A CRITICAL EVALUATION OF THE ACTIVITIES OF SERIFED FOR THE DEVELOPMENT OF SERICULTURE INDUSTRY IN KERALA

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Under the Faculty of Commerce and Management Studies

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CERTIFICATE

This is to certify that the thesis entitled **"A Critical Evaluation of the Activities of Serifed for the Development of Sericulture Industry in Kerala"** is an authentic record of the bonafide research carried out by **Mr. Sudhakaran A.,** Research Scholar, under my supervision and guidance for the award of the Ph.D. degree of the University of Calicut and that no part of this work has been presented before for the award of any degree, diploma or other similar title in any university.

Dr. V.K. Janardhanan
(Supervising Teacher)

DECLARATION

I hereby declare that the thesis entitled **"A Critical Evaluation of the Activities of Serifed for the Development of Sericulture Industry in Kerala"**, is a bonafide record of research work done by me under the supervision of Dr.V.K. Janardhanan, Reader, Department of Commerce and Management Studies, University of Calicut and that no part of it has been previously submitted to this or any other university for the award of any Degree or Diploma.

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- *Central Library, University of Mysore.*

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CONTENTS

ACRONYMS

CSB: Central Silk Board (Bangalore).

CSRTI: Central Sericultural Research and Training Institute (Mysore).

CSTRI: Central Silk Technological Research Institute (Bangalore).

DFL: Disease Free Laying.

DGCIS: Directorate General of Commercial Intelligence and Statistics (Kolkatha).

DWCRA: Development of Women and Children in Rural Areas.

FAO: Food and Agriculture Organization.

IBRD: International Bank for Reconstruction and Development.

IDA: International Development Association.

IRTC: Integrated Rural Technology Centre

JICCA: Japanese International Cooperation Agency.

NCERT: National Council of Educational Research and Training.

NSP: National Sericulture Project.

ROTCEP: Report on Rupees Thousand Crore Employment Program.

SDC: Switzerland's Agency for Development and Cooperation.

SERIFED: The Kerala State Sericulture Co-operative Federation Ltd.

SEWA: Self Employed Women's Association

UNCTAD: United Nations Conference on Trade and Development.

WTO: World Trade Organization.

GLOSSARY

Bivoltine Cocoons: Cocoons built by a silkworm race or hybrid with only two generations (life cycles) in a year.

Charka: A simple appliance used for reeling cocoons.

Chawki Rearing: The process of rearing young silkworms.

Chawki: The name given to a silkworm before it has cast off its second skin and entered the third stage of its life as a caterpillar.

Cocoon: Silken shell spun by the silkworm larvae that serves as a protective covering to the insect during its pupal stage of existence.

Cottage Basin: A reeling appliance, which is an improved version of Charka

Denier: A unit of fineness of silk equal to one gram per 9000 metres of yarn.

Disease Free Layings (DFLs): Silkworm eggs with an average of 400 eggs per laying for Multivoltine, up to 600 eggs per laying for bivoltine.

Dupion: Silk reeled from double cocoons producing stubby threads.

Fibroin: The silk filament remaining after the gum (or sericin) is discharged.

Filament: Thread spun by the silkworm, ranging from 300 to 1800 metres.

Filature: A large factory where reeling of cocoons is done using advanced technology.

Grainages: Establishments where disease free layings are produced on scientific lines.

Instar: The period before moulting of the silkworms is called instar. There are five instars in a silkworm's life.

Kanva 2 (K2): A variety of mulberry, which is an open pollinated hybrid selection from the seedling population of Mysore Local variety. It can be grown under varied agro-climatic conditions and is cultivated in almost all Indian States.

Moulting: A process where the silkworm casts off its existing skin in place of a new one. Silkworm moults four times during its larva stage

Mulberry: The basic food plant for the silkworms, which is a native of Indo-China and widely distributed all over the world. It belongs to the genus Morus and the family Moraceae with more than twenty species.

Multivoltine Cocoon: Cocoons built by a silkworm race or hybrid with more than two generations in a year.

Raw silk: Silk reeled by drawing together the required number of filament from the cocoons and containing the original gum or sericin.

Rearing: The process of nursing the silkworms for producing cocoons.

Reelability: It is the fitness of cocoons for economically feasible reeling. It is expressed as a ratio of cocoons reeled without break and the total number of cocoons utilised.

Reeling: The process of unwinding silk filaments from cocoon.

Renditta: The cocoon to raw silk ratio: the weight of cocoons required to produce a kilogram of raw silk.

Sericin: Natural gummy coating on raw silk filaments, a protein soluble in boiling water.

Sericulture: The rearing of silkworms for the production of cocoons.

Sericulturist: A person doing sericulture. Also called seri-farmer or farmer.

Silk: A protein fibre produced by the silkworm for spinning a cocoon. Basically, there are two proteins namely, fibroin which constitutes the core of the fibre and sericin, a waxy substance which encases the fibroin.

Silk Exchange: A place where cocoons and raw silk were traded by way of open auction, established in Karnataka in order to overcome malpractices and ensure stable prices.

Silk Road: A traffic route used to exchange the cultures of the East and West, which connected Asia and Europe during ancient times.

