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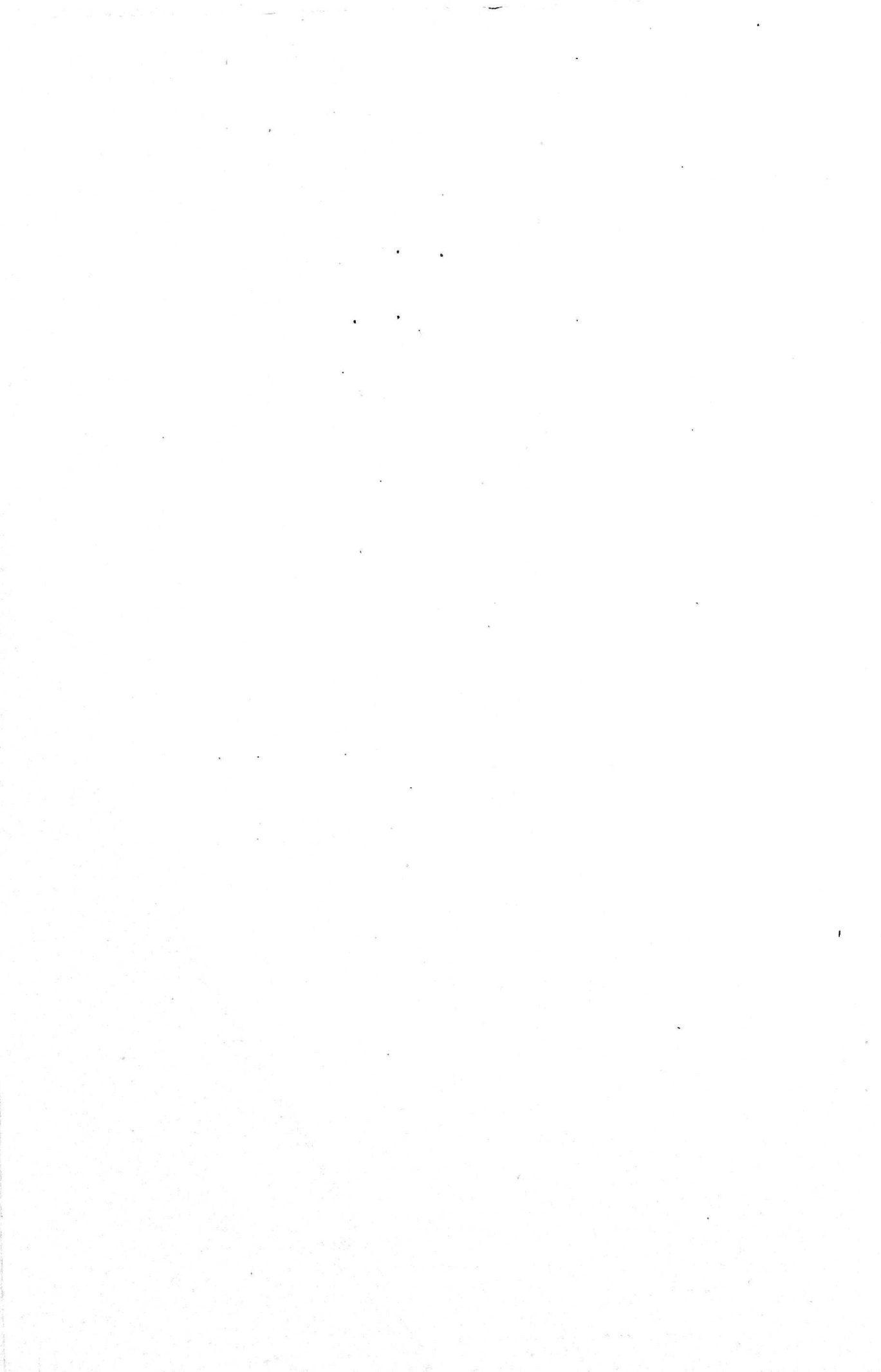
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FOR OFFICIAL USE ONLY FARM FORESTRY SURVEY REPORT NO. 5

GOVERNMENT OF KERALA
Report of Farm Forestry Survey
(Social Forestry) Kerala 1993

DEPARTMENT OF ECONOMICS AND STATISTICS
1993.



GOVERNMENT OF KERALA



REPORT OF THE FARM FORESTRY SURVEY IN
KERALA 1993

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PREFACE

India's National Commission on Agriculture spelt out the objectives of Social Forestry Programme in 1976 as;

- a) to provide fuel and thus to release cowdung for use as manure;
- b) to increase production of fruits and thus add to the potential food resources for the country;
- c) to hold conservation of soil and stop further deterioration of soil fertility;
- d) to help create shelter belts around agricultural fields to increase their productivity;
- e) to provide leaf fodder for cattle and thus to relieve intensity of grazing over reserved forests;
- f) to provide shade and ornamental trees for the landscape;
- g) to include tree consciousness and love of trees amongst the people;

- h) to popularise the planting and tending of trees in farms, villages, municipal and public lands for their aesthetic, economic and protective value etc.

The most important component of Social Forestry is the Farm Forestry. The progress of Farm Forestry is generally measured in terms of the number of seedlings distributed. But what is more important is the survival of seedlings and their growth.

To ascertain the survival percentage of the seedlings distributed to the public during 1988, Government of Kerala have accorded sanction to the Department of Economics and Statistics to conduct a survey vide G.O.(Rt) 457/82/F&WLD dt. 16-12-1992.

The results of the survey are presented in this report.

