ANALYSIS OF FACTORS INFLUENCING TIMBER PRICES IN KERALA

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APPENDIX I

Criteria for Classification of Timber

1. Size Classification

	Class	Girth in cm	Length in m
Teak	I	150 and above	3 and above
	I1	100 - 149	-do-
	111	75 - 99	-do-
	IV	60 – 74	-do-
Short log	I	150 and above	1 and above but less than 3
"	I1	100 - 149	-do-
"	III	60 - 99	-do-
Hardwood species	I	150 and above	3 and above
	I1	100 - 149	

2. Quality Specifications

A : Straight sound logs without any defect.

B : Logs with minor defects.

C : Logs with major defects but where the out-turn expected is above 40 percent.

D : Logs with major defects but where the out-turn expected is below 40 percent.

APPENDIX I1

Kerala Forest Department's Timber Depots

Southern Forest Circle	Central Forest** Circle	Northern Forest Circle
1. Achencoil*	1. Chalakudy*	1. Aruvacode*
2. Angamoozhi	2. Chettikulam	2. Bavali*
3. Areekkakavu	3. Ernakulam	3. Chaliyam
4. Aryankavu	4. Kothamangalam	4. Kallai
5. Kadakkamon	5. Kumily	5. Kannoth
6. Konni	6. Mudickal*	6. Kuppadi*
7. Kulathupuzha*	7. Parampuzha*	7. Mysore
8. Maravanchira*	8. Thalacode*	8. Nanjangode*
9. Pathanapuaram*	9. Trichur*	9. Nedumgayam"
10. Shencottah	10. Varapuzha	10. Nemmara
11. Thenmala*	11. Veetoor*	
12. Thirumala	12. Vetticaud	
13. Tuet, Quilon		
14. Veeyapuram		

*Timber depots selected for the study.   **Includes depots belonging to High Range Circle.

APPENDIX III

Timber Prices in Kerala at 1970-71 Prices (Rs. Per m^3)

Year	Anjily	Chada-chy	Irul	Maru-thy	Teak	Them-bavu	Vengai	Venteak
1956-57	382	159	239	271	706	294	324	296
1957-58	387	156	229	271	713	335	388	302
1958-59	325	188	236	236	703	348	329	283
1959-60	299	190	221	235	745	3 G 3	312	243
1960-61	331	172	285	.223	669	309	289	201
1961-62	350	192	232	221	752	308	351	230
1962-63	358	187	255	248	686	276	354	272
1963-64	369	169	235	187	647	264	348	192
1964-65	362	179	240	209	596	233	311	190
1965-66	382	206	228	220	598	231	393	194
1968-67	308	180	217	190	594	200	286	141
1967-68	290	169	174	175	502	199	328	148
1968-69	342	203	202	184	423	227	377	165
1969-70	278	189	242	206	465	249	351	222
1970-71	309	187	220	186	503	199	293	185
1971-72	288	211	319	207	496	222	287	205
1972-73	294	238	244	220	545	274	329	210
1973-74	270	230	230	251	577	353	288	215
1974-75	297	215	223	210	606	216	227	192
1975-76	341	216	270	244	716	260	362	230
1976-77	337	203	224	185	575	222	350	240
1977-78	413	261	293	244	640	282	414	276
1978-79	649	416	488	431	1021	408	547	479
1979-80	802	502	584	540	1163	566	739	556
1980-81	734	498	527	475	1220	518	713	509
1981-82	703	483	500	480	1285	545	714	507

APPENDIX IV

5-Year Moving Averages of **Timber Prices in Kerala at 1970-71 Prices (Rs. per m^3)**

Year	Anjily	Chada-chy	Irul	Maru-thy	Teak	Them-bavu	Vengai	Venteak
1956–57	—	—	—	—	—	-	—	—
1957-58	—	—	—	—	—	—	—	—
1958-59	345	173	242	247	707	318	828	265
1959-60	338	180	241	237	716	321	334	252
1960-61	333	186	246	233	711	309	327	246
1961–62	341	182	246	223	700	292	331	228
1962-63	354	180	250	218	670	278	331	217
1963-64	364	187	238	217	656	262	351	216
1964-65	356	184	235	211	624	241	338	198
1965–66	342	181	a19	196	587	225	342	173
1966-67	337	187	212	196	543	218	339	168
1967-68	320	i89	213	195	516	221	347	174
1968–69	305	186	211	188	498	215	327	174
1969–70	301	192	231	192	479	219	327	187
1970–71	302	206	245	201	487	234	327	199
1971-72	288	211	251	214	518	239	310	209
1972-73	292	216	247	215	546	233	285	203
1973–74	298	221	257	226	588	245	299	210
1974-75	308	220	238	222	604	245	311	217
1975-76	332	225	248	227	623	247	328	231
1976-77	407	262	300	263	651	278	380	283
1977–78	508	320	372	329	823	848	482	356
1978-79	587	376	423	375	924	399	553	412
1979-80	660	432	478	434	1066	464	625	465
1980-81	—	—	—	—	—	—	—	—
1981-82	—	—	—	—	—	—	—	—

APPENDIX V

Disposal of Timber in Kerala (m^3)

Year	Anjily	Chada-chy	Irul	Maru-thy	Teak	Them-bavu	Vengai	Venteak
1956-57	1439	NA	1575	7100	28647	3034	1710	3339
1957-58	1800	NA	3335	9095	30764	5477	1921	5209
1958-59	1958	NA	5235	10328	30710	7138	2650	5318
1959-60	1704	NA	8697	13649	26744	9227	3476	9151
1960-61	2988	NA	8144	16695	23441	8353	3473	13371
1961-62	2760	NA	7763	21922	37847	10423	4708	13932
1962-63	1662	NA	6902	19053	34732	10762	3927	18060
1963-64	2607	NA	7739	26573	31452	12168	6344	23834
1964-65	4208	1951	10673	25248	32082	8187	4771	21621
1965-66	2393	1413	12281	29780	32172	20907	9688	20959
1966–67	4042	2488	12660	37408	31260	20585	9561	22397
1967-68	5236	343	11785	37948	47065	19179	9699	25608
1968-69	3796	2854	22422	41911	38064	13651	8970	30981
1969-70	8128	1613	16149	40472	37438	14365	7410	30096
1970-71	5725	1420	11224	43942	45028	14280	9188	24019
1971-72	1839	246	12868	15488	31190	2558	5219	18107
1972-73	5189	NA	8123	19959	42712	12658	7953	14742
1973–74	6030	NA	20678	33607	52362	11980	4955	31686
1974-75	6624	1464	9251	45373	46843	12939	9394	24917
1975-76	9503	3995	21122	67801	53984	34194	12316	33322
1976-77	14960	4002	24249	50259	57861	29869	15733	34757
1977–78	3347	2888	11413	2435	37438	13769	6034	19253
1978-79	2941	1675	18913	26949	36298	17868	5771	20498
1979–80	3513	1367	16663	40941	37983	13408	7422	21590
1980-81	4121	2438	9547	27868	30562	8509	5090	15793
1981–82	2732	2653	7561	15319	19252	4293	3162	9121

NA: Not available

APPENDIX VI

Real Prices of Timber Auctioned at Tamil Nadu Forest Department's Depot at Pollachi (Rs. per m^3)

Year	Chadaehy	Maruthy	Teak	Thembavu	Vengai	Venteak
1974–75	181	277	598	*	373	278
1975-76	NA	NA	NA	NA	NA	NA
1976-77	156	185	621	210	350	175
1977–78	*169*	174	573	259	346	185
1978-79	232	294	807	342	439	398
1979-80	277	523	816	359	568	551
1980-81	290	*	1095	362	511	504
1981-82	370	451	*	581	769	692

* No auction   NA : Not available

APPENDIX VII

Out-turn of Timber in Round Logs from the Forests of Kerala and Tamil Nadu (m3)

Year	Kerala	Tamil Nadu	Percentage of out-turn of timber in TN to that in Kerala
1972-73	509491	39665	7.8
1973-74	541463	30810	5.7
1974-75	451632	29079	6.4
1975–76	492347	39306	8.0
1976–77	540643	37665	7.0
1977-78	528924	10633	2.0
1978–79	447090	NA	—
1979-80	434831	12215	2.8
1980–81	529768	5283	1.0
1981-82	255867	6404	2.5

NA : Not available

APPENDIX VIII

Circle-wise Real Prices of Timber (Ks. per m^3)

Year	Anjily			Chadachy		
	SC	CC	NC	SC	CC	NC
1975-76	330	372	NA	215	245	194 .
1976-77	353	307	368	211	243	196
1977-78	446	358	357	285	298	250
1978-79	664	612	506	456	492	358
1979-80	834	706	780	535	534	476
1980-81	742	682	692	512	559	448
1981-82	783	601	832	456	509	466