Silkworm: Common name for the silk producing larvae of any other several species of moths. The domesticated silkworm belongs to the family Bombycidae and is classified as Bombyx mori L.

Victory 1 (V1): A fast growing variety of mulberry with large and dark green leaves. A variety proved to be excellent under efficient farming system with high fertilizer input and irrigation.

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CHAPTER I

INTRODUCTION

INTRODUCTION

1.1. Sericulture: A General View

Sericulture, the technique of making silk, is a traditional agro-based industry, playing a very important role in the rural economy of any developing country. This welfare-oriented enterprise provides scope for fast and sustainable economic growth and more employment opportunity within a very short gestation with less capital investment of establishment. It involves a series of bio-technological process for the production of silk that provides multiple ways of income generation through the different stages of activities from plantation of the host plant mulberry, to silkworm rearing and post cocoon activities of textile technology. It is a land-based occupation suitable for establishment in the rural areas where land is sufficiently available. This industry is rightly described as "The Industry of the Poor".

Sericulture industry combines the attributes of both agriculture and industry. It comprises three distinct activities viz. cultivation of mulberry, rearing of silkworms and reeling of cocoons. These three activities work in concert. The cultivation of mulberry and rearing of silkworms come under agricultural sector and the reeling of cocoon under industrial sector.

The industry revolves around both on-farm and off-farm activities, and all these require a lot of labour. Therefore, sericulture is a labour-intensive industry

quite suitable for labour-rich countries. Further, sericulture is an art in the hands of rural folk, and an anti-poverty program for rural population.

Silk is the outcome of sericulture industry. Silk is a strong, shiny fiber that is used to make fabrics. Silk has a natural beauty and no other fabric can match its luxury, luster and elegance. It is the most precious, natural fibre, which has a unique place in the textile world and is rightly recognized as the "Queen of Textiles." It is an ecological and non-polluting material too with which humanity has been in love since the dawn of civilization.

Silk fabrics are mirrors of all the civilizations in which they have played a part. They are records of vast migrations that human beings have embarked upon over the centuries, taking with them their philosophies, technological discoveries, artistical designs and religious symbols.[1]

The silk industry comprises all the three sectors; Primary, Secondary and Tertiary. Agricultural activities of mulberry plantation come under primary sector, rearing of silkworms and reeling can be included under secondary sector and weaving, bleaching, production of cloth, etc. belong to tertiary sector.

1.2. Importance of Sericulture

Agriculture remains the main source of income, directly or indirectly, for majority of the people living in the developing countries. The majority of the rural farmers are small and marginal. It is realized that these small and marginal farmers constitute a resource base for major agricultural programs so that increase in

productivity for the small and marginal farmers can provide significant boost to the national economic growth as well as improved income distribution within the country.

It is estimated that the poorest countries will continue to live in the rural areas since the urban growth will remain severely limited. Therefore, agricultural labour force will have to find their employment opportunities in the rural areas itself in the coming decades. Such countries must focus all their development strategy on raising the productivity of the rural areas in order to achieve higher economic growth and better income distribution.

Sericulture, being an agro-based rural industry, is highly suitable to the countries having an agricultural base and problems of providing employment to the rural labourers. It is mainly a rural and labour intensive industry requiring relatively low investment and offering high profit potential and foreign exchange earnings.[2]

Mulberry sericulture is well suited for marginal, small and landless farmers. Because of its small initial investment, short gestation, labour intensiveness, gender sensitation and employment opportunities in both on-farm and off-farm activities, it has an edge over other crops in the rural sector. It is an ideal vocation for the weaker sections of the society. Once mulberry is planted, it takes only six months for initiating silkworm rearing and later, once in every 45 days a crop can be taken.[3] It does not require any sophisticated machinery. There is little risk that the jobs will

be wiped out by a sudden change of technology or by the introduction of heavy machinery.[4]

The more significant fact is that these employments are rural based and generating among the poorer sections of the population i.e. the agricultural labourers, reeling and twisting workers and weavers. The industry also offers considerable downstream employment and value addition to the manual labour.[5] In India, women constitute over 60 per cent of those employed in down-stream activities of sericulture in the country. This is possible because sericulture activities starting from mulberry garden management, leaf harvesting and silkworm rearing is more effectively taken up by the women folk. Even silk reeling industry including weaving is largely supported by them.

Mulberry, the sole food plant of silkworm, is a draught tolerant and robust perennial plant, and could be grown even in the areas with very less rainfall. Under draught conditions, when most of the agricultural crops do not survive, mulberry prospers. Even with as low rainfall as 320 mm (12 inches) per annum, it ensures two to three crops a year generating income sufficient to maintain a family at a subsistent level.[6]

Sericulture industry plays a vital role in transferring wealth from rich to poor sections because silk is consumed mostly by the rich and the money so spent is distributed among the rural poor. While sericulture is considered to be the industry of poor, silk, the empress of textiles is considered to be the fabric of affluent class.[7] Benefits of sectoral value-addition primarily accrue to rural households. As the end

product users are mostly from the higher economic groups, the money flows from high end groups to low end groups. About 57 per cent of the gross value of silk fabrics flows back to the cocoon growers. Table 1.1 shows the distribution of income from the sale of silk fabric among different sections of the society.