This report was prepared by Sri.K.P.Madhava Kurup Additional Director with the assistance of Smt.K.Thulasi Bai, Research Officer. Smt.B.Retnamma,

Confidential Assistant typed the entire manuscript. The sincere services rendered by the Investigators appointed for the survey and the District level officers of this department who supervised the field work and tabulation are acknowledged. I am also thankful to the Statistician and the officers of the Social Forestry Wing of the Forest Department for their unstinted co-operation for the successful conduct of this survey.

It is hoped that the findings of this survey will be useful to the planners and those interested in the social forestry programme in Kerala. Suggestions for improvement are most welcome.

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Thiruvananthapuram,
25-2-1994.

CONTENTS

Chapter

1. Introduction
2. Farm Forestry Activities in Kerala
3. Present Survey
4. Results of the Survey
5. Summary of findings

CHAPTER - I

Introduction

The large scale demand for fuelwood, fodder, green manure and small timber due to the pressure of population on forests has resulted in a vast deforestation and denudation of the forest wealth of the country. The traditional forest sector could not commensurate with the new demands. As a result the necessity to evolve new strategies has come up.

India's Forest cover, according to the latest official estimates, has been put at 19.52 per cent of the total land area which is 329 million hectares. At the time of independence, nearly 75 million hectares covering about 22 percent of the country's area was under forests. About 175 million hectares of land is supposed to be waste land due to degradation, while 18 million hectares constitute non-cultivable or barren land. As per the recent report of the Forest Survey of India (FSI) the country has only 64.01 million hectares of actual forest cover with average productivity of Indian forests at 0.5 cubic meters per hectare which is much behind the world average of 2.1

cubic meters. According to the survey of India and the National Remote Sensing Agency, out of the 19.52 per cent green cover, over 10 per cent is represented by closed forests, over 8 percent form open forests, about 0.12 percent consist of mangrove forest, and only 1.10 percent comprise of coffee plantations. It is estimated that at least 10 million hectares of degraded land needs to be brought under forest per annum to maintain ecological balance by the turn of the century. Forests have been diminished through illegal encroachment for cultivation, lopping and felling of trees for fuel and fodder. Similarly overgrazing has taken its toll on young trees and grass lands, further removing the ground cover necessary to hold and replenish the top soil.

Social Forestry is one such strategy identified with multiple objectives which are quite different from the traditional forestry. This can be identified as a forestry of the people, by the people and for the people.

The term 'Social Forestry' was first covered by Westaby in his lecture delivered during the Nineth

Common Wealth Forestry held in New Delhi in 1968. According to him Social Forestry is "a Forestry that aims at the flow of protection and recreation of benefits for the community". However, the social forestry needs a more meaningful definition that encompasses the current concept functions and objectives. So it is better defined as afforestation of all available lands outside the reserve forests with the purpose of meeting the requirements of ecological and environmental security, fodder, fuel wood, food and fibre security, socio-economic development of the rural poor, preventing soil erosion, and adding recreational and aesthetic values to the urban areas.

As part of the 20 point Programme in India afforestation was resorted to counter balance the de-forestation activity. More and more knowledge about the trees and the importance of growing them were propagated to the public through the extension media.

During the mid 20's the National Westelands Development Board was constituted with the idea to

bring more and more wastelands under tree cover and to preserve the eco-system. The National Wastelands Development Board since its inception in 1985 has been contributing to a very great extent for this national cause.

As the time progressed, it was felt that social forestry programmes could be converted to a commercial proposition with the active involvement of financial institutions and banks. Even external agencies started assisting such projects on liberal terms so that the campaign could gain momentum. Social Forestry, gives thrust in the area of active participation of the people in creating the durable assets benefiting the community.

There are several components in social forestry. The following are the major components.

1. Farm Forestry.
2. Raising of plantations on Government lands like large blocks, small blocks, strips, canal banks, road sides, railway sides etc.

3. Plantations on non-government land like private institutional compounds etc.
4. Rehabilitation of degraded forests.
5. Extension activities.
6. Involvement of women in social forestry.
7. Involvement of Panchayat in social forestry.
8. Involvement of voluntary organisation in social forestry.

Objectives of Social Forestry

By and large the aims and objectives of social forestry under different schemes are more or less in the following lines.

1. to increase the production of wood and wood products;
2. to assist the farmers to achieve self sufficiency in fuelwood, fodder and small timber to meet their own needs, either through direct production of fuelwood, fodder and poles or production of commercially marketable crops of poles and pulp wood;

3. to derive environmental benefits by reducing effects of water, soil and wind erosions and by rehabilitation of degraded forests;
4. to reduce the pressure on existing forests;
5. to help better economic benefits for the farmers;
6. to help conservation of soil and stop further deterioration of soil fertility etc.

The present programmes of Social Forestry have been started since 1981-82. The important programmes which are being implemented are the following.

- a. World Bank Project.
- b. Rural Fuelwood Scheme
- c. National Rural Employment Programme.
- d. Rural Landless Employment Guarantee Programme
- e. Drought and Flood Relief Schemes.
- f. Decentralised people's Nurseries.

The World Bank aided project, is the largest one with a provision for Rs.599.13 million for a period of

6 years from 1984. This project provides a physical target of 85,300 ha. for raising plantations including farm forestry and special programmes for tribals like tribal fuelwood and tribal medicinal plantations. The over all intention of all these programmes is to increase the tree wealth both on Government lands and on the lands at the disposal of farmers. While there is high emphasis on production of fuelwood, small timber, fodder etc. the attraction for the farmer is mainly to get more income.

