22 per cent in US.

In most developing countries, agricultural land reported under organic agriculture is minimal and less than 0.5 per cent of agricultural lands. UK has increased budget of the organic farming scheme to support conversion of organic agriculture to 20 million pounds per year. With 3 million ha, Argentina accounts for more than 90 per cent of certified organic land in Latin American countries and has the second largest area of organically managed land in the world after Australia. The organic food sales in Germany is 3-4 per cent of total sales while organic milk have covered 10per cent market share. Organic coffee which accounts for 0.2 per cent of world coffee consumption, ac-



counts for 5 per cent of US coffee market. An analysis of UK organic market is shown in BOX. 4.6.

4.56 Future growth in organic agriculture will depend more on supply constraints than on developments in demand, at least over the medium term. The supply of quality raw materials and rules governing organic production and processing might limit the extent to which developing countries could satisfy the demand in developed countries.

4.57 Organic farming is practiced in developing countries have more out of economic necessity than as a life style. Consumers in developed countries are reportedly willing to pay additional 10-40 per cent for organic produce. Price advantage may disappear in the long run and major market would tend towards organic agriculture. Kerala could exploit the growing international markets especially in pepper, tea, coffee etc. Detailed action plan to promote organic agriculture in collaboration with Commodity Boards and Non-Governmental organizations would help in exploiting the emerging international markets.

#### Box - 4.6

##### Analysis of Organic Market in UK

- Imports from India are dominated by tea, nuts and spices
  - 85% of organic tea is from India
  - The main import from Mexico is coffee and vegetables.
  - Brazil's organic exports to the UK comprise concentrated orange juice, cashew nuts and cane sugar. 70% of quantity imported from Brazil to UK is Citrus based Products.
  - 100% of organic banana is imported from Egypt.
  - China exports 14 different products to UK market mainly rice, sunflower seeds, soyabean and green tea.
- EU is the largest organic market in the world and UK recorded annual growth in organic sales in excess of 40%

#### Medicinal Plants

4.58 The world trade in medicinal and aromatic plants is currently valued at US \$ 60 billion and India accounts for a negligible share valued at about US \$ 100 million only where as China accounts for about 40 per cent of world trade. One of the major benefits of globalisation has been the growing awareness about herbal and aromatic plants. Global market for medicinal plants has been growing at a healthy 7 per cent annually. Now the potential for exploitation of this market has been recognized

4.59 Coordination of agencies involved in the promotion of medicinal plants in the state like forest Department and Agricultural department is needed. Instead of promoting individual plants, a product oriented approach by promoting the group of plants needed for various products would be better from the commercial angle.

4.60 Quality control is critical in this business. The herbal and medicinal market in India is still unorganised but has great potential if made systematic and organised. Along with export market, domestic market also could be exploited.

#### Plantation crops

4.61 Kerala has a substantial share in the four plantation crops of rubber, tea, coffee and cardamom. These four crops together occupy 6.40 lakh ha, accounting for 29 per cent of the net cropped area in the state and 43 per cent of the area under these crops in the country. Kerala's share in the national production of rubber is 92 per cent, cardamom 72 per cent, coffee 23 per cent and tea 8 per cent.

4.62 Plantation crops in general are either export oriented or import substituting and therefore assume special significance from the national point of view. It is estimated that nearly 14 lakh families are dependent on the plantation sector for livelihood. Each of the four plantation crops of South India has its distinct characteristics and economic problems. Consequent to the removal of quantitative restrictions on import, plantation crops in general are facing the threat of unbridled inflow of these commodities.

#### Rubber

4.63 Global natural rubber production at 71.10 lakh MT in 2002 was below the record level of 72.10 lakh MT in the previous year. The production in Thailand,

the world's largest producer with a share of 35 per cent has been declining steadily from the peak attained in 2000, mainly due to unfavourable weather conditions and govt. efforts to manage supplies in order to strengthen the prices. In Indonesia, the second largest producer, 5 per cent increase in output due to favourable weather condition was recorded. The declining trend in production in Malaysia over the past decade was reversed in 2002 with output rising at 8 per cent from the 2001 level. The upward trend in production in Vietnam continued with output rising by 20 per cent to 3.8 lakh MT.

4.64 India is the third largest producer of natural rubber with a share of nine percent in the world after Thailand and Indonesia relegating Malaysia to the fourth position. The production of natural rubber in the country was 6.49 lakh MT in 2002-03, registering 2.9 per cent growth over the previous year. India is at the same time the fourth largest consumer of natural rubber after China, USA and Japan. The annual growth rate in production in 2001-02 was the lowest (0.08 %) after 1982-83 while annual growth rate of consumption was the lowest in 2000-01 after 1980-81, which recovered to 1.07 per cent in 2001-02 and to 9 per cent in 2002-03. Indian industry comprising 29 tyre manufacturing units and 250 medium scale and 5500 small scale units in the organised sector offers 35,000 diversified products, but over 95 per cent of the industry is outside Kerala. The long experience in the manufacture of such a large number of diversified products and the low cost man power available have to be considered as the relative advantages the country possesses on the promotion of rubber based industries for export purposes and steps should be taken to attract such units to Kerala.

4.65 Kerala accounts for

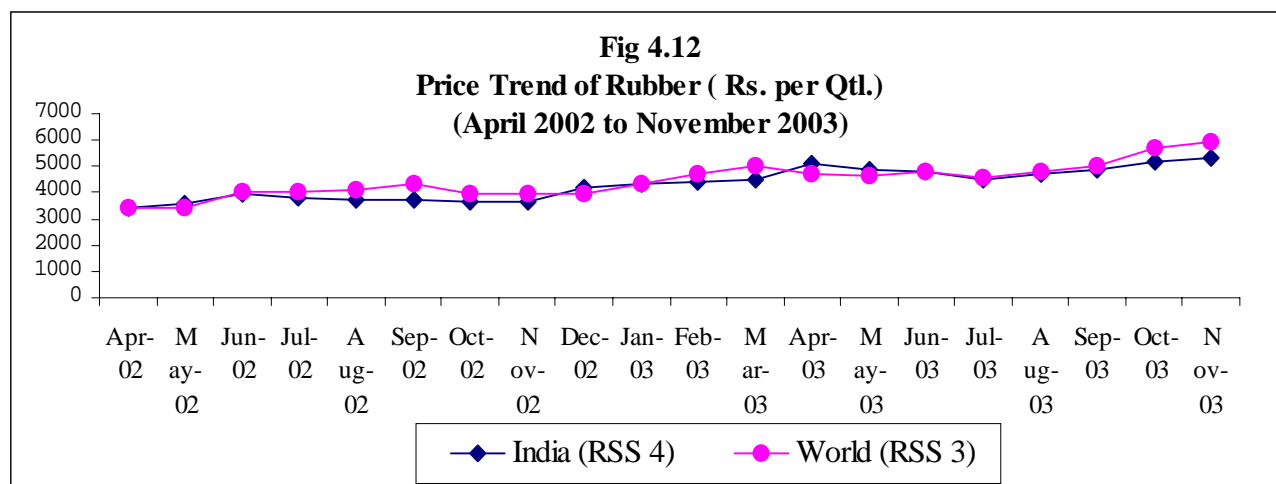
84 percent of the area under rubber in the country. The coverage under the crop in 2002-03 was 4.76 lakh ha, higher by 1008 ha. over the previous year. The production of natural rubber in Kerala during the year was 5.95 lakh tonnes. The increase in production registered during the year was 2.5 per cent over the previous year. Being predominantly a small holder plantation crop in Kerala, the average size of a small rubber holding is as low as 0.50 ha. The increasing trend in productivity continued during 2002-03. It was 1190 kg. per ha in 1998-99, which rose to 1250 kg. during 2002-03. In terms of tapping area, productivity recorded was 1635 kg. per ha during 2002-03.

4.66 Eventhough the domestic prices of natural rubber were more or less comparable to international prices during 2002-03 (See Appendix-4.23 and Appendix-4.24) the industrial sector still resorts to imports in bulk quantities since the import duty is only 25 per cent. The total quantity imported was 26000 MT in 2002-03 which increased to 40,000 MT in the first half of 2003-04. The annual average growth of the domestic natural rubber industry for the period 1996-97 to 2002-03, showed an annual average increase of 2.8 per cent in production where as consumption had increased at 3.7 per cent per annum while import of natural rubber increased by 62 per cent.

**Table 4.10**  
**Consumption of Rubber during 2001-02 & 2002-03**

Sl. No	Item	Consumption (in MT)		Growth ( % )
		2001-02	2002-03	
	Natural Rubber (NR)			
1	Auto Tyres & Tubes	304,425	353032	16.0
2	Others	333,785	342393	2.6
3	Total of NR	638,210	695425	9.0
	Synthetic Rubber (SR)			
4	Auto Tyres & Tubes	95,277	107483	12.8
5	Others	79,253	87367	10.2
6	Total of SR	174,530	194850	11.6
	NR & SR			
7	Auto Tyres & Tubes	399,702	460515	15.2
8	Others	413,038	429760	4.0
9	Total of NR & SR	812,740	890275	9.5

Source: Rubber Board, Kottayam



4.67 The world consumption of NR amounted to 7.2 million MT in 2002, 2 per cent higher than previous year. Higher demand for motor vehicles and hence for tyres stimulated by the stronger economic growth in several key markets and the spike in oil prices which resulted in higher prices for synthetic rubber contributed to the higher demand of natural rubber. In 2002, Natural rubber consumption in China rose by more than 7 per cent and in India by 9 per cent. The import demand for natural rubber rose by nearly 10 per cent largely due to higher automobile sales influenced by economic recovery. Since world natural rubber consumption surpassed production in 2002, global stocks declined. The year end stocks in producing countries reached a multiyear low of 5.43 lakh MT. After dropping to below 1 million MT in 2001, imports into US, the largest importer of NR rebounded to 1.10 million MT in 2002 and imports into Japan increased by 8 per cent. These contributed to the revival of world natural rubber prices. The higher prices in the international market is reflected in the domestic market also. **The average price of RSS4 in the domestic market at Kottayam was Rs. 33.89 per kg. in April 2002 which increased to Rs. 53.46 in November 2003. The international price of RSS3, equivalent of RSS4 of India, increased from Rs. 34.22 to Rs. 59.54 in the corresponding period.**

### Coffee

4.68 World Coffee production reached 7 million MT in crop year (Oct-Sept) 2002-03 indicating 5.6 percent increase over the previous crop year. This growth is mainly attributed to production growth in Brazil, world's largest coffee producer with a share of 41 per cent. On the contrary, in all major coffee producing

countries in Asia outputs declined in 2002-03. The fall in output was prominent in Vietnam (-18%) which is mainly due to unfavourable weather conditions. India is the sixth largest producer of coffee in the world with a share of 4.9 per cent. The top producers being Brazil, Columbia (9%) and Vietnam (8%), during 2002-03. The share of Robusta production increased from 53.7 per cent in 1995-96 to 62.9 per cent in 2002-03 indicating a 6.1 per cent annual growth while Arabica production remained more or less static.

4.69 According to the crop estimates for 2002-03, the area under coffee in Kerala was 0.841 lakh ha out of 3.47 lakh ha in the country, which works out to 24 per cent. The share of Kerala in production is 23.40 per cent. Major variety grown in Kerala is Robusta with a share of 95 per cent in planted area. Production of coffee during the year was only 0.64 lakh MT against 2.75 lakh MT for the country. Productivity of the crop in Kerala (766 kg/ha) is lower than the national level of 793 kg./ha. Area under coffee registered substantial increase during the last two decades with an annual growth rate of over 2 per cent. The increase in production recorded during the period was much higher and registered an annual average growth rate of nearly 9 per cent. Coffee provides opportunities for livelihood to nearly one lakh families including agricultural labourers. In Kerala, coffee is also one of the small holder plantation crops with nearly 75,000 holdings coming under the category with an average size of 1.1 ha. Consumption of coffee has remained more or less static at around 55,000 tonnes for the past one and half decades inspite of growth in incomes as well as population.

4.70 Coffee is a highly export dependent crop and more

than 80 per cent of domestic production is exported. The unit value realization has declined drastically from Rs. 95.37 per kg. in 1997-98 to Rs. 50.67 per kg. in 2002-03. The quantity of coffee exported from India also declined in 2002-03 to 2.07 lakh tonnes from 2.14 lakh tonnes in 2001-02. Increasing stocks in consuming countries more than offset the contraction in stocks of producing countries in 2002. Coffee stocks declined in producing and consuming countries by 4 per cent and already there is higher stock in 2001 which is more than double the stock size of 1996-98 period. National production for the year 2002-03 was estimated at 2.75 lakh MT compared to 3.0 lakh MT in 2001-02.

4.71 World coffee prices had fallen to the lowest level since 1973 in nominal terms. The fall in Robusta prices has been particularly pronounced and it declined from 67.53 US cents per lb in 1999 to 27.54 US cents per lb in 2001. However since October 2002 ICO indicator prices showed an increasing trend. The international price trend got reflected in domestic prices also. The price of Robusta coffee in 1999 was Rs. 58.86 per kg. which declined to Rs. 28.54 per kg. in 2001. The ICO composite price averaged 48 cents/lb in 2002, 5 per cent higher than the average in 2001 and the price continued to rise slightly in 2003. The price of Robusta is likely to stay slightly higher in major Robusta producing countries during 2003-04 due to smaller expected crop.

4.72 The average domestic price for 'Plantation A' in 1999 was Rs. 80.21 per kg. which declined to Rs. 55.35 per kg. in 2002 and the corresponding price for Robusta cherry AB was Rs. 58.86 and Rs. 28.12 respectively. The prices improved slightly to Rs. 60.14 and Rs. 35.08 respectively during January to June 2003. Recovery of coffee prices is still fragile and uncertain. Though there appears to be some evidence of a cyclical recovery in coffee prices, the fundamental problem of over supply remains. The revival of prices depends on the expected production from Brazil during 2004-05. The short term uptrend in prices have stemmed from market sentiments arising from the forecast of decline in Brazil's crop in 2003-04. However a high forecast of Brazilian crop at 43 million bags during 2004-05 makes the emerging Arabica coffee situation quite vulnerable. Indications suggest that risk of frost in Brazil has disappeared and early flowering has already started.

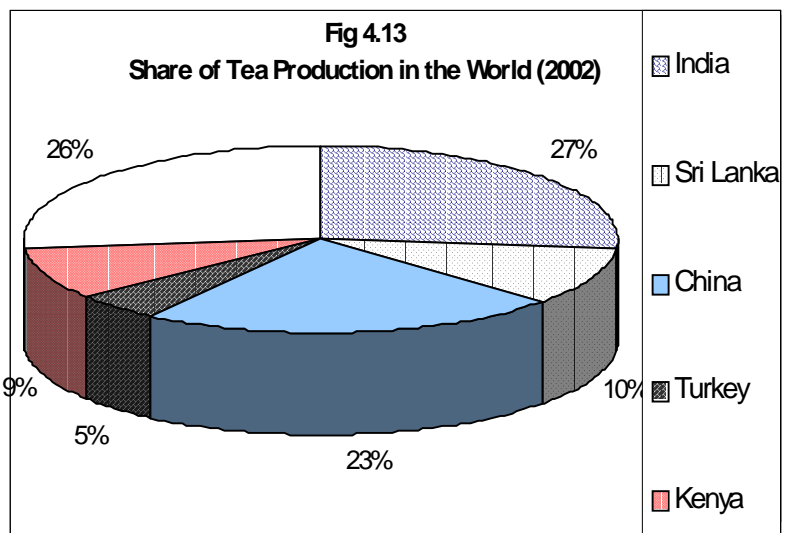
4.73 The new package announced by the Ministry of Commerce for coffee growers which is an improvement on the

special coffee term loan announced earlier may have a limited impact in the state considering the severity of the crisis. The pilot project of Coffee Board on income insurance proposed to be implemented in collaboration with the World Bank's commodity group would be one of the effective interventions in the liberalized economy. However, coverage of farmers under the scheme from the State has to be increased.

**Tea**

4.74 World tea production increased at an annual growth rate of 2.8 per cent between 1970 and 2000 expanding from 1.27 million MT to 2.97 million MT. Most of the growth was due to the increase in productivity rather than expansion in area. Preliminary estimates indicate that world tea production in 2002 reached 3 million MT. Black tea accounts for more than 70 per cent of world tea production and 22 per cent by green tea. India is the leading producer and accounts for 27 per cent of global production. The output in India is estimated to have fallen by 3 per cent due to inadequate monsoon rains and due to low prices. The production during 2002 was 826.3 Million kg. in the country.

4.75 Against the total area of 5.11 lakh ha under tea in the



country Kerala accounts for only 0.37 lakh ha. In respect of production also Kerala could retain its share of eight per cent. Tea plantations owned by big companies employ a labour force of over 84,000 in the organised sector. There is fluctuation in production and it ranged from 64.8 Million kg. in 1995-96, reaching to 69.1 Million kg. in 2000-01 which declined to 65.8 Million kg. in 2002-03.

4.76 After the removal of quantitative restrictions in April 2001, one of the major threats faced by the tea industry is the increased import of inferior quality teas into India particularly from Indonesia resulting in further depression in prices. Imports increased from

13.4 Million kg. in 2000 to 16.6 Million kg. in 2001 and further increased to 21.9 Million kg. in 2002. The disturbing fact is that most of the countries are exporting to India at low prices. The unit value of imported tea during 2001 was Rs. 55.72 per kg. in 2001 which declined to Rs. 45.95 in 2002. Around 55 per cent of the quantity is imported from Vietnam followed by Indonesia (20%)

4.77 The average auction prices for 1999 at Kochi was Rs. 62 per kg. which declined to Rs. 47 per kg. in 2002. International FAO composite price also declined during this period by 10 percent. The FAO composite price averaged US\$ 1.48 /kg. during 2002, being 6 per cent lower compared to 2001 level. The price fall is because of increase in supply as well as due to large carry over stocks. Prices of tea were buoyant during 1998 but started declining from 1999.

4.78 The Reserve Bank of India has announced a relief package to the tea industry on the basis of the recommenda-

tions made by the working group under the Chairmanship of Mr. Madhukar. Salient features of the scheme are shown in BOX. 4.7. The package could be availed by the borrowers if they liquidate at least 60 percent of the peak hypothecation outstanding.

4.79 Though the wholesale prices fetched by the producers at the auctions have sharply declined, there has been no softening trend in the retail prices. Considering the wide gap between auction price and retail price of teas, the Commerce Ministry appointed AF. Ferguson's & Co to study the market structure of tea and to suggest appropriate reforms, that will lead to reduction in transaction cost besides introducing greater transparency. Based on the recommendations, Government of India has issued the Tea (Marketing) Control Order 2003, with effect from 1<sup>st</sup> January 2003 in super session of the Tea (Marketing) Control Order 1984. The major changes in the order as compared to previous one are shown in BOX.4.8:

#### Box - 4.7

##### Salient Features of Tea Relief Package announced by RBI based on Madhukar Committee Report

- The seasonal deficit of tea borrowal accounts (classified as standard assets) will be converted to a term loan repayable within a period not exceeding 5 years
- The period allowed to liquidate the working capital dues of last season extended upto a maximum of 6 months in such cases where the entire outstanding is backed by the stock of tea or by the prompt (receivables) without affecting the drawing and the working capital limit of current season
- Banks can fix the rates of interest upto two stages better than the rate as applicable to such borrowers according to its credit rating by the individual banks subject to the condition that after such reduction, the rate of interest should not be below PLR.

#### Box - 4.8

##### Salient Features of Tea (Marketing) Control Order 2003

- All primary buyers have to register themselves with the Tea Board.
- Apart from manufacturers of bulk tea, those who manufacture value added products like packet teas, tea bags, instant tea etc. have also to get registered (subsequently amended, reported below)
- Similarly, apart from primary buyers of bulk tea, primary buyers of value added products like packet teas, tea bags, instant tea etc. have also to get registered. (subsequently amended)
- Enabling provision has been introduced to prescribe compulsory purchase of tea of a specific percentage through the auction in respect of buyers.
- Enabling provision has been introduced for prescribing a reasonable price to be paid for green leaf in terms of a formula to be specified.

##### Amendments introduced by Government of India

- Manufacturers of hand-made tea have been excluded from the definition of the term 'manufacturer' and only those who make tea in factories will come within the purview of the order. Those purchasing value added tea products and secondary buyers who do not source their teas either from auction or from manufacturers have been excluded from the definition of 'buyer'
- Buyers will be required to file only quarterly returns with the registering authority. The registration fee and fee for the issue of license has been reduced from Rs. 5,000 to Rs. 2,500 and for renewal of licensee the fee has been reduced from Rs. 1,000 to Rs. 500

4.80 Government of India had appointed three separate Expert Committees for a complete investigation into the affairs of the closed tea units in West Bengal, Kerala, Assam and Tripura. The Committees have submitted their reports to the Ministry of Commerce, and are under the scrutiny of the Government. Government of Kerala also announced relief package to the ailing plantation sector. A Committee was constituted under the Chairmanship of Chief Minister to address the issues in the Plantation sector, and tax exemptions were allowed for one year in the sector.

### Cardamom

4.81 The total production from India and Guatemala was estimated at 22500 MT in 2002. The production in Guatemala improved by 14.4 percent in 2002 over the previous year while it declined by 21 per cent in India and estimated at 9000 MT in 2002. On an average, Guatemala exported around 73 per cent of its production, where as India's share of export in total production is only 8 per cent.

4.82 Productivity which was more or less stagnant around 50 kg./ha. in the 1980s has improved to the level of around 203 kg. per ha by 2001 but declined to 146 kg/ha in 2002. Kerala was lagging behind the national level till 1992-93 but has improved its position by raising its productivity from 50 kg. to 203 kg. per ha over the last five years. Consequently, the share of Kerala in production at the All India level also increased from 28 per cent to 72 per cent in 2002-03. While area under cardamom in the country has declined from 0.96 lakh ha to 0.72 lakh ha. in the period, in Kerala it has come down from 65,000 ha to 44237 ha. On the export front cardamom has been facing competition from Guatemala although the quality of Guatemala cardamom is inferior. The country could tide over the chal-

lenge by expanding domestic market through market promotion. The average auction price during 2000-01 was Rs. 570 per kg. which improved to Rs. 622.96 in 2001-02 and further declined to Rs. 561.13 in 2002-03. The early trends indicate that situation had further worsened and reached a record low at Rs. 358.34 per kg. during August 2003, compared to Rs. 743.94 during August 2002. The Indian export of cardamom has increased from early nineties and reached a peak level of 1100 MT in 2000-01 and then declined by 50 percent in 2002-03 to reach 550 MT. The unit price realised increased steadily to Rs. 620 per kg. in 2001-02 from Rs. 514 per kg. in 2000-01 and further improved to Rs. 683.64 in 2002-03. It declined to Rs. 538.14 per kg. in April-July 2003.. However the market for cardamom is largely domestic as could be seen from the fact that the share of exports is only 8 per cent of the production.

### Farm Commodity Price

4.83 The farm prices of major commodities were on a revival path during 2002-03 compared to the previous year and prices firmed up in varying degrees. The lowest price for coconut in the last 13 years was in 2000-01 and the highest in 1996-97. The increase in prices during 2002-03 compared to the previous year was 40 percent and price of coconut reached the level of 1999-00. For paddy the peak price over 13 years was in 1999-00 and there was 12 percent increase in price in 2002-03 over the previous year and a decline of 4.5 percent compared to the peak price. The peak prices of paddy, arecanut, cashewnut ginger and pepper were in 1999-00 over the last 13 years, and 1995-96 for rubber. The price of tapioca was its peak level in 2002-03. The price of rubber improved by 21 per cent in 2002-03 over the previous year. However prices of tea and coffee continued to the depressed.

**Table 4.11:**  
**Average Farm Price of Important Agricultural Commodities** (in Rs.)

Year	Paddy (Qtl.)	Coconut with husk (in '00 Nos)	Arecanut (in '00 Nos)	Cashewnut (Qtl.)	Banana (in '00 Nos)	Tapioca (Qtl.)	Ginger-dry (Qtl.)	Pepper (Qtl.)	Rubber (Qtl.)
1999-00	684.43	476.12	75.25	3638.50	160.39	368.09	6393.68	20505.35	3099
2000-01	647.16	281.19	41.93	2336.70	189.50	349.06	4881.31	12467.97	3036
2001-02	585.75	340.64	32.81	2519.85	173.66	320.41	3070.64	6942.22	3228
2002-03	653.56	475.60	32.53	2718.35	176.82	393.57	4137.54	7814.10	3919
% change in 2002-03 over 2001-02	11.58	39.62	-0.85	7.88	1.82	22.83	34.75	12.56	21.41

4.84 Data on average farm prices of principal crops grown in Kerala are shown in Table 4.11. The table shows increase in 2002-03 compared to previous year in respect of most of commodities, namely paddy (11.58 %), tapioca (22.83%), pepper (12.56 %), ginger (34.75 %), banana (1.82%). A slight decline was reported for arecanut (-0.85%). Global agricultural prices have also indicated a recovery path from the later half of 2002 and continued in 2003 also. Data on month-wise prices of the commodities during 2002-03 is shown in (Appendix 4.25)

4.85 The Cardamom auction prices declined to Rs. 561.13 per Kg. in 2002-03 from Rs. 622.96 per kg. in 2001-02 and tea auction prices at Kochi declined further to Rs. 47.21 in 2002 from Rs. 52.21 in 2001 and to Rs. 45.49 in January to November 2003. Auction price of Robusta cherry AB had declined to Rs.28.12 in 2002 from Rs. 28.54 in 2001 and improved slightly to Rs. 32.59 per kg. in January to September 2003.

4.86 Under regulated situation, the domestic prices are less volatile than the international prices. This implies that unregulated and free trade would bring instability to domestic prices. The variability in domestic prices of major export commodities like pepper (62%) and cashewnut (31%) were relatively high over a period of eleven years from 1991-92. As a consequence with removal of quantitative restrictions, producers are facing the threat of imports. Large scale import of edible oils was facilitated by sharply falling world prices coupled with the relatively low level of tariff rates. The international price of coconut oil was US \$ 658 per MT in 1998, which declined to US\$318 in 2001 and later recovered to US\$421 in 2002 and further improved to \$451 in 2003. The price of palm oil also showed a similar pattern and declined from US\$ 671/tonne in 1998 to US\$ 286 in 2001 which increased to US\$ 390 in 2002 and \$431 in 2003. The annual average import of edible oil during 1995-96 was about 10.62 lakh MT which increased to 42.68 lakh MT during 2000-01. During 2000-01, palm oil accounted for 72 per cent of the imported edible oil. The magnitude of price fall for pepper was to the extent of 44 per cent in 2001-02 compared to the previous year and a slight improvement in 2002-03. Being an export commodity, movement in international prices determines the level of domestic prices of pepper. World prices of pepper doubled during 1996 to 1997 from US\$ 1.14 to US \$ 2.02 per lb and then steadily de-

clined. World markets for coffee and tea continue to be depressed due to large production surplus and slow down in consumption.