TABLE 1.1

Distribution of Income from Sale of Silk Fabrics

Sl. No.	Category of Persons	Gross Value of Silk Fabrics (Percentage)
1	Cocoon Grower	56.8
2	Reeler	6.8
3	Twister	9.1
4	Weaver	10.7
5	Trader	16.6
Total		100

Source: http://www.indiansilk.kar.nic.in/body_sericulture.html#2

From Table 1.1 it can be understood that out of the total income from the sale of silk fabrics, 56.8 per cent goes to the cocoon producers. The reelers are only getting the smallest share i.e. about 6.8 per cent of the total income. The Table clearly shows that the cocoon producers, i.e. the persons engaged in sericulture are getting the major share of income of the silk industry.

The sericulture technology is more labour intensive rather than capital intensive. Therefore, this enterprise is very well suited to small and marginal farmers who have got relatively less land and capital and more labour. The residue of mulberry leaves after feeding silkworms serves as a very good feed for milch animals. The adoption of sericulture by small farmers along with crop and dairy

enterprise will not only help to augment income from the entire farm but also provide gainful employment to the family members throughout the year. It is said that silk and milk go together.[8]

The whole activities of sericulture from the cultivation of mulberry till the production of silk are eco-friendly also. As a perennial crop with good foliage and root-spread, mulberry contributes to soil conservation and provides green cover. Waste from silkworm rearing can be recycled as inputs to garden. Dried mulberry twigs and branches are used as fuel in place of firewood and thereby reduce the pressure on vegetation or forest. Developmental programs initiated for mulberry plantation are mainly in upland areas where un-used cultivable lands are made productive. Mulberry can also be cultivated as intercrop with numerous plantations. Mulberry being a deep-rooted perennial plant can be raised in vacant lands, hill slopes and watershed areas.

1.3. Statement of the Problem

Poverty and unemployment are the two major problems faced by Kerala today. Since the economy of Kerala is mainly based on agriculture, a meaningful solution to these problems should come from agriculture itself. The growth and diversification of the agricultural sector is pertinent particularly from the point of view of employment generation and balanced regional development of the State's economy. But, the figures show that Kerala failed to keep pace with the growth rates recorded in other important agricultural States in the country. The contribution of the agricultural sector to the State GDP declined from 66 percent in the early fifties to

30 percent in the mid nineties.[9] The traditional agricultural activities of Kerala are facing a set back either due to labour problems or due to marketing constraints. It is at this juncture sericulture becomes a boon to Kerala. Mulberry sericulture is a land-based activity with good potential for generating productive employment.

The strategy for agricultural development must be one of maximizing the income from land so as to ensure livelihood security to the population dependent on agriculture. Sericulture would be helpful to a great extent to achieve the objectives of agriculture envisaged in the Five Year Plans. A cultivation of mulberry on a minimum of 50 cents of land is profitable. When compared to other agro-based activities the advantages of sericulture are labour intensiveness, low capital investment, short gestation and ready market. A highlight of this industry is that it is an area where women labourers can be successfully employed. The following Table shows that compared to some of the agricultural crops, sericulture is a more labour deployed industry.

TABLE 1.2

Employment Potential in Various Crops (Man-days /acre)

Sl. No.	Crop	Condition	
		Irrigated	Rain fed
1.	Mulberry	393	116
2.	Ragi	85	50
3.	Potato	150	52
4.	Groundnut	93	72
5.	Paddy	80	N.A.

Source: Sericulture for Prosperity NCERT, New Delhi, 1994.
N.A.: Not available.

It is very clear from Table 1.2 that when compared to paddy, sericulture creates 393 man-days per acre, which is about 5 times more than the same created from paddy cultivation.

Sericulture involves simple technologies, which are easy to understand and adopt even by illiterate farmers. It gives returns in quick succession yielding income for every two or three months. Sericulture does not involve hard labour and therefore, the rearing of silkworms is generally attended to by women and old people. It involves the use of simple appliances and does not require any complicated machinery. This is an industry with tremendous scope for decentralization.[10] The raw silk has very good demand both in the domestic and international markets.

1.4. Importance of the Study

Rural development occupies a vital place in the growth strategies of developing countries. It comprises several factors and it has its own dimensions which need to be understood in proper perspective. About 90 percent of the rural population is poor who work on farms and other activities connected with agriculture. It shows that growth and diversification of agriculture is inevitable for the long term alleviation of poverty. The poverty is generally associated with unemployment. Therefore, any solution to the problem of unemployment calls for structural changes.

The choice of land augmenting technology is the only alternative strategy to create more employment opportunities within agriculture itself. Since the scope for

expanding area under cultivation is highly limited, employment in agriculture can be augmented by increasing the intensity of labour to land.

Sericulture is a crop enterprise which provides employment both at the stage of cultivation of mulberry and rearing of silkworms. Full mechanization of the industry is not possible. Hence, sericulture has relatively greater employment potential than other allied enterprises. It provides employment both for unskilled and semi-skilled men and women in rural and semi-urban areas. It has been observed in the case of small and medium farmers that large portion of on-farm employment generation is from family labour. In the case of small farming operations, the whole activities can be managed by a few family members.

In India, sericulture provides employment to more than six million persons, most of them belonging to the weaker sections of the community.[11] Sericulture has got special significance in employment of women and aged who have limitations due to poor resources, poor physical stamina or due to prevailing social customs.