NA : Not available

Year	Irul			Maruthy		
	SC	CC	NC	SC	*CC*	NC
1975-76	237	*28* 1	262	235	260	250
1976-77	179	206	277	186	187	183
1977-78	263	270	330	252	241	238
1978-79	483	466	565	433	403	478
1979-80	495	619	607	532	561	538
1980-81	442	491	584	454	430	497
1981-82	482	491	562	479	444	593

SC : Southern Circle   CC : Central Circle   NC : Northern Circle

Year	Teak			Thembavu		
	SC	CC	NC	SC	CC	NC
1975-76	750	745	650	*207*	282	222
1976-77	621	526	583	*2 13*	*210*	222
1977-78	678	620	633	337	274	263
1978-79	993	928	1053	507	423	478
1979-80	1386	1196	1052	570	573	554
1980-81	1229	1164	1231	510	462	508
1981-82	1406	1219	1300	503	322	575

Year	Vengai			Venteak		
	SC	CC	NC	SC	*CC*	NC
1975-76	35 1	365	403	252	216	277
1976-77	366	223	390	228	211	274
1977-78	434	332	429	303	247	294
1978-79	508	437	652	492	446	514
1879-80	783	635	689	532	574	559
1980-81	640	569	790	460	507	513
1981-82	601	523	850	488		551

ABSTRACT

This study is an attempt to analyse the temporal and spatial variation in timber prices in Kerala and to identify the factors that could possibly influence such variation.

Average annual prices for 8 species for the period 1956-57 to 1981-82 were estimated from the data collected from the records of the Forest Department. Five-year moving averages, based on real prices obtained by deflating the current prices using wholesale price indices, were utilised to identify the trend. From the analysis it can be seen that prices of all species had increased over the whole period. The period upto 1976-77 was characterised by stable prices and the increase was marginal. A sharp increase in prices for all species was noticed during the period 1976-77 onwards.

Both changes in supply and demand seem to influence the prices. The average annual supply of timber has declined to 69 per cent between the periods 1968-69 to 1976-77 and 1977-78 to 1981-82. While supply has declined internal demand has increased, primarily due to growth of the construction activity as indicated by the increase in the number of buildings. Price expectation during sales to consumers seems to be an important factor that determines bid prices. Price expectation, however, depends upon anticipated demand and expected supply. During the period 1976-77 onwards, not only that demand has increased but also supply has declined, and both have cumulatively contributed to a rapid price increase.

On the basis of the circle-wise real prices of timber for the period 1975-76 to 1981-82, it can be observed that for certain species the prices were consistently high in some circles for most of the years while for some others, such a consistent trend was not noticeable. Local preferences developed over time, availability etc. seem to be the most important factors affecting such regional variation in prices.

INTRODUCTION

Price obtainable for a commodity in a given market is dependent on a number of factors. Analysis of prices is a starting point for several studies such as predicting future prices through projections (Nomura and Yukutake, 1981), ascertaining the long-term trend in the availability of natural resources (Barnett and Morse, 1963), location of distribution outlets and planning sale strategies. Hitherto, no comprehensive study has been undertaken in India on the behaviour of timber prices and to identify the factors that influence them. The present study was initiated with the following objectives,

to examine the temporal and spatial variation in timber prices and

2. to analyse the factors that could possibly influence the variation in prices.

An attempt is made here to analyse the temporal and spatial variation in prices during timber auctions held at the Kerala Forest Department depots. As a prelude to the study, a discussion of the structure of the timber market in Kerala is presented in section 1. The methodology adopted for assessing the temporal and spatial variation and the factors that could possibly influence these differences is given in section 2. Section 3 gives the results of the trend analysis. The pattern of spatial variation in timber prices among three regions in the state is given in section 4. Conclusions emanating from the study are given in section 5. The limitations of the study are also briefly indicated in the above section.

1. STRUCTURE OF THE TIMBER MARKET IN KERALA

From forest to final consumers of timber, there are several stages of transactions involving government, contractors, traders, saw-millers, manufacturers, etc. and a market exists at each stage of the transaction. Figure 1 gives a highly simplified structure of the timber market in Kerala.1 The main sources of timber supply in Kerala are (1) forests (2) non-forest land primarily house compounds and estates and (3) imports from other states. Demand for timber is both from within the state (construction, industries, etc.) as well as from the neighbouring states (export).

Timber from Kerala forests is exploited either under the selective felling system or under the clearfelling system. The former is resorted to in the case of evergreen forests and a major proportion of timber is supplied directly to wood-based industries. Clearfelling is followed in areas for reforestation (or in areas meant for non-forestry purposes) and is undertaken in two stages. In the first stage, all Teak trees irrespective of girth and valuable trees above 100 cm girth at breast height are marked and worked down to government timber depots by contractors. At the depots, logs are classified according to species, quality and dimensions (see Appenbix I)-

The logs are then grouped into lots and put up for auction at periodic intervals. Auctions are given wide publicity and they attract a large number of participants. In theory, a more or less perfect competition prevails during auction. But, in practice, due to ring formation by traders competition may not be perfect always. Invariably, most of the participants in the auction are timber traders and generally the system adopted excludes occassional small scale consumers.

In the second stage of clearfelling, the right to remove valuable trees beiow 100 cm girth 2 and the residual material that remain in the area after the initial felling is also sold in auction. Timber from the sale coupes is generally purchased by timber traders.

The present study is limited to the analysis of prices obtained at the stage of auction in government depots. Although a detailed study covering the different stages of transactions will give a better insight into the functioning of timber markets, this is difficult on account of non-availability of data. While taking the prices obtained at the government depots as the basis for analysis, it has been assumed that these prices will give a general indication of the prices at the subsequent transactions,

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[1]Trade in timber exists between Kerala and other countries. A marginal quantity of timber is imported from countries like Malaysia and superior timber such as Rosewood and Teak in converted form is exported to Japan, USSR etc.

[2] Rosewood trees are retained in the area as future crop.

Fig 1. STRUCTURE OF THE TIMBER MARKET IN KERALA

a) Source and Distribution of Timber.
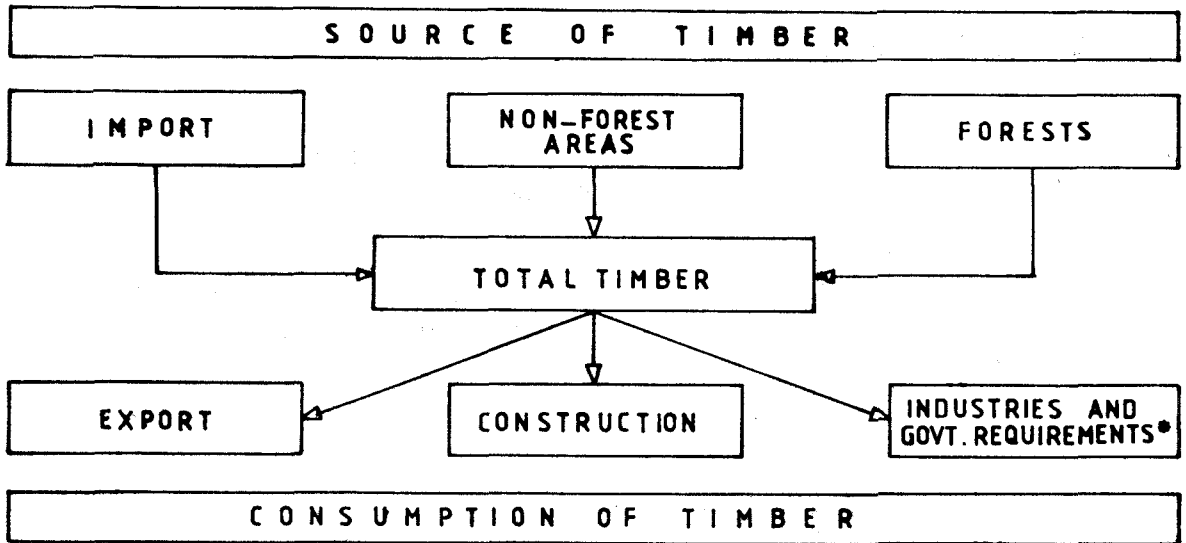
b) Flow of Timber from Kerala Forests
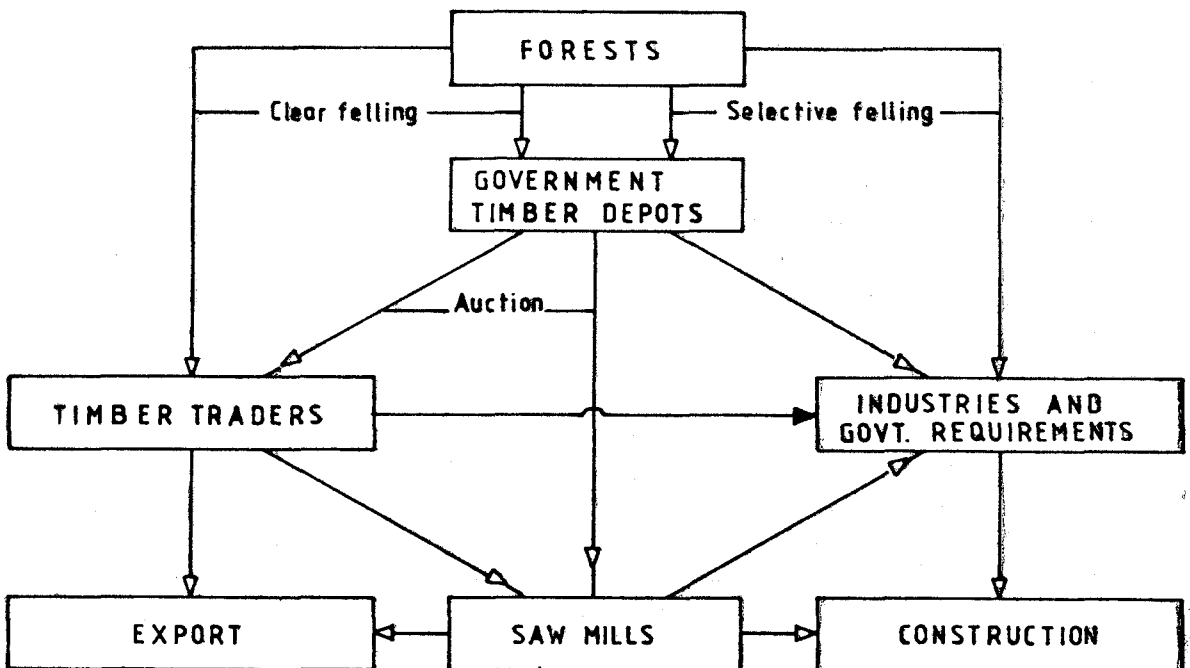
* Include supply to govt. departments such as Railways, Defence, Posts and Telegraphs, Electricity etc.