4.87 Recent evidence of improvement in international prices of commodities is suggestive of a new trend in world prices of agricultural commodities. Till recently, most of the agricultural commodities have been experiencing long range declines in their prices. Agricultural prices continue to be determined by demand and supply factors and three factors in general played a role in the recent buoyancy in international prices.

4.88 The first is the lagged effect of low prices on production, since direct income support has increasingly been decoupled from production decisions in developed countries. The second is the spur to demand for agricultural commodities resulting from sharply reduced prices. The net result of this has been that the volume of stocks of individual commodities has tended to either stagnate or decline, and country specific developments such as drought, frost or pest attacks have tended to reduce world supply even further being the third reason. Palm oil and coconut oil prices have been increasing owing to small crops in major producing countries and reduced inventories and palm oil prices have also been affected by large purchase by India and Pakistan

4.89 High demand for tyres, higher crude oil price induced substitution of synthetic rubber with natural rubber, the relatively low stocks at both the world level and in producing countries, good growth in demand particularly in major Asian markets like China and India and the possible effect of the ITRO production reduction scheme are the reasons for strengthening the world rubber prices in the short run. World rubber production is projected to reach 7.2 million MT in 2003, approaching the expected demand. Over the long run, price increase would be limited by the good potential which exists to increase supply through more intensive tapping and due to rising production capacity in newer producing countries such as Vietnam, where major investment have been made in the recent past.

## OUTLOOK

### Coffee

4.90 Global coffee production during the 2003-04 season is expected to be about 107 million 60 kg bags,

down from last season's 123 million bags. Almost all of the reduction is because of reduced Brazilian output due to unfavourable weather conditions. Coffee prices are projected to increase in 2004, with arabica up 9 per cent and robusta up 5 per cent. Over the longer term, real coffee prices are expected to increase relative to the 2002 depressed levels but remain well below the historical highs of the 1970s and more recent highs of the mid 1990s.

### Tea

4.91 The auction average tea price is expected to remain largely unchanged in 2003-04 compared to 2002-03. The weakness in tea prices is expected to persist because of over supply and a trend of slow growth of consumption. The production in 2003-04 is expected to increase due to increased production in Vietnam and threaten to depress prices further. Vietnam has doubled production since 1990.

### Rubber

4.92 Rubber prices are expected to remain high in 2003-04, after falling to historical lows in 2001-02. Natural rubber prices are expected to remain above US \$ 0.90 /kg. for the next two to three years. The consumption in 2002 increased 3.6 percent over 2001 and preliminary figures for 2003 indicate that it will stay strong. The demand for natural rubber has also been aided by lower demand for synthetic rubber whose prices increased considerably because of high crude oil prices.

### Coconut Oil

4.93 International coconut oil prices is expected to increase in 2003-04 up from \$ 421 in 2002 and further to \$ 460/tonne in 2004. The price of Palm oil is expected to increase to \$ 425/t in 2003-04 from \$ 390 in 2002 and projected to decline to \$ 415/t in 2004. However slight variation in international prices of palm oil as a substitute product of coconut oil could be warded off through appropriate tariff structure.

### Coconut

4.94 The world coconut production for 2003-04 is expected to decline by 8 per cent from the estimated output while India's production is expected to increase by 2 per cent and a slight improvement in Indonesia's production is forecast and world exports of coconut oil for 2003-04 is forecast to decline by 2.4 per cent from the level of 2002, mainly due to the shortfall in the production in Philippines.

4.95 The decline of the dollar since early 2002 (10 percent on a real trade weighted basis) also contributed to the rise in commodity prices. Similarly reduced supplies from earlier low prices and severe El Nino related droughts in 2002 which reduced oil seed production, coffee production, pepper etc. Most of the sharp agricultural price increase in 2002 and 2003 are expected to be reversed as surplus production capacity once again results from higher prices.

**Table 4.12:**  
**International Commodity Prices and Price Projections**  
**for 2004 ( in current US Dollars)**

Sl.No.	Commodity	Unit	Price		
			2000	2002	2004
1.	Coffee (robusta)	Cents / kg	91.3	66.2	92.6
2.	Tea *	Cents / kg	187.6	150.6	155.0
3.	Coconut oil	\$ / mt	450.3	421.0	460.0
4.	Copra	\$ / mt	304.8	266.3	380.0
5.	Palm oil	\$ / mt	310.3	390.3	415.0
6.	Rubber RSS 1, Malaysia	Cents / kg	69.1	77.1	90.0

\*Auctions average (3)

Source : World Bank

### Crop Development Programme - Review of Annual Plan 2002-03

4.96 During the Annual plan 2002-03 an amount of Rs. 9877.00 lakhs was provided to crop husbandry which include Rs. 18.00 lakhs for partially aided schemes and Rs. 5859.00 lakhs under 100 per cent Centrally sponsored including MOU schemes. The State sector schemes incurred an expenditure of Rs. 8836.10 lakh and showed an expenditure of 89.46 per cent. During the year government of India have released Rs. 2952 lakhs and State government released Rs. 403 lakhs .

### Crop Husbandry

4.97 Specific strategies are formulated for different crops during Tenth Plan. A number of programmes were implemented for the development of agriculture during the year 2002-03. Major crop wise achievements made during the period is furnished below.

**Table 4.13:**  
**Financial Performance of Crop Husbandry during 2002-03**  
(Rs. in Lakhs)

Sl.No.	Item	Outlay	Expenditure	% of Expdr. to outlay
1.	State Plan Schemes	4000.00	5874.31	146.86
2.	Partially Assisted Central schemes	18.00	9.94	55.00
3.	100% Centrally Sponsored Schemes including MOU	5859.00	2951.85	50.00
<b>Total</b>		<b>9877.00</b>	<b>8836.10</b>	<b>89.46</b>

### Rice

4.98 Rice development activities in the State were carried through State schemes and Centrally sponsored schemes. The ultimate objective of rice development programme during the Tenth Plan period is to sustain rice cultivation in 4 lakh ha and to augment the average productivity to more than 2.8 MT per ha. Revitalisation of group farming samithies in predominant rice growing areas like Palakkad, Thrissur, Ernakulam and Alappuzha, assistance to paddy development agencies and assistance to seed development agencies were continued under State plan for attaining the targeted level of rice production and productivity. During the year 2002-03, it was targeted to introduce revitalisation ac-

tivities in 0.75 lakh ha and attained progress in 0.73 lakh ha.

4.99 Major items implemented for rice development through MOU schemes were seed production programme, cultivation of HYV, green manure seed, scented rice development etc. During the year seed production programme was implemented in 2526 ha. against the target of 2050 ha. cultivation of HYV seed production achieved 3219 MT against the target of 6000 MT, green manure seed production achieved 40.55 MT against 100 MT and scented rice production implemented in 300 ha. through tribal samithies.

### Coconut Development

4.100 During the year 1182 ha. was brought under integrated pest management against the target of 1236 ha. Under integrated nutrient management programme fertilizer was applied to 64.49 lakh palms against the target of 64 lakhs and 1097 pump sets were distributed and 512 wells were constructed for irrigating coconut palms during the year.

4.101 As per the Centrally sponsored scheme the Coconut Development Board provides assistance for production and distribution of quality hybrid coconut seedlings. During the year, 0.64 lakh TxD coconut seedlings were produced and distributed against the target of 0.94 lakh seedlings.

**Table 4.14:**  
**Major Scheme wise Expenditure during 2002-03**  
(Rs. in Lakhs)

Sl.No.	Schemes	Expenditure
1.	Rice development	1630.50
2.	Coconut development	1992.86
3.	Pepper development	776.6
4.	Cashew development	781.36
5.	Vegetable and Fruit Production Council	130.00
6.	Vegetable development	377.75
7.	Fruit development	84.55
8.	Women development	47.51

**Pepper**

4.102 Pepper development programme include production and distribution of pepper cuttings, area expansion, rehabilitation of old pepper gardens, promotion of organic pepper, integrated pest management for pepper and promotion of soil conservation measures. During the year 85.15 lakh pepper cuttings were produced and distributed, Pepper rehabilitation was introduced in 2915 ha. Along with pepper other spices such as ginger, turmeric, chillies and tree spices also received support during this period.

**Cashew**

4.103 In the case of cashew development, rehabilitation, plant protection and establishment of cashew nurseries were given importance during the Annual plan 2002-03. Through Centrally Sponsored programme an area of 888.83 ha was brought under rehabilitation programme against the annual target of 5500 ha. Plant protection measures were implemented in 3343 ha. and 10 nos. of cashew nurseries were established during this period.

**Vegetable development**

4.104 Vegetable promotion programmes are implemented through State and Centrally sponsored schemes which include promotion of commercial cultivation, seed multiplication programme, providing irrigation facilities, promoting vegetable cultivation in educational and public institutions, infrastructure support for marketing etc.

4.105 During the year 2002-03, 1682 ha was brought under vegetable cultivation through 'Haritha Sanghom', 500 of vegetable gardens were established in educational institutions through State schemes. Under Centrally sponsored scheme 100 ha. was brought under cool season vegetable cultivation. Financial assistance was given for promoting vegetable cultivation in 1103 ha. during 2002-03. Vegetable development programme received priority in local level planning of panchayats also.

**Vegetable and Fruit Promotion Council's Programme**

4.106 Vegetable and Fruit Production Council, Keralam, was also involved in the implementation of vegetable and Fruit Promotion Programme. It is the successor organisation of Kerala Horticulture Development Programme.

The programme has been initiated to improve the livelihood security and thereby enhance and sustain the income of fruit and vegetable farmers of Kerala. KHDP has successfully implemented the programme in seven districts and the same model has been followed in Kollam and Alappuzha districts during 2002-03. The programme covers production, formation of SHGs, credit management and marketing.

4.107 The area brought under Vegetable cultivation was 343.11 ha. against the targeted area of 1572 ha. and Banana cultivation in 175.88 ha. against the target of 208 ha.

**Fruit development**

4.108 The agro climatic endowments and topographical features of Kerala offers excellent prospects for fruit production. The total area under fruit crops in Kerala comes to 3.2 lakh ha. Tenth plan gave thrust on the production and distribution of sufficient quantity of planting materials, improving the productivity by replanting with superior varieties, commercial cultivation of fruits like Pineapple, Pappaya and Mango in well established pockets, training to farmers and post harvest handling of fruits etc.

4.109 Through Centrally Sponsored programme Banana cultivation was done in 523.3 ha against the target of 600 ha, pineapple and other fruits in 40.1 ha against 100 ha and pomegranate in 15 ha. during the year 2002-03.

**Supplies and services**

4.110 The State has a strong network for supplies and services. This include Krishi Bhavans in all the Grama panchayats for transfer of technology and organising agricultural services. Planting material delivery system has been developed which includes 33 state seed farms, 10 district farms, 10 special farms and 8 coconut nurseries. The paddy seed farms and the District Agricultural Farms are under the control of the District Panchayats for facilitating appropriate seed planning at the grass root level. In spite of such elaborate progeny support, supply of quality seeds of paddy and other seasonal crops remain as a weak link in the production front.

4.111 During 2001-02, the consumption of fertilisers

**Table 4.15:**  
**Season-wise Consumption of Fertilisers in Kerala**

('000 MT)

Sl.No.	Nutrients	2000-01			2001-02			2002-03		
		Khari	Rabi	Total	Khari	Rabi	Total	Khari	Rabi	Total
1	N	38.86	24.90	73.76	40.12	36.30	76.42	43.70	43.00	86.70
2	P <sub>2</sub> O <sub>5</sub>	21.50	16.10	37.60	19.17	18.07	37.24	19.10	21.10	40.20
3	K <sub>2</sub> O	35.14	26.71	61.85	35.16	28.31	63.47	38.30	39.50	77.60
4	Total	95.50	77.71	173.21	94.45	82.58	177.13	101.10	103.60	204.70

Source: FAI

increased from 1.73 lakh tonnes from the previous year to 1.77 lakh tonnes and by 2002-03 increased to 2.05 lakh tonnes. Table 4.15. The trend of fertilizer consumption shows fluctuations and it reached a peak level during 1997-98 and reached lowest level during 2000-01. The per hectare consumption is the lowest during 2000-01 at 58 kg/ha. (see Appendix 4.26). The State average is lower than the national average (86 kg.). The necessary steps are to be taken to reverse the situation so as to augment the productivity of major crops..

4.112 In plant protection, the strategy was one of need-based adoption of chemical control. The mite attack on coconut which emerged as a very serious threat for coconut warranted chemical intervention. With the active involvement of the local bodies, state government organised massive control programme for coconut mite and the menace could be contained to a great extent. However, a long term solution lies in evolving biological control measures. Selected indicators of progress are given in Appendix 4.27.

### Kissan Kerala

4.113 Kissan Kerala, a television based agricultural information dissemination system has been initiated in the state. The objective of the project is to disseminate information of regional relevance regarding best farming practices, soil and water conservation, forecast and precaution on pest and disease incidence, weather and market information etc in an interactive mode. Recent announcement by the Prime Minister to dedicate a Television channel for the farmers may address the basic issues in technology and costs for faster dissemination of information. However location specific content generation for the state is a challenging job which necessitates the involvement of research in-

stitutions and IT experts.

### Agricultural Insurance

4.114 Two crop insurance schemes are currently in operation in the State, viz., The State Crop Insurance Scheme and The National Agricultural Insurance Scheme. The State Crop Insurance Scheme, being implemented since 1995, provides insurance cover to 24 major crops against crop loss due to natural calamities like drought, storm, cyclone, flood, landslip, forest fire, sea erosion, earth quake and lightning. The National Agricultural Insurance Scheme (NAIS), was introduced from 1999-2000, replacing the Comprehensive Crop Insurance Scheme (CCIS) which was in operation since 1985. NAIS is implemented in the State through the GIC of India, and provides insurance cover to Paddy, Banana, Tapioca, Pineapple, Ginger and Turmeric against risks such as natural fire and lightning, storm, hailstorm, cyclone, typhoon, tempest, hurricane, tornado, flood, inundation and land slide, drought, dry spells, pests and diseases. Small and marginal farmers are eligible for 50 per cent subsidy on premium, which is equally shared by the State and Central Governments.

4.115 The State Crop Insurance Scheme, has so far enrolled 1,22,657 farmers. Out of this 52,488 farmers have benefitted, with a total sanctioned relief assistance of Rs. 1128.63 lakhs, against the collected premium of Rs. 304.18 lakhs. This has necessitated to seek alternatives for making the Crop Insurance Fund, self-sustainable. It is also required to include more perennial crops like, Coconut, Rubber, Pepper etc. in the National Agricultural Insurance Scheme, and withdraw these crops from the State Insurance Scheme. An amount of Rs.75.00 lakhs, provided under the State budget has been credited to the Crop Insurance Fund

during 2003-04

4.116 The NAIS implementation since Rabi, 1999 has made an enrollment of 1,20,343 farmers till Kharif, 2003 and 17,818 farmers have so far made claims, amounting to Rs.625.51 lakhs. Since the insurance charges being Rs. 235.76 lakhs only, the claim ratio comes to about 268 per cent.

4.117 The Government of India, as per the budget proposal 2002-03, has initiated action for setting up of a separate corporation of agricultural insurance, to be promoted by the existing public sector general insurance companies. The task force, constituted by the government has proposed to set up the company as "Agriculture Insurance Company of India Ltd."

### Women in Agriculture

4.118 The National Agricultural Policy of India (2000) and the Indian National Policy for the empowerment of Women (2001) have highlighted the need for incorporating gender issues in the agricultural development agenda to provide recognition of women's role as farmers and producers of crops and livestock, users of technology, active agents in marketing, processing, and storage of food and agricultural labourers. An expert committee constituted on women in agriculture, in the Department of Agriculture and Co-operation, Ministry of Agriculture, GOI has also analysed the policies and the frame work required for the programme.

4.119 The strategic objectives identified for the programmes are:

- i) To increase rural women's access to land and water resources, credit services and entrepreneurship training.
- ii) To Ensure agricultural policies and programmes are sensitive to gender differences in roles and activities.
- iii) To Ensure that agricultural research and extension programmes are gender-sensitive.
- iv) To Increase gender awareness in the commercialisation of agriculture.
- v) To Increase women's empowerment and access to decision-making.

4.120 Various central sector schemes are in operation in different states on women in Agriculture. The Central Government had launched the scheme under the 8<sup>th</sup> Five Year Plan to make farm women farmers self-

reliant by providing them opportunities to avail themselves of the benefits and opportunities of the existing agricultural system. The project was implemented on a pilot basis, with one district each from Rajasthan, Haryana, Himacal Pradesh, Punjab, Kerala, Maharashtra and Uttarpradesh. In Kerala the project was implemented in Palakkad district since 1994. An evaluation study conducted on the programme in Palakkad District under the Kerala Research Programme on Local Development (2001) has revealed that equality of members in the group, participation of group members in group activities, identified leadership and exposure of members to new technologies were the major strengths, where as lack of collective action, feasibility of enterprises, credit and market linkage and common savings as thrift group were identified as the major weaknesses. (BOX.4.9)

4.121 The state has formulated a programme on 'Women in Agriculture', in congruence with the policy for economic empowerment of women, with ultimate objective of making all potential women, economically independent and self-reliant. The 10<sup>th</sup> plan has also envisaged a paradigm shift in the objectives of LSGs from Local Development' to 'Local Economic Development' by attracting youth and women in Agriculture.

4.122 The Department of Agriculture has been implementing a project on 'Women in Agriculture' under macro management, to make women farmers self-reliant by motivating and mobilising them, through group approach. During 2002-03, this programme was implemented in Alappuzha, Malappuram and Wayanad districts and it has been extended to all other districts, except Palakkad during 2003-04. The project has been drawn as per the broader guidelines of the Centrally Sponsored Schemes, with emphasis on women empowerment, monitoring and evaluation and assistance for starting women enterprises, with a total provision of 100 lakhs. The 100 per cent central sector scheme on women in Agriculture is now in the 3<sup>rd</sup> phase of implementation in Palakkad District..

4.123 The State Poverty Eradication Mission (SPEM), Kerala, through 'Kudumbasree', has increasingly recognised the programme on 'Women in Agriculture', as a powerful tool for poverty eradication. Leased land farming, skill development, agri-business, agri-processing etc. are their thrust areas. The micro enterprises

**Box - 4.9**

**Extracts from the study on 'Women in Agriculture: an evaluation of the Central Scheme in Palakkad District' by the Kerala Research Programme on Local Development, 2001**

**Salient Features**

- The project has resulted in significant increase in terms of contribution to the total family income, with 35% of the members contributing 25% to 50% of the total family income and 55% contributing up to 25%
- There was only moderately low adoption of enterprises with 64% of the members adopting less than 25% and 36% between 25% to 55% of the enterprises.
- Nearly 20% of the members showed positive attitude towards farming while 60% remained neutral and about 20% expressed negative attitude
- The extent of empowerment of the members through participation was moderate among 57% and high among 25% of the total members.
- About 43% of the members maintained regular contacts with co-members. Nearly 1/3<sup>rd</sup> had contacts only as part of their group activities and another 1/4<sup>th</sup>, only occasionally
- About 48% of the members were involved in the decision making process of their group.

**Major Constraints**

- Failure in developing proper marketing channels for the enterprises established by the groups or their members
- Non availability of quality inputs and lack of effort to procure inputs on a group basis, to cut down prices.
- Inflexible nature of the training schedule, not focussing at the individual needs
- The schemes seemed to have never considered group savings as an essential component in its functioning.

**Strategies**

- Thrust to be given to thriftiness of the group and strategies to be evolved to formulate group activities with savings as an integral part of the programme
- To fix the group size flexible, according to the nature of the enterprises and to ensure the feeling of compactness and togetherness
- To adopt selective training in a phased manner rather than superficial trainings.
- To channelise inputs through collective purchase and to provide adequate infrastructure facilities.
- To develop effective marketing strategy for each products, including brand assignment and to ensure maintenance of product quality

**Table 4.16**  
**District wise details of Farming Undertaken by Kudumbasree**

Sl. No.	Name of District	No. of GPs	No. of NHGs	No. of families	Area (Ha)
1	Thiruvananthapuram	52	607	7082	139.59
2	Kollam	32	500	10025	209
3	Pathanamthitta	22	186	1468	20
4	Alappuza	39	1996	23522	347.14
5	Kottayam	11	370	5041	405.91
6	Idukki	42	3398	37469	1673.88
7	Ernakulam	68	1788	17204	1132.00
8	Thrissur	84	674	7335	275.10
9	Palakkad	61	921	16660	553.62
10	Malappuram	33	72	1200	146.94
11	Kozhikode	59	794	8525	221.13
12	Wayanad	25	2001	20176	1107.52
13	Kannur	57	1459	22020	272.42
14	Kasargod	36	1103	8325	250.15
<b>TOTAL</b>		<b>621</b>	<b>15869</b>	<b>186052</b>	<b>6754.4</b>

Source: State Poverty Eradication Mission, Kerala

strategy adopted by the mission has helped so many NHGs to engage in agriculture related enterprises such as vegetable farming, crop nurseries, hardening units, mushroom cultivation, vermi compost production, bee keeping, dairy, hatchery units, backyard poultry, agro-processing, produce marketing etc. There are about 15869 NHGs spread over 621 GPs of the state engaged in farming in about 6754 Ha.. The major crops cultivated by these groups other than paddy are vegetables, banana and tuber crops . There are about 186052 families involved in such farming. The no. of families and no. of NHGs involved and area of cultivation are maximum in Idukki District.. The coverage under farming in different districts by Kudumbasree is given in Table: 4.16

#### **Agricultural Research and Education**

4.124 The Kerala Agricultural University is the principal institution in the state providing human resources and technology required for the sustainable development of agriculture, encompassing all production activities based on land and water, including crop production, animal husbandry, forestry and fisheries. The University fulfils its obligations and commitments through a network of 36 big and small campuses spread through out the state consisting of ten colleges, six regional agricultural research stations, twenty six research stations, five Krishi Vigyan Kendras (KVK) and three

centres of advanced studies. The Central Training Institute, the Centre of Excellence in Training for Plantation Crops and the Communication Centre support the training and research activities. The University has a strong technical manpower consisting of 1,000 academics and over 800 technical staff.

4.125 Research initiatives undertaken in the university are focussed on increasing the productivity of crops, livestock and fish currently raised in the state through manipulation of the genetic base; improvements in the management practices; control and management of pests; diseases and parasites; increasing the efficiency of the bio-physical and human resources, and inputs used in production; the introduction of new crops, animals, and machines; evaluating and designing policies, programmers, institutions and infrastructure; and analysis and appraisal of the value systems and gender equation which are conducive or inhibitory to the adoption of technologies and innovations evolved through research. The research support for the sustainable development of the agriculture sector of the state is rendered in a partnership mode in close association with the research institutions managed by ICAR, Commodity Boards and Departments of the State and Central Government. Over 700 research projects are currently in operation, under the different research faculties of the University.

4.126 The extension network, for the transfer of latest technological innovations of the University is operationalised through the Agricultural Technology Information Centre (ATIC), University Communication Centre, KAU Press, Central Training Institute and the Centre of Excellence for Training in Plantation Crops. Extension activities are also taken up through the 10 teaching institutions, 6 zonal research stations and 26 other research stations of the University. The ATIC envisages to provide a single window delivery system for products and technologies developed by the University, to strengthen farm advisory services, to provide a mechanism for feedback and to function as a repository of agricultural information. During the financial year 2002-03, the transactions through ATIC has exceeded one crore. The communication centre, apart from its farm advisory services and media publications, is instrumental in brining out the 2 Research Journals and publication of many books and periodicals. The KVKs located in the major-agro-ecological zones of the state cater to the specific technology and socio-economic requirements of the respective regions.

4.127 University facilitates in-service training on new innovations, technologies and extension management to the grass root as well as middle level functionaries of development departments and agencies drawing considerable technical, scientific and professional capacity available in the University.

4.128 The Central Training Institute and the Centre of Excellence in Training for Plantation Crops, co ordinate and facilitate empowerment of the different stakeholders such as field extension functionaries of the development departments, commodity boards, commercial and rural banks. The centre has started capacity building programmes for professional graduates for taking independent ventures like agro-clinics, agri-business centre etc, with the help of Government of India, NABARD and other agencies such as MANAGE and Small Farmer's Agricultural Consortium.

4.129 Agro Bio-technology Agency for Rural Employment (ABARD), launched by the University as a pilot project, aims at technological empowerment of rural youth, especially women, for entrepreneurship development and to extent quality services and products at affordable rates. ABARD is a joint venture of the KAU, supported by Thrissur District Panchayat, Thrissur DCB Ltd. and 3 Grama Panchayats – Ollukkara, Pananchery

and Madakkathara. The University has also initiated a new project on Participatory Extension System for technology generation, dissemination and refinement.

4.130 Research studies conducted by KAU on Water Resource Management on tropical hill slopes of Kerala, has suggested that *lined pits and storage tanks with recharge wells* are effective and economical means of water harvesting in these regions. Evaluation studies on the various Farm Implements and its uses have suggested that, while many implements still need modification, there are many modern high-capacity machinery like *Transplanters and Combined Harvesters* available with different departmental agencies not fully utilised. The University has started a project on Development and testing of farm machinery for plantation crops of Kerala and has so far developed prototypes for *basin lister* for tree crops, *micro tiller*, *pit digger*, *powered palm climber*, *rotary coconut husker* etc. A revolving fund project aided by ICAR for production and popularisation of farm machinery is also in the offing.

4.131 Animal nutrition studies, undertaken by the university has suggested that, feeding of *complete feed* to calves improves the conversion efficiency, daily body weight gain, better dressing percentage, meat yield and meat-bone ratio. Studies on bacterial quality of meet, sampled from meat processing plants has revealed presence of pathogenic and spoilage organisms like *E.coli*, *Staphylococcus aureus*, and *Pseudomonas* in all the 3 meat species namely beef, pork and poultry. Salmonella was also isolated from beef and chicken samples.

4.132 Table 4.17 shows real growth and intensity of agricultural research funding at state level. The growth in real funding was highly uneven among states during the 1970s. These differences narrowed in the 1980s with steady growth in all states. The growth of total state funding increased from 1.3 per cent per annum in the 1970s to 8.2 per cent in the 1980s, but slowed to 3.8 per cent in the 1990s. The intensity of state funding has increased in all states since 1980s, except in West Bengal. However there remains wide variations in the intensity between states. The growth rate in real funding for the period 1992-99 in Kerala was 1.85 per cent and funding per hectare was highest in Himachal Pradesh followed by Jammu and Kashmir and Kerala during 1995-97. Kerala is one of states with higher intensity of research funding.