The industry in India was confined to only five states, but since more and more farmers have taken up the sericulture activity, it is now spread to almost all States of the Country. As appropriate technology has been developed for mulberry cultivation and silkworm rearing, sericulture can be introduced in all kinds of areas.

The promotional agencies are playing a very important and dynamic role in the development of sericulture. The Central Silk Board, Bangalore and Central Sericultural Research and Training Institute, Mysore are providing technological and

infrastructural facilities for the development of the industry. The National Sericulture Project has given a very big boost to this industry.

The industry is developing in Kerala also. The soil and climatic conditions of Kerala are very much suitable for the cultivation of mulberry and rearing of cocoons. At present, all the 14 districts are having sericulture operations. The Kerala State Sericulture Co-operative Federation Ltd. (SERIFED) is giving the technical and other facilities required for its development.

Though this industry is growing in Kerala, it needs support from the government as well as from other agencies for its healthy growth. This industry in Kerala is suffering from organizational, financial and technical problems. The weakness of this industry is reflected from the poor production figures. Though there is considerable increase in the area of cultivation and in the number of farmers, there is no significant change in the production of cocoons. From the point of view of farmers and extension workers, there is a great need for finding out the ways to achieve increased productivity. It is in this connection, the studies on the economic aspects of sericulture and the role of promotional agencies for the development of sericulture, assume utmost importance.

Although there are several studies at the national, regional and local levels, most of them are general or scientific in nature. There have been no specific studies on the developments and problems of this industry in Kerala based on the activities of a promotional agency. Therefore, the thrust in this study is to analyse the role of

SERIFED in the progress of sericulture industry in Kerala and to study the industry in general.

The present study is intended to assess the progress of the industry in Kerala by giving due importance to the role of SERIFED. The ultimate aim is to suggest some package or program to be implemented by Serifed or by other promotional agencies for the overall revival of the industry, which will provide more employment opportunities to the rural people.

1.5. Scope of the Study

In Kerala, sericulture is mostly practiced by the traditional rural farmers. These farmers are cultivating mulberry, rearing silkworms and producing silk cocoons, which are sold to Serifed. Though Serifed has extended its activities to post-cocoon sector like silk reeling and weaving, these activities are not included under the purview of the present study as these functions are performed by organizations formed exclusively for those purposes. Therefore, the focus of the present study is on the activities of mulberry cultivation and silkworm rearing which are performed by the rural farmers and the services of Serifed towards these activities.

1.6. Objectives of the Study

1. To examine the growth of sericulture industry in Kerala with its problems and prospects.

2. To examine the various financial packages and subsidies given by SERIFED.

3. To assess the effectiveness of training and other technical assistance provided to farmers by SERIFED.

4. To evaluate the procedure of cocoon procurement adopted by SERIFED.

5. To suggest some schemes for the improvement of working of SERIFED for the development of sericulture.

1.7. Hypotheses

1. There is significant difference in the sericultural pattern of the three districts.
2. There is considerable difference in the financial assistance provided by Serifed in the three districts.
3. The perceptions of the farmers about the functions of the Serifed are different in the three districts.
4. The problems experienced by the sericulturists are not the same in all the three districts.

1.8. Research Methodology

Sericulture activities are distributed in all the 14 districts of Kerala and in each district Serifed is having district office. To keep the study within manageable limits without in any way minimizing its significance, three representative districts were selected as the study areas. For this purpose, the entire Kerala has been stratified in to three zones, namely South, Central and North zones. From each zone, a representative district is selected purposively on the basis of maximum

concentration of farmers (year 1999-2000). Thus, Alappuzha district of South Zone, Malappuram district of Central Zone and Kannur district of North Zone were selected as the representative districts.

From the selected districts, three Blocks from Alappuzha, five Blocks from Malappuram and four Blocks from Kannur were selected where sericulture is practiced intensively. Again, on the basis of intensive sericultural operations, seven Panchayats from the three selected Blocks of Alappuzha district, 13 Panchayats from the five selected Blocks of Malappuram district and 10 Panchayats from the four selected Blocks of Kannur district were selected. Thus, a total of 30 Panchayats were selected and from each Panchayat, 10 farmers were drawn at random as samples for the study.

Primary Data: Primary data were collected from a total of 300 farmers drawn as above from the three study districts by way of a pre-tested and structured schedule.

Secondary Data: Secondary data were collected from:

- Head office of Serifed at Thiruvananthapuram and its three district offices of Alappuzha, Malappuram and Kannur by way of an unstructured schedule.
- Various theses and works connected with sericulture.
- Study reports of government and other agencies.
- Textbooks related to the topic.
- Various articles published in leading journals and
- Internet sources.