2. METHODOLOGY

The methodology adopted for collection and analysis of timber prices and for identifying the factors that influence prices is given below:-

2.1. Selection of Species

As many as 57 tree species are collected during the clearfelling of forest areas. Taking into account the availability of price data and the importance of species, the following were selected for the present study.

1. Anjily (*Artocarpus hirsutus*)
2. Chadachy (*Grewia tiliifolia*)
3. Irul (*Xylia xylocarpa*)
4. Maruthy (*Terminalia paniculata*)
5. Teak (*Tectona grandis*)
6. Thembavu (*Terminalia crenulata*)
7. Vengai (*Pterocarpus marsupium*)
8. Venteak (*Lagerstroemia microcarpa*)

The above species accounted for about 48 per cent of the total disposal from the forest department depots during 1974-75 to 1980-8 1.

2.2. Choice of Period

To identify the long-term trend in prices eliminating the effect of short run fluctuations, data Over a sufficiently long period have to be annlysed. Availability of reliable data is the major constraint in a trend analysis. Kerala State was formed in 1956 and data prior to 1956-57 are not readily available. The study is therefore limited to the period 1956-57 to 1981-82.

2.3. Database

The data for the period 1975-76 to 1981-82 were collected from the auction. registers maintained in the forest department depots. There are 36 depots in the state.[3] ,Based on the volume of transactions, 16 major depots, 5 each from the northern and southern forest circles and 6 from the central forest circle, were selected for collection of price data. Based on the total sale value realised and total quantity sold, the average price obtained in the state as a whole was worked out for each Species.

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[3] Clearfelling has been discontinued in Kerala since 1984, and consequently the supply of timber has declined drastically. This has led to the closure of some of the depots recently (See Appendix 11).

Data pertaining to the pre 1975-76 period are not available from the depot registers. However, most of the Forest Working Plans give details of prices obtained for different species of timber during auctions in depots. Since information on quantity sold is not available, weighted average price for the state could not be estimated. Instead, only simple averages were worked out.

Size and quality differences have not been taken into account in the present study. Even within a given. size class, considerable difference exists in quality. Since the study is focused on price trend for the species as a whole, these differences have not been taken into account.

2.4. Estimation of Real Prices

Changes in current market prices are due to (1) changes in real prices and (2) inflation. Real price is obtained by deflating the current price using the wholesale price index for all commodities. The wholesale price index with 1970-71 ($= 100$) as the base year has been used to deflate the current prices.

2.5. Moving Averages

Year to year price fluctuations are smoothened out by taking moving averages. This helps to clearly discern the long-term trend. Five-year moving averages were used to estimate the long-term price trends.

2.6. Factors Influencing Prices

The simplest and most general model on price formation is

$P = f(D,S)$

where P : price,

D : quantity of the commodity demanded,

S : supply of the commodity.

Under ceteris paribus conditions, an increase in demand or a decline in supply or both may increase the prices. However, in the real world situation, price formation is extremely complex.

Most of the participants in timber auctions are traders. Although, bid prices may be influenced by the number of bidders, ultimately, expected price when timber is sold to consumers is an important consideration that affects bid prices. This is particularly due to the fact that there is usually a time-lag between auction and removal of timber from the depots and its ultimate sale to actual consumers. A more appropriate function of bid price formation will be

$$P_t = (I_t, P_{et+1}, P_{t-1})$$

where Pt, Pt-l   :   bid prices at time t and t — 1 respectively,

      I_t :   stock of timber available with the traders at time t,

      P_{et+1} :   expected price of timber at t + 1 which can be expressed as

$$P_{et+1} = f(D_{et+1}, S_{et+1})$$

where D_{et+1} :   expected demand for timber at t + 1,

      S_{et+1} :   expected supply of timber at t+ 1.

Usually when a huge stock has accumulated with the traders, competition during bidding is adversely affected, consequently reducing the prices. The stock of timber includes timber from (I) depots and sale coupes (2) private lands, especially estates and house compounds and (3) other states in the country. No information is, however, available on the source-wise distribution of the stock of timber. Therefore S_t, the quantity of timber disposed off from the Forest Department depots in the year t is taken as a proxy for I_t on the assumption that (i) this accounts for a major portion of quantity of wood supplied and (ii) the quantity of wood available from sale coupes is more or less directly proportional to S_t. Data on disposal of timber from depots were obtained from the Annual Administration Reports of the Forest Department (Government of Kerala, 1956-57 to 1979-80; Government of Kerala, 1980-81 and 1981-82).

Expected supply of timber (S_{et+1} is also an important factor in determining competition during auctions and consequently the bid price. Since preliminary work for timber extraction (survey and demarcation of coupes, marking trees, etc.) commences about a year before the timber finally reaches the depot for auction, the quantity that is expected to be available for the next one year can be estimated easily. When a large quantity is expected to arrive in the market, prices tend to be low, while a high price can be expected when the expected supply is low.

Since the demand for timber is a derived demand, end uses of timber have to be identified and changes in the pattern of demand for these products have to be analysed. The large number of end uses makes this extremely difficult. Bulk of the round logs, especially of the species under study, is sold within the state. Most of the internal consumption is in the construction sector, particularly in residential buildings (Chandrasekharan, 1973) and hence the trend in housing is an important factor influencing demand and consequently the prices. To get a general picture of the trend in construction activity the following information was collected. (i) Sample Panchayats were selected from Trichur District and the data

collected by them for the purpose of assessing building tax were perused. Information on the number of buildings under different categories — based on building materials used — is available for the years 1973, 1978 and 1983. (ii) General trend in the growth in the number of sawmills was ascertained through information collected by the Industries Department.

Although timber is a bulky material, a substantial quantity, both round and sawn, is known to be transported to the wood-deficit states like Tamil Nadu.[4] A large number of traders from TamilNadu participates in the depot auctions. Obviously, bid prices are a reflection of the situation that exists in the consuming centres in Tamil Nadu. To get an indication of the prices and movement of timber, the following information was collected. (i) Bid prices obtained in the Tamil Nadu Forest Department Depot at Pollachi were collected for the years from 1974-75 to 1981-82 and compared with the Kerala prices. (ii) The quantity of timber moved through the major exit checkposts at Walayar and Aryankavu were collected. This provided an indication of the movement of round and sawn timber outside the state. Sawmill and depot owners at Quilon, Alleppey. Ernakulam, Perumbavoor, Trichur, Palghat, Calicut and Cannanore were contacted to obtain their assessment on the trend in timber prices, in relation to supply and demand.