**Table 4.17**  
**Growth and Intensity of Agricultural R&E Funding by State Governments**

State	Annual growth rate in real funding			Funding per ha		Funding as share AGDP		Share in the total funding by all State
	1972-81	1982-91	1992-99	1981-83	1995-97 a	1981-83	1997-99	1997-99
	(%)			(1999 Rupees)		(%)		(%)
Andhra Pradesh	11.4	6.47	5.23	26.21	78.02	0.16	0.28	8.08
Assam	-0.07	9.51	-0.03	63.66	95.67	0.28	0.33	2.84
Bihar	18.52	8.55	5.1	25.95	71.97	0.13	0.25	4.96
Gujarat	0.61	9.71	4.78	28.03	85.2	0.19	0.41	7.52
Haryana	28.56	5.16	8.18	70.58	196.27	0.28	0.44	6.23
Himachal Pradesh	-0.09	12.76	10.21	150.68	567.78	0.62	1.52	3.31
Jammu & Kashmir	-0.09	10.97	12.79	73.35	295.13	NA	NA	2.25
Karnataka	12.91	7.54	3.03	22.57	52.07	0.19	0.28	5.74
Kerala	25.4	5.23	1.85	100.08	242.89	0.31	0.41	5.65
Madhya Pradesh	-0.08	13.29	1.09	5.19	18.16	0.07	0.14	3.42
Maharashtra	0.74	7.06	2.43	42.04	84.94	0.39	0.43	14.21
Orissa	7.75	6.5	-0.02	14.27	27.85	0.1	0.21	1.78
Punjab	3.43	10.28	2.41	72.66	155.01	0.24	0.3	6.48
Rajasthan	3.63	10.95	3.58	9.6	27.85	0.12	0.18	4.13
Tamil Nadu	3.8	13	7.44	36.15	160.2	0.21	0.59	9.34
Uttar Pradesh	-0.06	5.74	2.06	28.63	45.07	0.13	0.16	8.03
West Bengal	12.13	2.35	4.73	46.19	65.48	0.17	0.17	4.89
Average for all States	1.34	8.23	3.82	29.84	28.28	0.24	100 b	

Note: Figures for the R&E intensity are three year averages; 1972 refers to 1971/72 and so on.

a: Triennium average of NCA ending 1997.

b: Column total may not add upto 100 percent as expenditure for small states is not reported here.

Source; ICAR, 2003.

4.133 Overall the Government of India provides 52 per cent of public funding for agricultural R&E in India which almost entirely passes through ICAR. A large proportion of these funds (87%) is directed to the State Agricultural Universities. However the recent decline in external funding for Kerala Agricultural University is a cause for concern and KAU should take effective steps to get more funding from external agencies.

4.134 A number of research stations were established under the KAU decades back and a restructuring of the stations with changes in mandate as well as incorporation of new courses in agricultural education are needed in the changing agricultural scenario. Government has constituted a high level committee to study the issues in research, education and administration of the University. A vision document has to be prepared for the University similar to the ones prepared for the individual institutions under ICAR.

### Agricultural Marketing

4.135 An efficient agricultural marketing system is indispensable for the overall development of the economy. In the changing scenario, the nature of marketing support required for safeguarding the interest of the small and marginal farmers is different. In an increasingly globalised market arising out of trade lib-

eralisation, *inter alia* through WTO Agreement, impact on Kerala agriculture needs to be analysed in the context of both exports from Kerala and imports into Kerala especially spices and plantation crops.

4.136 Government of India has recognised the importance of streamlining agriculture marketing in the wake of the World Trade Agreement (WTA). The removal of QRs on imports has several adverse implications for the sustainability of cash crops of Kerala. In the liberalised context, marketing and marketing studies assume paramount importance in future agricultural development of the state.

4.137 The inter-Ministerial Task Force set up by the Ministry of Agriculture to strengthen agricultural marketing submitted its report in June 2002. It recommended amendments to the State APMC Act for promotion of direct marketing and contract farming, development of agricultural markets in private and cooperative sectors, stepping up of pledge financing, expansion of futures trading to cover all agricultural commodities, introduction of negotiable warehousing receipt system and use of information technology to provide market led extension services. The Ministry of Agriculture, Government of India have constituted a committee under the Chairmanship of Shri. K.M. Sahani, Additional Secretary and the committee has

prepared a model legislation titled the State Agricultural Produce Marketing (Development and Regulation) Act, 2003 mainly to reform the APMC Acts in various states. Facilitation of E- Commerce , including online trading under a transparent environment with suitably strengthened market intelligence set up and quality assurance system would go a long way in helping to protect the poor farmers from the unstable price regime.

4.138 Government of India have appointed a Working group under the Chairmanship of Dr. Kalyan Raipuria for finding implementable solutions to the recommendations of the Expert Committee (Guru Committee) on Agricultural marketing. The report of the working group specifically covers areas relating to commodity forward and futures markets. The major recommendations are shown in BOX 4.10. Since the beginning of 1990s, concerted efforts have been made in expanding the scope of futures trading along with general economic reforms. Though major initiatives have been taken up in promoting commodity futures markets in India, many of the constraints still persist.

4.139 With the issue of notification dated 1.4.2003, Futures Trading is not prohibited in any commodity. Futures Trading can be conducted in any commodity subject to the approval and recognition of the Government of India. BOX 4.11. Around 91 commodities are in the regulated list.

4.140 As proposed in the National Agricultural Policy, 2000, more agro commodities are being identified and added to the list of permitted commodities for futures trading.

4.141 The overall level of trading in all exchanges is indeed marginal compared to the production levels and value added remains abysmally low. In order to succeed in futures market, quality certification and related procedures along with availability of quality warehouses, transparency and professionalism are essential. Professional methods have to be followed in predicting prices of futures for which marketing wing of department of Agriculture should be strengthened with specialists, to facilitate dissemination of information which may form as a base in price fixation. Conventional practices may lead to exploitation also.

#### Box - 4.10

##### Major Recommendations of the Working Group on Forward and Futures Markets

- Commodity specific approach to futures trading to be discontinued. Instead recognized associations/exchanges could apply for permission for trading in any 'contracts'
- Negative lists should be pruned drastically.
- Exchanges should come out with feasibility studies on commodities and products based on costs and benefits analysis of futures trading. The system of piecemeal opening up and permission based on the Regulators (FMC)/ Governments evaluation may be discontinued. Contracts proposed by the Exchanges based on proper feasibility studies should be approved by the Regulator.
- The design of contracts and the type of contracts should be left to the Exchange.
- The system of warehouse receipts needs to be universalized in futures trading to enable enhancing volumes and in minimizing transaction costs.
- Legal framework for making warehouse receipts transferable and negotiable should be strengthened in making negotiable warehouse systems the demat of commodity futures trading.
- The Regulator (FMC) needs to be strengthened and made an autonomous organisation with adequate powers and professional capabilities to monitor and surveil in an expanded and liberalised futures market.
- Rules and procedures need to be simplified to provide transparency
- The role of commodity market regulator may be redefined to regulate all derivative products.
- The target turn over of futures trading may be kept at least 10% of the GDP from a level of 1.26% in 2000-01.
- A policy to be framed for convergence of futures m markets, ie. the commodities derivatives exchanges and securities derivatives exchanges to trade in either or both the categories of derivatives products.

*Government of India - 2001-02*

**Box - 4.11****Futures Trading in Agricultural Commodities**

- Commodity futures hedge the risks faced by farmers and agricultural trade functionaries from seasonal and cyclical fluctuations in the prices of Agricultural Commodities. Futures markets perform the two important functions of price discovery and price risk management, helping to stabilize the amplitude of price variations.
- Internationally Futures Trading is allowed in a range of commodities and even in a number of non-commodities such as weather indices and pollution permits.
- The first organized futures market in India evolved with the setting up of the Bombay Cotton Trade Association Limited in 1875. The Forward Contract Regulation Act (FCRA) was enacted in December 1952. During the 1960s and 1970s, however FT was either suspended or prohibited. The Khusro committee recommended the reintroduction of futures trading in major commodities. On the recommendation of Kabra Committee in 1993, the Government of India permitted futures trading in a large number of commodities. There are at present 22 exchanges in the country. International futures market in pepper and castor oil were developed by upgrading the existing exchanges at Kochi and Mumbai. A multi commodity Nationwide exchange has also been started in Ahmedabad.
- Indian Commodity futures markets are still at a nascent stage. They are dispersed and fragmented with small turnover and catering to separate trading commodities in different regions. Apart from physical infrastructural constraints such as limited online trading, online surveillance and monitoring, the non availability of a fool proof legal system of contracts relating to the warehouse receipt system is impeding the development of futures markets in India. Furthermore, the hawala markets, which have been operating since decades, trade 20-30 times the volume of official with low transaction costs and hence attract many speculators and small hedgers. Efforts are being made to bring informal forward trading into the ambit of the Forward Markets Commission to ensure their orderly integration with the formal marketing structure. Effective co-ordination and interface between the exchanges, banks and the warehousing agencies is crucial in evolving the necessary framework for a mature warehousing system based on legally enforceable contracts and supporting transferability and negotiability.

**Agri Export Zone**

4.142 The EXIM Policy 2001 has introduced the concept of Agri Export Zones to give primacy to promotion of agricultural exports and effect a reorganisation of export efforts on the basis of specific products and specific geographical areas. Till December 2002, the Central Government has sanctioned and notified 41 AEZs in 17 states. These 41 AEZs will entail an estimated investment of around Rs. 1142.53 crore, out of which around Rs. 333.68 crore will flow from various central government agencies, Rs. 168.61 crore from State Governments and Rs. 640.24 crore from Private sector. The projected export from these AEZs is Rs. 3000 crore during the next five years. The measures envisaged to promote exports from such zones include financial assistance by dovetailing and extending existing financial assistance to various agricultural ex-

port related activities and fiscal incentives. The Agri Export Zone covering nine districts from Thiruvananthapuram to Palakkad was established. The commodities identified for export are vegetables, banana, pineapple and banana chips. More attention is needed to attract private investment in the AEZ established in the state. Considering the relative advantage for Kerala, steps are to be taken to establish separate Agri Export Zones for spices and medicinal plants in association with Commodity Boards and other agencies involved in the production and marketing of these commodities. However, Private investment is the crucial factor determining the level of exports.

**WTO and Agriculture**

4.143 The Uruguay Round and World Trade Agreement yielded no significant reduction in protection in

developed countries. The reason includes weaknesses in specific aspects of the agreement such as high base-line support levels from which reduction were made. In US, measures undertaken before the negotiations were adequate to fulfil the new rules on reducing domestic support. Now protection in agriculture takes different forms, like tariff protection, subsidies, tariff peaks, TRQs, tariff escalation and opaque tariffs.

4.144 The structure of border protection in developed countries continues to be high, non-transparent and anti development. About 28 percent of domestic production of OECD countries are protected by Tariff Rate Quotas (TRQs). tariff peaks as high as 500 per cent confront imports from developing countries. Tariffs also increase by degree of processing, creating a highly escalating tariff structure that limits access for processed foods. In many industrial countries, the average income of farmers are higher than the national average, reaching almost 250 per cent of average income for the Netherlands, 175 per cent for Denmark, 160 per cent for France and 110 per cent for the United States and Japan.

4.145 When subsidies depress prices the impacts in poor countries can be severe. Import growth rates in industrialised countries declined across all groups of agricultural products exported from developing countries while the opposite occurred in developing countries. However the developing countries in general gained market share in manufacturing sub sector to a limited extent except food processing. The protection rates for food processing in industrial countries are extremely high.

4.146 Compared to the slow reforms in OECD countries, the change in protection in developing countries were significant in 1990s. The average agricultural tariff of developing countries declined from almost 30 percent in 1990 to about 18 per cent in 2000, a decline of 35 percent. An extensive network of subsidies has evolved to support agriculture particularly in rich countries. The support accorded to OECD country producers through higher domestic prices and direct production subsidies was \$ 248 billion in 1999-2001. Protection rates for producers in the OECD decreased from 62.5 per cent in 1986-88 to 49 per cent in 1999-01. Agricultural support tends to be counter cyclical in rich countries, pushing price adjustments into the global market and accentuating price drops. In European

Union farmers prices are 34 percent higher than the international prices in 1999-01.

4.147 Tariff escalation hinders diversification into value added and processed products in which trade is expanding rapidly, but such escalation directly penalises investors in developing countries who seek to add value to production for support.

4.148 The total of Green and Amber box supports in the OECD countries was higher in 1996 in nominal terms (US\$ 259 billion) than during the base period (US\$ 221 billion) The total transfers to agriculture in OECD amounted to \$ 327 billion in 2000 compared to \$ 298 billion in 1986-88 and exceeded the value of world trade in agricultural products. It is in this background that developing countries took their stand at Doha and recently at Cancun

4.149 The state government have taken steps for the implementation of the major recommendations of the Commission on WTO concerns in agriculture. A Virtual University on Agrarian prosperity would be set up in 2003-04 by the Kerala Agricultural University in collaboration with the Indian Institute of Information Technology Management, Kerala.

#### **Sanitary and Phyto Sanitary (SPS) and Technical Barriers to Trade (TBT) Agreements**

4.150 The SPS and TBT Agreements confirm the right of WTO members to apply measures necessary to protect human, animal and plant life and health. These include the setting of technical regulations and standards governing quality requirements for food, packaging, marking and labelling and rational 200 and phytosanitary measures to protect animal and plant life and health.

4.151 The SPS norms in US differ from that in EU to a great extent. The permissible limit for total aflatoxin in food and feed is 20 ppb in US and Australia while in EU it is 1 ppb. The EU norms are higher than the codex norms. Even EU member countries follow their own norms which vary greatly. Though codex standards are considered as base, the norm set by the importing countries matters most in disputes.

4.152 The SPS norms are gradually emerging as trade barriers. The developing countries need to actually participate in global standard setting bodies.

Expert groups of scientists, and food technologists should be identified and database has to be created with associated infrastructure. The SPS and TBT agreements contain promises of financial and technical assistance for the developing countries. However, translating these promises into action has not yet been achieved. Further conforming to EU and other norms entails massive investments in Hazard Analysis and Critical Control Points (HACCP) methods which are capital intensive. Major findings of a study on coffee farms conducted in Karnataka are shown in BOX 4.12. Out of 282 farms surveyed, 149 are SPS complying farms. Partial financial support could speed up adoption of SPS norms by the farms.

### Issues in WTA

#### Tariff escalations

4.153 Current tariff levels for value added teas are higher in major markets while those for bulk teas are very low or even zero. Value addition is significant in international trade.

#### Harmonisation of Phyto sanitary measures

4.154 Harmonisation of phytosanitary measures, through the establishment of International Standards for Phytosanitary Measures (ISPMs) by the International Plant Protection Convention (IPPC), started only recently. A substantial number of concept ISPMs have been adopted but much work

remains to be done, in particular on standards specific to individual pests, plants or plant products. Maximum Residue Levels (MRLs) should be harmonised for produces such as tea, coffee and pepper for retaining the market share. The level of participation of developing countries in both the number and effectiveness in international standard setting bodies remains an issue. Developing countries lack the technical and financial capacity to fully participate in activities of international standard setting bodies and they lack the supply side capacity to meet the increasingly strict and high standards adopted by the developed countries.

#### Rules of Origin

4.155 The raw materials produced in one country is moved to another for processing and to yet another as a export product. Imported low quality pepper and tea are reported to be blended with Indian varieties and exports as Indian varieties. Such products with multi country origin should be enforced strictly to protect Kerala's traditional markets, especially for tea, cashew, coffee and pepper. Consumer Ministry's recent stipulation of multi country origin declaration mandated for tea should be extended to other commodities also. This is more urgent for protecting Kerala's market share especially spices in the international market.

#### Regional Trading Blocks

4.156 Along with the evolution of multilateral system, there has also been a parallel movement towards the formation of RTBs. Disciplines are lacking with respect to preferential rules and WTO has no mandate to monitor the trade effects of RTBs. Around 250 preferential trading blocks are reported throughout the World and it is growing. Eventhough the Fifth Ministerial meeting at Cancun was a failure, multilateralism will dominate in World trade along with proliferation of RTBs. Indo-ASEAN Negotiations are in an advanced stage. Kerala also could exploit the possibilities of these agreements. However more transparency at GOI level is needed to involve state governments also in the negotiation process since trade liberalisa-

#### Box - 4.12

##### Major Findings of a Study on SPS in Coffee

- SPS complying farms experienced an increase in labour input per unit of land. The mandays per hectare was 575 for non-SPS complying units and 878 for SPS complying units.
- SPS complying farms experienced 43% increase in labour costs over non-SPS complying coffee farms in pre harvest operations. The increase experienced by these farms in the matter of harvesting operations was 33%.
- The full SPS compliant farms included in the sample uprooted 90% of their old coffee plants and partial SPS compliant units undertook only non-replanting based SPS measures.
- The incremental costs and cash crunch faced by SPS complying farms increased the risk of non-repayment of loans.

Source: Damodaran, 2002

tion with these countries may have an impact in the agricultural economy of the state, especially in rubber, palm oil and pepper.

### **Indigenous Traditional Knowledge**

4.157 Indigenous Technical Knowledge (ITK) has been used for centuries by indigenous and local communities. Despite the growing recognition of Indigenous Knowledge as a valuable source of knowledge, western intellectual property laws continues to treat it as a component of Public domain. The importance of IK has gained recognition in International fora. Thus, in 1981, a WIPO - UNESCO Model Law on Folklore was adopted, In 1992, the convention on Biological Diversity specifically addressed the issue. In 2000, an intergovernmental committee on Intellectual Property and Genetic Resources, Indigenous Knowledge and Folklore was established under the auspices of WIPO.

4.158 A large number of patents have been granted on genetic resources and knowledge obtained from developing countries without the consent of the possessors of the resources and knowledge. The CSIR asked for a reexamination of the patent granted for the Wound Healing property of turmeric. The US patent and Trademark office revoked this patent. In 2000, the patent granted to WR Greece Company and USDA on bio pesticide property of Neem was revoked.

4.159 Geographical indications especially appellations of origin, could be used to protect products of a special region like Basmati rice, Darjeeling Tea, Alphonso mago, Kolhapur slippers Malabar pepper, Alleppey turmeric etc.

4.160 The global market for herbal products is expanding very fast. It is estimated to touch \$ 5 billion by 2020. China and India are major sources of medicinal plants. Local tribal communities have the exclusive rights of collecting Non-timber forest produce (NTFP) like nuts, flower, gum, resins, medicinal and aromatic plants, honey, wax etc. Action plan has to be prepared to exploit the market with appropriate protection of traditional knowledge.

4.161 Preparation of village wise community Bio diversity Registers has been undertaken in some Panchayats. The Traditional Knowledge Digital Database (TKDC) project has been initiated at Government of India level. TKDC is based on software which facilitates classification of traditional knowledge. making it compatible with international patent classification. In India, a National Innovation Foundation has

been set up. This foundation with an initial corpus of Rs. 20.00 crores is intended to build a national register of innovations, mobilize IPR protection, set up incubation for converting innovations into viable business opportunities. It has established four incubation centers across the country.

A project on documenting ITKs in the state has been initiated. This is more relevant in the context of TRIPS.

### **Livestock Sub Sector**

4.162 Livestock sub sector has a vital role in the States' economy. This sector has high potential for alleviating poverty and unemployment in rural areas. Majority of livestock owning farmers are either small and marginal or even landless. In view of its suitability for combining with crop sub sector and sustainability as a household enterprise with the active involvement of the farm women, it is emerging as a very popular supplementary avocation in the small farm segment. The rural women play a significant role in the development of Livestock sub sector and are involved in operations like feeding, milking, breeding, management and health care and running micro enterprises. It is estimated that about 32 lakh out of the total number of 55 lakh households in Kerala are engaged in livestock rearing for supplementing their income. The homestead settlement pattern, the relatively high level of literacy particularly among women, the highly favourable agro climatic conditions conducive for bio mass production and the long tradition in livestock rearing are the inherent strengths which the Kerala economy possesses in favour of livestock rearing. In the context of removal of Quantitative Restrictions (QRs), measures to safeguard the domestic sector from import of cheaper products and to ensure that the incoming items conform to Indian standards are to be strengthened.

4.163 As per earlier Census figures, Kerala accounts for 1.61 per cent of the total cattle population in the country. In 2000 about 72 per cent of the breedable cattle in the State were crossbred which was made possible by expanded health care facilities and veterinary services. So far out of 2887 artificial insemination centers 2523 have been established by the Animal Husbandry Department, 12 by Dairy Development department 140 by Voluntary Agencies, 185 by APCOS. The embryo transfer technology introduced in the recent past is yet another step towards livestock development. As a result milk production increased from 9.82 lakh MT in 1981-82 to 22.58 lakh MT in 1996-97 and

27 lakh MT in 2001-02. By 2002-03 milk production declined to 24.19 lakh MT recording a reduction of 11% compared to previous year.

4.164 Though livestock sub sector makes significant contribution to the State's economy, it is facing serious constraints due to inadequate fodder base as a result of sharp and continuous decline in the area under livestock-supporting seasonal crops especially paddy and the limited scope for fodder cultivation in the State. Marginalisation of agricultural holdings, declining trend in the family participation particularly among youth and high cost of production as a result of increasing reliance on external source for inputs have further aggravated the problem. The biggest challenge faced by the State in the livestock sector is the threat of foot and mouth disease because of large scale inflow of cattle from the adjoining states.

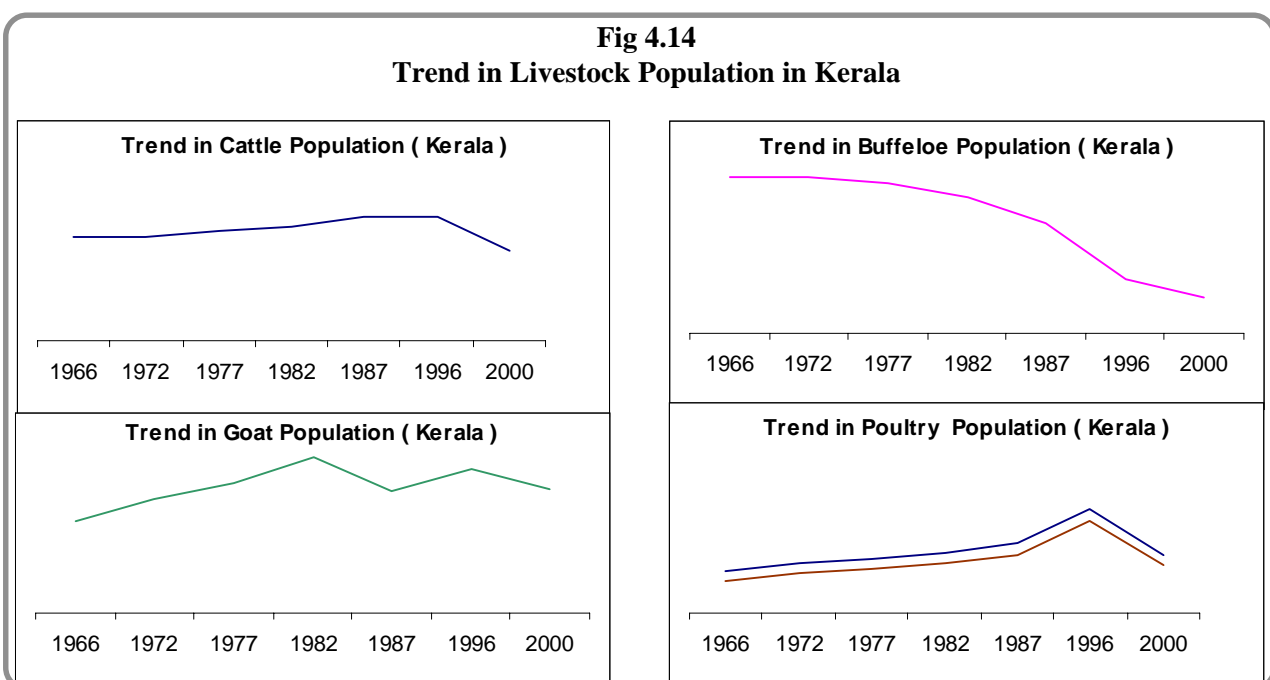
4.165 Tenth plan strategy of Kerala is framed in consonance with the national strategy with due adaptation to the Kerala context giving due importance for Upgradation of standards of veterinary institutions and services, establishment of disease free zones, extending health cover and stock upgradation and increasing production through scientific and better management. Enhancing fodder availability and fodder seed/planting material, promotion of farming system approach, development of micro enterprises for poverty reduction are also given importance.

### Trend in Livestock Population

4.166 The trend in livestock population has been examined on the basis of the quinquennial livestock census data. The distribution trend of livestock and poultry for the last three decades is presented in the Appendix 4.33. On analysis of data, it can be seen that Livestock population was showing an increasing trend up to 1982 and by 1987 there was a decline of 2.54 per cent. Even though it showed signs of improvement by 1996 (1.38%), total livestock population declined by 23.01 per cent during 2000. Kerala possesses 24.9 lakh cattle, 1.1 lakh buffaloes, 16 lakh goats, 0.9 lakh pigs, 10.4 lakh ducks and 169.1 lakh poultry as per 16<sup>th</sup> Quinquennial Census 2000. The provisional data of ongoing Census (17<sup>th</sup> Quinquennial Census 2003) showed further reduction in population and the State possess 21.21 lakh cattle, 0.71 lakh buffalo, 12.05 lakh goats, 123.33 lakh poultry and 6.74 lakh ducks.

4.167 An analysis of the Census figures for 2000 shows an overall negative trend during 1996-2000 period in cattle, buffaloes, cows and she buffaloes population. During the period cattle population declined by 9.06 lakhs (26.55%), adult cows by 7.37 lakhs (24.47%), buffaloes by 0.54 lakhs (32.73%) and She buffaloes by 0.44lakhs (44.89%) respectively. The transition occurred in the structure of bovine population during the census period 1956-2000 is given in Appendix 4.34. Compared with preceding census Bovine population has declined to 35.6 lakh in 1996, further by 27 per cent in 2000 and by 15.8 per cent to 21.9 lakhs in 2003.

**Fig 4.14**  
**Trend in Livestock Population in Kerala**



4.168 As already stated the buffalo population is on the decline. The State has not undertaken any concerted attempt in implementing buffalo development programme. KLD Board has been producing frozen buffalo semen and the same is made available through AI units for artificial insemination.