1.9. Sample Design

Samples were selected from the three districts of study. A total of 300 farmers comprising 70 farmers from Alappuzha, 130 farmers from Malappuram and 100 farmers from Kannur were selected as explained above. These farmers consisted of small, medium and large classes. The sample design is given in the figure shown below:

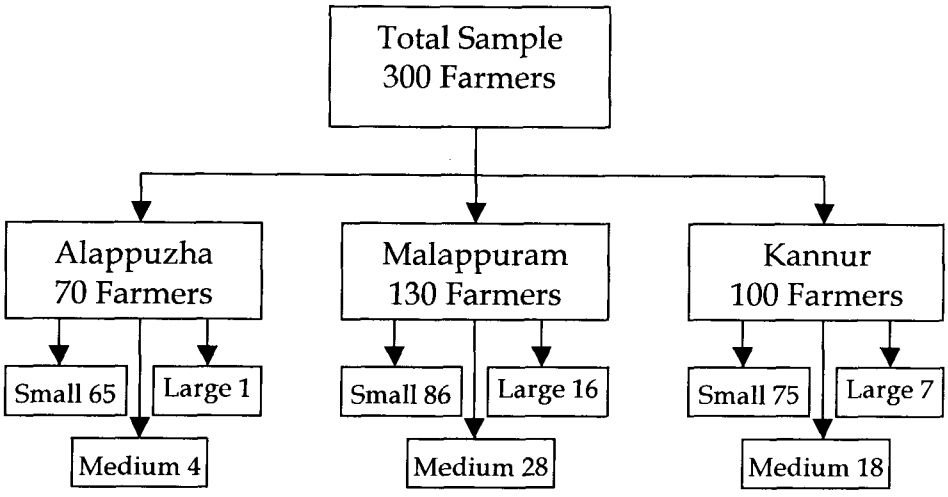

Figure 1.1 Sample Design

1.10. Statistical Tools Used for Analysis

1. Percentages/Averages: Percentages and arithmetic averages are mostly used to analyse and interpret the values provided in the various tables.

2. Standard deviation: This tool is used to measure the dispersion of different values where the variations in the values are to be interpreted along with averages. The following formula for calculating standard deviation is used:

$$SD = \sqrt{\Sigma d^2 / N}$$

Where, SD stands for stand deviation, $\sum d^2$ for the sum of the squares of the deviations measured from the arithmetic average and N for the number of items.

3. Chi-square test of independence: This is used to test the hypotheses set for the study. The following formula is used:

$$\chi^2 = [\sum (O - E)^2 / E]$$

Where, χ^2 stands for Chi-square, O for observed frequencies and E for expected frequencies. The critical values were decided at five percent level of significance for (r - 1) (c - 1) degrees of freedom to interpret the calculated values of Chi-square. (r stands for number of rows and c for number columns in the frequency matrix).

1.11. Period of the study

A period of 10 years is selected for the study beginning from the year 1996 and ending in 2005. However, this time limit was not followed for information having historical importance. Again, for collecting primary data, only the financial year 2004-05 is considered.

1.12. Limitations of the study

A major part of the study was based on the information provided by the rural farmers. They might not have revealed some information due to any personal reasons. The study was also based on the secondary data provided by SERIFED

from its Head Office and District Offices. It is afraid that certain information might not be revealed by them due to secrecy or other reasons. However, sincere effort has been made to draw authentic conclusions.

1.13. Layout of the Study

The entire thesis is divided in to seven chapters including the present chapter. A brief description of these chapters is given below:

The first chapter provides a general description of sericulture, its economic importance, importance of the present study, scope and objectives of the study, hypotheses formulated, research methodology, sample design, statistical tools used, period of the study and limitations of the study.

The second chapter covers a review of earlier literature available in the field of sericulture and silk industry.

In the third chapter, a global view of sericulture is given. The chapter contains an explanation of the history and development of sericulture, international production and transactions of silk, a brief description of the varieties of silk and procedure of sericulture, progress and production details of silk in India and an explanation about the promotional agencies of sericulture in India.

The fourth chapter explains about the sericulture in Kerala. This chapter has two sections. The introduction of the industry in Kerala, its progress through years and information on Serifed are given in the first section. The second section contains an empirical analysis of the general features of sericulture in Kerala.

In the fifth chapter, an analysis of the financial aspects of the various phases of sericulture in the districts of study is provided. A discussion of the cost and income aspects of sericulture of these areas is also given in this chapter.

The sixth chapter provides an analysis of the activities of Serifed and a discussion on problems faced by the sericulturists in the area of study.

The seventh and the last chapter presents the findings of the study and some suggestions put forward for the improvement of the functions of Serifed and for the development of the sericulture industry in Kerala.

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CHAPTER II

REVIEW OF LITERATURE

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Sericulture is an area, which has attracted the attention of a number of researchers. The importance of this multi-dimensional industry in solving the problems of poverty and unemployment has inspired the economists, planners and scholars to think about its various aspects. The superfluity of surveys, reports, articles and scholarly works show the significance of this subject and the interest shown by various writers. There are numerous scientific and research works in agricultural aspects of mulberry, silkworm varieties and breeding technologies. Extensive works are also found on the economic and commercial aspects of sericulture. In this chapter, an attempt is made to review the available literature on this subject.

With a view to place the study in proper perspective, the important contributions in this field are analysed and to identify the gaps, the different scholarly works are classified in to six major categories namely, (1) Marketing and Demand (2) International Trade and Quality Control. (3) Cost, Returns and Pricing (4) Income and Employment (5) Credit and Financing and (6) Extension, Training and Development. Studies related to Kerala are reviewed under a separate category.

2.1. Marketing and Demand

Marketing is the most important factor, which influences the development of sericulture in any country. Timely marketing facilities and reasonable prices can encourage the sericulture activities.