CHAPTER II

Farm Forestry Activities in Kerala

Farm Forestry consists of mainly tree planting undertaken in the individual land holdings of the farmers. The number and type of seedlings planted will depend upon the size of the holdings, the type of soil and also the objectives for which they are planted by the farmer. Often these seedlings are planted in the interspaces in coconut gardens or along the boundaries in the holdings and if more areas are available, the seedlings are planted either in the form of small block or in small strips as pure plantations.

Farm Forestry is designed to help the rural households in meeting their own needs of fuelwood, fodder and poles through tree planting directly by the farmers. It is also designed in such a way that it benefits the poorer sections of the society who are hard hit by the increasing scarcity of fuelwood and small timber. Maximum emphasis has been given to Farm Forestry under the Social Forestry Programmes as it is

purely a people's programmes. Under the World Bank Schemes there is a target for the distribution of 340 million trees samplings during the 6 year project period and this constitutes 81 per cent of the total physical target of the project.

SOCIAL FORESTRY PROGRAMME IN KERALA

Till recently Kerala was the most densely populated State in India with a density of three times that of the All-India average. But according to the 1991 census, the State with a density of population of 749 persons per sq.km as against the all-India average of 273 is pushed back to the second place next only to West Bengal, which has 767 persons per sq.kms. Kerala enjoys good sunlight, plentiful network of water resources and a good rainfall from both south-west and north-east monsoons. The climate in Kerala is sub-tropical with the annual temperature varyng from 20° to 35° celsius. In view of the above favourable climatic conditions the State has a luxuriant growth of forests and its productivity is much higher than the all-India average. The area under forests in

Kerala as per official records is 10.81 lakh hectares (1991-92) which constituted 27.3 percent of the total geographical area of the State as against the all-India average of 21.9%. But the actual area under forests is likely to be less than the official figures, as a portion of forest land has been converted to other land uses during the last five decades. Individual conversion of forests to farm land, often through illegal encroachment, illegal lopping and felling of trees from reserved forests, construction of hydro-electric and irrigation schemes, the establishment of wild life sancturies and national parks etc. have reduced the actual area under forests. Further under the Grow more Food campaign, large tracts of forests land were taken over for the cultivation of food crops. The forests in Kerala can be broadly grouped under (1) tropical evergreen or rain forests, (2) mixed deciduous or monsoon forests and (3) sub-tropical or temperate ever green forests.

Even though forests in Kerala cover 27.8% of the geographical area the per capita forest area in the State is only 0.04 ha. as against the all-India average

of 0.11 ha. The Government of Kerala having concerned over the growing pressure on wood products and the need for preserving at least the existing forests for ecological reasons initiated a massive social forestry programme. The social forestry wing of the forest Department has been implementing the social forestry programmes throughout the State under different schemes including the World Bank aided Kerala Social Forestry Project 1984.

Scope for Farm Forestry in Kerala

As pointed out earlier farm forestry is the most important component of social forestry programme as it is a people's programme. It consists of mainly tree planting undertaken in the individual land holdings of the farmers to meet their own needs of fuelwood, fodder and small timbers. Since the scope for farm forestry depends mainly on the availability of land to grow trees, it is important to have a brief discussion on the land utilisation pattern in Kerala. It could be seen from the table 2.1 that the land use pattern in

Kerala has witnessed only a marginal changes during the last 15 years. Owing to the acute scarcity of land (the per capita land availability in Kerala is only 0.13 hectare as against the all-India average of 0.39) most of the cultivable land has already been brought under cultivation and the crop intensity ie. proportion of gross cropped area to net area sown, is 135 as against 127 in India. A significant point to be noted from the table is the reduction in the proportion of land under miscellaneous tree crops from 2.2 in 1975-76 to hardly 0.5% in 1991-92 indicating a substantial reduction in the tree population meant primarily for firewood and timber. A comparison of land use data of Kerala with that of all-India data presented in Table 2.2 also give an impression that there is only very limited scope for devoting more land for farm forestry.

Table - 2.1

Land utilisation pattern in Kerala 1975-76 and 1991-92

Sl. No.	Land use	1975-76		1991-92	
		Area (000ha.)	% to Total	Area (000ha.)	% to Total
1	2	3	4	5	6
1.	Total area	3885	100	3885	100
2.	Forest	1081	27.8	1081	27.8
3.	Land put ton non-agricultural uses	259	6.8	301	7.76
4.	Barren and uncultivable land	78	2.1	55	1.41
5.	Permanent pastures and other grazing land	20	0.5	2	0.05
6.	Land under miscellaneous tree crops not included in not area	84	2.2	34	0.9
7.	Cultivable waste	113	2.9	93	2.4
8.	Fallow other than current fallow	23	0.6	27	0.7
9.	Current fallow	37	1.0	44	1.1
10.	Net area sown	2189	56.0	2248	57.9
11.	Area sown more than once	792	-	773	-
12.	Total cropped area	2981	-	3021	-

Table - 2.2

Land Utilisation pattern in Kerala & India (1987-88)
(Area in million ha.)