4.169 Goat population is also on the decline mainly due to indiscriminate slaughter, shrinking of grazing lands and urbanisation. Goat population showed a significant increase from 1966 to 1982 but declined by 21 per cent as during 1987 census and then increased by 17.71 per cent during 1996 census period. By 2000 it showed a reverse trend and declined by 14.13 per cent and during 2003 another 24.6 per cent.

4.170 Even though some efforts were made by KLD board and MPI to foster swine industry, compared to 1996 the pig population declined by 70 per cent during 2000 .

4.171 In the case of poultry and duck population decline during 2000 census was 34.07 per cent and 12.27 per cent respectively. During 2003 they further declined by 27.06 per cent and 35.30 per cent (Appendix 4.33)

4.172 The last two livestock census reveals a drastic decline in livestock and poultry population and it needs urgent correction. Non availability of quality fodder, lack of sufficient land for fodder cultivation, high feed and feed ingredient cost, labour cost, increased consumption of meat and indiscriminate

slaughter, inflow of products from neighbouring states etc., are the main reasons for this tendency.

4.173 An overall review of the past investments in the Livestock sector shows that development efforts were largely confined to cattle development with focus on dairy cattle through herd improvement. This approach has paid rich dividends by way of steady improvement in productivity and continuous increase in milk production. It is estimated that about 80 per cent the dairy cattle in Kerala are cross bred

4.174 The spatial distribution of the different categories of livestock in Kerala shows a regional pattern. While dairy activity is popular in almost all districts, poultry rearing is concentrated in Idukki and Pathanamthitta, goats in Malappuram and duck in Alappuzha and Kottayam districts. The emerging trend also reveals a shift in the population of dairy cattle from the coastal districts to midland and high land regions.

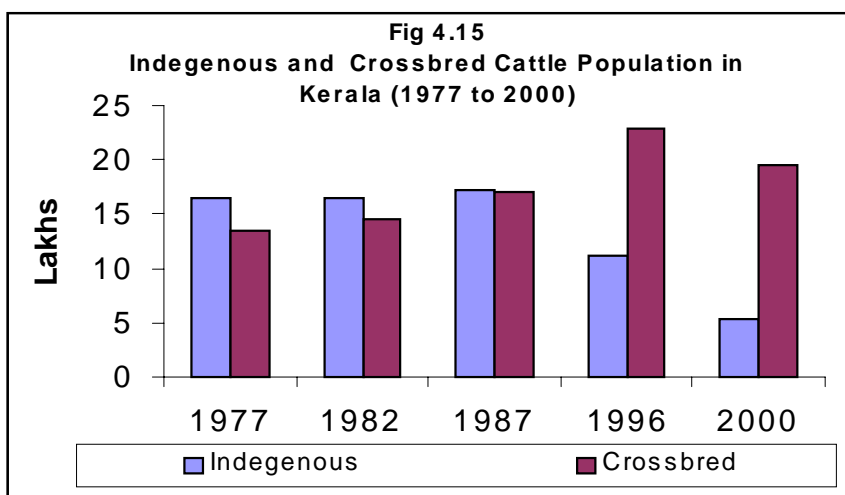
#### Weak Feed and Fodder Base

4.175 Most of the reports regarding the availability of fodder in the country project an alarming gap between demand and supply. The National Commission on Agriculture (1976) estimated the demand of fodder in the country for the year 2000 AD at 256.8 million ton dry fodder and 575 million ton green fodder. The future scenario of demand and supply position as shown in Tenth Plan Working Group Report of the Planning Commission on Animal Husbandry and dairying reveals a huge deficit (prevailing and expected) in green fodder in the country. The available fodder can meet the demand of only 46.7 percent of the total livestock .The deficit as on 2000 in green and dry

fodder in the country was 61.10% and 21.93% respectively.

#### Demand and Supply of Fodder

4.176 Likely future scenario of demand and supply position in relation to forages in the Country is given in Table-4.18. It reveals a huge deficit (prevailing and expected) in green fodder in the country.



**Table – 4.18**  
**Supply and Demand of Green and Dry Fodder Estimated**  
 (in million MT )

Sl. No.	Year	Supply		Demand		Deficit as % of Demand	
		Green	Dry	Green	Dry	Green	Dry
1	1995	379.3	421	947	526	59.95	19.95
2	2000	384.5	428	988	549	61.10	21.93
3	2005	389.9	443	1025	569	61.96	22.08
4	2010	395.2	451	1061	589	62.76	23.46
5	2015	400.6	466	1097	609	63.50	23.56
6	2020	405.9	473	1134	630	64.21	24.81
7	2025	411.3	488	1170	650	64.87	24.92

Source: KLDB

4.177 Projected gap between demand and supply of green and dry fodder presents a challenge for fodder production in the coming years. While the deficits are anticipated to increase as a proportion of the requirements in both the case, the situation appears all the grimmer in case of green fodder. Focussed strategies and concerted efforts are the need of the hour to face this challenge.

4.178 The situation in Kerala is worse. Kerala is a deficit State as far as fodder production is concerned. Earlier cattle rearing has been integrated with rice farming system to the advantage of both. With the shift in cropping pattern, the area under rice has come down by 50 per cent over the last two decades leading to drastic reduction in the availability of straw for feeding cattle. It is estimated that the state produces only 60 per cent of the roughage requirement for cattle in Kerala. The dry matter requirement of adult cattle is 53.6 lakh MT. Total dry matter available in the State as per KLD Board report is only 16.76 lakh MT during 2002 - 2003. The dry matter requirement for 26.80 lakh adult cattle is estimated at 53.6 lakh MT Availability of dry matter in Kerala for the period 1997-98 to 2002-03 is given in Table 4.19.

4.179 Regarding the cattle feed concentrate, State is not producing even half the requirement. Cheap and quality feed and fodder are scarce in Kerala. Shift to animal unfriendly cropping pattern, increased labour cost, scarcity of input for cattle feed etc., are forcing the cattle sector of Kerala to heavily depend on “imported cattle feed”. Green fodder is yet to be incorporated into the state-cropping pattern because its cultivation is not as profitable as that of other crops. Non-availability of land for fodder cultivation also stands as a major limiting factor. The cost of concentrated feed is ever on the increase making it almost impossible for the dairy farmers in the State, especially those with limited financial resources to maintain cattle. The present price of compounded feed ranges from Rs.7/- to Rs.7.50 per kg. There is an increasing trend in the price of ingredients also.

4.180 Kerala farmers have adjusted the situation by restricting the number of cattle and that too by preferring high yielding cross breeds. This is evident from the steady increase in the proportion of crossbred animals, which Kerala could achieve during the last three decades. The proportion of crossbred animals in the total

**Table - 4.19**  
**Details of Dry Matter Availability in Kerala** (in Lakh MT )

Sl.No.	Year	Paddy Straw	Cultivated Fodder	Sugarcane Top	Pineapple Waste	Tapioca Leaf and Stem	Others	Total
1	1997-98	11.46	0.498	0.1641	0.3778	3.69	2	18.1899
2	1998-99	10.9	0.6948	0.2028	0.3778	3.95	2	18.1254
3	1999-00	11.55	0.6528	0.1734	0.4986	3.4	2	18.2748
4	2000-01	11.26	0.6522	0.101	0.5394	3.49	2	18.0426
5	2001-02	10.55	0.659	0.9801	0.5045	3.38	2	18.0736
6	2002-03	9.4	0.4866	0.9366	0.5781	3.36	2	16.7613

Source: KLD Board

cattle population is of the order of 79 per cent (see Appendix 4.31). There is drastic reduction in other categories of livestock such as bullocks, indigenous female cattle, male calves etc. ( Appendix 4.36 & 4.37). The recent trend reveals that the farmers are reluctant to maintain even high yielding cross-bred cows during their dry period.

**Table 4.21**  
**Average Annual Growth Rate of Milk & Egg Production**

Sl.No.	Year	Milk		Egg	
		Kerala	India	Kerala	India
1	1950-51 to 1960-61	2.50	1.64	NA	4.63
2	1960-61 to 1970-71	2.52	1.15	NA	7.91
3	1970-71 to 1980-81	12.52	4.51	NA	3.79
4	1980-81 to 1990-91	6.41	5.50	4.89	7.70
5	1990-91 to 2000-01	4.42	4.16	2.75	4.59
6	1996-97 to 2001-02	3.78	4.37	(-) 0.22	4.09

### Trend in Production of Major Livestock Products

4.181 The important contribution of livestock sector to the economy in Kerala is derived from milk, meat and egg. Trends in requirement and availability of major livestock products are given in Table 4.20. Milk is the only product which could maintain its growth rate in tune with the increase in demand. The per capita availability of milk during 2002-2003 was only 205 g/day compared to 234g/day during the previous year. Compared to the Kerala situation per capita availability of milk in India during 2001-02 is 226 gm/day (still below world average of 285 g/day). In the case of egg, the domestic production is sufficient to meet only 30 per cent of the internal requirement. The per capita availability of egg is 59 Nos/per year during 2002-03 showing a decrease from 63 Nos/year during 2001-02. The state is largely dependent on external sources for maintaining the supply of meat. The internal supply is more or less around 15 gm per capita per day.

4.182 The average Annual growth rate of milk and egg production in Kerala & India for the period from 1950-51 to 2001-02 is given in Table -4.21

### Milk

4.183 In spite of a shrinking fodder base, the dairy sector in Kerala could maintain its performance during 1990-91 - 2001 and the growth rate is 4.42 per cent, compared to India (4.16) but during the Ninth plan period (1996-97 - 2001-02) it came down to 3.78 per cent while that of India increased to 4.37 per cent. The compound annual average growth rate recorded during the last decade was 4.2 per cent, which was maintained during 2002-03 as well. The genetic upgradation attained through the artificial insemination programme launched by the state with the support of the frozen semen technology has helped it to attain new heights in milk production. However, the high yielding potential secured through cross breeding could not be converted into a corresponding increase in productivity. Despite considerable increase in the proportion of high yielding crossbred cattle, average milk yield per animal per day remains low at 6 litres compared to its potential of 8-10 litres. However, the average productivity attained by Kerala is higher than the national average (2.78 litres) and has been increasing. Index of milk production of Kerala and India from

**Table 4.20**  
**Requirement and Availability of Livestock Products**

Sl. No.	Year	Milk (Lakh MT)		Egg (Million Nos.)		Meat ('000 MT)	
		Requirement	Availability	Requirement	Availability	Requirement	Availability*
1	1981	18.62	9.82	2952	1618	177	50.81
2	1991	21.24	17.85	3471	1710	208	120.65
3	2001	23.20	27.18	4230	2002	249	172.80
4	2002**	23.74	24.19	4301	1347	253	181.02

Source: Animal Husbandry Department

\*including unauthorised sector \*\* Provisional based on projected population figures

1984-85 to 2002-2003 is given in Appendix-4.40.

4.184 There are significant inter state differences in productivity of cows and buffaloes. The milk yields of indigenous cows were highest in Gujarat (7.5 kg. per day), followed by Punjab (7.4 kg. per day) and Maharashtra (6.6 kg. per day). the average yield of buffaloes was highest in Punjab (5.7 kg. per day). In general, the milk yields of both cows and buffaloes were lowest in Orissa. The inter state disparity in milk production vis-avis population and average yields requires the development of appropriate strategies for equitable development of livestock sector in the country.

### Egg and Meat

4.185 Poultry farming for egg production relying on purchased feed is uneconomic in Kerala. Poultry rearing on commercial lines is therefore largely confined to broiler production. The Egg production which has reached the level of 2024 million numbers by the end of Eighth Five Year Plan is now showing signs of slowing down. The production which was 2054 million nos. in 1999-2000 is showing a downward tendency to 2034 million nos. in 2000-01, 2002 million nos. in

2001-02. This is against the target of 2279 million nos. during Ninth plan. Compared to previous year, a drastic fall of 32.47 per cent was recorded in the egg production to 1347 million nos. during 2002-03. Average annual growth rate of egg production was even negative (-) 0.22 per cent in Kerala during 1996-2002 period while that of India was 4.09 per cent (See Table – 4.21). Index of egg production of Kerala and India over the years 1984-85 to 2001-02 is given in Appendix 4.40

4.186 Meat production in Kerala comprises of beef, mutton, pork and broiler chicken. Out of this, beef is almost entirely from the culled animals brought from the neighbouring states. The rearing of goat and pig is concentrated in selected pockets. As in the case of poultry, meat production under stall-fed condition in general is not economical in Kerala. However, there is scope for fostering this activity in selected areas largely by utilising the bio wastes available.

4.187 The production of poultry meat including broilers is on the increase. It reached 52611 MT in 2002-03 as against 42693 MT in 2001-02. Details of milk, egg and meat production are furnished in Table 4.22.

**Table 4.22**  
**Year-wise Estimate of Milk, Egg and Meat production**

Year	Milk Production ( lakh tonnes )				% contribution of Kerala	Egg Production ( million numbers )				% contribution of Kerala	Kerala	
	India	% change over previous year	Kerala	% change over previous year		India	% change over previous year	Kerala	% change over previous year		Poultry Meat ( tonnes )	Meat other than Poultry Meat (
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1993-94	606	-	20.01	-	3.3	24167	-	1844	-	7.3	28000	101223
1994-95	638	5.28	21.18	5.84	3.3	25975	7.40	1916	3.90	7.2	30000	103551
1995-96	663	3.91	21.92	3.49	3.3	27284	5.03	1987	3.70	7.3	32000	105933
1996-97	683	3.02	22.58	3.01	3.3	27492	0.76	2024	1.86	7.4	34000	108336
1997-98	705	3.22	23.43	3.76	3.3	28400	3.30	2033	0.44	7.2	31688	114306
1998-99	752	6.67	24.20	3.29	3.2	29476	3.79	2044	0.54	6.8	32480	117840
1999-00	781	3.86	25.25	4.34	3.2	31501	6.87	2054	0.48	6.5	33204	121875
2000-01	810	3.71	26.05	3.17	3.2	32420	2.92	2034	(-)0.97	6.3	41515	122808
2001-02	846	4.44	27.18	4.34	3.2	33600	3.64	2002	(-)1.57	6.0	47693	125100
2002-03	NA	-	24.19	- 11.0	-	NA	-	1347	(-)32.7	-	52611	125130

Source: Economic Survey and Department of Animal Husbandry \*Provisional @ including unauthorised sector

### Poultry Rearing in India

4.188 The poultry production model in vogue (high input-high output using commercially developed strain of birds) has been primarily responsible for the rapid growth in production of eggs and broiler meat in the country, but it is successful mainly in large scale units (more than 1,000 units of birds). Due to high feed cost, non-availability of credit and marketing support, most of the small farmers have become contract farmers and are exploited by middlemen. Government intervention, by way of various support mechanisms, is now needed for the promotion of poultry in rural areas. Indigenous poultry breeds, including the improved strains that can survive with low quality raw feed and better resistance against diseases, can be reared under free range conditions by rural unemployed youth and women for some additional income and employment.

#### Box - 4.13

##### 2020 Vision for Indian Poultry Industry

- A relatively strong growth for egg and poultry meat both in the urban and rural areas is projected in the next two decades.
- Egg consumption is found to grow much faster rate than poultry meat with per capita consumption rising from 30.4 in 2000 to 69 in 2020.
- Per capita egg consumption of lower income group both in the urban and rural areas are likely to grow at a much faster pace than the upper income groups.
- Average per capita poultry meat consumption is found to increase from 0.69 to 1.28 kilogram during 2000 to 2020.

Total egg consumption is projected to increase by 200 percent from 34 billion in 2000 to 106 billion by 2020.

*Source: International Poultry Review, 2003.*

### Poultry Rearing and Kerala State Poultry Development Corporation

4.189 Kerala State Poultry Development Corporation was established in 1989 to give special attention for the revival of poultry farming. The Corporation had built up a broiler breeding farm and hatchery at Kudappanakunnu in Thiruvananthapuram District with a total investment of Rs.5.95 crore. The Corporation

has partially commissioned a project to rear 15,000 parent stock against the target of 25,000 and to hatch 28 lakh day-old chicks against the target of 58 lakh by utilising financial assistance from the State Government and commercial banks.

#### I. Backyard Poultry Rearing

4.190 Backyard poultry system is having good potential in the state. As per the information available 8-10 lakh chicks are being introduced every year in the State. Animal Husbandry Department and KSPDC are involved in this activity. Apart from this few NGOs and Private firms are also involved in the activity. It has been estimated that around 1 lakh families are getting benefits and around 10000-15000 direct employment opportunities generated. No hybrid variety of Broiler birds are being reared as Backyard system, since they need sophisticated Management System in order to give maximum output. Coloured birds seen are the cross breeds of birds such as Austrolop, Plymothorock, Black minarca, White Leghons and non descript (local) Breeds. These birds are being reared to cater the need for both meat and eggs.

4.191 During 2002 to 2004, KSPDC has targeted to supply 6 lakh backyard commercial chicks to the farmers of Kerala. Upto 2003 September, 3.01 lakh chicks supplied and it is estimated that 4.76 crores of eggs will be produced additionally in the State. The Corporation is marketing chicks mainly through various self help groups.

#### II. Broiler Production

4.192 There is steady increase in the Broiler Production and demand for the chicken meat in the State. The total Broiler chicken production in the state is around 36000-42000 MT. Except KSPDC, no other hatcheries are maintaining Broiler inside the State. 10-15 Private hatcheries, working as satellite hatcheries are also contributing to this local production of chicks and chicken meat.

4.193 Apart from this around 30000-40000 MT of chicken meat which includes broilers, layer chicks, broiler and layer parent culls etc. being imported from neighbouring state. Approximately 40000-50000 direct employment opportunities are generated through Broiler production.

#### Poultry Feed

4.194 There is need of Broiler feed to the extent of 2000-3000 MT per month which is being catered by 6-7 private feed manufactures. Average price of the feed is Rs. 10000/- to Rs. 11000/- per MT. Road tax levied is 4 per cent with

Table 4.23

## Meat Production under Authorised Sector in Kerala

Sl. No	Category	Period	Numbers (000' Nos)	Qty. of meat produced (MT)
1	Cattle	2001-02	483.29	24278
		2002-03	524.25	25897
2	Buffalo	2001-02	180.30	10394
		2002-03	151.53	8637
3	Goat	2001-02	553.56	5202
		2002-03	665.74	6276
4	Pig	2001-02	40.70	1830
		2002-03	44.50	1994
	Total(1-4)	2001-02	1257.85	41710
		2002-03	1386.02	42804
5	a)Spent Chicken	2001-02	18525.00	17228
		2002-03	15064.50	13859
	b)Broiler Chicken	2001-02	23841.70	30465
		2002-03	26176.90	38752
	Chicken- Total	2001-02	42366.70	47693
		2002-03	41241.40	52611

Source: Integrated Sample Survey for Estimation of Production of Milk, Meat & Egg

15 per cent additional sales tax.

### New opportunities for meat production

4.195 In Kerala beef\* is the cheapest meat costing only 50 per cent of the prices elsewhere. This is because of the migration of large number of cattle and buffalo from the neighbouring states for slaughter. As per the study by the Swiss Agency for Development and Co-operation (1998) the number of animals migrating to Kerala is of the order of 11 lakh per annum. Kerala has the relative advantage for substantially increasing manufacture and export of meat and meat products. Male calves available as the bye-product of intensive cross breeding programme are estimated to be about 1.5 lakh every year. If properly looked after for value addition, these could be utilised for export. Farmers are reluctant to keep the male calves, as fattening with purchased inputs is not an economic proposition. Rearing of cattle for meat purposes continues to be a losing proposition in Kerala and it is therefore prudent to rely on external sources for meeting domestic demand.

4.196 There are 774 authorised slaughter houses in the State as on 2002-03 Category wise no of animals slaughtered and quantity of meat produced during 2001-02 and 2002-03 are given in Table 4.23

4.197 Of the total meat production beef contributes 60 per cent, buffalo meat (20%), mutton (15%) and pork (5%).

4.198 Details of meat production as per the report is based on the data collected from the recognised slaughter houses functioning in the State and hence the data of meat production in the unauthorised sector is not available. It is estimated that about 2/3<sup>rd</sup> of the meat production in the State is from unauthorised sector.

### Import and export of Milk and Milk products

4.199 The salient features of import regulations related to milk and milk products to India are given in Box.4.14.

#### Box - 4.14

#### Salient Features of Import Regulations Related to Milk and Milk Products

- All imported milk products have to conform to the requirements under the Prevention of Food Adulteration Act
- Skimmed milk powder, condensed milk and infant food must also conform to standards specified by the Bureau of Indian Standards
- It is necessary to obtain an animal health sanitary import permit from the Government of India, before importing any livestock products including milk products
- At the time of entry to India all imported food products should have valid shelf life of not less than 60% of its original shelf life, with the original shelf life calculated as the difference in date of manufacturing and expiry date
- Imported food products in packaged form must conform to the requirements under the Packaged Commodities Rule (under the Standards of Weights and Measures Act)
- Processed food products imported in bulk shall contain a declaration that it does not contain any beef

Source: IDF Bulletin

4.200 The Export of Milk Products Rules (Quality control, Inspection and Monitoring) 2000 set out the requirements related to quality of milk products destined for export and mechanisms to ensure pre shipment inspection as well as approval of establishment for export. Quality requirements include animal health at farm level and hygiene requirements at farm, collection centre, processing establishments, storage and transportation. As at the end of March 2003, 38 establishments had obtained certification from the authority for undertaking exports. Details of exports and imports of milk and milk products are given in Table - 4.24. During 2001-02 it was estimated that 14.74 lakh Nos of egg, 28.734 MT of meat and 2114 kg butter were exported from Kerala.

**Table - 4.24**  
**Export and Import of Dairy Products ( India)**

Sl.No.	Category	2000-01	2001-02
	Exports ('000 MT)		
1	Skimmed Milk Powder	7.3	14.4
2	Whole Milk Powder	1.5	2.1
3	Other Milk Powder	1.0	1.5
4	Butter	0.1	0.2
5	Butter oil/melted butter	1.0	1.5
<b>Imports ('000 MT)</b>			
6	Skimmed milk Powder	0	0.6
7	Butter oil	1	3.2

\*estimated. Source: NDDB, 2003

## Animal Health Care

### Indian Scenario

4.201 India has a large network of veterinary hospital/dispensaries. At the end of 2000, there were 7749 veterinary hospitals/polyclinics, 15554 veterinary dispensaries, 27543 veterinary aid centers including mobile dispensaries. These institutions employed some 36000 professional staff and over 70000 para veterinarians. The primary emphasis is on clinical services and as a result, endemic disease such as Foot and Mouth Diseases (FMD) are still prevalent in India. The limited emphasis on preventive services contributes to India's inability to eradicate animal disease epidemics, which limits the country's competitive advantage in the glo-

bal market place. Due to the prevalence of some diseases, the Sanitary and Phyto Sanitary regulations of many OECD countries deny entry of Indian livestock products.

4.202 Free Veterinary and AI Services have resulted in an infrastructure that is vast and expensive. Low levels of cost recovery have further limited the revenue generating capacity of State departments to meet their operation needs making it difficult to provide high quality services.

### Kerala

4.203 Health cover is an important support, which has to support the intensive cattle improvement programme. Veterinary health care programmes are implemented through a network of institutions consisting of veterinary polyclinics, veterinary hospitals, mobile units and district veterinary centres. At the end of Ninth Plan period every village panchayat in the State had a veterinary institution (hospital/dispensary) but for 23. There is a strong network of veterinary health care now in the State comprising 200 Veterinary hospitals, 938 veterinary dispensaries and 14 District Veterinary Centres and other related health care Institutions. At present 3400 cattle units are attended by each veterinarian.

4.204 There is significant demand for Veterinary Services. A study was conducted to assess the Willingness to Pay (WTP) for curative veterinary services in Gujarat, Rajasthan and Kerala by IIM, Ahmedabad. It was found that most of farmers were Willing To Pay (WTP) for Veterinary services and a larger proportion of farmers were found to opt for home service. For home service a significant positive relationship was found between income and WTP in Gujarat while such a relationship was absent in Kerala and Rajasthan. The major findings of the study are shown in Box 4.15. In addition to the WTP framework, the survey also collected information on various aspects of animal health and use of present Veterinary services.

**Box - 4.15****Major Findings of a Study on Willingness To Pay for Livestock Services in three States**

A Survey was conducted in three States covering 1164 households to examine the willingness to pay for veterinary services. The sample included 406 households in Gujarat, 353 households in Rajasthan, and 405 households in Kerala

- Nearly 50% of the respondents in Gujarat and Rajasthan and 30% in Kerala had not used veterinary services during the 12 months preceding the Survey.
- In Gujarat in centre veterinary services was nil. Out of 140 sample visits in Gujarat by Govt. veterinarians 130 were at home, while in Rajasthan out of 257 visits, 178 visits at home, while in Kerala out 534 visits, 304 were at home and 230 were at the centre.
- The average visit charge per house visit by a govt doctor in Kerala was Rs. 94 and private Rs. 98, while in Gujarat, the corresponding figure was Rs. 111 and Rs. 185, in Rajasthan, Rs. 227 and Rs. 206 respectively.
- For home service, a significant positive relationship was found between income and willingness to pay in Gujarat while for other states, no relationship was found.

*Source: Vinod Ahuja, Kenneth E. MC cossne. IIMA, 2003*

**Box - 4.16****Major Findings of a Study on Delivery of Animal Health Care Services in Kerala**

Detailed household survey on the utilisation of animal health care and breeding services by the livestock owners was conducted in three Panchayats in Thiruvananthapuram district during Feb- April . 1999, covering 124 households.

- Clinical Service was utilised once, in 40%, twice in 16% and four times in 4% of the households during the one year period prior the survey and 6% did not utilise the services.
- Among the 86 cases, 55% were treated at the premises of the animal and 45% in the hospital. In the case of minor diseases 60% was presented at the hospital while nearly 77% of major cases were treated at the premises of the animal.
- Average cost of treatment at hospital was Rs. 167 for minor and Rs. 290 for major cases while Rs. 335 for minor and Rs. 507 for major cases in premises of animals. Corresponding charges for Private services were Rs. 454 and 1400/-
- Cost of artificial insemination was Rs. 90 per insemination with cost of semen and transportation/service charge.
- 19% of the respondents have utilised the services of private Veterinarians.
- Problems encountered in Vet hospital/dispensaries 93% of the Doctors in Hospitals indicated lack of medicines and 74% indicated lack of lab facilities.

*Source : KAU*

4.205. Even though it was envisaged in the Ninth plan that health cover irrespective of income levels in Kerala will be provided at doorstep of the farmer, this aspect could not be achieved. The study highlights the importance attached by the farmers for the door delivery of Veterinary services. Strengthening of the infrastructural facilities are also needed in veterinary hospitals. A micro level study conducted in Thiruvananthapuram district has highlighted the importance of animal health service facilities apart from the tendency to treat in premises of the animals. Major findings of the study are shown in BOX 4.16.