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[4]For quite sometime Kerala was a net exporter of timber and firewood. With the decline in supply from Kerala forests, the trend has reversed. Presently a large quantity of timber is imported to Kerala, especially from states like Orissa and Andhra Pradesh.

3. RESULTS OF TREND ANALYSIS

3.1. Long-Term Price Trend

The trend in real prices (at 1970-71 prices) of timber is shown in Figure 2 (See Appendix 111). Although real prices have increased over the whole period, the increase has not been monotonic but characterised by yearly fluctuations. Figure 3 gives the long-term trend based an five-year moving averages (see Appendix IV). Although over the whole period the prices for all species have increased, distinct periods of ups and downs can be identified as given in Table 1.

TABLE 1. Compound Annual Growth Rate* of Timber Prices in Kerala.

(in percentage)

Period	Anjily	Chada-chy	Irul	Maruthy	Teak	Them-bavu	Vengai	Venteak
1958-59 to 1979-80	+3.1	+4.5	+3.3	+2.7	*2.0*	+1.8	+3.1	+2.7
1958-59 to 1968-69	— 1.2	*+0.7*	— 1.4	— 2.7	— 3.4	— 3.8	— 0.1	— 4.1
1968-69 to 1076-77	+3.7	+4.4	+4.5	+4.3	+3.4	+3.3	+1.9	+ 6.3
1976-77 to 1979-80	+17.5	+18.1	+16.8	+18.2	+17.9	+.18.6	+18.0	+18.0

* Based on five-year moving averages of timber prices at 1970-71 prices.

From 1958-59 to 1968-69 the real prices have registered a small decline except in the case of Chadachy whose price increased at the rate of 0.7 percent. With Thembavu, Venteak, and Teak the prices registered a significant decline. The period 1968-69 to 1976-77 is marked by an increase in prices, at rates varying from 1.9 percent (Vengai) to 6.3 percent (Venteak) per annum. A drastic increase in prices is noticed during the period 1976-77 to 1979-80, when the rate of growth varied from 16.8 percent (Irul) to 18.6 percent (Thembavu). Variation in growth rate of prices between periods is significant, while that within the period for different species is not significant.

3 2. Factors Influencing Prices

In theory, changes in both supply and demand tend to affect the prices. On account of constraints in availability of data, it has not been possible to clearly indicate the contribution of each of the causative factors. Nevertheless, there are some indications as to what could be the important factors that influence prices.

Fig.2. TIMBER PRICES AT 1970-71 PRICES (Rs. per m^3)

- ANJILY
- CHADACHY
- IRUL
- MARUTHY
- TEAK
- THEMBAVU
- VENGAI
- VENTEAK

Fig. 3 . FIVE-YEAR MOVING AVERAGES OF TIMBER PRICES AT 1970-71 PRICES
Rs. per m3

ANJILY
CHADACHY
IRUL
MARUTHY
TEAK
THEMBAVU
VENGAI
VENTEAK
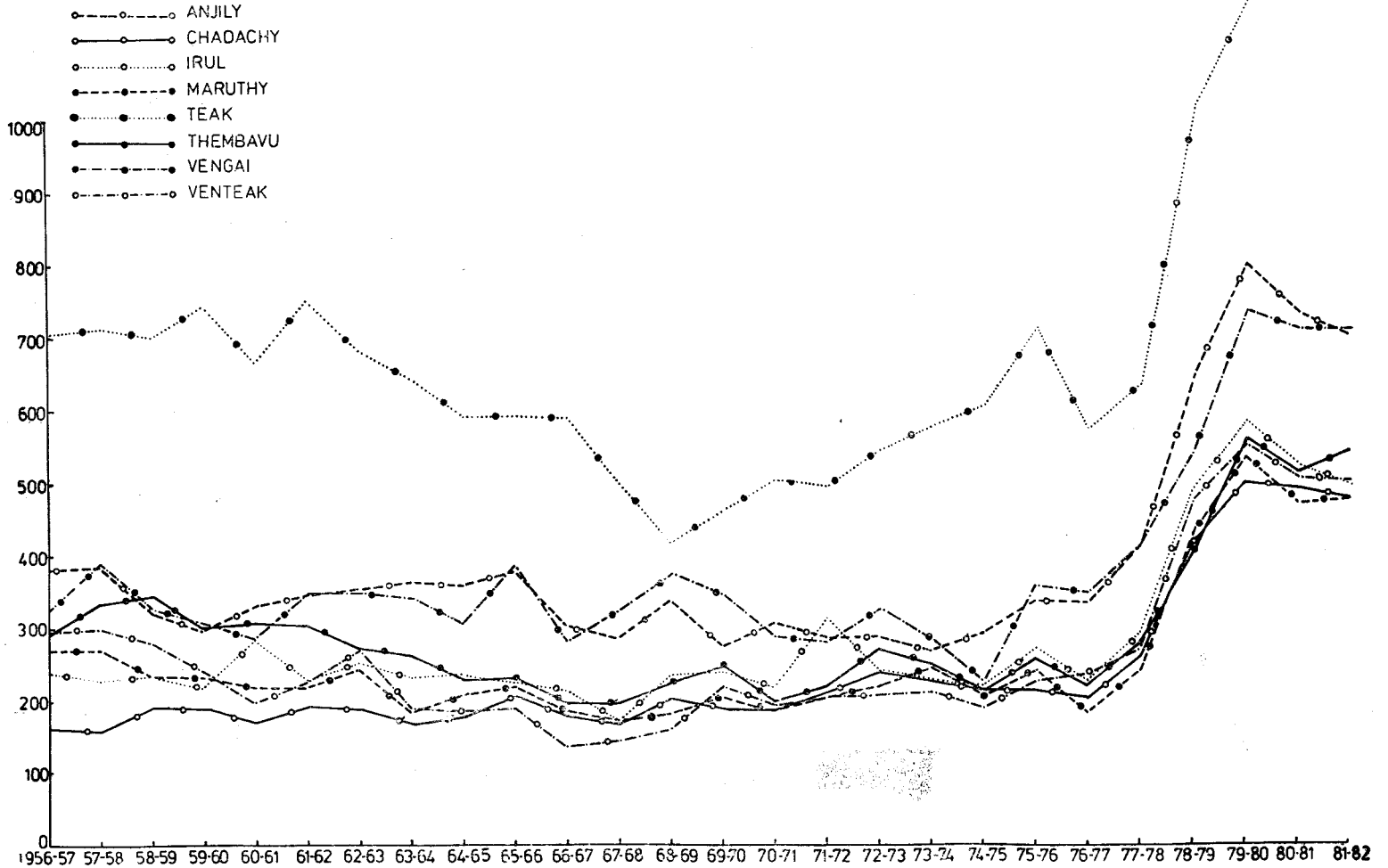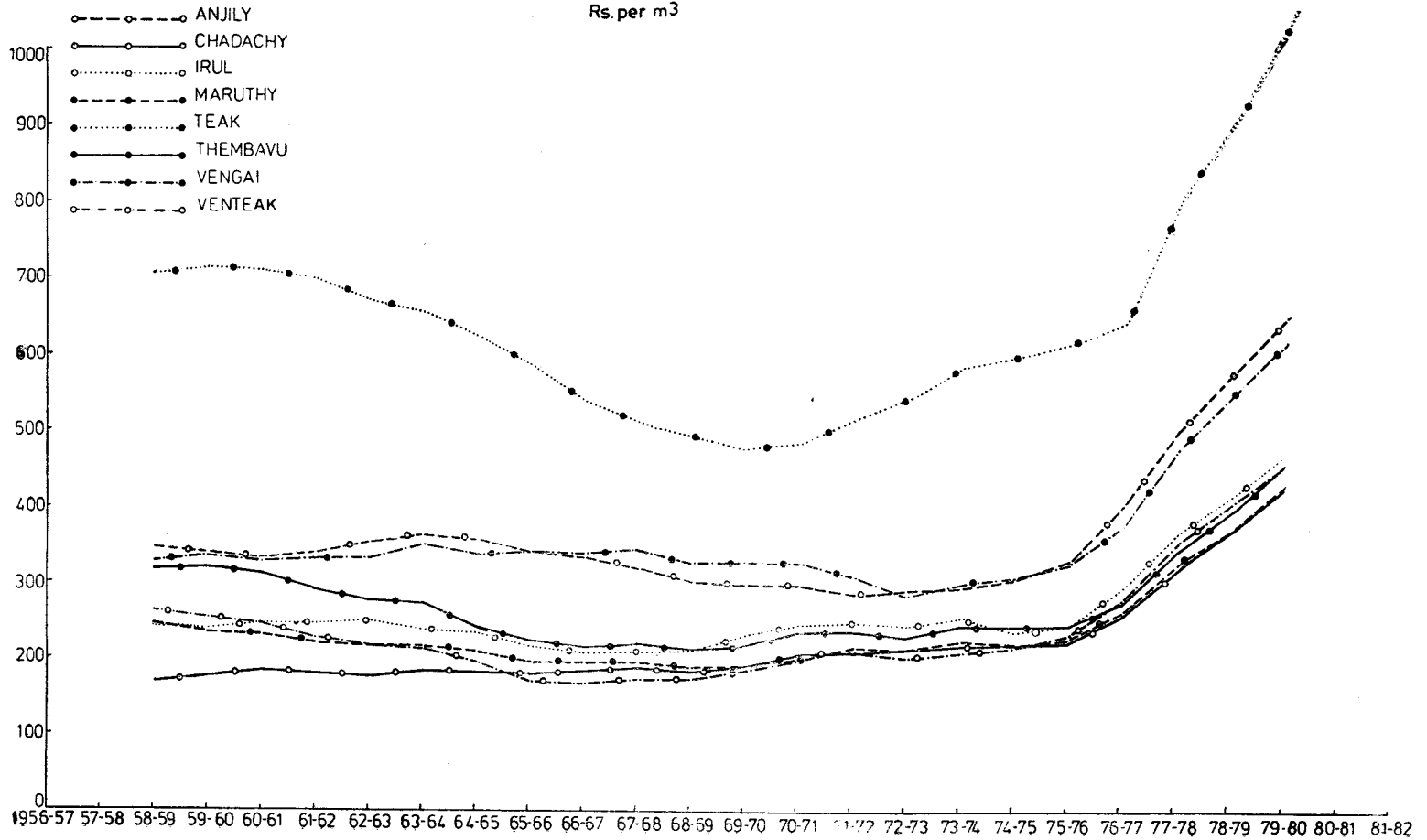
3.2.1. Price and Quality of Timber Supplied