Sl. No.	Head of Classification	India		Kerala	
			%		%
1	2	3	4	5	6
1.	Total geographical area	304.85	100.0	3.89	100.0
2.	Forests	66.86	21.9	1.08	27.8
3.	Land put to non-agricultural uses	20.81	6.8	0.28	7.2
4.	Barren and uncultivable land	20.39	6.7	0.07	1.8
5.	Permanent pastures and other grazing lands	11.85	3.9	0.03	0.8
6.	Land under miscellaneous tree crops not included in net area sown.	3.53	1.2	0.04	1.0
7.	Cultivable waste	15.63	5.1	0.11	2.8
8.	Fallow land other than current fallow.	11.13	3.7	0.02	0.5
9.	Current Fallow.	18.47	6.0	0.05	1.3
10.	Net area sown.	136.18	44.7	2.21	56.8

However the steady increase in the price of timber and firewood and the certain advantage of growing trees under farm forestry is becoming more attractive to a good section of land holders. Therefore a brief discussion on the distribution of land holdings in Kerala is attempted below. The data on land holdings are collected in the quinquennium agricultural Census carried out throughout India as a centrally sponsored scheme. The latest Agricultural Census was conducted in Kerala during 1990-91 and according to this census there were 54.19 lakh holdings in the State with an average size of 0.46 hectares. The distribution of operational holdings according to various size classes presented in table 2.3 shows that 92.5% of the holdings is having less than one hectare of land and 84% have only less than 0.50 hectares. Holdings with 4 hectares and above constitute only 0.46 and those with 10 hectare and above constitute only 0.07%.

Table - 2.3

Number of operational holdings and area operated by size class 1990-91 (Total)

Sl. No.	Size of holdings		No. of operational holdings		Area operated (he)	
	in (he)		No.	%	Total	%
1.	0	- 0.02	635124	11.72	8300	0.46
2.	0.02	- 0.5	3914282	72.23	535099	29.70
3.	0.5	- 1.0	466673	8.61	336073	18.65
4.	1.0	- 2.0	280900	5.18	381437	21.17
5.	2.0	- 4.0	97698	1.80	253797	14.08
6.	4.0	-10.00	21384	0.39	112755	6.26
7.	10 and above		3128	0.07	174362	9.68
All sizes			5419189	100.00	1801823	100.00%

Source: Agricultural Census (1990-91) Directorate of Economics and Statistics.

A brief discussion on the cropping pattern is necessary to examine the scope for farm forestry in the State. The cropping pattern indicating the proportion of cropped area under each crop given in table 2.4 shows not only the dominance of perennial tree crops but also the increasing share of perennial crops like coconut, rubber, cashew in the cropping pattern. The most important factor attributed to the change in the cropping pattern in favour of perennial crops is their higher profitability in comparison with seasonal and annual crops like paddy, tapioca etc. All these perennial crops yield timber and fuelwood as by products. They also meet the demands of wood based industry. Thus these perennial crops of Kerala serve the purpose of forestry even in their subsidiary role.

Table - 2.4

Cropping pattern of Kerala - 1957-58 & 1991-92

(000 ha.)

Sl. No.	Crops	1957-58		1991-92	
		Area	%	Area	%
1	2	3	4	5	6
1.	Rice	766.76	34.68	543.33	17.92
2.	Other cereals and pulses	57.65	2.61	31.64	1.05
3.	Banana & Plantains	40.57	1.83	65.07	2.15
4.	Tapioca	213.96	9.68	141.88	4.70
5.	Coconut	463.27	20.95	863.00	28.57
6.	Arecanut	49.71	2.25	63.43	2.10
7.	Cashewnut	44.04	1.99	112.06	3.71
8.	Tea	39.92	1.81	34.62	1.15
9.	Coffee	16.64	0.75	84.02	2.78
10.	Rubber	99.87	4.52	425.77	14.09
11.	Other crops	418.61	18.93	658.24	21.78
Total cropped Area		2211.00	100.00	3021.12	100.00

The discussion on the land use pattern and cropping pattern raises the question "Is there any scope for farm forestry in Kerala? It is to find out an answer to this question that the Kerala Forest Department conducted a social forestry land use survey in 1982, to ascertain from the land holders whether they really need trees and forests* The survey revealed that there is good scope for social forestry in Kerala and people with large and small holdings are anxious to reap the benefit of social forestry programmes. Their willingness to participate in the programme is a result of not only a better awareness among the public on the value of tree wealth but also better economic considerations. Trees can be grown in all types of lands if suitable species are available and they will not only yield timber and firewood but also provide valuable green manure and fodder for the farmer. The costs and input in growing trees are low compared to other forms of land use and the output is high compared to the input.

It is on the basis of the findings of the above survey that an ambitious farm forestry programme was launched in Kerala under the World Bank aided Social Forestry Project.

* "Social Forestry Land use Survey for Kerala, Kerala Forest Department 1982".

CHAPTER III

PRESENT SURVEY

Objectives of the Survey

Background of the survey

In the World Bank Scheme the target under farm Forestry is to distribute 340 million tree sapling covering 81% of total physical target of social forestry programme of the World Bank. Under this Scheme farmers are supplied with seedlings free of cost (now it is priced for persons requiring large number of seedlings) to be planted in their farm. The Social Forestry wing of the Forest Department is the implementing agency of the scheme viz. Kerala State Social Forestry Programme. Every district has social forestry office headed by an Assistant Conservator of Forests under where two or more ranges are functioning each under the control of a Range Officer. The Department raises the nurseries and the seedlings are distributed by involving voluntary agencies like Mahilasamajams, Forestry Clubs, School Clubs, arts and Sports Clubs, National Service Scheme etc. These organisations are given distribution registers to record the name and address of

beneficiaries and also species-wise number of seedlings distributed and it is necessary to know whether the seedlings are planted and looked after properly. This feedback information is necessary to rectify the defects if any in the system and further improve the distribution system. The World Bank and the Government of India wanted the Social Forestry Programme to be evaluated regularly and prescribed an 'Operational Guide' Popularly known as "Red Book". A detailed questionnaire was designed as per the guide line to collect data for the purpose of evaluation.