4.206 A systematic approach and programme could not be developed for Helminthiasis and mastitis control. The state is implementing a programme for Foot and

Mouth control with the assistance of Government of India. Systematic vaccinations are over up to Central Kerala and now the programme is extended up to the northernmost district, Kasaragod. Also Brucellosis has now emerged as a new threat to the livestock wealth of the State. Helminthiasis control also needs attention. Worms and other internal parasites cause considerable economic loss to the farmers. It is necessary to control worm infestation through proper surveillance and medication. Data regarding outbreaks, attacks and deaths of major contagious diseases of animals in Kerala for the period from 1993 to 2002 is given in Table 4.25.

**Table 4.25**  
**Outbreaks, Attacks and Deaths due to Major Contagious Diseases**  
(in Nos)

Sl. No.	Disease	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1	<b>Anthrax</b>										
	Outbreaks	3	4	0	0	0	11	10	0	2	3
	Attacks	4	52	0	0	0	463	463	0	6	4
	Deaths	4	3	0	0	0	22	21	0	5	4
2	<b>Black Quarter</b>										
	Outbreaks	2	5	3	3	1	2	0	0	1	1
	Attacks	24	124	300	3	1	2	0	0	1	1
	Deaths	22	5	22	3	1	1	0	0	1	1
3	<b>Haemorrhagic Septicemia</b>										
	Outbreaks	4	9	3	8	4	9	9	2	4	8
	Attacks	265	123	5	29	308	121	56	27	170	23
	Deaths	214	38	5	10	22	10	64	0	31	12
4	<b>Foot &amp; Mouth Disease</b>										
	Outbreaks	149	481	159	79	232	475	804	48	49	470
	Attacks	3072	8713	3714	2253	189	14214	19205	212	1026	9918
	Deaths	241	164	31	17	6753	0	1178	0	344	814
5	<b>Rinderpest</b>										
	Outbreaks	2	2	0	0	0	0	0	0	0	0
	Attacks	15	19	0	0	0	0	0	0	0	0
	Deaths	13	4	0	0	0	0	0	0	0	0

Source: Animal Disease Surveillance Programme –1998 and A H Dep

4.207 Even though vaccinations were carried out, frequent outbreaks were reported which lead to production loss to farmers. During 2002-03, 470 F&M disease outbreaks, 9918 attacks and 814 deaths were reported. Compared to 2000 & 2001 nearly 10 fold increase in out breaks and compared to 2000, 47 fold and 2001 nearly 6 fold increase in attacks occurred. No of deaths increased from 344 in 2001 to 814 in 2003.

4.208 Constant movement of animals from neighbouring states to our State, non awareness among farmers about the diseases and disease control act, less interest among farmers to vaccinate the animals except at the time outbreaks, absence of a National level strategy for the systematic control measures to eradicate Foot and Mouth Diseases (FMD) from all the States are the main draw backs. More over 80 to 85 per cent of the livestock population is to be covered through vaccination in order to get herd immunity. More involvement of public, local bodies and NGOs are needed for the success of this task.

4.209 A project for the creation of disease free zone with the assistance from NDDDB is on the anvil. The State has already eradicated the dreadful disease of Rinderpest and the reports of major diseases like Anthrax, Black Quarter and Hemorrhagic Septicemia are very meager and hence the aim of the project can be

achieved with less effort.

#### **Production of Vaccine in Veterinary Biological Institute, Palode**

4.210 Though the State is blessed with a diverse livestock wealth, infectious diseases pose a major threat to the economic viability of the sector. Most of the major diseases of Cattle and Poultry are today controlled by the use of biological products like sera and vaccines. The manufacture of biological products in our country was initiated at Indian Veterinary Research Institute.

4.211 It is over thirty years ago that the State made a small beginning in biological production by opening the Veterinary Biological Institute. The Veterinary Biologicals, Palode is the sole agency engaged in the production and distribution of animal vaccine in the State. The following viral vaccines viz., Ranikhet Disease Vaccine (K), (Freeze Dried Komorov Strain), Ranikhet Disease Vaccine (F), Fowl Pox Vaccine, Freeze dried Duck Plague vaccine, Tissue culture Rinderpest Vaccine and Bacterial Vaccines viz., Haemorrhagic Septicaemia broth Vaccine, Haemorrhagic Septicemia oil adjuvant Vaccine, Black Quarter Vaccine and Anthrax Spore vaccine are manufactured here. The production details are shown in Table 4.26.

**Table 4.26**  
**Production of Vaccine by Veterinary Biological Institute (1998-99 to 2003-04)**  
(in lakh doses)

Sl. No.	Name of Vaccine	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04*
1	RDVK	18.458	13.316	21.024	26.654	54.45	60.01
2	RDVF	7.262	20.659	5.132	12.872	17.61	23.31
3	FPV	0.418	8.664	1.,003	3.115	.45	-
4	DPV	3.542	12.972	9.110	11.462	10.64	23.87
5	HS Oil adjuvant	0.706	0.327	0.390	0.132	0.411	0.49
6	HS Broth	0.839	0.763	0.734	0.734	0.667	0.51
7	BQ	0.888	0.839	0.469	0.589	0.667	0.46
8	Anthrax	0.598	0.573	0.429	0.839	0.281	0.08
9	FMD Vaccine**	NA	NA	2.193	8.297	12.154	NA

\*\*Supply from Other Sources \* till December 2003

Source: Animal Husbandry Department

4.212 Apart from the production of vaccines, the institute is engaged in the manufacture of diagnostic reagents and other animal health products. During 2003 three diagnostic antigens were released viz., Rose Bengal Plate test antigen, milk ring test antigen for detection of bovine brucellosis and salmonella pullorum coloured antigen for detection of salmonellosis in poultry and introduced California mastitis test reagent for screening of sub clinical mastitis which accounts for the major loss in dairy sector.

4.213 Compared to previous year poultry vaccine production increased by 54 per cent to 88.18 lakh doses and Live stock vaccine decreased by 12 per cent to 2.03 lakh doses. Number of vaccinations done during the year was 12.11 lakh for livestock and 31.94lakh doses for poultry recording an increase of 131 per cent and 156 per cent respectively.. Details are given in Appendix 4.41. Strengthening of the institute is essential to face the challenges in animal health in the State.

### **Breeding Support**

4.214 By the end of 2000 there were about 4.2 AI Centres/10000 breedable bovines in the country with Kerala appearing on the top of the list with 10.3 AI Centres and comparable figures of Gujarat and Rajasthan were 7.2 and 2.4 respectively.

4.215 Kerala Livestock Development Board (KLDB) is involved in the production and distribution of frozen semen and maintains three bull stations at Mattupetty, Dhoni and Kulathupuzha for the production of cross-

bred and purebred cattle and buffalo bulls. Production of frozen semen during 2001-02 increased to 28.94 lakh doses from 24.78 lakh doses in 1996, the terminal year of 8<sup>th</sup> Five Year Plan. The increasing trend is maintained throughout the Ninth plan period, but for the year 2000-01 during which production came down to 20.13 lakh doses. But the distribution inside the state remained more or less static. Details are furnished in Appendix 4.42

4.216 The Department of Animal Husbandry is responsible for providing artificial insemination (AI) support. The Tenth plan strategy is for improving the quality of AI Services rather than increasing the number of Centres and the target is to extend the facility to remote areas through realigning / shifting of AI centres with low performance. The number of AI centres under Animal Husbandry Department decreased to 2505 in 2001-02 from 2537 in 2000-01 and by 2002-03 increased to 2523. Along with 364 centres operated by other agencies the total number of AI centres operational is 2887. ( Appendix-4.43).

4.217 Animal Husbandry Department has launched a pilot programme to extend artificial insemination facilities to the doorstep of farmers. The number of AI centres has been almost doubled during the last decade. But there is no proportionate increase in the number of inseminations conducted. The achievement in this regard was 2.4 percent only. The number of inseminations done during 2002-03 was 13.69 lakh nos.

and calvings recorded is 4.02 lakh. This is against 3.61 lakh calvings recorded out of 13.72 lakh AI during 2000-01 and 3.33 lakh calvings out of 12.49 lakh AI during 2001-02. In spite of the expansion of AI facilities, the average no of insemination done by one centre showed a decreasing tendency from 570 in 1999-2000 to 542 in 2000-01 and to 499 in 2001-02. By 2002-03 average AI done per Centre increased to 543 showing an increase of 10%. The average number of inseminations needed for producing one calf is four which had remained stagnant over the last 7 years is showing signs of improvement and by 2002-03 it decreased to 3 ( Table 4.27 ).

4.218 Apart from the frozen semen technology, KLD Board is also engaged in research and development activities like progeny testing, embryo transfer, production of liquid nitrogen, fodder seed production and training programmes. The Board has an embryo transfer centre at Mattupetty, a goat farm at Dhoni for production of frozen semen and kids, a pig breeding cen-

calves are registered under the programme. Another notable achievement of KLD Board is the introduction of Boer goats which are considered far superior to any other goats for meat production into the Kerala scene. It is known for rapid weight gain and heavy muscling and has high fertility. Boers typically give birth to twins. Crosses of local goats with Boer goats have proved to be a suitable genotype for the goat production system and well adapted to all types of climate.

#### Cattle Feed

4.220 Based on cattle population, the potential daily requirement for concentrated cattle feed in Kerala has been estimated at 5372 MT. At present the State has three cattle feed plants functioning at Pattanakkad, Malampuzha and Kallettumkara. The cattle feed plant at Pattanakkad (300 MT/day capacity) and Malampuzha (200MT /day capacity) are under KCMMF, whereas Kerala Feeds Ltd. Kallettumkara

**Table – 4.27**  
**Number of Artificial Inseminations Conducted**  
**and Calving Produced**

Sl. No.	Year	No. of artificial Insemination Centres	No. of Artificial Inseminations done	No of AI Done Per centre	Recorded Calving	No of inseminations per calving
1	2	3	4	5	6	7
1	1993-94	2037	1353058	664	299358	5
2	1994-95	2097	1464941	698	306975	5
3	1995-96	2298	1240116	540	323958	4
4	1996-97	2293	1151189	502	332962	4
5	1997-98	2393	1259419	526	327365	4
6	1998-99	2408	1251119	520	313859	4
7	1999-00	2440	1391495	570	348834	4
8	2000-01	2537	1371655	542	360645	4
9	2001-02	2505	1248996	499	332967	4
10	2002-03	2523	1369112	543	402173	3

Source: Animal Husbandry Department

tre at Puthur etc. During the year, the Board has produced 244 Malabari kids and 57 Boer kids, collected 34 embryos and trained 292 personnel. Other activities of the Board are given in Appendix 4.44

4.219 Under herd book scheme implemented by KLD Board the female progeny born to the test bulls are identified and recorded. They are followed up at half yearly intervals by way of girth measurements. A total of 96885 animals have so far been identified and registered under the programme. During 2002-03 against the target of registering 5000 calves, 4406

with an installed capacity of 500 MT/day commissioned in 1999 is operating under a separate management. The production of two Cattle Feed Units under KCMMF and Kerala Feeds Ltd. is insufficient to meet the internal demand.

4.221 Due to the heavy demand of the pellet feed from farmers, the proposal to augment the capacity of Malampuzha plant from 200 MT to 300 MT and to introduce Pelletization facility was approved by NDDB and the implementation of project planning activities has already started. During 2002-03, the two plants

under KCMMF produced 1.09 lakh MT of feed jointly as against 1.17 lakh MT produced during 2001-02. There was reduction in the sale from cattle feed plant, Malampuzha due to reduction in indents from APCOS under MRCMPU mainly because of the farmers preference for pellet feed.

4.222 The production of cattle feed by Kerala Feeds Ltd., increased from 0.82 lakh MT in 2001-02 to 1.06 lakh MT in 2002-03 showing a growth of 29.34% and sales from 0.83 lakh MT to 1.07 lakh MT showing a growth of 29.04%. The KFL have received ISO 9001:2000 quality system certification and is the only cattle feed manufacturing facility in India which have received the above certification. The Company has a good marketing network which included 400 dealers and 450 Co-operatives. Their products are also sold in other States like Karnataka and Lakshadweep etc. On the basis of the growing demand, the Company is planning to expand the present capacity to 2 lakh MTs/annum and set up one more Cattle Feed Production Unit in the State.

4.223 Production and sales details of the above cattle feed plants are given in Table 4.28.

**Table 4.28.**  
**Production and Sales of Cattle Feed** (in Lakh MT)

Sl. No.	Factory	Production			Sales		
		2000-01	2001-02	2002-03	2000-01	2001-02	2002-03
1	Pattanam (KCMMF)	0.71			0.67	0.71	0.68
2	Malampuzha (KCMMF)	0.55	1.17	1.09	0.57	0.45	0.40
3	Kerala Feeds Ltd.	0.72	0.82	1.06	0.71	0.83	1.07
	Total	1.98	1.99	2.15	1.95	1.99	2.15

#### Better Management of Young Calves

4.224 Bringing down the age at first calving and reduction in the inter calving period of cross-breds have been recognized as the most effective measures for augmenting milk production. With this objective, a 'calf rearing programme by subsidising cattle feed for rearing cattle up to 32 months along with health cover and insurance' was under implementation during Eighth

Plan through dairy co-operatives. From 1997-98, i.e. the first year of the Ninth Five Year Plan, this scheme is being implemented by local government as State Sponsored Programme. This is one of the effective programmes of Animal Husbandry Department and it has helped in reducing the age at maturity and inter calving period and improving milk production. Even though 60741 calves were enrolled during Ninth Plan period enrolments during the last three years were comparatively lower than the first two years. During 2002-03, 6700 calves and during 2003-04 (as on November) 2975 calves were enrolled in the programme.

**Table 4.29.**  
**Year-wise Details of Calves Enrolled under Special Livestock Breeding Programme**

Sl.No.	Year	No. of calves enrolled under SLBP
1	1997-98	30000
2	1998-99	10000
3	1999-00	8917
4	2000-01	7339
5	2001-02	4485
6	2002-03	6700
7	2003-04*	2975

\* Up to November 2003. Source: A H Dept.

#### Details

are furnished in Table 4.29.

4.225 According to a recent study, "Evaluation of Status of Production Performance of Crossbred Cows in Selected Districts of Kerala", conducted in 3 districts of Kerala by KLD Board, even though the percentage of enrollment in all the 3 districts of Palakkad, Idukki and Alappuzha together constitute only 3.9 per cent of the total enrollment, a trend in

peak yield to increase with percentage of enrollment is noticed. Among the 3 districts a higher peak yield is noted in Alappuzha where the enrollment of surveyed cows in the calf subsidy scheme in their calf hood is higher compared to other two districts. According to the study enrolment under the scheme ensures a better calf hood and heifer management resulting better yielding cows.

### Kamadhenu Insurance Scheme

4.226 The Animal Husbandry Department in collaboration with United Insurance Company has formulated a Kamadhenu Insurance Scheme to insure the family of the farmers and their crossbred milch cows. The scheme is under implementation from 1998-99 onwards with the target of covering 400 crossbred cows per panchayat. The Animal Husbandry Department provides technical assistance and the local government are subsidising the premium at varying rates. The response from the farmers as well as the local government for participation in the scheme is encouraging. The number of cows insured during 2001-02 was 3037 and during 2002-03 was 6425. Details of number of farmers insured, amount of premium remitted and claims settled are given in Table 4.30.

annual output of over 69 million MT of milk. India's milk output during 2001-02 was estimated to be 84.6 million MT and is expected to reach the level of 88 million MT during 2002-03.

4.229 The National Dairy Development Board (NDDB) has drawn up a perspective plan 2010 to strengthen the country's cooperative dairy sector. NDDB has already released Rs. 760 million to district milk unions for activities such as productivity enhancement, quality assurance, cooperative business including milk marketing and building a national information network. It has implemented the Women Dairy Cooperative Leadership Programme in 50 districts across the country, increasing women dairy farmers' participation in dairy cooperatives.

**Table 4.30**  
**Kamadhenu Insurance Scheme Progress of Implementation**

Year	Progress of Implementation			Claims settled ( cum )					
	No. of cows insured	No. of farmers insured	Amount of premium (Rs. lakh)	Cattle Insurance		Accident death		Medical Re-imbursment	
				No.	Amount (Rs. lakh)	No.	Amount (Rs. lakh)	No.	Amount (Rs. lakh)
1998-99	42583	69003	339.99	NA	NA	NA	NA	NA	NA
1999-00	37008	61288	277.24						
2000-01	28677	45607	160.25	754	52.86	16	12.36	781	12.20
2001-02	3037	3796	70.62	1009	70.55	16	8.41	761	20.32
2002-03	6245	8838	58.25	875	73.58	52	5.60	746	25.55

Source: Animal Husbandry Department

### Prices

4.227 Average price of important inputs and products of livestock sector for the last seven years is presented in Appendix 4.45. Compared to 2001-02 there was an increase in the price of all meat other than broiler and pork during 2002-03. In the case of all other products though the prices showed a slight upward tendency. During the year, price of milk recorded a decrease of 0.39 per cent, broiler chicken 3.96 percent, fowl-white egg 2.1 per cent, fowl- brown egg 2.4 percent. On the input side, the cost of groundnut cake remained unchanged and coconut cake increased by 5.49 percent, gingely oil cake decreased by 2.6 per cent straw by 3.05 per cent and fodder by 26.35 per cent

4.230 Dairy sector in Kerala made spectacular progress during the last three decades. Milk marketing continues to be largely under private sector. However, with the inception of Operation Flood Programme, the organised sector under the co-operative fold started giving lead for the production and marketing of milk in Kerala. 'Milma' has installed a milk powder plant with a capacity of 10 MT/day. Besides marketing support, the Federation also provides extension support, input delivery service and health cover. The year 2002-03 was a land mark for Central products Dairy as it became the first dairy in Kerala to get ISO 9002 Certificate for manufacture of products.

### Dairy Development

4.228 The Indian dairy industry registered a substantial growth from the 8<sup>th</sup> Plan onwards, achieving an

4.231 Extension support for dairy development, fodder development programmes, advisory service, quality control measures, training of farmers etc. are the

**Box - 4.17****World Dairy Situation 2003**

- World milk production in 2003 is estimated at 6000 million MT or 1.1% more than the year before.
- The speed of growth has slowed down in comparison with earlier year, affected by drought and depressed market returns, but still within the average over the last 10 years and the reduction in growth does not seem to decrease in Southern Asia and Latin America.
- In the last 10 years from 1992 to 2002 milk production grew by 63 million MT of which, cow milk was up by 40 million MT or 0.9% on an average whereas buffalo milk grew in total 20 million MT or 3.5% on average which is mainly produced in Indian sub continent. In relative terms increase in Buffalo milk is the fastest, but cow milk production is the strongest in absolute volumes.
- Cow milk production is expected to reach 505 million MT by 2003. Buffalo milk production exceeded 70 million MT in 2002 still continuing its expansion and as per INC report an expansion of herd by 1.1 million head or 2.9% over the year before.
- Around 305 million MT of milk (76% )of the milk produced is delivered to dairies for further processing
- On an average around 24% of the milk which is processed in dairies worldwide is immediately treated for liquid consumption, and in addition a certain quantity is produced by reconstitution from milk powders, concentrates and butter oil
- The growth of cheese production will be mainly limited to Europe and North America. that of whole milk powder to Oceania, Latin America and Asia
- The EU, the United States, Japan, Russia and many other countries have increased their imports, but other traditionally importing countries have declined
- Prices of butter and milk powders have remained at the reduced levels of 2002 in many countries, although on the world market they have notably increased in terms of the devalued US Dollar

*Source: Bulletin of International Dairy foundation*

major activities coming under the purview of Dairy Development. The Department is undertaking activities such as promotion of indigenous milk product units and assisting the co-operatives for making them economic. The development programmes are operated through 3090 dairy co-operatives including 2456 Anand pattern societies functioning under KCMMF.

4.232 In order to achieve the desired level of self reliance and then going beyond, the Indian dairy industry will have to make strenuous efforts to upgrade quality of its products to become economically viable and self sustaining. India today is proudly the highest milk producing country. Technology upgradation is must for us to improve our product quality to international levels.

4.233 In Kerala the last decade witnessed considerable increase in demand for packeted milk. Several organisations which do not come under the purview of MMPO are operating in the State and their main source of supply is Tamil Nadu where milk is comparatively cheaper. KAU which had conducted a field survey on the market milk concluded the presence of preservatives and adulterants which are injurious to health in many of the samples.

4.234 During Eighth Plan, quality control units were established in eight districts. Six more units were made operational by 1998-99. Out of the 93487 milk samples tested during 2001-02, 53419 (57%) were of low quality and this clearly speaks of the necessity of en-

forcing strict quality control measures on milk and milk products .

4.235 Realising the importance of fodder development in optimising economic return from the dairy activity, the KLD Board has taken up fodder development as an important activity right from the beginning. KLD Board produced 13.51 MT of fodder seeds during 2002-03 against 15.98 MT of seeds during 2001-02. (see Table 4.31.) During the year, Dairy Development Department procured and supplied 49 MT fodder seeds (from NSC, KLD Board and Government of India) against 73 MT during 2000-01 and 51.30 MT during 2001-02. The Department also supplied 100 lakh root slips/stem cuttings during 2002-03 against 400 lakh during the previous year. The total area covered under fodder cultivation is 2000 ha against 2315 ha during the previous year ( Table 4.32) Besides this a large area has been brought under fodder cultivation through programmes under local government.

4.236 As per available details the requirement of dry matter in the State to feed our cattle is 53.6 MT per annum against the internal availability of 16.76lakh MT. To cover the deficit, intensive fodder cultivation is to be promoted.

4.237 Below given are some of the findings of the ex-post evaluation study of the impact of investment in dairy sector mainly on income and employment generation in Kollam district of Kerala. According to the study purchase of good quality milch animals, better management, availability of infrastrucure and linkages in the district helped the dairy farmers to earn reasonable income. The return of investment was adequate to make different types of dairy units viable. The average loan recovery under dairy sector was comparatively better than all other Sectors. Most of the farmers who borrow for purchase of high yielding milch

**Table – 4.31**  
**Production and Sale of Fodder seeds by KLD Board**

Sl.No.	Year	Quantity of Seeds Produced (MT)	Quantity of Seeds Supplied* (MT)
1	1996-97	28.42	29.35
2	1997-98	31.64	28.96
3	1998-99	26.50	30.48
4	1999-00	30.21	28.36
5	2000-01	16.20	35.09
6	2001-02	15.98	20.68
7	2002-03	13.51	50.84

Source: KLD Board Annual Reports

\* Including sales to outside agencies and used for KLDB programme

**Table 4.32**  
**Procurement & Supply of Fodder seeds / Root Slips and Area Covered under Fodder Cultivation**

Sl.No.	Year	Procure ment of seeds	Total quantity of seeds supplied to farmers	Area covered	Fodder root slips/stem cuttings supplied	Area covered	Total area covered under fodder cultivation
		( in MT )	( in MT )	( in Ha )	( in lakh )	( in Ha )	( in Ha )
1	1996-97	196.49	196.49	5932	546	2182	8114
2	1997-98	310.45	310.45	9326	200	799	10125
3	1998-99	307.40	307.40	9026	250	1000	10026
4	1999-00	91.00	91.00	3560	460	1840	5400
5	2000-01	72.80	72.80	2820	400	2000	4820
6	2001-02	51.30	51.30	2315	400	2000	4315
7	2002-03	49.00	49.00	2000	100	500	2500

Source: Dairy Development Departmen

animals are of APL Families. Weaker section could not avail the benefit of loans due to the problem of collateral security. Some of the main constraints are non availability of green/dry fodder and high cost of feed leading to higher maintenance cost of the animals.

#### Box - 4.18

#### Major Findings of ex-post Evaluation Study of Dairy Development In Kollam District of Kerala

- Ninety percent of the animals purchased were of European species (Jersey, Brown Swiss, Holstein- Friesian etc.
- The cost of maintenance per animal per year with family labour vary from Rs.15532.93 to Rs.18624.25 and with out family labour it varied between Rs.12332.93 to Rs.15190.92
- High cost of feed and non availability of fodder made the recurring expenditure on animals higher, resulting in reduced margin vis-à-vis the prices of milk
- The average feed and fodder consumption per animal was not adequate for crossbred cows
- Educated youth in rural areas are now coming forward for taking dairy enterprise as a source of self employment, which needs to be encouraged
- Facilities have to be explored for converting fluid milk into ghee, khoa, paneer etc., at the ground level
- Better diary management training has to be imparted to women for better milk yield

Source : NABARD , 2002

#### Milk Marketing

4.238 The Co-operative Milk Marketing Federation (KCMMF) has a wide spread network of outlets for marketing of milk. With the advent of Operation Flood Programme, under the aegis of the KCMMF, a well established system for regular procurement of milk from the producers for distribution to the regular consumers became a reality and it has helped in ensuring better returns to the dairy farmers. With the implementation of North Kerala Dairy project supported by Swiss

Development Agency, the entire state is under the network of Anand pattern dairy co-operatives (APCOs). As on June 2003, the federation was operating through 2517 APCOs with a total membership of 6.85 lakh. The average milk procured per day by APCOs during the year was 7.09 lakh litres against the previous year average of 6.39 lakh litres. The activities of KCMMF are presented in Appendix 4.46.

4.239 In Kerala, where the production of milk is concentrated in the small farm sector and ultimate supply is dependent on seasonal factors, maintaining uninterrupted supply particularly during lean period is very difficult. The federation is thus forced to import milk from the neighbouring States. The periods August-September and January-May are considered to be lean periods when the internal supplies used to shrink. The excess requirement was met by procurement of fluid milk and milk powder from neighbouring states. Season-wise milk production in Kerala is given in Table 4.33. The procurement of milk by KCMMF stood at 2253 , 2484 and 2412 lakh litres respectively 2000, 2001 and 2002 against the sale of 2293, 2080 & 2479 lakh litres during 2000, 2001 & 2002. Procurement and sale of milk by KCMMF stood at 1020 and 1316 lakh litres respectively as on June 2003. Data on procurement and sale of milk by different dairies of KCMMF during 2000 to 2003 is presented in Appendix 4.47.

4.240 The veterinary services rendered by KCMMF are noteworthy. During 2002, services were provided through 16 regular and 38 emergency routes and 0.12 lakh animals were treated as on June 2003. KCMMF has sold 1.03 lakh MT of cattle feed during 2002 Cattle Feed sold during 2003 as at the end of June is 0.66 lakh MT. Also produced 912 MT of ghee and sold 893 MT s of ghee during the year. Year wise details for the period from 1995 to 2003 are furnished in Appendix 4.46.