Table 2 gives the average annual quantity of timber supplied and the average real price for two distinct periods, 1968-69 to 1976-77, a period during which prices increased at a moderate rate and 1976-77 to 1981-82 during which there was a rapid increase in prices.

TABLE 2. Price-Supply Relationship

	1968-69 to 1976-77		1977-78 to 1981-82	
	Av. Qty. sold (m3) per year	Av. Real Price (Rs. per m3)	Av. Qty. sold (m3) per year	Av. Real Price (Rs. per m3)
Anjily	6866	306	3329	660
Chadachy	2228	210	2204	432
Irul	16232	242	12819	478
Maruthy	39868	210	26946	434
Teak	44254	546	32306	1066
Thembavu	16277	236	11569	464
Vengai	9004	318	5496	625
Venteak	26959	208	16644	465
For all species	161688	318	111313	646

It is evident from Table 2 that changes in supply of timber have a noticeable effect on timber prices. For all species, between the periods average annual supply has declined to 69 percent and partly due to this an increase in price by 203 percent is seen

TABLE 3.   Indices of Real Price and Quantity of Timber Disposed off in Kerala

(Base: 1975-76 = 100)

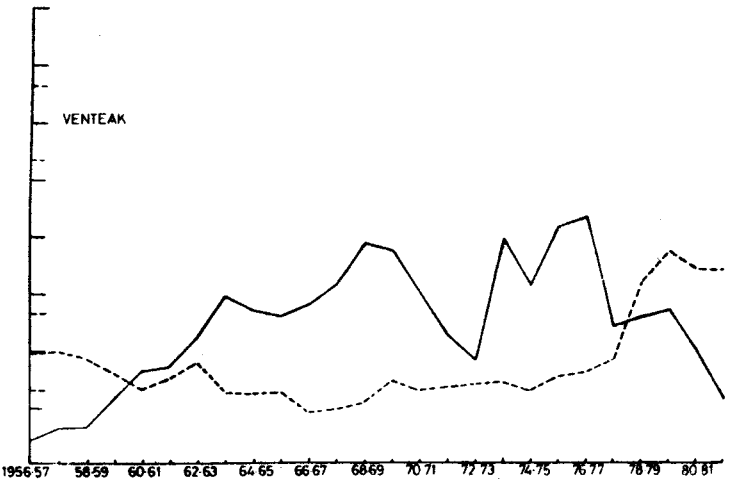| Year	Anjily		Chadachy		Irul		Maruthy	
	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
1975-76	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1970–77	157.0	98.8	100.2	94.0	114.8	83.0	74.1	75.8
1977-78	35.2	121.1	72.3	120.8	54.0	108.5	35.9	100.0
1978-79	30.9	190.3	41 9	1.92.6	89.5	180.7	39.7	176.6
1979–80	37.0	235.2	34.2	232.4	78.9	216.3	59.4	221.3
1980-81	43 4	215.2	61.0	230.6	45.2	195.2	41.1	194.7
1981-82	28.6	206–2	66.4	224.6	85.s	185.2	23.5	196.7
Coefficient of correlation	— 0.73		−0.83		−0.53		−0.53	

Fig 4 a REAL PRICE AND DISPOSAL OF TIMBER IN KERALA

Fig. 4.b REAL PRICE AND DISPOSAL OF TIMBER IN KERALA
REAL PRICE (Rs. per m3)
DISPOSAL OF TIMBER (m3)
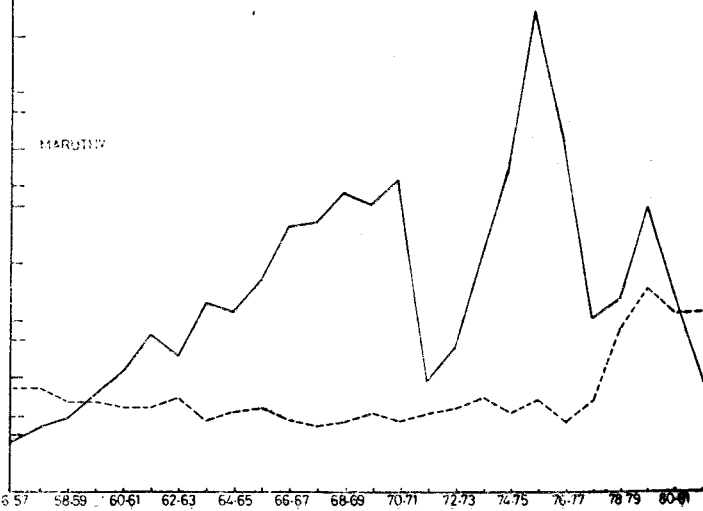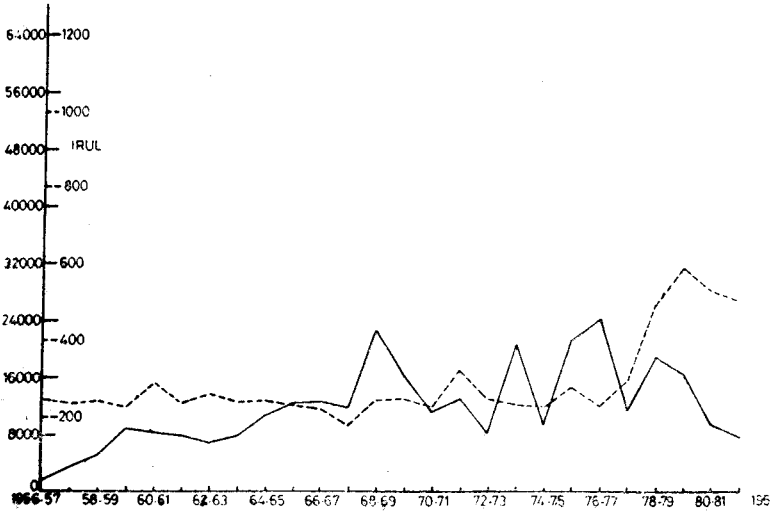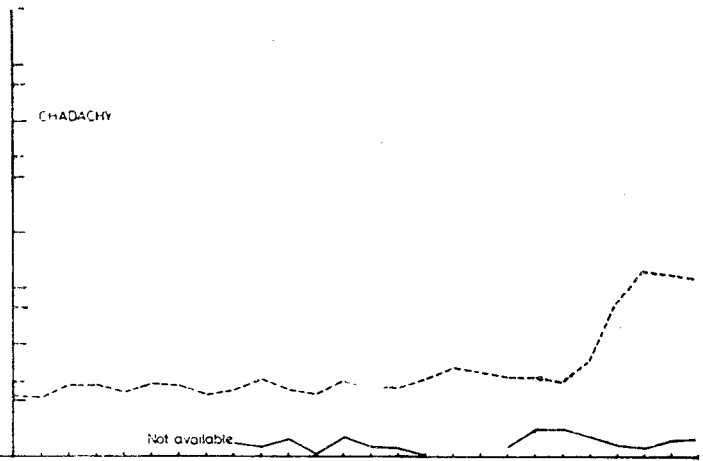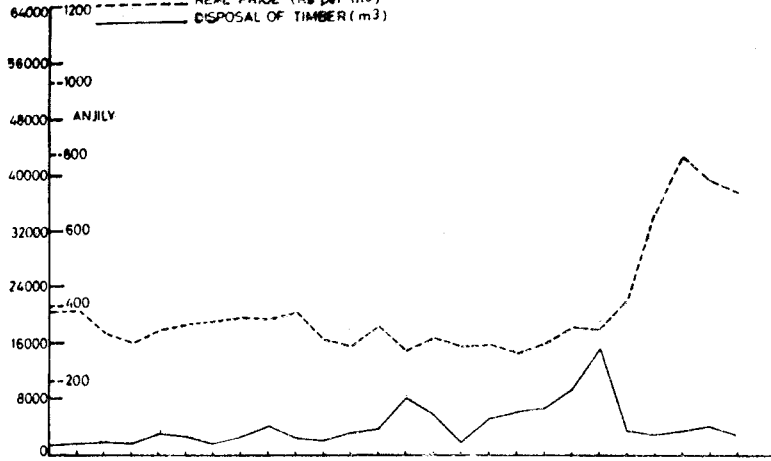
TEAK