The present study is conducted with the following objectives in mind.

- (a) to assess the overall impact of the Farm Forestry Programme in the State in general.
- (b) to assess the survival rate of seedlings distributed under Farm Forestry.
- (c) to identify the category of the farmers who are benefited.
- (d) to find out the adequacy or extension activities.

- (e) to find out the reasons for mortality of the seedlings distributed.
- (f) to assess the aptitude of the farmers with regard to future participation in Social Forestry.
- (g) to suggest the management methods for better implementation of the project on the basis of the conclusion and inferences drawn from the survey and feed back information.

In the past, evaluation studies to assess the survival rate of seedlings distributed and to find out the reasons for the mortality of seedlings were conducted by different agencies based on small samples. The first State-wide sample survey to assess the survival rate of seedlings distributed under the farm forestry was carried out by this department in 1988 with respect to seedlings distributed in 1986. But the sample size was only 0.2% of the total beneficiaries listed in the Distribution Registers. The second survey relates to the seedlings distributed during 1987 and the sample size has been enhanced to 1% of the beneficiaries. The present survey relates to the seedlings

distributed during 1988 and sample size has been enhanced to 2% of the beneficiaries for getting better representation.

Coverage and sample design

It is a State-wide survey covering all the 14 districts of Kerala. Multi-stage systematic sampling method is used for the selection of beneficiaries. First stage of selection is the Seedling Distribution Register (SDR). The S.D.Rs in each district were arranged in ascending order on the basis of the number of beneficiaries. The total number of recipients of seedlings as per the Distribution Registers during 1988 was 978219 and the sample size for this survey was 2%. Each district was divided by the number of ranges in each district so as to get the number of registers from each district. The number of beneficiaries from each selected registers were obtained by dividing the total sample size by the number of selected registers.

Method of enquiry and field work

Data for the survey were collected in a schedule specially designed for this survey by

interviewing the household members and by enumerating the seedlings planted. The field work was carried out by the Investigators selected for this survey from persons registered in the Employment Exchanges under the supervision of one of the District level Officers of the Department of Economics and Statistics. The field work was carried out during April 1993 to November 1993. The State level tabulation and report writing was done in the Directorate of Economics and Statistics during the succeeding two months.

Limitations of the Survey

Name and address of the beneficiaries were not properly recorded in many distribution registers. Even if the names are recorded, it was not supported by house number, ward number of panchayat or municipality. In some panchayats, house numbers given are old numbers which had changed subsequently. In view of the above reasons the investigators found it difficult to locate the beneficiaries. Since some of the voluntary agencies involved in the distribution of seedlings have not proper identity it was difficult to check with them the correct address of beneficiaries.

It was also difficult to identify the seedlings planted in 1988 from those planted earlier or after that year even from household members due to memory lapse. As such the survival rates for basketted and bare rooted seedlings could not be worked out separately. The various limitations mentioned above have to be borne in mind while using the results of this survey.

CHAPTER IV
RESULTS OF THE SURVEY

The survey covered all the 14 districts of the State. The district-wise number of beneficiaries, percentage to the total number of beneficiaries, density of population according to 1991 census and the percentage of forest area to the total geographical area are furnished in the Table 4.1 given below.

Table - 4.1

District-wise distribution of beneficiaries

Sl. No.	District	No. of beneficiaries	Percentage	Density of population 1991	Percentage of forest area to total area
1	2	3	4	5	6
1.	Thiruvananthapuram	1197	6.37	1344	22.80
2.	Kollam	1263	6.72	967	32.33
3.	Pathanamthitta	1704	9.08	450	57.75
4.	Alapuzha	1906	10.15	1415	-
5.	Kottayam	1391	7.40	830	3.71
6.	Idukki	721	3.84	215	50.67
7.	Ernakulam	2640	14.06	1170	3.45
8.	Trissur	2628	14.00	903	34.62
9.	Palakkad	865	3.65	532	31.03
10.	Malappuram	790	4.21	872	28.48
11.	Kozhikode	1438	7.66	1118	17.74
12.	Wyanad	1098	5.85	315	37.06
13.	Kannur	1141	6.08	759	16.42
14.	Kasaragod	174	0.93	538	2.87
State		18776	100.00	749	27.83

The above table reveals that Ernakulam district with 1170 density of population and 3.45% forest area accounts for 14.06% of beneficiaries followed by Trissur and Pathanamthitta districts. It may be noted that Kasaragod district had only 0.93 percentage, of beneficiaries even though it had 2.87 percentage of forest area. Eventhough Pathanamthitta and Idukki had 57.75% and 50.67 percentage of forest area respectively, the percentage of beneficiaries were only 9.08 and 3.84.

While identifying the beneficiaries of seedlings according to their main occupation, the survey results reveal that cultivators constitute hardly 28.65% of the total beneficiaries where as casual laboures have a share of 30.29%. Government employees are not taking much interest in this scheme (7.88%). The reason for the interest shown by the casual laboures may be the land reform measures introduced in the state since 1970 and the confirmation of ownership of land to large number of landless casual workers. The casual workers had availed the benefit of the free distribution of seedlings from the forest department. More details are given in table 4.2.