4.241 Besides milk , a wide variety of milk products are manufactured by KCMMF. A comparison of sales by KCMMF from 2000-01 to 2002-03 is given in Appendix 4.51. Among the products, sale of Milma Plus (bot) chokolik, Paneer sip up & ice cream recorded notable increase compared to previous year. The products introduced during 2002-03 Yoghurt and Skimmed Milk Powder.

**Table 4.33**  
**Season wise Estimated Production of Milk**

Sl. No.	Year	Summer		Rainy		Winter		Total
		Quantity	% to total	Quantity	% to total	Quantity	% to total	
1	1996-97	7.49	33.17	7.71	34.15	7.38	32.68	22.58
2	1997-98	7.81	33.33	7.94	33.89	7.68	32.78	23.43
3	1998-99	8.14	33.64	8.26	34.13	7.80	32.23	24.20
4	1999-00	7.83	31.01	9.48	37.54	7.94	31.43	25.25
5	2000-01	8.21	31.52	9.39	36.05	8.45	32.43	26.05
6	2001-02	8.43	31.02	9.74	35.84	9.01	33.14	27.18
7	2002-03	7.77	32.12	8.59	35.51	7.83	32.37	24.19

Source: Integrated Sample Survey

4.242 As part of joining the national stream to promote co-operative brand in the light of competition from private sector, 'Milma' joined hands with other State Dairy Co-operatives in accepting mnemonic symbol introduced by the NDDDB during 2001-02. It was the first Federation in India to introduce the mnemonic symbol throughout the State. KCMMF have been provided financial support for carrying out local promotional activities by NDDDB. In this connection mass media campaign is being organized by NDDDB in liaison with the Federation.. The national level brand building exercise initiated by NDDDB brought rich dividend as well and several mass media campaigns were organised by KCMMF in consultation with NDDDB.

4.243 KCMMF has entered into an agreement with Mother Dairy Foods Ltd., for the formation of a Joint Venture Marketing Company 'Milma Foods Ltd', on 16.12.2002.and the company was registered under the Indian Companies Act 1956 on 17.3.2003. The said Mother Dairy Foods Ltd., is a wholly owned subsidiary of the Mother Dairy Fruit and Vegetable Ltd., which in turn is a wholly owned subsidiary of the National Dairy Development Board. The authorized share capital of Milma Foods Ltd., is Rs.175 lakhs comprising of 17.50 lakhs of equity shares having a face value of Rs.10/- each. The initial paid up capital is Rs.100 lakhs, of which Mother Dairy Foods Ltd., and KCMMF have subscribed to 51 per cent shares and 49 per cent shares respectively. The Joint Venture Company is to undertake the distribution, marketing of liquid milk, milk products and other food products in the State of Kerala.

4.244 Milk processing capacity has touched Rs.8.50 lakh liters per day with the expansion of various projects during the year. The Quality control wing of KCMMF

renders technical and legal assistance to primary dairy co-operatives and regional Milk Unions.

#### **Annual Plan 2002 -03 : A Review**

4.245 The total outlay approved for the livestock sub sector under Annual Plan (2002-03) was Rs.42.75 crores. This included Rs.40.75 crores provided for Animal Husbandry and Rs.2 crores for Dairy Development (Table – 4.34). Against this actual expenditure in AH sub sector amounts to Rs.22.86 crores (56.10%) and Dairy Development sub sector amounts to Rs.1.25 crores (62.50%).

4.246 During 2002-03 the envisaged target for milk production was 27.18 lakh MT egg production to 2180 million Nos. and meat production was 1.63 lakh MT Against this the actual achievement is comparatively low ie., 24.19 lakh MT 1347 million Nos and 1.71 lakh MT.

4.247 During the annual plan, major share of plan outlay was directed for the development of Veterinary Services and Animal Health, Expansion of Cross Breeding Facilities, Special Livestock Breeding Programme and Commercial Fodder Production Programme . Approved outlay and expenditure incurred for the major activities during period are given in Table- 4.35

4.248 More utilisation of plan funds are seen to be achieved in the case of Rural Dairy Extension and Farm Advisory Services (71%), Modernisation of Dairy Co-operatives (115%), Extension and Training (88%), Centrally Sponsored Scheme for Veterinary Services for Cattle Development (104%), Poultry Farms and Expansion of Poultry Production (94%) and Commercial Fodder production Programme (99.75%).

**Table-4.34**  
**Financial Performance of Livestock sub Sector during Annual Plan 2002-03**  
 (Rs. in Lakhs)

Sl. No	Sub Sector	Approved Outlay	Expenditure	Expenditure as percent to total outlay
1	Animal Husbandry	4075	2286	56.10
2	Dairy Development	200	125	62.50
Total :Livestock sub sector		4275	2411	56.40

**Table: 4. 35**  
**Scheme wise Outlays and Expenditure for Major Schemes of Annual Plan**  
 (Rs. in Lakhs)

Sl. No.	Name of Scheme	Approved Outlay	Actual expenditure
1	Strengthening of Veterinary Service	1420	360.93
2	Expansion of Cross Breeding facilities	675	371.48
3	Special Live Stock Breeding Programme	735	526.88
4	Assistance to Public Sector undertaking viz., KLD Board, KCMMF, KSPDC and MPI	596	-
5	Commercial Fodder Production Programme	170	169.63

4.249 During the year, 13.69 lakh number of artificial inseminations were done through departmental institutions, 11.68 lakh animals were protected against foot and mouth diseases, 29391 personnel were given training in various aspects of Animal Husbandry practices 34 numbers of panchayats were provided with assistance for construction of buildings for veterinary institutions and 1000 infertility camps were conducted. 125 Vigyana Vyapana Kendras were established in Veterinary Institutions and goat farm, Parassala had been made functional.

4.250 An IT unit has been set up at LMTC, Kudappanakunnu and with the assistance of NIC, a data base and MIS software is being build up to record all the activities of the Animal Husbandry department

4.251 Under Dairy Development during 2002-03, with a view to provide a venue for interaction among progressive farmers, experts, bureaucrats so as to shape policies, initiatives etc., 10 district level and 151 block level cattle shows and seminars were conducted. As an useful arena for exchange of ideas and solving micro level problems 9633 farmers ,contact programmes were organised during the period. Also conducted 4248 training programmes for dairy farmers, employees of dairy co-operative societies and rural women.

With a view to reduce the fodder shortage in the State intensive fodder cultivation was promoted in the State and during 2002-03 perennial fodder is cultivated in an area of 1719 ha.

4.252 A review of the Annual Plans of the local bodies indicates that substantial outlays have earmarked by them for livestock development. The flow of grant-in-aid to local bodies for the development of livestock sector was clearly about two times the normal funding as part of the State sector.

#### **FISHERIES DEVELOPMENT**

4.253 The National strategy for the Tenth Plan for the 'Fisheries' sector contemplates integrated development of riverine fisheries, habitat restoration and fisheries development of upland waters, development of reservoir fisheries, management of coastal fisheries, deep sea fisheries, vertical and horizontal development of aquaculture, infrastructure development and improved post harvest management, policy intervention including monitoring, control and surveillance.

4.254 The state has all the requisite natural endowments for building a strong and vibrant fisheries economy in tune with the national strategy. They include a stretch of coastal belt extending over 590

km. and an extensive inland waterspread of around 4 lakh hectares. The exclusive economic zone (sea spread upto 200 metres) lying adjacent to Kerala coast is spread over 36000 square kilometres which is almost equivalent to the land area of the state.

4.255 The state is endowed with rich inland water bodies consisting of 44 rivers (having an area of 0.85lakh ha) 30 major reservoirs (0.30 lakh ha) fresh water ponds and tanks (0.25 lakh ha) 45 back-water and extensive brackish water are a (2.43lakh ha). But the inland fish production accounts for only about 11.06% of the total production. Eventhough the state is endowed with extensive waterspreads offering tremendous potential for the development of inland fisheries, this opportunity has not been tapped to the desired extent.

4.256 There are 222 fishing villages in the marine and 113 fishing villages in the inland sector, where fishing and related activities provide livelihood to a vast majority of the population. The estimated fisher folk population in Kerala during 2001-02 was 10.85 lakh, which includes 8.36 lakh in marine and 2.49 lakh in the inland sector. The number of active fishermen during the period was 2.21 lakh which comprises of 1.77 lakh in marine and 0.44 lakh in inland sector. Alappuzha district is in the first place in the number of fisher folk with a population of 1.83 lakh followed by Thiruvananthapuram (1.77 lakh). The district-wise details of fisher folk population are presented in Appendix 4.52.

4.257 In the marine sector, organising resource conservation measures under a participatory approach combined with regulatory measures was given the major thrust, as part of the implementation of the strategy and to oversee the conservation measures. With the available speed boats (5) in the Department, patrolling in sea water has been conducted to regulate illicit fishing and 5.60 lakhs of fry and 36.81 lakhs of finger lings were stocked during 2002-

03.

Although the total potential available for inland fish production has not been quantified precisely, it can be roughly projected at 1.5 to 2.0 lakh MT. past performance of these sector reveals that the state could tap only around 50 per cent of the total fisheries potential. In the marine sector, the activity is largely concentrated in the inshore areas without any serious effort for tapping the potential available in the off shore and deep sea areas. Against the maximum sustainable yield of 5.7 lakh tonnes,

**Table - 4.37**  
**Estimated Annual Catchable Potential in 0-50 m depth in Kerala**

Sl.No.	Category	Potential (MT)
1	Oil Sardines	111274
2	Other Sardines	12637
3	Pomfrets	2226
4	Mackerels	48686
5	Ribbon fishes	18580
6	Penaeid Prawns	64482
7	Cephalopods	18852
8	Others	294580
<b>9</b>	<b>Total</b>	<b>571317</b>

Source: CMFRI, Department of Fisheries.

the fish landing from the inshore area is around 6.0 lakh tonnes thus leading to a resource depletion crisis. Marine resource potential is shown in the Table- 4.36. The species wise marine fisheries potential estimated in the depth range of 0-50 m. in the state is shown in Table-37.

4.259 Around 60 per cent of the major fish resources in the world are mature and these resources are in urgent need of conservation. FAO has concluded that 44 per cent of the stocks for which formal assessments are available are intensively or fully exploited, 16 per cent were over fished, 6 per cent of the known stocks were in need

**Table: 4.36**  
**Marine Resource Potential in Kerala and India** (in Lakh MT)

Sl.No.	Area	Demersal Resources		Pelagic Resources		Total
		0-50m Depth	Beyond 50m Depth	0-50m Depth	Beyond 50m Depth	
1	India	10.36	6.49	11.74	7.42	26.01
2	S.W.C. of India	3.60	1.12	5.89	2.49	13.2
3	Kerala	2.29	0.56	3.42	1.24	7.50

Source: Fisheries Survey of India.

of urgent management. Demersal high value species were overfished and that a reduction of at least 30 per cent of fishing effort was required to rebuild the resources.

### Species-wise Composition of Fish Landing

4.260 Although the fish catches from the Kerala coast include more than 300 different species, the commercially important number about forty only. The high value species among the fish catches are still few, prominent among them are seer fish, pomfret and prawn. Ribbonfishes are also now a target group and nearly 60-70 percent of the landings in frozen form are exported to China, Japan and other South East Asian countries. The quantity of these high value species in the total catch ultimately decides the income of the fishermen. Unfortunately the share of these high value varieties in the total marine fish catch has been remaining stagnant. The annual potential of prawn is estimated at 64482 tonnes while the average catch during 2002-03 was 54000 tonnes. The catch of oil sardine, the most important variety consumed mainly by the poorer sections of the society exceeded the potential in recent years. The species wise landings are shown in Appendix: 4.53

### Fishing Crafts

4.261 There was enormous increase in the number of fishing crafts operating in Kerala during the last decade. The total number of mechanised and non-mechanised crafts has increased from 34007 in 1988-89 to 55501 in 2002-03. The increase was mainly in the case of motorised crafts which rose from 9914 to 29395 (Table-4.38).

4.262 However the permissible limits as estimated by Kalawar Committee in 1985 were 20,000 non-motorised crafts, 2960 Motorised crafts and 1145 mechanised boats. The enormous increase in the number of crafts does not appear to have helped in boosting the marine fish production proportionately. With the increase in the number of mechanised crafts the share of traditional crafts in the total fish

landings has considerably eroded over the years. Kerala coastal waters had been witnessing continuous confrontation between traditional fishermen and trawler operators. Active fishing with synthetic fibres, propulsion with outboard motors and modification of craft and gears including indigenization of fishing techniques such as mini purse seine and mini trawling have contributed to over fishing. Increase in fishing by the mechanised sector which has led to large scale destruction of egg bearing and juvenile fishes. The state has enacted the Kerala Marine Fishing Regulation Act for enforcing strict regulatory measures for restricting the number of crafts and their operational areas. As the restriction was followed strictly monsoon trawling has been banned as a conservative measure. The ban on monsoon trawling has been in force from 1989 onwards.

4.263 In 1998, 55737 fishing gears were in use, of which trawl nets (9261) and gill nets (36552) accounted for more than two-third and the rest being ring seine (2277), boat seine (2394) shore seine (1115), hooks line (4295) and others (25). Although the recommended number of ring seines is 300, there are about 2227 ring seines in operation in the state. The proliferation of the mechanised boats and trawlers along the coastal line of the State and the indiscriminate use of gears and nets in violation of the Marine Fisheries Regulation Act need effective regulatory measures. Considering the quantity of juveniles landed by various destructive gears as revealed in a preliminary survey conducted by CMFRI along the Kerala coast, the total annual economic loss estimated was about Rs. 600 crores.

4.264 The major findings of a comparative study on fuel consumption and comparative efficiency of trawlers in Kochi and Visakhapattanam are shown in BOX 4.19. The profit margin was estimated to be high in Visakhapattanam owing to the longer duration of fishing and catch rate.

### Trend in Production

4.265 World marine and inland capture fisheries produc-

**Table 4.38**  
**Fishing Crafts Operating in Kerala** (in Nos)

Sl. No.	Category of crafts	1988-89	1998-99	1999-00	2000-01	2001-02	2002-03*
1	Mechanised	3548	4040	4194	4150	4150	4510
2	Motorised	9914	27094	28829	29144	29395	29395
3	Non-motorised	20545	21598	21751	21854	21956	21956
	<b>TOTAL</b>	<b>34007</b>	<b>52732</b>	<b>54774</b>	<b>55148</b>	<b>55501</b>	<b>55501</b>

Source: Directorate of Fisheries \*Provisional

**Box - 4.19****Major findings of a Study on fuel consumption and Comparative efficiency of trawlers.**

- Actual fuel consumption by trawlers collected from 448 fishing trips at Kochi was analysed
- Average fuel consumption is 1250 litres by larger trawlers (above 48' OAL) for seven day trip and the expenditure is Rs. 22680, forming 65% of the operational cost.
- For small and medium vessels, fuel cost works out at Rs. 6070 and 15060 respectively forming above 60% of the operating cost.
- Depending on the design and mode of operation of larger trawlers, the rate of fuel consumption of larger trawlers varied from 13 to 15.5 litre per hour of operation.
- Fuel consumption studies at Visakhapatnam showed an average consumption rate of 4000 litres costing around Rs. 70,800 per 10-20 days fishing trip.
- Both the fuel cost and profit margin were estimated to be high at Visakhapattanam compared to Kochi, mainly due to longer duration of fishing and high catch rate at Visakhapattanam.
- The smaller class of vessels upto (40'OAL) engaged in one day fishing yielded a revenue of Rs. 10120 against its operational expenditure of Rs. 7188 in 2001-02. The medium class vessels (40-48'OAL) with an average of three day fishing trip reported a revenue of Rs. 25100 against an expenditure of Rs. 19700 and larger trawlers brought in a revenue of Rs. 49100 against an expenditure of Rs. 36080 for an average of five days per trip.

Source: CIFT, 2001-0

tion increased on average by as much as 6 per cent per year from 18 million tonnes in 1950 to 56 million tonnes in 1969. During the 1970s and 1980s, the average rate of increase declined to 2 per cent per year, falling to almost zero in the 1990s. This levelling of the total catch following the general trend of most of the World's fishing areas, which have apparently reached their maximum potential for capture fisheries production. With the majority of stocks being fully exploited, it is therefore unlikely that substantial increase in total catch will be obtained from the marine sector. In

contrast, growth in aquaculture production has shown the opposite tendency. Starting from an insignificant total production, inland and marine aquaculture production grew by about 5 per cent per year between 1950 and 1969 and by about 8 per cent per year during the 1970s and 1980s and further to 10 per cent since 1990s. The global pattern of fish production owe much to the activities of China, which accounts for 32 per cent of world production.

4.266 The marine fish production in the state is stagnant and seems to have achieved a saturation level whereas the inland fish production showed signs of improvement for 1999-00 followed by slight decline. During 2002-03, marine production increased from 5.94 lakh tonnes in 2001-02 to 6.03 lakh tonnes and inland fish production declined slightly from 0.78 lakh tonnes to 0.75 lakh tonnes. (Table - 4.39).

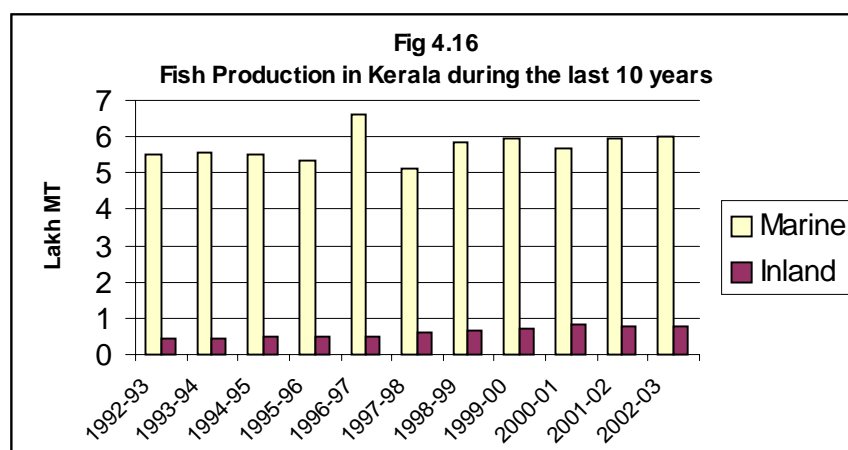
**Export**

4.267 The marine products export from the state dur-

**Table 4.39**  
**Fish Production in Kerala**  
**during the last 5 years**

(in Lakh MT)

Year	Marine	Inland	Total
1998-99	5.82	0.66	6.48
1999-00	5.94	0.74	6.68
2000-01	5.67	0.85	6.52
2001-02	5.94	0.78	6.72
2002-03	6.03	0.75	6.78



ing 2002-03 was 81393MT valued at Rs. 1047 crores constituting 17 per cent in terms of volume and 15 per cent in terms of value to Indian marine products export. The export of marine products from the state during 2002-03 increased by 12 per cent in quantity terms and 10 per cent in rupee terms and 8 per cent in dollar terms compared to the previous year. The overall export from the country also increased during this period by 16 per cent in quantity and 7.56 per cent in value terms.

4.268 The major export item is frozen shrimp which constitutes 52 per cent in value term of total export from the State during 2002-03 while National level the corresponding share is 67 per cent. But the declining export share of frozen shrimp from the State is a cause for concern and it declined by 1.88 per cent in quantity terms and 1.15 per cent in value terms over the previous year while at the national level it increased by 11% in value terms in 2002-03.

4.269 The State's share in all India exports has been declining in recent years. The share declined from 27 per cent in quantity terms in 1999-00 to 15 percent in 2002-03 and the share in value declined to 17 per cent from 22 per cent. (Table 4.40). European Union continues to be the major market for the marine products exported from Kerala with a share of 47 per cent in value during 2002-03 followed by USA (20%) relegating Japan to the third position (13%).

### World Shrimp Situation

4.270 The world production of shrimp in 2001 was 4.2 million tonnes, one per cent higher than that in 2000. At 1.2 million tonnes, China remains the largest shrimp producer, despite a 2.5 per cent decline in volume in 2001. The drop in Chinese output was partially balanced by production increase in Mexico (+11%), Indonesia (+8%) and Vietnam (+4%) Shrimp production

**Table 4.40**  
**Export of Marine Products from Kerala**  
*vis-a-vis* India

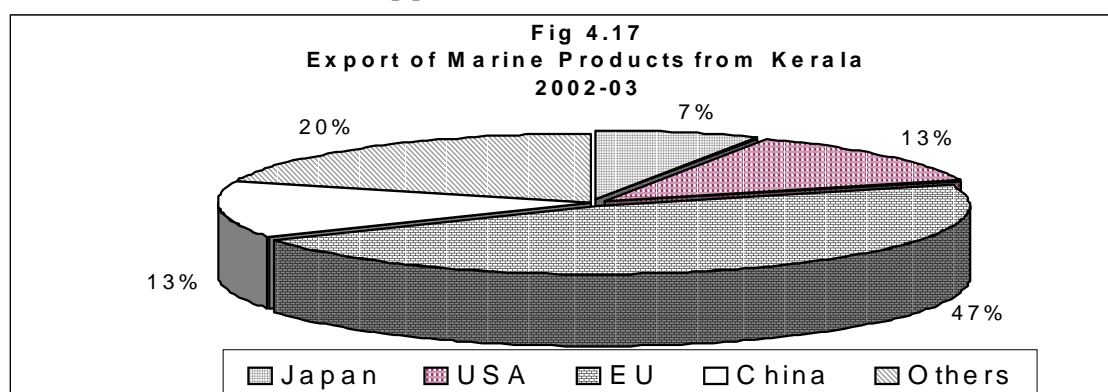
Year		India	Kerala	Share of Kerala (%)
1992-'93	Q* V**	209025 1768	49094 414	23 23
1993-'94	Q V	243960 2503	63848 622	26 25
1994-'95	Q V	307337 3575	74653 817	24 23
1995-'96	Q V	296277 3501	78895 856	26 24
1996-'97	Q V	378199 4121	92288 936	24 22
1997-'98	Q V	385818 4697	89366 948	23 20
1998-99	Q V	302934 4627	70641 817	23 18
1999-00	Q V	343031 5117	92148 1148	27 22
2000-01	Q V	440473 6444	88852 1046	20 16
2001-02	Q V	424470 5957	72756 951	17 16
2002-03	Q V	467297 6881	81393 1046	17 15

\*Q: Quantity in MT., \*\*V: Value in . crore Rs

Source: MPEDA

in Ecuador which had fallen by over 50% in 2000 due to white spot disease, rebounded by 22% in 2001 to 63000 MT. At over 8 lakh MT, black tiger shrimp remains the most important species in world production.

4.271 Global shrimp markets during the first half of 2003 have shown a continuation of the weak price levels for farmed shrimps which characterised trade in 2002. This trend is a result of a strong supply situation



for farmed shrimp combined with weak demand in key markets. The steady decline in shrimp prices began in 2001 and continued through 2002. The decline was due to a variety of factors, demand weakened in Japan as well as due to weak Yen. (Box 4.20) In fact, with above average inventories of black tiger prawns and no apparent shortage of white shrimp supplies from Latin America and Asia, prices may weaken further over the coming months in 2003-04. Poor economic outlook projected for EU also may weaken the demand.

4.272 In the EU, the appreciation of Euro vis-a-vis the

#### Box - 4.20

##### Income Elasticity of Demand for Fresh Fish in Japan

- A recent study of fish consumption in Japan showed that in the period 1965 to 1998, the income elasticity of demand for fresh fish by Japanese households was -0.26. For each 1 per cent increase in average income, Japanese households demanded 0.26% less volume of fresh fish.

Source: FAO - 2000

dollar effectively reduced import prices for shrimp and prices normally are quoted in dollar terms. On the supply side, the EU ban on Chinese seafood resulted in increased offers of Chinese shrimp on the US market during 2002. Finally increase aquaculture production in countries such as Vietnam and Brazil as well as strong catch levels for European cold water shrimp contributed to the negative price trend for the products in key markets.

4.273 The strong supply situation for farmed shrimps reflected the increased imports again in 2003 in the USA, the leading shrimp import market, as well as in France, the EU's second import market. Shrimp de-

mand in both the countries has benefited from weaker price particularly in relation to farmed shrimp products. Weak prices have not had the same impact in Japan where volume of imports are less in 2002. Japan was the second major market for export of shrimp from Kerala in 2001 while in 2002, it became third after USA. A negative import trend is also evident in Spain and Italy both of which have been affected by the reduced availability of Argentinean shrimp. EU import ban continues to be applicable to Chinese farmed shrimp imports.

4.274 EU shrimp prices are generally lower than the ones in Japan and in the USA. Kerala is exporting a major share to EU market. The average unit value of export from India to different countries is shown in table. The EU market does not play a dominant role in fixing tropical shrimp prices, rather followed the price trend set by Japan.

4.275 Thailand is the world's leading shrimp exporter, is also the leading shrimp supplier to the USA, accounting for over a quarter of volume of imports. China is the largest producer of farmed shrimp and the second largest supplier to the US market in 2002 and increased exports in 2003 first quarter by over 60 per cent especially due to restrictions on farmed shrimp imports in EU. Vietnam, the third largest supplier to US also increased its share in 2003.

#### Infrastructure facilities

4.276 Out of the 367 freezing plants in the country. 101 units are located in Kerala alone, of which 52 units are having EU standards. Modernisation of processing facilities by the rest of the units for EU approval and production of value added items will increase the

**Table: 4.41**  
**Average Unit Value Realisation of Frozen Shrimp exported from India**  
**for the period from 1997-98 to 2001-02**

( in Rs. /Kg.)

Sl. No	Countries	Year				
		1997-98	1998-99	1999-00	2000-01	2001-02
1.	Japan	356.73	416.65	390.87	470.49	389.38
2.	USA	232.17	238.78	283.82	378.79	360.15
3.	UK	205.74	231.06	250.71	290.90	296.59
4.	China	213.39	216.80	275.85	251.86	221.62
5.	France	155.86	196.97	223.10	257.23	287.33
6.	Germany	221.64	231.95	275.29	286.46	309.88
7.	Kuwait	242.94	-	-	644.06	-
8.	Saudi Arabia	150.82	-	-	169.30	171.66

export of marine products from Kerala.

### Quality Standards

4.277 Competition in the international market is increasing and Kerala has to keep the quality standards to retain the market share. The Sanitary and Phyto Sanitary (SPS) agreement under the World Trade Agreement stipulates maximum permissible chemicals residue, and other standards. The state has to move towards international standards of product hygiene in order to retain the market share in future. A large number of countries now have specific Hazard Analysis and Critical Control Point (HACCP) based regulations regarding the safety of fish products. USA was the first to adopt the HACCP based regulation of fish and fish products. All developed countries and a large number of developing countries have already shifted to HACCP based systems. The salient findings of a study on 100 fish export processing units, of which 50 from Kochi, 25 from Calcutta and 25 from Mumbai and shown in Box: 4.21.