D.V. Jahagirdar[1] in his study pointed out the need for developing efficient marketing system for cocoons. He explained that good market support scheme is essential to protect the interests of the producers and to save them from middlemen.

The study of K.B. Ramakrishna, *et al.*[2] revealed that marketing is a weak link in sericulture industry in India. According to them, the cocoon growers are invariably left to the mercy of the reelers. The survey of S. Venkatagiriyappa, *et al.*[3] revealed that the exorbitant luggage charges, unscientific assessment of cocoons, unsatisfactory weighment and price paid by private reelers are the major problems in marketing of silk cocoons.

According to T.H. Somashekar[4] the open auction system in silk exchanges has not assisted in the development of desired linkages between rearers and reelers and reelers and weavers, while such linkages are extremely important in the quality improvement. Priti Tandon[5] explained about the hurdles in marketing of silk goods. The study revealed that the marketing is very complicated as the silk product passes through several intermediate agencies before it reaches the final consumer. According to Ronald Currie,[6] the main features of today's market are turbulence,

uncertainty and innovation. He pointed out that the traditional image of silk has been seriously altered since the new markets for silk have opened up.

Gopal Naik[7] has tried to evaluate the regulated cocoon markets of the country. He observed that there is no scientific grading in these markets as quality assessment is mostly done by visual inspection. P.G. Chengappa, *et al.*[8] gave an account of the silk exchanges of the country. They are of the opinion that the silk exchanges should imbibe the concept of a real produce exchange with facilities for both spot and forward sales. They stress on the need for a silk exchange, which is not subject to much controls and which prompt buyers and sellers to voluntary trade rather than compulsion.

Raveendra Mattigatti, *et al.*[9] have identified the marketing constraints in sericulture and revealed that there is no strong linkage among the marketing system, input supply and services. They suggest that there is a need for such facilities under one roof, which would ensure timely supply of inputs and services. S. Narasimha Reddy and H. Jayaram[10] in their study found that the weaving industry has been characterised by middlemen who exploit the poor, illiterate weavers. The weavers are the weaker section of the community and they find it too hard to invest adequately in the necessary outlay, thus making them to depend largely on the master weavers for their raw material and marketing needs.

M.N. Ramesha[11] feels that there is a need for systematic effort to introduce new products at regular intervals to the market. He pointed out that it is the exclusiveness of a product that attracts a buyer in the market. Therefore, the need is

for a regular system that could work for a systematic research and development in product diversification and also to assist the entrepreneurs to popularise the Indian silk goods in different markets so that they could gain better value addition and brand recognition.

According to Dr. C. Ravikumar and Prabha Sekhar[12] the cocoon markets and silk exchanges of Karnataka are successful in providing a healthy competition in the market. They are of the view that the centralised cocoon markets are assuring the farmers immediate sale of their produce, ready payment to the seller and a competitive price for the produce.

The findings of R. Chandrasekhar Reddy[13] reveal that the buyers and auctioning agents are playing fraudulent practices against sericulture farmers in the cocoon market. He reports the existence of secret agreements between the purchasing and auctioning authority in the market yard. G.R. Gopinath[14] in his analysis on scope for large-scale farming in sericulture finds that large scale farming will assure reliable and steady supply of quality cocoons to the reelers and pave the way for a marketing tie up with buy back arrangements between the farmers and the reelers.

As far as the demand for silk is concerned, Ronald Currie[15] is of the opinion that the traditional image of silk has been seriously altered since the new markets for silk have been opened up. He reports that since silk has lost its exclusive aspect, it has also lost much of its unique appeal. The findings of H.V. Henle[16] revealed that demand for silk and silk products is not easy to quantify and very aggregated

volume data tend to become blurred in their significance and therefore, less meaningful. Value figures are even less apt to describe the true composition of demand. For to the amounts of raw silk offered, demanded and then traded must be added at least four or five other categories of products between which a shift of demand is generally not or not easily possible for various technical and commercial reasons.

Gopal Naik[17] explains that the growth of silk industry in the long run depends on the growth in the demand in the consuming markets as well as how efficiently these demands are transferred at various levels within the industry, i.e. demand from silk fabric to demand for raw silk and cocoon. He points out that growth in demand is influenced by some controllable variables such as marketing mix variables and external variables such as growth in purchasing power.

P. Joy Oommen[18] is of the opinion that driven by a strong and tradition-bound home demand, Indian silk industry has been to a large extent insulated against international competition and cushioned against low quality. According to K.S. Arunkumar, *et al.*[19] the demand for raw silk has been gradually expanding. They revealed that with the declining trend noticed in Republic of Korea and steady trend in Brazil and the withdrawal of Japan from the world silk market, the persisting domestic demand in various countries will have to be met by India and the Republic of China. K. Periasamy and S.Radhakrishnan[20] are of the opinion that the overall world demand for silk will remain far above the actual supplies.

Jiro Obitsu[21] reveals that the domestic consumption has been ahead of raw silk production in the country as the demand exceeded local production capabilities. He points out that demand for silk cannot be satisfied for many years to come. G. Thimmaiah and C.S. Nagabhushna[22] are of the opinion that it would be better if India launches a program for promoting the sale of Indian silk goods within the country for which there is great potential. M. Madan Mohan Rao[23] is of the view that simply increasing the production of cocoons is not enough. Providing marketing facilities and thereby increasing the demand for the cocoons is extremely essential for sustaining the industry.