Table 4.2

Distribution of beneficiaries according to
main source of income

Sl. No.	Category	Number	Percentage to total
1	2	3	4
1.	Cultivators	5380	28.65
2.	Government Employees	1479	7.88
3.	Private Employees	1916	10.20
4.	Casual Labourers	5688	30.29
5.	Others	4313	22.97
Total		18776	100.00

Another noticeable feature of the results of the survey was the holders in the range of 10 cents to 49 cents of land were dominating among beneficiaries with 42.88 percentage while the holders with less than 10 cents availed only 16.53%. Among holders less than 10 cents, 10 cents to 49 cents 50 cents to 99 cents the trend tallies with the results of the survey held in 1991. There were slight increase in the number of beneficiaries in the categories of 100 to 249 cents

and 250 to 999 cents. The number of beneficiaries increased from 12.58% to 16.11% and 5.01% to 7.57% respectively. The details are furnished in Table 4.3 below.

Table 4.3
Distribution of beneficiaries according
to operational holdings

Sl. No.	Size of holding	Number	(Area in cents)
			Percentage total
1.	Less than 10 cents	3104	16.53
2.	Between 10 to 49 cents	8052	42.88
3.	" 50 to 99 cents	3129	16.66
4.	" 100 to 249 cents	3024	16.11
5.	" 250 to 999 cents	1422	7.57
6.	1000 cents and above	45	0.24
7.	No land holdings	-	-
All sizes		18776	100.00

The distribution of beneficiaries according to number of cattle is given in Table 4.4 below.

Table 4.4

Distribution of beneficiaries according to
number of cattle

Sl. No.	No. of cattle	Number	Percentage to total
1	2	3	4
1.	No. of families with no cattle	102417	54.58
2.	No. of families with 1 cattle	3019	16.08
3.	No. of families with 2 cattle	3574	19.04
4.	No. of families with 3 cattle	1080	5.75
5.	More than 3 cattle	856	4.56
Total		18776	100.00

The possession of cattle in the households of the beneficiaries have a direct bearing on the survival and growth of seedlings. It is possible that mortality rate is high in households having cattle. At the same time if the seedlings are protected from the attack of cattle they will have a luxuriant growth in view of the availability of farm yard manure. It could be seen from the table that 54.58% of the

beneficiaries have no cattle and households with more than 3 cattle constitute only 4.56 percentage. During 1991 survey the percentage in these categories were 54.03 percentage and 7.49 percentage respectively.

Number of seedlings distributed

The details on district-wise seedlings distributed during 1988 is given in Table 4.5 below.

Table 4.5

District-wise distribution of seedlings distributed during 1988

Sl. No.	District	Seedlings distributed		Average No. of seedlings per beneficiary
		Number	Percentage to total	
1	2	3	4	5
1.	Thiruvananthapuram	27617	5.99	23
2.	Kollam	15974	3.47	13
3.	Pathanamthitta	27790	6.03	15
4.	Alapuzha	38022	8.25	22
5.	Kottayam	19996	4.34	14
6.	Idukki	76084	16.51	106
7.	Ernakulam	43052	9.34	16
8.	Trissur	36851	8.00	14
9.	Palakkad	14454	3.14	21
10.	Malappuram	13144	2.85	17
11.	Kozhikode	14205	3.08	10
12.	Wyanad	96534	20.95	88
13.	Kannur	31051	6.74	27
14.	Kasaragod	6084	1.32	35
Total		460858	100.00	25

The table reveals the total of 460858 seedlings were received by the beneficiaries covered by the survey. The average number of seedlings per beneficiary is worked out at 25. While examining the district-wise number of seedlings distributed it could be seen that as in the case of number of beneficiaries, Wyanad received the largest number of seedlings followed Idukki and Ernakulam.. The proportion of seedlings received by Ernakulam district is only 9.34% as against 14.06% of the total beneficiaries. The average number of seedlings per beneficiary vary from district to district. In Idukki the average is 106 compared to the state average of 25. Kozhikode received only an average of 10 seedlings. It may also be noted that the average size of holding in Idukki is 0.29 against the state average of 0.38 and that of Kozhikode is 0.81 according to Agricultural Census 1990-91.

Purpose of planting

The main objective of farm forestry programme is to encourage the land holders to grow trees so as

to enable them to meet their own requirement of fuel wood, fodder, green manure and small timber. In the present survey, the recipients of seedlings were asked to explain the purpose for which seedlings were planted and their views are presented in Table 4.6.

Table 4.6

Main purpose of Planting

Sl. No.	Purpose	No. of beneficiaries
1.	Fuel wood	23724
2.	Fodder	664
3.	For sales	11676
4.	Ornamental purpose	4189
5.	Timber for own use	9926
6.	Fruits	8544
7.	Other uses	4598
8.	Not with any other specific- purposes	1779

As one species will not meet all their requirements, more than one species are planted depending upon the availability of land and seedlings.

An analysis of purposewise distribution of beneficiaries reveals that tree planting is done mainly for sale and to meet their own timber requirements. In view of the very high prices of timber used for building construction and furnishing, planting of teak wood trees, Mahagony etc. are becoming very attractive to a large number of households with financial capacity. Planting of trees mainly as a source fire wood is very rare in Kerala as firewood requirements are met largely from coconut and other tree crops and also from trees planted mainly for timber, fruits fodder and manure. Cultivators have a preference for trees which provide wood for sale and at the same time provides, fuel from part of the trees.

Planted area according to land use (before planting)

The survey results reveal that the seedlings in the surveyed households covered an area of 1121

hectares out of which nearly 44.25 per cent were in home steads and 32.38 were under planted. Seedlings were also planted in Bunds fences etc. separating the land of one cultivation from another and such area covered 17.57% of the estimated area. More details are furnished in Table 4.7 below.