### Reservoir Fisheries

4.278 Under the Pilot project assisted by Germany, culture fisheries was taken up on an organised scale during Eighth Five Year Plan. Although the module developed is worth emulating in all the reservoirs, it is adopted only in 10 reservoirs with an area of 6776 ha. There are 30 reservoirs with waterspread area of 43,000 ha. in the state suitable for taking up fish culture.

4.279 During 2002-03, a total of 5.90 lakh catla, 8.33 lakh rohu, 5.81 of mrigal and 7.13 lakh of Labea were stocked in these reservoirs. Total catch recorded was 69.22 tonnes valued at Rs. 27.60 lakhs. The average productivity is very low. (Table 4-42)

4.280 The Indo-German Project has estimated an annual potential fish supply of 850 tonnes from the five reservoirs and 1700 tonnes from all reservoirs of Kerala. The present production from the ten reservoirs is very low and the average yield range from 1.70 tonnes in Walayar reser-

### Box - 4.21

#### Major Findings of a Study on Fish Export Processing Units

- The Nominal Protection Coefficients (NPCs) without compliance of international standards with SPS measures vary from 0.46 for Sardines to 0.72 for Tuna. A ratio of less than 1 implies comparative advantage.
- The NPC with food safety ranged from 0.57 for Sardine to 0.81 for Tuna
- The magnitude of erosion in competitiveness varied from as high as 24 per cent in the case of Ribbon fish to about 10% in the case of cuttle fish.
- Prawn and Shrimps also suffered a set back in their export competitiveness.
- Installation cost of HACCP plants varies from Rs. 10 million to Rs. 25 million. On an average an export processing firm is entrusted to spend about Rs. 2 million/yr to maintain HACCP system.
- On an average, HACCP implementation has led to pre export and handling cost of Rs. 7 per kg. Small firm had to incur Rs. 10 /kg. on pre export processing of fish

Source: Anjana and Praduman Kumar 2003

voir to 111.28 tonnes in Meenkara in 2002-03. The low productivity in most reservoirs can be attributed to undesirable species mix as revealed in studies and fast growing species do not get the desired level of representation.

4.281 Reservoirs offer good potential for fisheries de-

**Table: 4. 42**  
**Reservoirs in Kerala with average fish productivity (2002-03)**

Sl. No.	Name of Reservoir	Production (Kg)	Productivity (Kg/ha)
1.	Pothundy Reservoir	3400	9.37
2.	Mangalam Reservoir	14210	35.88
3.	Walayar Reservoir	440	1.70
4.	Kanhirapuzha Reservoir	2400	5.26
5.	Chulliar Reservoir	4340	27.30
6.	Meenkara Reservoir	27820	111.28
7.	Malampuzha Reservoir	-	-
8.	Peechi Reservoir	4470	3.54
9.	Vazhani Reservoir	12140	47.61
10	Peruvannamozhi	-	-
	<b>Total</b>	<b>69220</b>	

velopment in the state and forms one of the most important inland fishery resources. Detailed action plan has to be prepared to exploit the potential with the involvement of SHGs.

### **Ornamental Fisheries**

4.282 Annual world export in ornamental fisheries is around US \$ 200 million. Asia supplies more than 50 per cent of world supply of ornamental fisheries. New players like Czech Republic and Malaysia are now emerging as suppliers. The major importers are US (28%), Japan (14%), Germany (9%), France (8%) and UK (8%). In value terms fresh water species account for 90 per cent of trade. The state has good potential to exploit the ornamental trade both in the domestic and export markets.

### **Major developmental Programmes**

4.283 The major developmental programmes implemented during the Plan period include, NCDC assisted Integrated fisheries Development Project, schemes implemented with financial assistance from NBCDC, Fishing harbours and landing centres and programmes ensuring social and livelihood security of fishermen population. The developmental programmes undertaken in the marine sector include modernisation of country crafts, popularisation of new generation crafts and distribution of suitable components of fishing gear.

#### **1. Integrated Fisheries Development Project**

4.284 The NCDC assisted Integrated Fisheries Development Project is implemented by Matsyafed. The scheme components include distribution of fishing inputs, setting up of adequate village level infrastructure for marketing, working capital assistance, and assistance for execution and trading facilities. During 2002-03, a total of 384 crafts and 889 OBMs were distributed, and the total expenditure was Rs. 27.95 crores. Details are shown in Appendix: 4.55 MATSYAFED has completed four phases of the integrated fisheries development project. The supply of fishing inputs at subsidised prices and a lower rate of interest led to group ownership system among fishermen.

#### **2. Theerasmridhi Scheme**

4.285A special central assistance scheme for Rs. 15 crore was taken up to assist renovation of dilapidated houses of fishermen, drinking water supply and sanitation of fishermen villages. Drinking water facilities were provided in 15 fishing villages at a cost of Rs.

3.00 crore, common sanitation for 80 units, individual sanitation for 8000 units and repairs and sanitation of 4000 houses were assisted under this scheme during 2002-03.

#### **3. Social Security and livelihood support to fishermen Community**

4.286 A number of programmes were under implementation for providing social security and livelihood support to the fishermen community. They include saving-cum-relief scheme, NFWF housing, HUDCO assisted housing, DANIDA model sanitation, Group insurance to fishermen etc. The major highlights are given in Appendix-4.56

4.287 Under NFWF assisted housing scheme, under the Model villages development Programme, 8729 houses were constructed spending Rs. 35.02 crores during Ninth Plan. All active fishermen are covered under group accident insurance scheme. About 2.2 lakh fishermen were insured under the scheme. Assistance is provided to accidental death/missing of fishermen while fishing, permanent and total disability and partial disability.

4.288 The Kerala Fishermen Welfare Fund Board is the implementing agency for welfare and relief schemes to the fishermen in the state. The Board has 220279 registered contributing fisher folk and 43075 registered contributory allied workers. Besides there are 27488 fishermen and widow pensioners and 642 allied workers pensioners.

4.289 The saving cum relief scheme is for providing assistance to fishermen during lean period by mobilizing their savings during the peak season. This is a 50% CSS and during 2002-03, 1.06 lakh beneficiaries were assisted and the total expenditure was Rs. 6.08 crores.

#### **4. Schemes Implemented with the Financial Assistance of NBCDFC**

4.290 Special programmes assisted by the National Backward Classes Development Corporation (NBCDFC) were also under implementation. With the financial assistance of NBCDFC, 493screwpine mat making units, 46 cold storages and 916 fish marketing units have been established for providing additional employment opportunities to fishermen. In addition, autorikshaws have also been supplied under this scheme for

promoting self-employment among fishermen.

### Fishing Harbours and Landing Centres

4.291 Neendakara, Munambam, Puthiyappa, Mopla Bay and Chombal- have been completed and commissioned. The progress of work in respect of the ongoing Harbours and landing centres is given in Appendix.4.58 and Table 4.43. All the harbours are constructed with 50% Central assistance. The three projects Thankassery, Munambam and Neendakara, the central assistance has already been exhausted and the construction is progressing with State Government share. The revised estimates of most of the harbours are pending with Government of India.

4.292 Vizhinjam Harbour was scheduled for commissioned by March 1999. Rahabilitation issues, communal tensions, litigation by the contractors etc. have contributed to the delay in commissioning. Work on Muthalappozhy, Ponnani and Kayamkulam are progressing. The total revenue collected during 2002-03 was Rs. 171.25 lakhs, out of which Neendakara contributed about 50 per cent (Appendix 4.59).

4.293 As a part of modernising Government Programme, a policy on long pending infrastructure projects was approved. Detailed status report and action plan for completion of all long pending harbours would be prepared during 2004-05.

4.294 There are 10 landing centres for mechanised boats and 15 for traditional fishermen. Out of the fish landing centres for traditional fishermen, eight have been completed. Work on Pollathai is progressing. Two centres at Poovar in Thiruvananthapuram and Kanjanhad at Kasargod could not be commenced due to the non availability of land and resistance from local people. Proposed centre at Vizhinjam North has been abandoned and the one proposed at Quilon was dropped in view of the development of Thankassery Port.

4.295 The construction of fishing harbours and landing centres has to be done on a strict project mode with different methods of financing and participation.

### FFDA & BFFDA

4.296 The Fish Farmers' Development Agencies are functioning in all the districts for promoting aquaculture. The FFDA's have established six fish seed farms. They have enrolled farmers, surveyed 9093 ha water area and organised fish culture in 4390 ha. in 2002-03. During the year 21802 farmers were benefited and 21.8 lakh fingerlings were stocked and fish production was 705 tonnes from these activities.. However the development efforts initiated under FFDA's are yet to make any perceptible impact on the development of inland fisheries. The first FFDA was established in Palakkad district in 1976. Originally it was started as a 50% scheme and later in 2000-01 it was converted as a 75% Centrally Sponsored scheme. But there was no release of funds from Government of India from 1998-99 onwards. In some of the districts the functioning is inadequate and further strengthening is needed.

4.297 Brackish Water Fish/Prawn Farmers' Development Agencies are functioning in six districts. An area of 592 ha. has been brought under Prawn culture through the promotional programmes implemented during 2002-03. During the year, 1708 farmers were benefited and 36.83 lakh fingerlings were stocked.

4.298 Multiple agencies are involved in the promotion of aquaculture in the state, working for similar objectives and functional integration is needed to exploit the institutional synergies to maximise output from the sub sector.

**Table -4. 43**  
**Fishing Harbours in Kerala** ( in Lakh Rs)

Sl.No.	Name of Fishing Harbour	Total estimated cost		Year of starting	Expenditure upto March 2003
		Original	Revised		
1.	Vizhinjam	704.00	1583.00 *	1987	1487.871
2.	Muthalappozhi	1366.00	-	2000	249.245
3.	Thankasseri	1980.50	4385.50 *	1991	3920.540
4.	Neendakara	585.00	622	1982	808.193
5.	Kayamkulam	624.60	1770.00	1994	658.959
6.	Munambam	1167.20	1895.80 *	1988	1717.659
7.	Puthaiappa	527.00	962.50	1988	1149.093
8.	Chombal	556.00	975.00	1992	876.093
9.	Mopla Bay	564.00	816.00	1992	1007.986
10.	Ponnani	2759.40	-	2001	243.450
11.	Thalai	1370.00	-	-	40.972

Source: Harbour Engineering Department

\* Revised Estimated submitted to Government for sanction

### **Integrated Development of aquaculture in Kuttanand**

4.299 The project envisages augmentation of fish/prawn production by introducing eco friendly culture and ranching practices in greater Kuttanad region covering 100 ha. of waterlogged areas during 2002-03 with the participation of local bodies. This is a credit linked programme and production of 40 MT of fish and 75 MT of Scampi (*Macrobrachium*) are projected.

### **Co-Operation**

4.300 The spread and growth of co-operatives in different sectors were nurtured under development plans with government initiatives and government finance. As co-operative movement is a people's movement, the restrictions imposed by government has affected the growth of the sector. The Planning Commission constituted the Bhahma Perakash Commission towards the end of 1980s. The Report of the Committee (1991) is a landmark in co-operative reforms. Based on the report, Government of India has circulated to state governments suggestions for effecting necessary changes in the Co-operative Laws.

4.301 The Law Reforms Committee constituted under the chairmanship of the Law Minister has proposed the detailed draft of the Kerala Self-Reliant Co-operative Bill 2002 which is under the consideration of the Government. Early enactment of the law will help to reform and revitalise the co-operative sector in the state.

4.302 The amendments to the state Co-operative Societies Act on the lines of the Model Co-operative Societies Act as recommended by Chaudhary Brahma Perakash Committee has been under the consideration of various State governments. Nine State governments have enacted the Parallel Co-operative Legislation for self reliant Co-operatives, containing the enacted features of the Model Act.

4.303 The Companies Act, 2002 came into force from February 6, 2003. The legislation provides for incorporation of specially structured producer companies possessing the unique characteristics of co-operative business. The legislation also offers a purely voluntary option for existing co-operatives to become producer companies.

4.304 A study on innovative behaviour in 30 co-operatives in Kerala was undertaken in 2001-02 by the Tilburg University. In innovative co-operatives the

### **Box - 4.22**

#### **Major reforms introduced in the co-operative sector in the country from November 2002 to October 2003.**

- The Companies (Amendment) Bill, 2002 was passed in the Lok Sabha on December 10, 2002, and came into force from February 6, 2003. The legislation provides for incorporation of specially structured Producer Companies possessing the unique characteristics of a co-operative business and also offers a purely voluntary option for existing co-operatives to become Producer Companies.
- The Government of India committed Rs.100 crore for recapitalisation of co-operative credit institutions and gave assurance for consideration of provision of additional funds depending on the pace of reforms, in the Union Budget for the year 2003-04.
- The Uttaranchal Self-Reliant Co-operative Act, 2003 was notified on May 21, 2003. Uttaranchal has now become the ninth State in the country after Andhra Pradesh, Madhya Pradesh, Chhattisgarh, Karnataka, Orissa, Bihar, Jharkhand and Jammu & Kashmir to enact a parallel co-operative legislation for self reliant co-operatives.
- The Banking Regulation (Amendment) and Miscellaneous Provisions Bill, 2003 was introduced by the Government in the Lok Sabha on August 13, 2003. It proposes 'freezing' of all regulatory exemptions currently enjoyed by co-operatives banks under the Banking Regulation Act, 1949 thereby bringing the regulation of the sector at par with commercial banks. The bill also bars connected lending involving lending to related persons and associated companies by the banking co-operatives societies.
- The parliament passed the National Bank for Agricultural and Rural Development (Amendment) Bill, 2003 on August 21, 2003. The bill seeks to provide direct refinance of District Central Co-operative banks (DCCBs).

democratic organs participated and different organs of the cooperatives at different stages of innovation process, while in non-innovative ones, participation of such organs were absent. The major findings of the study are shown in BOX. 4.23: Lack of professionalism was also highlighted. This study again highlights the im-

portance of reforms in cooperative sector for innovative behaviour.

### Box - 4.23

#### Major Findings of a Study on Innovative Behaviour in Co-operatives

- A total of 30 co-operatives were covered, which carried out a total of 57 innovations of different levels of impact. Out of these 57, 35 were product innovative, where as 11 were process innovation and another 11 market innovations. Impact scores are given and identified 10 as innovative and 20 as non-innovative.
- 10 innovative co-operatives produced 34 innovations, 30 of which are of medium or high impact to the firm. Where as the (20) non-innovative co-operatives produced only 23 innovations, of which 12 are of low impact and only 3 are of high impact. The 12 low impact and 7 of the medium impact innovations were product innovations. In the five year period of the research, the innovative co-operatives present 0.7 innovations a year on an average, the non-innovative one on an average only 0.2
- Neither the government nor the apex organization played a significant role, neither in the innovative nor in the non-innovative co-operatives.
- The innovative ones produced about three times as many innovations as the non-innovative ones did and these innovations were for a greater part of a medium or high impact whereas those of the others were more of a low or medium impact.
- Co-operatives with a higher turn over (size), direct export (distribution channel), sales abroad (market) and in Kannur district (location) were more innovative.
- Appointments of Secretaries of the co-operatives were not always based on managerial skills but often rather on political linkages.
- Co-operatives should be encouraged to market their own products
- Government and related institutions should play a role in teaching skills to managers to be appointed in the organisations.

Source: Tilburg University, 2002.

#### Support by NCDC

4.305 The role and relevance of NCDC in the context of promotion and development activities leading to production, processing, storage and marketing of agricultural produce food stuffs and various other commodities in the co-operative sector was very significant. Considering the over all improvement in the efficiency levels of co-operative, Kerala has been continuing to avail NCDC's development assistance to the co-operatives in the state. As on March 2003 the Corporation has released a total financial assistance of Rs.544.48 crores as term loan . which is 7.67 per cent of total amount released in the country. The amount released by NCDC from 1962 - '63 are given in Table: 4.44. During 2003 Rs.39.75 crores was availed by the co-operative department, out of Rs.50.18 crores An amount of Rs.8.06 crores (16.06%) was released for co-operatives of weaker sections like Fisheries, Handloom, Coir, SC/ST etc. The sector-wise sanction and release of assistance from NCDC in 2001-02 and 2002-03 are furnished in Appendix 4.60 and 4.61

4.306 The NCDC loans have been high interest loans and even though recently steps have been taken to reduce interests rates, further downward revision is needed in tune with the market interest rates. Otherwise the need for channeling the loans through a special agency may have to be reviewed.

**Table 4.44**  
**Year wise release of NCDC loans with interest rates**

(in Crore Rs)

Year	Release of fund	Interest rate (%)
1962-63 to 92-93	122.08	
1993-94 to 98-99	195.47	
1999-00	56.07	13.75
2000-01	69.04	13.75
2001-02	51.64	13 – 12.25
2002-03	50.18	11.50 – 10.5
Total	544.48	

#### The Primary Agricultural Credit Societies (PACS)

4.307 The Primary Agricultural Credit Societies (PACS) are institutions at the grass root level for the disbursement of co-operative credit. As on March 2003, there were 1628 PACS with a total membership of 2.26 crores with a paid up share capital of Rs. 506 crores and reserves of Rs. 925 crores. During 2002-03, out of 1628 societies, 754 societies were on profit and 874 were on loss and 1560 societies have paid secre-

taries.

4.308 To solve the problem of resource scarcity in Co-operative Banks, this year NABARD had introduced a new scheme in which minimum involvement would not be insisted upon and 50 per cent of the money disbursed would be reimbursed by NABARD. NABARD had also come out with a scheme of Gold Loans for crop production

4.309 The total loan disbursed through PACs during 2002-03 was Rs.8750.50 crores against a disbursement of Rs.5859.62 crores during the previous year. The credit disbursed for agricultural purposes was Rs. 4554.97 crores during 2002-03 against Rs.2100.64 crores in 2001-02. Out of the total credit the percentage disbursed to agriculture was 52 per cent as against 35.8 per cent in the previous year. A significant increase in the rate of total disbursement was noted in the agriculture sector. Details are furnished in appendix 4.62 and 4.63

4.310 Even though the PACs are multi functional societies for multi purposes, the challenges faced by them have increased the number of loss making societies. The increased in deposit per society shows the ability to mobilize funds locally, while mobilized deposits have not seen deployed in a profitable manner. The problem of over dues continues to be a major challenge confronting the PACs in the State. The loans outstanding have increased by 55 per cent between 1999-00 and 2002-03 while loan overdue increased by 113 per cent during this period.

#### **One Time Settlement Scheme (OTS)**

4.311 The One Time Settlement Scheme was implemented first time in the co-operative sector with a view to reduce the overdue position of the co-operative institutions and extend some relief to the loanees who could not repay the loan in time due to draught/flood and consequent loss of agricultural products. The defaulters of this scheme were exempted from the payment of penal interest and compound interest if they remit back the dues in lumpsum and they were also permitted to pay back the dues in ten installments. In this case the interest will be charged at the current rate of document rate whichever is less. This scheme was implemented in all the co-operative banks. Subsequently the scheme was further extended up to March 31,2004. By virtue of this, the interest rate will be

calculated @ 12 per cent on the amount outstanding as on March 31, 2002. The KSCB and DCBS have also implemented the OTS scheme as suggested by the Reserve Bank of India. About 3185 co-operative societies have implemented the scheme and 3.64 lakhs members are benefitted. The societies were able to collect Rs.668.19 crores as over due.

#### **A brief Review of Plan Schemes 2002-03**

4.312 The budget provision for the year 2002-03 was Rs.1400.00 lakhs and the expenditure was Rs.1226.18 lakhs. The sub sector wise financial achievement during the year is shown in Table 4.45.

**Table: 4.45**  
**Financial Achievement during 2002-03**  
( in Lakh Rs)

Sl. No	Sub Sector	Financial Achievement
1	Credit Co-operatives	125.04
2	Processing Co-operatives	201.08
3	Consumer Co-operatives	143.83
4	Housing Co-operatives	100.00
5	Research, Education and Training	49.50
6	Modernisation and Administrative Reforms	161.16
7	Other Co-operatives	445.17
	<b>Total</b>	<b>1226.18</b>

4.313 During the year, in order to strengthen the co-operative base through commercial operations 34 per cent of the total outlay ( Rs.475.00 lakhs ) was earmarked for rehabilitation programme for weak but potential co-operatives and expansion and diversification of activities of co-operatives. Under these schemes all categories of co-operative societies, such as Marketing, Consumer, Housing etc. with viable project proposals were assisted. Of the total outlay of Rs.250.00 lakhs, 238.07 lakhs was expended during 2002-03 under the rehabilitation programme by way of subsidy, share and loan. Under Expansion and Diversification Scheme out of the total outlay of Rs.225.00 lakhs Rs.158.63 lakhs was expended as subsidy, share and loan.

4.314 Under the Scheme of Assistance to PACS subsidy and share were given to 18 societies and 67 societies respectively and 42 SHGs were formed. As on 03 / 2003, 554 PACs were selected for the implemen-

tation of SHGs by forming 7384 groups.. The members of SHGs consists of landless labours, artisans, small and marginal farmers, tribals etc. Short term and medium term loans for the cultivation of seasonal crops were disbursed through 1685 Primary Agricultural Credit Societies and 38 Farmers Service Co-operative Banks at the grass root level. Out of a total outlay of Rs 90.00 lakhs, Rs.69.04 lakhs was expended for the above purposes.

4.315 During 2002-03, seven Processing and Marketing Societies were assisted. Out of Rs.240.00 lakhs, Rs.201.00 lakhs expended. Most of the societies were rubber based processing societies. Share capital contribution of Rs. 5.00 lakhs was given to Cattle feed Processing Unit, Kannur.

4.316 Financial assistance was provided to State Co-operative union by way of grant –in-aid for running Co-operative Training Centre and implementing schemes relating to co-operative education, training, research and for conducting examination. There are 9 co-operative training centres functioning under the control of State Co-operative Union. Four of them are exclusively for SC/ST candidates. Two advanced management institutes of co-operatives ie. ICM, TVPM, ICM Kannur are under the control of National Council for co-operatives Training, New Delhi, which are established for imparting advanced management training programmes. In the year 2002-03 Rs.49.50 lakhs has been spent on training programme. Under the modernization of Co-operative Department Rs.12.30 lakhs has been spent for computerisation . Government has sanctioned share capital contribution of Rs. 80.00 lakhs to Primary Housing Co-operatives during 2002-03.

#### **Deposit Mobilisation Campaign by Co-operative credit institutions**

4.317 Deposit Mobilisation Campaigns by Co-operative Credit Institutions were conducted during the period. The target was to mobilise additional deposit of Rs.200.00 crores by the Co-operative Credit Institutions and the deposit of Rs.853.20 crores has been mobilised during 2002. The target for 2003 was Rs.400.00 crores. Year-wise target and achievement is given in the Table 4.46

**Table 4.46**

**Targets and Achievements of deposit mobilisation programme of Co operatives in Kerala**  
(in Crore Rs)

Year	Target	Achievement	Percentage
1999	200.00	725.57	362.79
2000	200.00	775.78	387.89
2001	200.00	1026.86	513.43
2002	200.00	853.20	426.60
2003	400.00	909.61	227.00

#### **Tribal Co-operatives**

4.318 Across the country, tribal communities do continue to depend on the forests for their daily needs as well as for their livelihoods, especially on minor forest produce. A study was conducted by International Labour Organisation in India on Tribal Co-operatives covering five States and major findings are shown in Box. 4.24: The Co-operatives were found effective when they were designed and managed by members. In Kerala the Tribal cooperatives are involved in collection of minor forest produce and more organised processing facilities are needed for better realization of prices to the members.

#### **Box - 4.24**

#### **Major Findings of a Study on Tribal Co-operatives in India**

- Ten primary co-operatives in Gujarat, Chattisgarh, Jharkhand, Orissa and Andhra Pradesh were studied.
- Co-operative for tribal communities were most effective when they were designed and managed by the members.
- Co-operatives for tribal communities were meant to be multipurpose, but had not in fact done significant business either in credit or in produce marketing. Reasons included insensitivity of the Co-operatives to tribal members, repeated reorganisation in terms of geographical areas/membership, unaccountable management, delayed audit etc. These co-operatives tended to sell more to the local communities, than they bought from them.
- Women were the Primary collectors of several items of minor forest produce, but they did not have a presence in the tribal co-operatives.
- Most of the co-operatives had not been voluntarily set up by the members.
- Interference in co-operation were common.

Source : ILO – 2002

### **Kerala State Federation of Scheduled Castes and Scheduled Tribes Development Co-operative Limited**

4.319 The Kerala State Federation of Scheduled Castes and Scheduled Tribes Development Co-operative Limited in the apex institution, consisting of 577 member societies including 482 SC and 95 ST societies. The Federation has an Ayurvedic Medicine Manufacturing Unit. A petrol pump of Indian Oil Corporation was run by the Federation. The sale turnover of the pump is about Rs.65 lakhs/month. The federation also collected and marketed minor forest Produce (MFP) from the 34 ST member societies affiliated to the Federation. The collection and sales during 2001, 2002 was Rs.258.56 lakhs and 298.56 lakhs respectively. The Federation provided employment to furniture making member societies by distributing cane collected from Nilambur forest. With the support of NCDC "Chevakai" powdering unit and Honey Processing Unit are established. The Federation provides financial support to ST member societies by distributing 3.20 lakhs each for construction of MFP godowns.

4.320 A Grain Bank was established during 2002-03 with an amount of Rs. 40.00 lakhs sanctioned by ST Development Department and implemented the scheme through 9 ST Co-operatives for the benefit of tribal population in Wayanad, Attappady and Parambikulam.

### **Miscellaneous types of Co-operatives**

4.321 Miscellaneous types of co-operatives have been organised in the state mainly for the purpose of generating employment opportunities to the unemployed youth and the weaker sections. Co-operative Hospital and Dispensaries, Education Co-operative Societies, Vanitha Co-operative Societies, Motor transport, Autorikshaw and Taxi Drivers Co-operative Societies, Tailors Co-operatives Societies, Washermen Co-operative Societies, Chethuthozhillali Co-operatives Societies etc. are some of the Co-operative Societies which are organised for the purpose of employment generation. There are also Social Welfare Co-operative Societies, Cultural Co-operative Societies, farming Co-operative Societies, Leprosy Patient Co-operative Societies Matsya Thozhilali Co-operative Societies, Photographers Co-operative Societies, Tailors Co-operative Societies etc. Government extends financial assistance to these societies by way of share capital contribution, grant, loans and subsidy. During 2002-03, assistance was given to 75 societies. Of the total budgeted outlay of Rs. 60.98 lakhs, Rs.48.78 lakhs was expended

### **Agricultural marketing Co-operatives**

4.322 Kerala's agricultural economy is dominated by cash crops like Rubber, Coconut, Arecanut, Spices etc. which are largely concentrated in the small farm sector and marketing support for the products is highly essential. In the liberalised economy the challenges in the marketing front has to be addressed through organised institutional support and the role of marketing cooperatives are important to address these challenges.