THEMBAVU
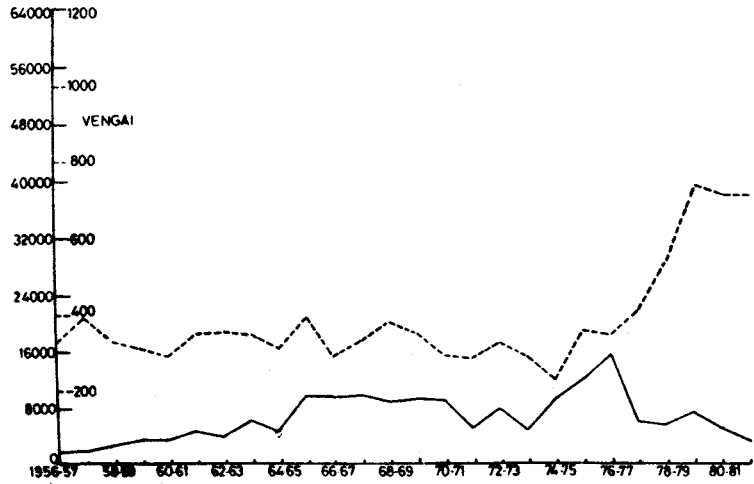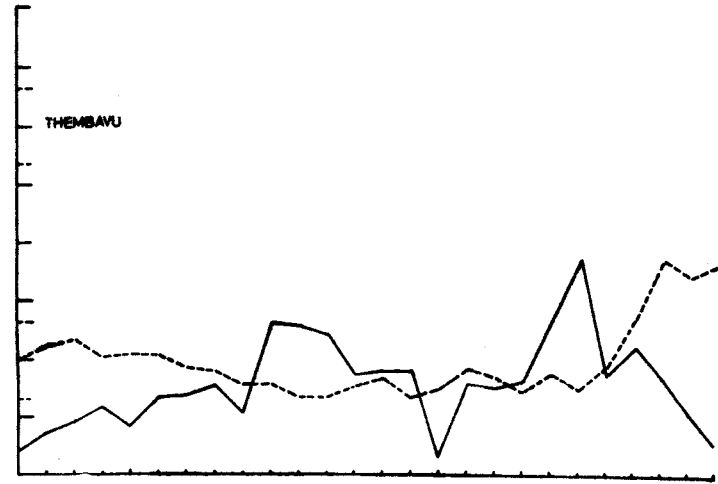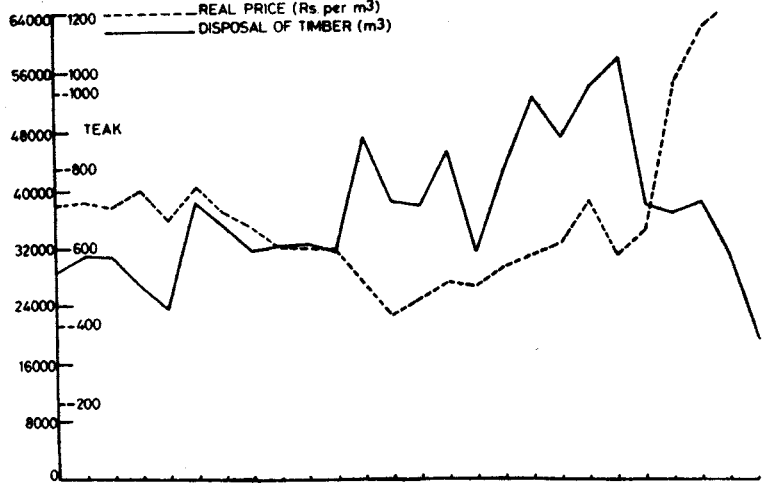
VENGAI

VENTEAK

(TABLE 3. Continued)

Year	Teak		Thembavu		Vengai		Venteak	
	Qty.	Price	Qty.	Price	Qty.	Price	Qty.	Price
1975-76	100.0	100.0	100.0	100	100.0	100.0	100.0	100.0
1976–77	107.2	80.3	87.4	85.4	128.8	96.7	104.3	104.3
1977-78	69.4	89–4	40.3	108.5	49.4	114.4	57.8	120,0
1978-79	67.2	142.6	52.3	156.9	47.2	151 1	61.5	208 3
1979-80	70.4	162.4	39.2	217.7	60.8	204.1	64.8	241.7
1980-81	56.6	170.4	24.9	199.2	41.7	197.0	47.4	221.3
1981-82	35.7	179.5	12.6	209.6	25.9	197.2	27.4	220.4
Coefficient of correlation	−0.82		−0.81		−0 74		−0.74	

The most conspicuous increase in prices has occurred during the period 1976-77 to 1981-82. Indices for real bid price and quantity of timber disposed off from depots given in Table 3 indicate the existence of an inverse relationship between quantity supplied and price (see also Figures 4. a. and 4. b., and Appendix V). Since most of the timber is obtained from natural forests through the process of clearfelling either for reforestation or for other purposes, quantity supplied is price inelastic. Supply is thus not determined by price. On the contrary, a reduced supply enhances the gap between demand and supply and thereby increases the price.

3.2.2. Changes in Demand

Apart from fluctuations in supply, change in demand is an important factor that influences prices. The demand for timber is a derived demand and changes in the pattern of demand for wood-based products affect demand for wood. As wood is used in a large number of end products, estimating the changes in demand is difficult. An attempt is made to indicate the broad magnitude of changes.

3.2.2.1. External Demand

A substantial quantity of timber is transported outside the state, especially to Tamil Nadu, a wood deficit state. In addition to purchasing a large quantity of timber from forest department depots, traders from Tamil Nadu also obtain a lot of timber through traders in Kerala. Based on the data collected from the Tamil Nadu Forest Department depot at Pollachi, changes in real prices of Chadachy, Maruthy, Teak, Thembavu, Vengai and Venteak were estimated. Figure 5 gives the trend in real prices of the above species in comparison' with the prices obtained in Kerala (See Appendix VI). It is evident that, although real prices obtained in Tamil Nadu