Table 4.7

Planting area according to land use (Before planting)

Sl. No.	Land use	Area (in hect)	Percentage to total
1.	Barren	63	5.62
2.	Under planted	363	32.38
3.	Substituted	2	0.18
4.	Bunds, Fences etc.	197	17.57
5.	Home steads	496	44.25
	Total	1121	100.00

Important species

Under the Scheme Social Forestry in Kerala State, Seedlings of both indigeneous and exotic species are grown and distributed. The important species distributed in Kerala are Ailanthus (Perumaram or Matti) casuarina, mahagony, teak, acacia, auriculiformis, cashew etc. The selection of a particular species depends mainly on the purpose for which it is required to serve and the suitability of the land for its cultivation. The Forest Department raises seedlings suitable to the general soil and climatic conditions of Kerala. But there is considerable variations in soil conditions even within a village. Most of the species grow well wherever soil has proper aeration, is well drained and moisture is available from rainfall or irrigation whereas some species grow well even in hard and dry soils. It is for the land owner to decide which are the species most suitable to his land for which he should have a prior idea about the seedlings distributed by the forest department and their specific requirement for growth. But most of the recipients of seedlings planted seedlings without any proper assessment of the

suitability of seedlings to the soil conditions of their land leading to high rate of mortality and stunted growth.

Survival rate of seedlings

One of the important objective of the survey is to ascertain the percentage of survival of seedlings. For working out the survival rate, the number of seedlings planted in 1988 were ascertained from the households and the actual number of seedlings survived at the time of enumeration were counted. The survival rate is the percentage of standing trees counted to the total seedlings planted in 1988. The survival rate for the state is worked out at 52.27. The district-wise survival rate is given in Table 4.8.

Table 4.8

District-wise distribution of seedlings
planted and survived

Sl. No.	District	Planted	Survival	
			Number	Percentage
1	2	3	4	5
1.	Thiruvananthapuram	27634	11342	41.04
2.	Kollam	15221	9767	64.17
3.	Pathanamthitta	26368	14043	53.26
4.	Alapuzha	38093	21753	57.11
5.	Kottayam	19807	12753	64.29
6.	Idukki	71014	31804	44.79
7.	Ernakulam	44982	19600	43.57
8.	Trissur	35805	17892	49.97
9.	Palakkad	13175	4572	34.70
10.	Malappuram	13144	5246	39.91
11.	Kozhikode	13342	7289	54.63
12.	Wyanad	97425	58254	59.79
13.	Kannur	31417	18564	59.09
14.	Kasaragod	6034	4190	69.44
	State	453461	237049	52.27

The above table reveals considerable variations in survival percentage from 69.44% in Kasaragod district to 34.70% in Palakkad. It is very interesting to note that during the last survey Kasaragod district had only 13.38% survival rate. Species-wise survival rates of important items reveal that the percentage of survival is the highest for the seedling of silver oak (57.52) followed by Ailanthus (54.83) (Perumaram or Matti) cashew (52.92) Acacia (52.08) etc. / Silver Oak and Teak wood are the most valued timber items and as such its seedlings are well cared by the land owners leading to high survival rate. Cashew being one of the cash crops is also attended by the cultivators. It is cultivated mainly for cashew nuts which earn Foreign exchanges. This crop requires less input (cashewnut cultivation is becoming more popular among cultivators and as such the survival rate is more than the average rate of all species). Mahagony and Matti are popular items as they grow fastly and can attain utilisable within a short span. Ailanthus or Matti is an important raw materials used by the match and plywood industries. In the social forestry programme of Kerala one exotic

species which received much attention and criticism is *Acacia Auriculiformis*, a native of Australia and the wood is used as small timber, fuel wood and pulp. It is grown even in dry, poor and murramy soils. The ease with which it can be grown and the fast rate of growth have made the species very popular in the social forestry programme on road sides, rail lines, community lands etc. But it is not very popular among individual lands holders who wants to maximise the return from their land. During the course of the survey it was found that the cultivators have cut down the seedlings of the species *Acacia auriculiformis*. This trend was prevailed during last survey also. In this regard it may noted that the survival percentage of casaurina rose from 9.81% in 1991 survey to 46.66 percent during this survey. More details are given in Table 4.9.

Table 4.9

Species-wise distribution of important seedlings
planted and survived during 1988

Sl. NO.	Specie	Survived		
		Planted	Number	Percentage
1	2	3	4	5
1.	Alianthus (Perumaram or Matti)	148168	81246	54.83
2.	Casaurina	12803	5972	46.65
3.	Swietenia Macrophylla (Mahagony)	42156	19576	46.44
4.	Teak	29033	14042	48.37
5.	Acacia	6780	3531	52.08
6.	Silver Oak	135945	78193	57.52
7.	Cashew	13875	7342	52.92
8.	Others	64701	27147	41.96

Reasons for mortality

The survey results also revealed the important reasons for the mortality of seedlings. The important reasons for mortality as furnished by the household members are presented in Table 4.10.

Table 4.10

Reasons for mortality

Sl. No.	Reason	Numbers	Percentage
1.	Animals	11341	5.78
2.	Insects	12104	6.17
3.	Heavy rain	12130	6.18
4.	Weeds	1573	0.80
5.	Soil conditions	12300	6.27
6.	Drought	135713	69.17
7.	Pest	1591	0.81
8.	Fire	80	0.04
9.	Other reasons	9372	4.78
Total		196204	100.00

However it may be noted that mortality is caused by more than one reason but only the most important reason is ascertained from the household. It can be seen from the table that 69.17% of the mortality is attributed to drought. The seedlings require

irrigation during this period. Poor soil condition and the attack of animals and insects are other important reasons for the mortality of seedlings. During the 1991 survey also the major reasons for the mortality was drought which affected 58.03% of seedlings.