2.2. International Trade and Quality Control

International trade in silk products takes place both at the primary and secondary levels like the cocoon, raw silk, thrown silk yarn, waste silk, spun and noil silk and fabrics, made ups, garments, carpets and furnishings. India is an exporter of finished garments and at the same time an importer of raw silk.

Ronald Currie[24] is of the opinion that there is a distinct swing away in importing countries from imports of raw silk towards the imports of finished goods. He explains that the import statistics of major silk importing countries like Unites States, Europe and Japan shows a tendency of increased imports of silk fabrics and made-ups in place of raw silk. Rajive Aggarwal[25] is of the opinion that there is good prospects for Indian silk exports when the indigenous mulberry raw silk is of excellent quality or when the raw silk imported at optimum price or when all wheels of export production and marketing are in excellent condition.

Mamta Vyas[26] has made an attempt to analyse the activities of Indian Silk Export Promotion Council, which has been established to undertake export promotion measures for silk goods. The author recommends for incentives and financial support to small exporters and suggests making efforts to explore new markets.

P.G. Chengappa, *et al.*[27] observed that the Indian silk industry has to depend on imported yarn to meet the requirements of the high quality export sector. They reveal that this situation will continue since there is a strong demand for quality silk not only for export of finished products but also for the domestic fabrics. They suggested integration of silk industry to the global market so that benefits of international markets are made available to our silk industry. The findings of the study of Dr. I. Satya Sundaram[28] reveal that there is a threat from Chinese silk to the Indian market. He reports that the coarse silk produced in India is facing severe competition from the superior quality Chinese Silk that is suitable for making Kanjeevaram and Dharmavaram Sarees.

Dr. C. Ravikumar and Prabha Sekhar[29] identified the invariably inferior quality of Indian silk products as the main bottleneck in capturing the world market. They warn that unless an effort is made to improve the quality of raw silk and the fabric woven from them, India will not be in a position to boast itself as a sericultural country, which would contribute much to the world sericulture. According to Urs Heierli[30], despite the predominance of China there is scope for an increase in

production in other countries. He concluded that, it is not easy to compete with China, because of their high production standards and low prices.

Dinesh Sharma, IAS[31] has made an attempt to analyse the new challenges in silk exports. He came to the conclusion that the Indian silk exports continue to remain to low level due to lack of both knowledge as well as competence to meet the demands of the market. The study of C.B. Jaganatha Rao[32] reveals that though there is a considerable increase in the growth rate of the total value of silk exports, there is no corresponding increase in the growth rate of the quantity of silk product exports. According to him, under the liberalised scenario, the motto of silk exporters from India should be producing for exports rather than exporting what we produce.

The survey of Dr. V. Vigneshwara[33] points out that the rising demand for silk within our country has reduced the quantum of surplus available for exports. He confirms the fact that this industry offers a vast scope for increasing production so as to meet domestic demand fully and also to earn valuable foreign exchange through exports. Dr. Neeru Saluja[34] explains that the essence of silk pricing policy in the international market is the realisation that the selling price is not a function of demand and supply but a function of salesmanship. It is well pointed out that the price that silk textiles fetch is dependent wholly on how well they are marketed.

Quality is an important concern as far as silk products are considered. Most of the silk produced in India are of inferior quality as the farmers rear multi-voltine varieties of silkworms. R.K. Datta[35] reports that India has to produce a large quantity of bivoltine cocoons and reel out the quality silk using modern filatures. He

suggests an all out national effort towards the production of uniform quality bivoltine silk in large quantity. K.Thangavelu[36] is of the opinion that the quality of silkworm races is by far the most important element of sericulture technology and because of this, efforts should actually be devoted to the breeding of better races.

T.N. Sonwalkar[37] reveals in his study that the response for much needed technology up gradation is rather slow for various reasons including the high investment cost. He stresses on the immediate need to adopt appropriate reeling technology that suit the quality for cocoons to derive the best. According to Gopal Naik[38], technology and process adopted in the Indian Silk Industry has been traditional at all stages resulting in lower productivity and poor quality products. He identifies the decentralised nature of the industry as the major hurdle in improving quality.

P.G. Chengappa *et al.*[39] points out that the quest for high quality fabric needed for domestic as well as export market would begin with the farmer who rears the silkworm to produce the silk cocoons. Therefore, the support system for the farmers should be strengthened to help the production of high quality bivoltine cocoons on a regular basis. He adds that quality should be built into an organisation and its products by being competitive by eliminating consternation, by managing costs and most of all by caring passionately for the customer. Raveendra Mattigatti *et al.*[40] are also of the opinion that the quality of silk depends upon the cocoon quality and processing technology. According to G. Sreerama Reddy[41] the quality of silk in India

is low due to the continuous dependence on multivoltine breeds of silkworm and also due to the organisational lacuna.