Fig.5. REAL PRICES OF TIMBER IN KERALA AND POLLACHI
Rs. per m³
—————— KERALA
— — — — — POLLACHI
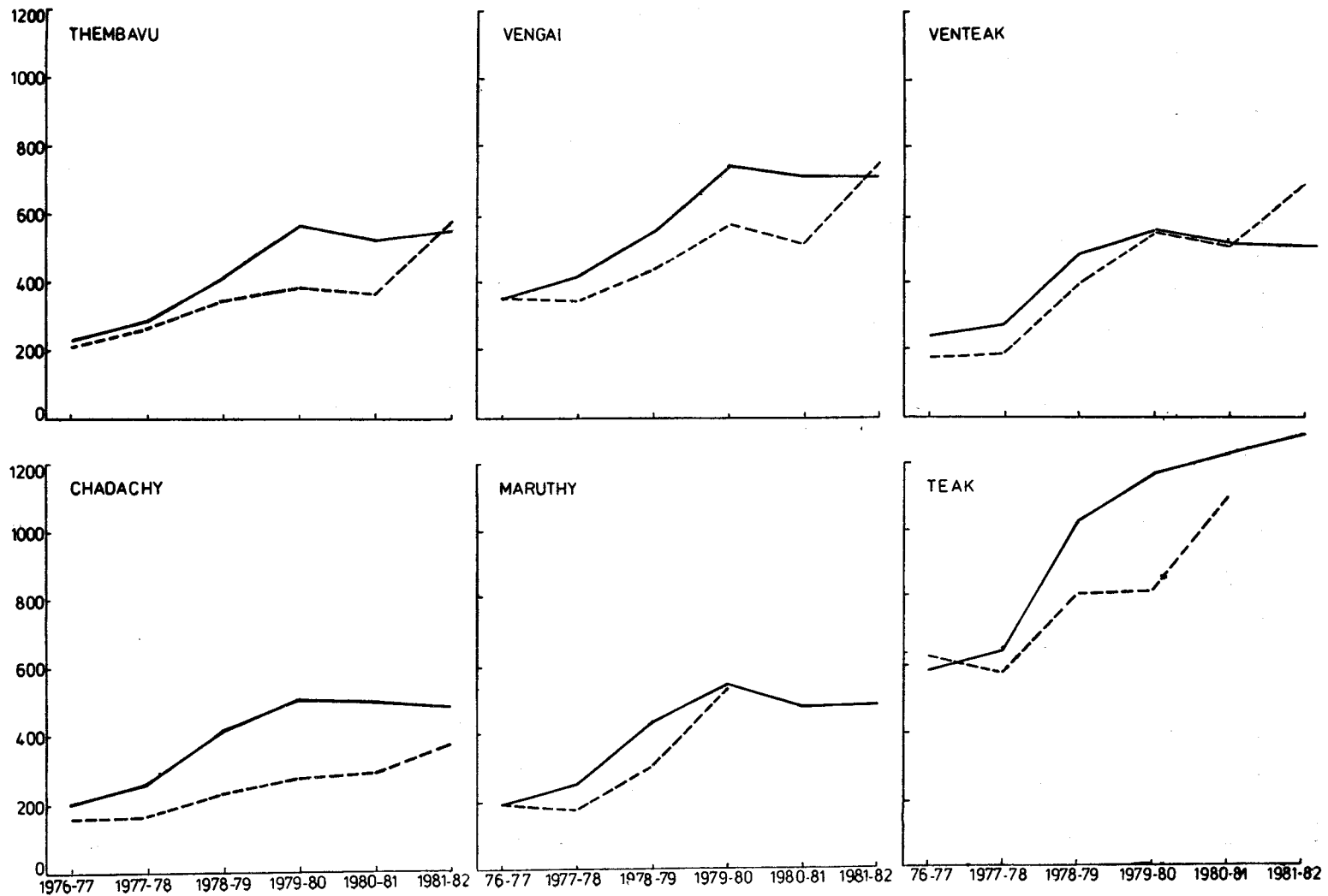
have been lower for all species 5, the general trend observed in Kerala more or less holds good for Tamil Nadu also.

Whether the prices in Kerala are influenced by the prices in Tamil Nadu or the prices in Tamil Nadu are influenced by the prices in Kerala is something which cannot be answered easily. Another problem is that a large quantity of finished products is also exported to Tamil Nadu and one cannot make a realistic estimate of the quantity. Whatever be the cause-effect relationship, a similarity in the general trend in prices is evident during the period 1976-77 to 1979-80. During the period 1979-80 to 1981-82, there was a slight decline in prices in Kerala, while in the case of Tamil Nadu the increasing trend continued although at lower rates than those prevailed during the period 1976-77 to 1979-80. This probably indicates a growing shortage of wood within the state of Tamil Nadu 6 (See Government of Tamil Nadu, 1972-73 to 1981-82): and the difficulty in importing a large quantity' from states like Kerala where the prices are quite high due to reduced supply as well as growing internal demand.

3.2.2.2 Internal Demand

Construction sector is a major user of wood, and most of the species studied are utilised as sawnwood in construction of buildings, transport equipment, boat building, etc. The trend in construction activity is bound to have a significant effect on timber prices. Table 4 gives the annual growth rate of residential buildings and all buildings during the periods 1973-74 to 1978-79 and 1978-79 to 1983-84.

TABLE 4. Growth rate of Buildings in Selected Panchayats in Trichur District

Period	Percentage annual growth rate	
	Residential buildings	All buildings
1978-74 to 1978-79	1.9	1.7
1978-79 to 1983-84	2.3	2.6

Source: Computed from the records at the Panchayat Offices.

[5]Absolute difference in price is difficult to explain. One possibility is that the quantity available at Pollachi Depot may not be adequate to attract traders who market the product in urban consuming centres like Madras, Coimbatore etc. Also, quality differences may be an important factor.

[6]Out-turn of roundlogs from the forests of Tamil Nadu declined from 37660 m^3 in 1976-77 to 6400 m^3 in 1981-82 (See also Appendix VII).

[7] Based on the information contained in the registers of two major checkposts, quantity of timber (including sawnwood) exported to Tamil Nadu has been estimated. Although no precise details are available, there is an indication of a declining trend in the movement of timber especially of round logs.

It can be seen that the growth rate has registered a significant increase during 1978-79 to 1983-84. Data based on the Census (Government of India, 1982), indicate an annual growth rate of number of occupied residential houses of 2.0 percent and 2.3 percent in Kerala for the periods 1961-71 and 1971-81 respectively. The construction boom has been particularly attributable to the inflow of remittance from the migrant workers in the Gulf Countries.

To what extent the expansion of the construction sector has contributed to increased demand for wood is difficult to estimate. The quantity of timber used in different types of construction varies considerably and increasingly a number of substitute inputs like cement, steel, glass and aluminium is being used. Discussions with timber traders indicate that despite the availability of such products, demand for timber continues to be high Growth in the number of sawmills and furniture units as given in Table 5 gives an indication of the continued growth of demand for wood.

TABLE 5. Index of Growth of Sawmills and Furniture Units in Selected Centres8 in Kerala   (Base 1975 = 100)

Year	Sawmills	Furniture Units
1970	69	3
1975	100	100
1979	157	144
1982	253	204

Given the long run decline in wood supply, coupled with a steady increase in demand, an increase in the real price of timber is inevitable. Although there are fluctuations, in the long run the increasing trend is likely to persist.

Short run fluctuations are caused by a number of non-economic factors, particularly the profit maximising behaviour of traders, Although auctions attract a number of traders, very often bidders form rings and prices are to some extent influenced by this. When demand continues to increase and supply is declining, depending upon the willingness of consumers the prices can be manipulated.

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* The indices are computed from the data collected from the District Industries Centres at Calicut, Quilon and Trichur.

4. SPATIAL VARIATION

The objective of the study on spatial variation is to ascertain the extent of price differences among localities and regions and to identify the factors that could possibly influence such differences. Here the analysis is limited to the variation in timber prices among the three Forest Circles, which approximately conform to the broad classification of the state as Northern Kerala, Central Kerala and Southern Kerala. A consistent trend of high or low price could be an indication of the existence of a segregated market, arising from specific local preferences, availability of wood, etc.

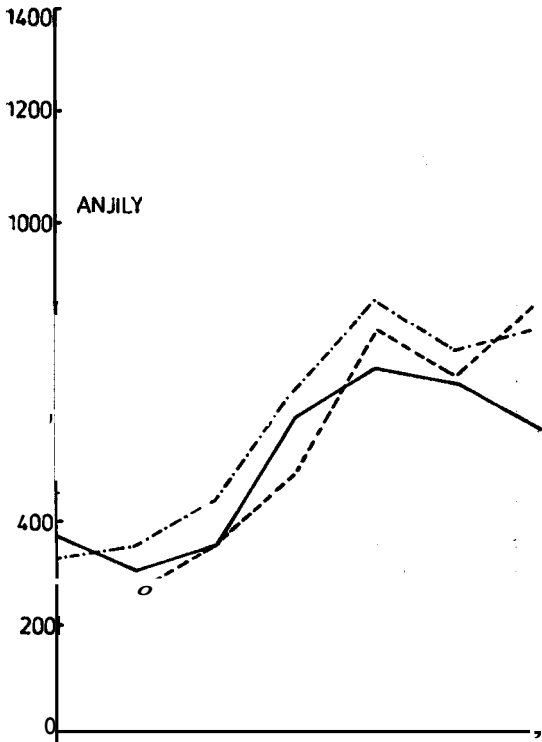## 4.1 Inter-Circle Variation in Prices

Figures 6.a. and 6.b. give the circle-wise real prices for different species for the period 1975-76 to 1981-82 (see also Appendix VIII). It can be seen that for certain species the prices are consistently high in some circles for most of the years while for some species, such a consistent trend is not observable. Table 6 gives the circle-wise average real price during the period 1975-76 to 1980-81 for different species.