Cultural practices

Seedlings of both indigenous and exotic species were distributed to the land holders but some species grow only if proper irrigation, manuring, weeding and other cultural practices are done. The various cultural practices, followed in Farm Forestry, are presented in Table 4.11.

Table 4.11

Distribution of beneficiaries resorting to cultural practices

Sl.No.	Cultural practices	Number	Percentage
1.	Irrigation	7547	40.20
2.	Manuring	2911	15.50
3.	Plant protection measures	503	2.68
4.	Weeding	6036	32.15

It reveals that 40.20% of the cultivators irrigated the seedlings, 15.50% manured it, 2.68% applied plant protection measures and 32.15% resorted to weeding. There is general opinion among the beneficiaries that the seedlings are distributed not according to the requirements of land owners.

Extension service

The term extension refers to a kind of educational process through which information and new ideas are conveyed to the target group with a view to create awareness among them so that new ideas could be adopted. The success of farm forestry programme depends on the extension services available to the farmers in respect of choice of species, techniques of planting, manuring and other cultural practices. The data collected from this survey show that while 63.08% of total beneficiaries needed advice, only 2.44% of the beneficiaries got advice on choice of species, 10.18% on planting techniques, 4.10% on irrigation, 1.45% of disease control etc. The details are given in the table 4.12 below.

Table 4.12

Distribution of beneficiaries according to advice on tree husbandry

Sl.No.	Item	Number	Percentage to total beneficiaries
1.	Farmers who needed advice	11844	63.08
2.	Farmers who got advice on:		
	i. Choice of species	458	2.44
	ii. Planting technique	1911	10.18
	iii. Manuring	554	2.95
	iv. Esplacement	612	3.26
	v. Irrigation	769	4.10
	vi. Disease control	272	1.45
	vii. Plant protection	1753	9.34

Future demand for seedlings

one of the important objectives of this study is to assess the species-wise future requirements of seedlings and the willingness of farmers for planting more trees. The details on species-wise number of beneficiaries requiring additional seedlings and the quantum of seedlings required are given in Table 4.13.

Table 4.13

Specific-wise requirements of seedlings

Sl.No.	Species	No. of beneficiaries requiring additional seedlings	No. of seedlings required	Percentage to total requirements
1	2	3	4	5
1.	Teak	92168	95210	60.51
2.	Ailanthus (Perumaram or Matti)	12680	11966	7.6
3.	Swietenia Macrophylla (Mahagony)	14876	27390	17.41
4.	Cashew	13963	16028	10.19
5.	Ucalyptus	991	744	0.47
6.	Casuarina	1174	2666	1.69
7.	Acacia Auriculiformis	289	854	0.54
8.	Almonad (Badam)	990	1071	0.68
9.	Sibabul	529	588	0.37
10.	Vaka (Albezia Faleataria)	791	340	0.22
11.	Others	250	493	0.31
Total		138701	157350	100.00

The table reveals that there is more demand for the seedlings of silver Oak Teak (60.51%) Mahagony (17.41%) followed by cashew (10.19%). These species have commercial importance and the beneficiaries prefer these species as they would help them to maximise their income. The demand for Vaka, Matti, Acacia, Ucalyptus etc. is very negligible.

Reasons for not planting

The reasons attributed for the beneficiaries not intending to plant more seedlings in the near future are given in Table 4.14.

Table 4.14

Reasons for not planting trees

Sl.No.	Reason	Number of beneficiaries	Percentage to Total
1	2	3	4
1.	No. space	2967	53.99
2.	Poor growth	501	9.12
3.	High Mortality of seedlings	295	5.37
4.	Required species are not available	185	3.37
5.	Other species are more profitable	475	8.64
6.	Others	1072	19.51
Total		5495	100.00

Lack of space to plant more seedlings is found to be the important reason for deciding against any future planting programme.

CHAPTER V

SUMMARY OF FINDINGS

The findings of present Farm Forestry survey is based on data collected from 18776 households constituting 2% of total beneficiaries to whom the seedlings were distributed during 1988.

The survey revealed that:

- a) 42.88% of the beneficiaries possess land between 10 cents, 49 cents, 16.53% of the beneficiaries possess only less than 10 cents of land and 0.24% possess land 10 acres and above.
- b) 54.58% of the families have not cattle in their household.
- c) While the State average number of seedlings per beneficiary is worked out at 25, the average of Idukki is 106 and that of Kozhikode is 10. Wayanad received the maximum percentage (20.94%) of seedlings distributed and Kasaragod received the minimum (1.32%).
- d) 52.27% of the seedlings distributed were survived with considerable inter district variations

ranging from 34.70% in Palakkad to 69.44% in Kasaragod. While analysing the species-wise survival rate, it is very high in the case of seedlings of Silver Oak followed by Ailanthus, Cashew and Acacia. The survival rate can be enhanced considerably if the seedlings are distributed after ascertaining the requirements of land owners and their interest in the scheme.

- e) The important reason for mortality of seedlings is drought. If the seedlings are irrigated for a couple of months after planting the survival rate can be enhanced considerably.
- f) The details collected for the survey point out the gross inadequacy of the extension services and that is also an important reason for the high mortality of seedlings.
- g) Regarding the future demand for seedlings land owners prefer more Teak, Mahagony and Cashew. It was Teak, Matti and Mahagony during 1991 survey.



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