4.323 The main agencies functioning in co-operative sector for marketing of agricultural products and the institutional network established by them are indicated below.

### **Central Arecanut and Cocoa Marketing and Processing Co-operative Limited (CAMPCO)**

4.324 Central Arecanut and Cocoa Marketing and Processing Co-operative Ltd. (CAMPCO) is a joint venture of State Governments of Kerala and Karnataka, registered under the Multi State Co-operative Societies Act of 1984. The area of operation of this co-operative extends to the entire states of Kerala and Karnataka. CAMPCO has a membership number of 78805, with a paid up capital of Rs.13.47 crores as on 31.03.2003. The main objectives of the co-operative is procurement and sale of Arecanut and Cocoa so as to stabilise market price by way of providing remunerative prices to the growers. CAMPCO had 118 procuring centres through out the two states. It also operates through 13 sales depots all over the states in India at different places. During 2001-02 the procurement and sale of Arecanut was 41242 tonnes and 38370 tonnes valued at Rs 238.59 crores and Rs.249.48 crores respectively. It increased to 44900 tonnes and 42400 tonnes valued at Rs.278.09 crores and 282.73 crores respectively during 2002-03.

4.325 CAMPCO entered into an agreement with M/s. Nestle India Ltd. and initiated manufacture and supply of bulk quantity of chocolates, semi finished product and cocoa products. Total quantity of chocolate sales during 2002-03 is 2426 MTs as against 2626 MTs in 2001-02. It was valued Rs.33.19 crores and Rs.33.01 crores respectively.

4.326 CAMPCO has established one copper sulphate producing unit with 300 MTs capacity/year. During

2002-03, 252.26 MTs valued Rs.138.26 lakhs was sold as against 366 MTs valued Rs.188.04 lakhs during 2001-02.

4.327 Besides, CAMPCO has a small consumer packing unit in the name of "Mangala Supari". In order to explore the market further started to manufacture "Kaja Supari" – a mixture of Cashew and Supari.

#### **Kerala Kera Karshaka Federation Limited (KERAFED)**

4.328 KERAFED was created for the integrated development, procurement, processing and marketing of Coconut and its products. Diversified value added products, like Kerakesh food products of coconut such as curry mix, chutney powder, confectioneries etc. are produced and marketed. The federation with the net work of distribution through the patronage of public distribution agencies all over the state. The federation has setup copra dryers of smaller capacities at local levels.

4.329 The procurement of copra by KERAFED during 2001-02 was 1778 MTs, which increased to 5199 MTs during 2002-03. At the same period 6.55 MTs alone was sold with a value of Rs.2.16 lakhs. Details of performance of KERAFED is given in Appendix. 4.66

#### **Kerala State Co-operative Housing Federation**

4.330 Kerala State Co-operative Housing Federation is the Apex institution of 207 Primary Housing Co-operatives in the State. The Federation raises funds for lending programmes as share capital from Government of Kerala and member societies, and borrowing from institutions like LIC, HUDCO, HDFC, NHB etc. During 2002-03, the institution received an amount of Rs.1.00 crore Rs.40.00 crores and 25.00 crores from State Government, LIC and NHB respectively. Out of the total amount of Rs.66.00 crores Rs.57.34 crores was spent for the construction of 7596 houses. The Federation has advanced loans for construction of 1,44,955 houses since its inception in 1970 by extending Rs. 766.85 crores.

#### **Kerala State Co-operative Consumer Federation (Consumer Fed.)**

4.331 Kerala State Co-operative Consumer Federation Ltd. is the apex institution of consumer co-operatives linked to the whole sale co-operative con-

sumer stores at district level with 12 primary co-operatives as its associated members. The basic objectives of the federation is to procure and distribute the various consumer goods and other products of daily use at reasonable prices through the District Co-operatives, whole sale stores, retail outlets named 'Triveni' and through the primary consumer co-operative societies. It deals with the business of groceries, pulses, cosmetics and toiletries, household and electrical goods note books, office stationery items, generator, Medicine, LPG, foreign liquor etc. The Federation has also established 1000 Neethi stores run by selected Primary Agriculture Credit Societies, besides 14 Neethi Distribution Centres sponsored by Government of Kerala and 17 Neethi Medical Stores are directly run by the Federation. During the year 60,000 gas connections were given through their LPG Bottling Plant. Retail sale of unadulterated foreign liquor through the network of 46 FLI shops in the state is undertaken by the Federation.

4.332 At present the Federation has 162 various units in the state. The total sales turn over for 2002-03 was Rs.305.55. crores.

#### **Kerala State Rubber Co-operative Limited (RUBCO)**

4.333 Kerala State Rubber Co-operative Limited, popularly known as RUBCO was formed in 1997 with an authorized share capital of Rs.300.00 crores, with the main objective of setting up industries based on Rubber and Rubber wood. The co-operative is also engaged in the trading business of Natural Rubber of different grades and forms and also acts as a market intervention agency of Government of Kerala for Natural Rubber, including its exports. RUBCO is very actively and effectively involved in the procurement and trading business of natural rubber. Details of procurement, sale and export of Natural Rubber by RUBCO is given in Appendix-4.66

4.334 A Hawaii chappal-manufacturing unit with a production capacity of 36 lakhs pairs per year has been established with the financial assistance of NCDC. Besides conventional Hawaii Chappals, the unit is producing Ultra light weight Hawaii Chappals under the brand name of 'Rubco Rainbow' with the technical assistance of Hitech Setters, Malaysia. During the year 2002-03, the unit produced 12,47,549 pairs of Hawaii Chappal and marketed 13,56,518 pairs

valued at Rs. 440.69 lakhs. The targeted sales for 2003-04 is Rs. 10.00 crores.

4.335 A cycle tyre and tube factory was established on 2000 with a total cost of Rs. 435.00 lakhs. Average monthly domestic sale of the product is 20,000 tyres and 10,000 tubes. RUBCO has contracted to export cycle tyres and tubes to various foreign countries. During 2002-03 the unit produced 776 MT cycle tyres and tubes and marketed 460 MT valued at Rs. 216.47 lakhs. The target for cycle tyres and tubes for the year 2003-04 is Rs. 10.00 crores. Rubberized coir mattress unit was also established with a total project cost of Rs. 27.00 crores. Rubber mattress are marketed under the brand name of 'Dosth, Safar, Heaven, Hitech, Yatri, Heal' etc. During 2002-03 the unit produced 908 MT mattress and marketed 859 MT valued at for Rs. 730.59 lakhs. The targeted sale for 2003-04 is Rs. 30.00 crores.

4.336 Rubco Huat Woods (P) limited is a subsidiary unit of RUBCO engaged in the production of various kinds of furniture in technical collaboration with M/s. Long Huat Group Berhad of Malaysia, situated at Tellichery, Kannur District. The commercial production commenced in 01.01.2000 and the product range covers domestic and office chairs, tables, computer tables, coat, sofa, Wardrobes, Fan stand, T.V. stand etc. The targeted sale for the financial year 2003-04 is Rs. 42.00 crores. Rubco Sreekanthapuram latex (P) limited became a part of Rubco Group and the company manufactures Black Rubber and Pale Latex crepe by processing latex directly from farmers and process the same to get value addition. Rubco Sales International Limited (RSIL) is a subsidiary company registered under Indian Companies Act, through which all products produced by RUBCO Group of companies are marketed.

4.337 The other projects in pipe line in the rubber sector a unit for manufacture of radial and bias tyres for heavy vehicles, passenger cars and for two and three wheelers are established. As a part of diversifying their activities, Rubco has proposed to establish a coconut based processing unit for the production of coconut spray, dried milk powder, activated carbon, tender coconut water and coconut water concentrate, with a total cost of Rs. 75.00 crores, using

imported technology. Also proposed to establish a unit for producing coconut oil directly from fresh coconuts and has already signed MOU with M/s. Kokonut Pacific Private Limited, Australia for technical collaboration of this project. They envisage to establish 200 small scale units in Kerala under the Primary Co-operative Societies.

### **Integrated Co-operative Development Project (ICDP)**

4.338 Integrated Co-operative Development Project (ICDP) aims at the development of selected districts through co-operative net worth and there by the development of horizontal and vertical functional linkages among the co-operatives in the rural economy in an effective manner with the financial assistance of NCDC. Now ICDP covers all the districts in the state. ICDP provides financial assistance to PACs, PAMs SC/ST co-operatives to providing infrastructural facilities such as godown, retail outlet, cash counters iron safe, strong room, furniture etc. Besides, several processing units have been setup under ICDP such as milk pasteurisation plant, cattle feed plant, spices powdering unit, Tea processing plant and Neem cake production plant etc. About 300 persons were provided employment under the units. The project facilitates skill improvement programme through training to the employees to PACs, PAMs and SC/ST co-operatives are also undertaken under the project.

### **Micro Financing of NABARD**

4.339 The micro finance initiative of the National Bank has made a sustainable social movement over a decade. The initiative has attracted the attention of a wide range of stake holders and the relevance of the micro finance programme was greatly enhanced for all the partners through the core strategy of Self Help Groups-bank linkage. NABARD launched this modest pilot project of SHG Bank-programme in 1992,

4.340 The cumulative number of SHGs credit linked with banks increased to 7,17,360 as on March 2003 by extending the programme to more than 116 lakh poor families as against 4,61,478 SHGs benefiting 78 lakh poor house holders as on 31<sup>st</sup> march 2002. The commutative position of bank loans disbursed and the refinance support provided by the National Bank (NABARD) is given in Table 4.47.

**Table: 4.47**  
**SHG-Bank Linkage Programme – Cumulative Progress**  
**(As on 31 March)**

Year	SHGs Finance (No.)	Bank Loans Disbursed (Rs.in crore)	SHGs Refinanced (No.)	Refinance Disbursed (Rs.in crore)
1999	32,995	57.07	32,995	52.09
2000	1,14,775	192.98	94,645	150.13
2001	2,63,825	480.87	2,13,213	400.74
2002	4,61,478	1026.34	3,40,131	769.47
2003	7,17,360	12,048.67	4,93,634	1,418.80

4.341 The important indications of SHG-Bank linkage programme in Kerala state can be described through three models (a) SHGs formed and financed by banks (b)

SHGs formed by formal agencies and NGOs but directly financed by banks and (c) SHGs financed by banks through NGOs. Agency-wise cumulative participation up to 31<sup>st</sup> March 2003 is given in Table 4.48 District wise cumulative achievement of SHGs-Bank linkage programme under Co-operative banks up to 31<sup>st</sup> March 2003 is given in Table 4.49

4.342 Under Co-operative banks, the total number of SHGs provided with bank loans up to March 2003

was 2726. The bank loan disbursed at the same was Rs.1.51 lakhs. Idukki, Alappuzha and Thrissur are major district formed

**Table 4.49**  
**SHG-Bank Linkage District wise Cumulative Progress of Participating Co-operative Banks**

Name of DCCB	Cumulative of SHGs provided with bank loan up to 31 <sup>st</sup> March 2003	Cumulative Bank loan disbursed up to 31 <sup>st</sup> March 2003.
Thiruvananthapuram	20	1.82
Kollam	138	12.96
Pathanamthitta	49	3.56
Idukki	953	28.73
Alappuzha	714	50.47
Kottayam	226	11.91
Thrissur	502	33.80
Kolzhikode	23	2.19
Wayanad	77	4.07
Kannur	2	1.22
Kasargod	22	0.73
<b>TOTAL</b>	<b>2726</b>	<b>151.46</b>

**Table: 4.48**  
**SHG Bank linkage in Kerala**  
**Agency-wise Cumulative Participation up to 31<sup>st</sup> March 2003**

Sl. No	Name of Bank	No. of SHGs	Bank Loan (Rs.in Million)
1	Commercial Banks	14068	402.75
2	RRB's	4218	90.66
3	Co-operative Bank	2726	151.46
<b>TOTAL</b>		<b>21012</b>	<b>644.87</b>

953,714 and 502 groups by availing Rs. 0.29 lakhs, Rs.0.50 lakhs, and Rs.0.34 lakhs respectively.

4.343 A National seminar on the SHG-bank linkage programme was organized by the National Bank in collaboration with SDC, GTZ and IFAD in November 2001 at New Delhi. Major recommendations of the Na-

tional Seminar on SHG-Bank Linkage is given in Box 4.25:

**Box - 4.25**

**Recommendations of the National Seminar on SHG-Bank Linkage**

- Promotion of new SHGs to be taken up on a large scale in eastern, northern and other backward states
- There is a growing need for meeting the cost of promotion, training and nurturing of SHGs through convergence of resources.
- A system of self-financial services by SHGs such as auditing, escort services for enterprises promotion etc needs to be encouraged.
- The issue of collateral for higher loans needs critical examination.
- SHG-Bank Linkage had a significant impact on the income level of the members of SHGs.
- The Government should divert a large part of subsidies, (subsidies provided under SGSY etc) for capacity building of the poor and also for establishing micro-enterprises

**Kerala State Co-Operative Union and Institute of Co-operative Management**

4.344 The Kerala State Co-Operative Union has the responsibility of imparting awareness and education to the officials and non-officials engaged in the Co-operative sector. The Union is conducting education through the nine Co-operative Colleges in the state. The National Co-operative Union of India has also established two Institutes of Co-operative Management in Thiruvananthapuram and Kannur districts with the primary objective of promoting advanced training courses and increase professionalism in management of co-operatives in the state.

(a) ICM, Kannur:- The Institute conduct Diploma courses ranging from 3 months to 9 months for different co-operative organisations for improving the managerial efficiency for the personnel working in various departments like Dairy, Bak-

ing, Industries etc. Sectoral Diploma courses are also conducting by the Institute. The Institute organizes Seminars, Work shops and Conference to discuss the latest issues emerging in the business field and offers consultancy services to help the co-operative with latest trends. The faculty members undertaken problem oriented studies in different aspects of co-operative management during 2002-03 the Institute conducted 55 number of courses by participating 1178 persons.

(b) ICM, Thiruvananthapuram:- During 2002-03 ICM, Thiruvananthapuram has conducted 54 programmes by participating 1463 personnel. Out of 54, two programmes are Diploma Programmes with the duration of 12 and 36 weeks. During 2003-04 up to October 34 programmes are conducted by participating 832 personnel.

**Kerala State Co-operative Employees Pension Board**

4.345 Government of Kerala have constituted the Kerala State Co-Operative Employees Pension Board as per G.O.(P) No.45/95 Co-op. Dated:15-03-95 and Pension fund was established as per G.O. (P) No.44/95 dated:14-03.95 for payment of pension to employees of Primary Co-operatives in the state coming under the administrative control of Registrar of Co-operative Societies and not covered under the Employees Provident Fund Scheme. The number of societies and employees admitted at the end of March 2003 was 2159 and 20050 respectively which was 2122 and 19750 numbers in the previous year. The pension fund collected during 2002-03 was Rs. 15.54 crores. In the same period Rs. 13.56 crores was sanctioned as monthly person and arrears.

**Extending Gehan System in Co-Operatives**

4.346 It was a long standing demand of the co-operatives in the state that the Co-operatives may be exempted from the registration of the documents with the registration authorities while awaiting loan from the co-operative Bank on the security of loaned property. The loanees were liable to pay registration fee at the time of availing loan and fee at the time of registration of release deed. The Government of Kerala have made provision for making suitable amendments in the KCS Act 1969 and Kerala State Co-operative Agricultural and Rural Development Act 1984. Gehan envisages a special charge on movable or immovable prop-

erty in favor of the society by a mere declaration in writing by the borrower for securing the payment of money advanced by way of loans. By the introduction of this system, the loanees will be relieved from the heavy burden of registration fees. The system was introduced as per the guide lines of NABARD for getting further assistance.

### COINS

4.347 The Co-operative Insurance Society has been registered under the Co-operative sector with a total share capital of Rs.125.00 crores. The major shareholders of the society are Kerala State Co-operative Bank, District Co-operative Banks, Kerala State Co-operative Agricultural and Rural Development Bank, Primary Agricultural Credit Societies and Primary Co-operative Agricultural and Rural Development Banks. Now the society is under the control of an Administrative Committee consisting of 3 members constituted by Government.

4.348 In Kerala the Co-operative sector has entered into the insurance business in collaboration with Iffco through COINs as a corporate agent. Iffco-Tokyo is the joint venture Insurance company with a partnership of Indian Farmers Fertilizers Limited (49%) Crishk Bharati Co-operative Limited (20%), Indian Pottash Limited (5%) and Tokyo Marine and Fire Insurance in Japan (26%).

### Co-operative Academy of Professional Education – CAPE

4.349 Under this Academy, a Co-operative Medical College at Kochi and Five Engineering Colleges at Vadamakara, Thrikkariapur, Thalassery, Perumon and Kidangoor were established. Pariyaram Medical College is also under the Co-operative Sector and the Government have obtained permanent affiliation from the Medical Council and also obtained sanction for Dental College, Nursing College, Nursing School, Pharmacy Course etc.

### Kerala State Co-operative Employees Welfare Board

4.350 Government of Kerala has constituted a welfare fund for the employees of co-operative

societies including commission agents/salesman in the co-operative institutions. The main objective of the Welfare Board is to raise and administer funds for the welfare of the members of co-operative employees and to alleviate the distress of employees and their dependents. The rate of monthly contribution of the employees irrespective of the grades has been raised to Rs. 30./-. Till march 2003, 39286 employees (from 3965 co-operatives societies) were admitted. As on 31/03/2003 an amount of Rs.14.67 crores is outstanding under welfare fund contribution of the employees after the total disbursement of Rs.3.34 crores for various welfare activities.

### Kissan Credit Card (KCC)

4.351 Kissan Credit Card scheme was introduced in 1998-99 as an innovative scheme for issuing short term loan for seasonal agricultural operations to farmers in a flexible and cost effective manner. Pursuant to the announcement made in the Union Budget for the year 2002-03, banks were advised to issue Kissan Credit Cards (KCCs) to all eligible borrowers in the agricultural sector by march 2004. A total of Rs. 3.13 crores KCCs were issued up to March 31st 2003 in the country. A personal insurance package to the Kissan Credit Card holders was introduced in the Union Budget 2001-02 to cover them against accidental death or permanent disability up to a maximum amount of Rs. 50,000/- and Rs.25,000/- respectively. The premium burden for this was to be shared by the card issuing institutions and the KCC holders in the ratio of 2:1. The personal insurance package linked in KCCs was operationalised in July 2001.

4.352 Under co-operative sector up to 2002-03 co-operative banks issued 193.81 lakh KCCs in the country. Co-operative Banks in Kerala have issued 4,21,872 KCCs up to 30-06-2003. The details of district-wise cumulative issue of KCCs is given in Table 4.51.

**Table: 4.50**  
**Agency - wise, Year-wise Kissan Credit Cards Issued in India**

( in Lakh Rs)

Year	Co-operative Banks	RRBs	Commercial Bank	Total
1998-99	1.56	0.06	4.45	6.07
1999-00	35.95	1.73	13.66	51.34
2000-01	56.14	6.48	23.90	86.52
2001-02	54.36	8.34	30.71	93.41
2002-03	45.80	9.64	20.67*	76.11
<b>Total</b>	<b>193.81</b>	<b>26.25</b>	<b>93.39</b>	<b>313.45</b>

\* Data up to 31<sup>st</sup> December 2002

Source: NABARD – Annual Report '02-03

**Table 4.51**  
**The Details of District-wise Cumulative issue of KCCs in Kerala**

District	Progressive Total 31/03/2003	No of Cards issued during 3 months	No of Cards issued up to 30/06/2003
Thiruvananthapuram	89485	7093	96578
Kollam	18938	33	18971
Pathanamthitta	5421	35	5456
Alappuzha	9496	294	9790
Kottayam	20088	2005	22093
Idukki	32479	10231	42710
Ernakulam	9278	-233	9045
Thrissur	48627	1190	49817
Palakkad	16518	2900	19418
Malappuram	24502	2125	26627
Kozhikode	9805	1230	11035
Wayanad	19559	1209	20768
Kannur	50101	4777	54878
Kasargod	32169	2517	34686
<b>TOTAL</b>	<b>386466</b>	<b>35406</b>	<b>421872</b>

Source: Kerala State Co-operative Bank Ltd.

#### Rural Infrastructure Development Fund (RIDF)

4.353 The Rural Infrastructure Development Fund (RIDF) of NABARD was set up in 1995-96 with contributions from the Scheduled Commercial banks against their short fall in agricultural target lending upto an extent of 1.5 per cent of the net bank credit. The total corpus of the fund at the all India level from RIDF I to RIDF IX stood at Rs. 34000 crore. The Union Budget 2002-03 provided an allocation of Rs. 5500 crore to the VIII tranche of the Fund and the rate of interest on loans to State governments was reduced from 11.5 per cent to 8.5 per cent per annum during 2002-03, and further down to 6.5 per cent during 2003-04. During 2003-04 under RIDF IX it was made mandatory to allocate 60 per cent of the funds to agriculture and allied sectors.

4.354 While Public sector banks and foreign banks as a whole achieved their overall targets, viz., 40 per cent and 32 per cent of net bank credit respectively for priority sector lending, private sector banks fell short of their stipulated targets viz., 40 per cent. The Public and Private sector banks with shortfalls in priority sector lending and of agricultural lending as at the end of March 2002 were advised to contribute to the RIDF VIII with a corpus of Rs. 5500 crore as announced in the Union Budget for 2002-03. In the case of RIDF I

to VI, the rate of interest on deposits placed in the fund was uniform for all banks irrespective of the extent of their shortfall. Effective from RIDF VII, the rate of interest on RIDF deposits is linked to the banks' performance in lending to agriculture. Accordingly banks receive interest at rates inversely related to their shortfall in agricultural lending. The foreign banks falling short of priority sector targets as at the end March 2002 have to deposit amounts equivalent to the shortfall with the Small Industries Development Bank of India

**Table 4.52**  
**Priority Sector advances (in Crore Rs)**

Year	Public Sector banks	Private Sector banks	Foreign banks
1997-98	91319 (41.9)	11614 (40.9)	6940 (34.3)
1998-99	1,07,200 (43.5)	14,295 (41.3)	8270 (37.1)
1999-00	1,27,807 (43.6)	18348 (39.4)	9699 (34.5)
2000-01	1,46,546 (43.0)	21550 (38.1)	11835 (34.1)
2001-02	1,71,186 (43.1)	21530 (38.8)	13,414 (34.2)

1. Figures in brackets are % shares in net bank credit in the respective groups.

2. The target for aggregate advances to the Priority sector is 40% of the net bank credit for domestic banks and 32% of net bank credit for the foreign banks.

(SIDBI) for one year.

### Deposits

4.355 With the receipt of deposits of Rs. 3857.09 crore from Commercial banks during 2002-03, the cumulative deposits under RIDF received upto 31 March 2003 stood at Rs. 16145.37 crore. Deposits amounting to Rs. 1422.87 crore were redeemed during 2002-03. The deposits outstanding at the end of March 2003 stood at Rs. 12159.23 crores.

### Assistance to Kerala

4.356 The State Government has been receiving assistance under RIDF from 1995-96 onwards. The major projects for which refinance has been disbursed include water shed development projects, rural bridges, rural roads, reclamation of water logged areas, inland navigation tourism oriented roads and rural market yards etc. The scope of RIDF had been widened in 1999-00 to include lending to Grama Panchayats, Self Help Groups and Non-Government Organisations for implementing village level infrastructure projects. The cumulative sanction of amount stood at Rs.1049.54 crores, which is 3.6% of the total amount sanctioned from RIDF, in the country, in respect of 1846 projects. This include minor irrigation projects (767), medium irrigation projects (6), flood control projects (14), inland navigation projects (1), roads and bridges (219), reclamation projects (1), rural roads constructed by CRD (444), and rural roads constructed by PWD (103), watershed management (181), rural market yards (108) and tourism roads (2). Up to March 2003, 878 projects have already been completed and another 344 projects are in progress. Apart from these , 98 projects with a total cost of Rs.17.46 crores have either been dropped or proposed to be dropped. As regards projects

sanctioned under RIDF-IV and V, the period for implementation is extended up to 31 March 2004. Under RIDF IX 1193 projects were sanctioned with RIDF assistance of Rs.65.50 crores. The projects covered were Minor Irrigation schemes (MIS) – 5, Drainage – 1, Rural Roads – PRI – 39, Rural Water Supply (RWS) – 8, School Building – 1136 and Boat jetties – 4.

4.357 The tranche wise projects sanctioned in the state is shown in Table 4.53 The projects sanctioned under RIDF-I were financially closed on 31<sup>st</sup> December 2000. Implementation period for projects under RIDF-II and RIDF-III has been extended upto 30 June 2002 and

**Table 4.53 :**  
**Tranche-wise Sanction & Disbursement under RIDF**

( in Crore Rs)

RIDF	Kerala (as on 11/03)		India (as on 3/03)	
	Sanction	Disbursement	Sanction	Disbursement
I	95.83	86.26 (90%)	1910.54	1760.71 (92.2%)
II	85.65	72.64 (85%)	2627.82	2373.68 (90.3%)
III	86.20	72.37 (84%)	2707.79	2377.03 (87.8%)
IV	63.71	48.26 (76%)	2976.53	2160.77 (72.6%)
V	124.94	99.34 (80%)	3532.52	2502.19 (70.8%)
VI	174.10	107.56 (62%)	4579.26	2788.38 (60.9%)
VII	191.76	58.62 (31%)	5056.77	2055.73 (40.6%)
VIII	196.55	52.28 (27%)	6084.07	1126.43 (18.5%)
IX	65.50			
<b>Total</b>	<b>1083.62</b>	<b>597.34 (55%)</b>	<b>29475.30</b>	<b>17145.08 (58.2%)</b>

Source: Annual Report 2002-03 NABARD

(Figures in brackets are % share of disbursement to sanction)

31<sup>st</sup> March 2003 respectively.

4.358 As part of rural infrastructure development, road length to the tune of 642 km, including 259 km of PWD road, (33 nos.) and 383 km of Block Panchayat roads have been added/improved up to March 2003. 108 bridges with a total length of 6883 m. have been completed. Under irrigation projects 43360 ha. of land was benefitted. Area benefitted by completed soil and water conservation projects is 22865 ha.