TABLE 6. Average Real Price of Timber during the Period 1975-76 to 1980-81.

| Species	Average real price (Rs. per m3)		
	Southern Circle	Central Circle	Northern Circle
Anjily	562 (70)	506 (27)	521 (3)
Chadachy	369 (20)	395 (27)	320 (53)
Irul	350 (33)	389 (40)	438 (27)
Maruthy	349 (62)	347 (21)	364 (17)
Teak	943 (33)	863 (21)	867 (46)
Thembavu	402 (63)	371 (7)	375 (30)
Vengai	514 (58)	427 (9)	559 (33)
Venteak	378 (39)	367 (31)	405 (30)

Figures in parantheses represent percentage average dispose1 of timber among the circles.

It can be seen that Anjily, Teak and Thembavu have received a higher price in the Southern Circle. In the Central Circle, Chadachy got a higher price than that in other circles. Irul, Maruthy, Vengai and Venteak have obtained higher prices in the Northern Circle in comparison with what has been obtained in the other two regions.

Fig. 6.b. CIRCLE-WISE REAL PRICES OF TIMBER (Rs. per m³)
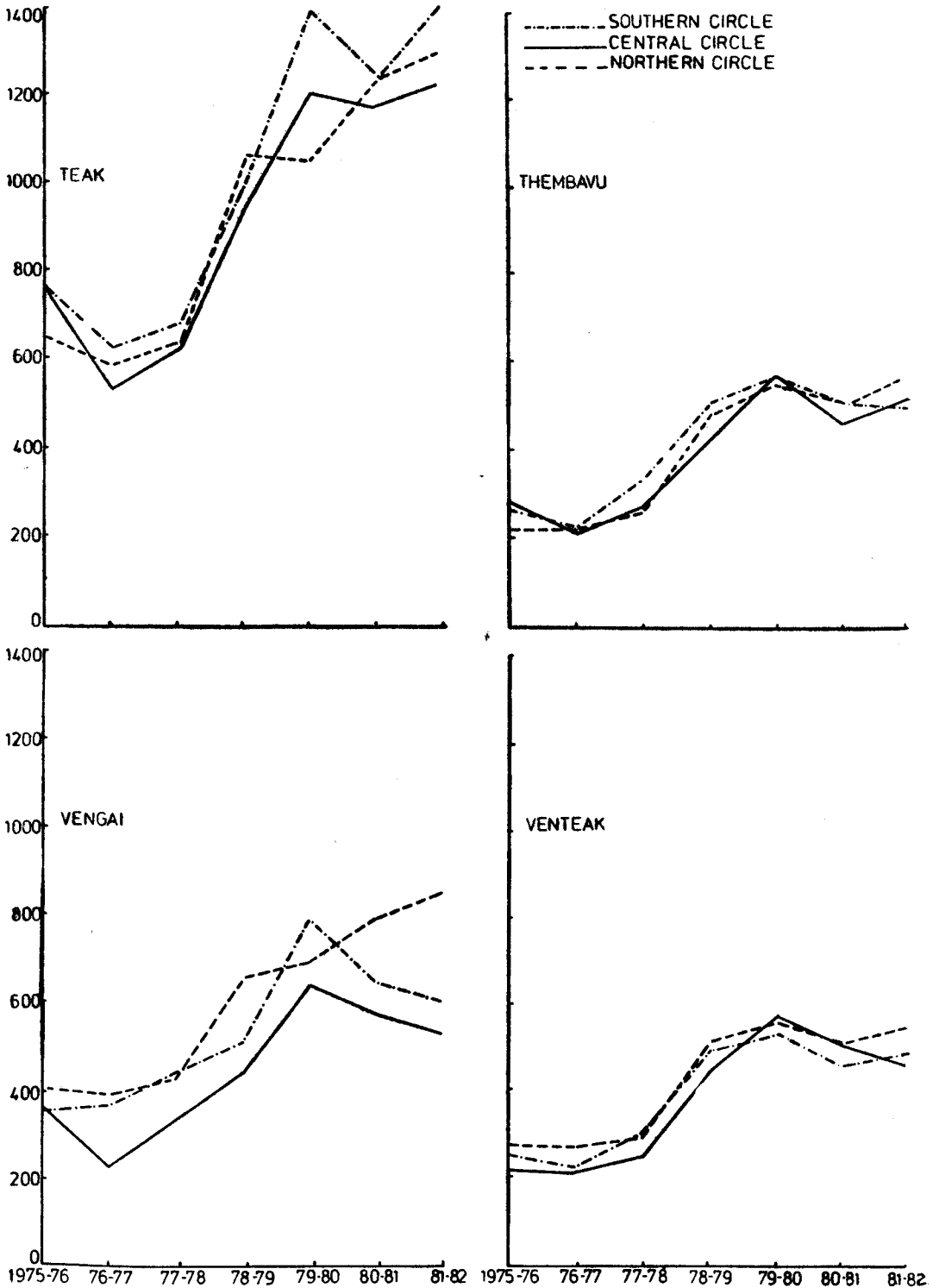
4.2   Faetors Influencing Regional Variation

The regional variation in prices could be an indication of local preferences developed over time and could be a resultant of availability, local belief, etc. Anjily and Thembavu are preferred in the southern region for construction purposes. Probably this is an important factor leading to the relatively high price which prevailed in the region for the above species despite the fact that more than 60 percent of the quantity disposed off in auction is from the region. Anjily, although known to be an excellent timber for construction purposes, is not used very much in the northern region and partly this could be due to non-availability. Of the total quantity disposed off during the period 1975-76 to 1980-81 only 3 percent was accounted by the depots in Northern Circle. Another species exhibiting significant regional variation in prices is Irul. The average real price obtained in the Northern Circle depots is significantly higher than that obtained in the other two regions. Irul is widely used in construction in the northern region, particularly for frames and shutters of windows and doors. Unlike Anjily and Thembavu, familiarity stemming from availability may not be an important factor as average annual disposal is more or less evenly distributed in the three circles (See Table 6). It is said that traditionally the species is not considered desirable on account of its name (Irul : darkness), and is not preferred for constructional uses, especially in the southern region.

During the period under study a large quantity of timber has been exported to states like Tamil Nadu. Often timber dealers from Tamil Nadu participate in auctions, especially when the depots are located conveniently for inter-state transport. Regional variation in prices noticed may thus be not entirely due to differences in local preferences but could be a reflection of the preferences in the captive market. In the absence of a detailed market survey, no realistic explanation can be offered for the observed variation in prices.

The timber market in Kerala is undergoing a rapid change on account of the acute scarcity of timber. Supply from government forests has diminished and the growing demand has led to an increase in the real prices. Non-availability of certain species which were traditionally used is bound to alter the preferences and new species which were considered as inferior or useless may find a growing market. In such a situation regional variation in prices for a given species will become more and more related to regional availability, demand and transport cost.

5. CONCLUSIONS

From the foregoing analysis it can be seen that timber prices have been more or less stable till 1976-77. This is mainly due to the fact that demand has been growing at a rate lower than the growth rate of supply. Especially the 1960s and 1970s are characterised by large scale clearance of natural forests, both for forestry and non-forestry purposes. Large quantity of timber released thus has helped to maintain more or less stable real prices. However, this situation has changed recently. There has been a drastic decline in the supply of conventional timber used in construction and consequently there has been a phenomenal increase in the real price.

Although a slight decline is noticed in timber prices during 1980-81 to 1981-82, this is only a temporary fluctuation. In the long run, prices are likely to increase, especially due to the fact that the area availabe for clearfelling is limited and supply cannot be increased in the short run. Further, plantation forestry in the state has been geared to the requirements of conventional timber species. It is focused mainly on growing high value species like Teak or pulpwood species like Eucalypts. This strategy is bound to have serious repercussions on wood supply.

The study clearly indicates some of the problems in balancing demand and supply of natural resources. For a product like timber requiring a long gestation period, it is necessary to carefully identify the priorities and formulate a long range plan.

The present study is based primarily on data on timber prices obtained in depots of the Forest Department. As such there are several limitations and some of the information on factors influencing prices are merely qualitative. To obtain a realistic picture, it is necessary to identify the different end uses and a market analysis has to be undertaken for each end product taking into account the pattern of demand, prices of substitute and complementary products. What has been done now is a preliminary analysis which has given some general indication regarding the trend in timber prices.

Price trend since I982

The increasing trend in prices of all the timber species continued during the period 1982-83 to 1984-85. The compound growth rate in the five-year moving averages of real prices varied from 11.6 percent (Anjily) to 17.1 percent (Maruthy) per annum during the period 1976-77 to 1982-83.

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