R.K. Datta *et al*[42] identify the challenges before silk industry as productivity and quality. M.N. Ramesha[43] says that with advanced technologies it is time for all the agencies to join hands for a collective and planned effort to produce quality silk in bulk that meets export needs. T.N. Sonwalkar[44] explains why quality control has not been effectively adopted in the Indian silk industry. He says that the industry is small and cottage based and a major quantity of raw silk produced is utilised by the handloom weaving sector. D.S. Srikantaradhya[45] suggests that there is the need for revamping filature units without which their working cannot be improved and also the much needed increase in the production of raw silk of superior quality cannot be achieved.

2.3. Cost, Returns and Pricing

B. Rajesh and Ismath Afshan[46] present a comparative study on the cost structure and subsequent returns with regard to sericulture and cultivation of some other crops. The study revealed that the cost benefit ratio is more in sericulture, as the cost of production is low and the number of crops realised in sericulture is more. The study of K.B. Ramakrishna, *et al.*[47] revealed that in the total cost of production, mulberry leaves had the major share. Out of the fixed costs, depreciation on rearing room and equipment was the major item followed by interest on fixed cost.

A study conducted by S.S. Misra[48] proved that the cost of producing mulberry has a direct impact on the cost of producing cocoon, as nearly 60 per cent of the total

cost of production of cocoons goes to the production of mulberry leaves. Mohamed Khaiser Ahmed[49] in his study proved that the major cost item in silk reeling is cocoon which account for over 90 per cent of the total cost in all the processes. S. Lakshmanan, *et al.*[50] report that there is inverse relationship between farm size and cost of production. The study brought out the fact that the smaller landholders had incurred higher cost in producing mulberry and cocoon than that of higher landholding groups. It was proved that the realisation of low return was due to higher investment in factors of production. Abdul Aziz and Vijayakumar Shetty[51] are of the view that research is required to identify areas of low efficiency in materials used and to evolve appropriate policy parameters to make the best use of the materials. The study of T.R. Somashekhar[52] reveals that a control of waste at various stages of the operations of reeling and weaving brings in a lot of savings since silk is a very expensive material.

T.N. Sonwalkar[53] points out that in silk reeling, cocoon cost comes to 80% and therefore, to get reasonable returns, the reeling units should utilise the silk waste also. According to K.V. Patel [54] the cost of family labour, which is often excluded from the calculation of total cost, should be included in the farm profit, while calculating the income of the family. G.R. Gopinath[55] is of the opinion that if large scale farming is introduced in sericulture along with better rearing practices, it is possible to save 80 percent of the labour costs. According to Dr. G. Rangaswami, *et al.*[56] the growth of sericulture on an industrial scale in a country is decided by its cost of production. Dr. Krishnaswami, *et al.*[57] says that though sericulture is practiced mostly on small or medium scale, the remunerative returns from it has opened the

possibilities of establishing the industry on a plantation scale.

Price is an important factor in sericulture, which controls the production of cocoons, yarns and cloths. L.V. Nagarajan[58] expresses his view that the economic theory on the relationship between demand and supply is applicable to sericulture and silk industry also. He argues that sericulture spread, quality of cocoons, and demand in the market are clearly and directly linked to prices in the different segments of sericulture industry. Shridhar Patali, *et al.*[59] are of the opinion that due to high unit value of silk products, it is essential to develop low cost products by mixing it with cheaper quality yarns, which will be within the reach of larger sections of the population.

According to N. Nagaraj, *et al.*[60] the price fluctuations for cocoons is not much when compared to other commercial crops, since the sericulture market is well organised and integrated and functions fairly efficiently. S. Lakshmanan and R.G. Geethadevi[61] point out that incentive price and minimum support price policies should be implemented in sericulture also so that farmers could be motivated in adopting new technologies at a faster rate.

B. Trudel[62] explains that the sericulture development is possible only if the prices of raw silk are kept reasonably high. G.S. Yadav, *et al.*[63] are of the opinion that apart from various economic aspects, the price factor have a definite influence on the existing unbalanced demand and supply position of silk yarn. T.N. Sonwalkar[64] says that prices of cocoon and raw silk should be based on quality, which would determine the minimum floor price of cocoon and raw silk. K.S. Menon, *et al.*[65]

report that the absence of quality based pricing makes the fluctuation in both cocoon and raw silk prices. V. Balasubramanian[66] is of the opinion that though silk exchange is established to relieve the reelers from the mercy of the merchants, in practice it has been degenerated and instead of open competition, the merchants still negotiate the price privately.

2.4. Income and Employment

Sericulture is a highly labour intensive enterprise, which provides regular income and employment opportunities to the rural population. A comparative study made by G. Sandhya Rani[67] reveals that the generation of man-days on one acre of mulberry garden is three times more than that of paddy, nearly four times than that of groundnut and five times than that of ragi. H.V. Henle[68] is of the opinion that a vibrant growing sericulture sector provides employment in great quantities, hence income to the rural population and feeds the domestic transformation industry. Trilok N. Hajare, *et al.*[69] expressed their opinion that sericulture being a low investment and high return oriented agro-based activity, suits well in ensuring better avenues of regular earning to the small and marginal farmers with limited resources.

The study of A.R. Rajapurohit and K.V. Govindaraju[70] establishes that sericulture is an enterprise when integrated with cereal and bovine enterprises through input output linkages, provides large scale employment and yields relatively high income. The findings of R. Chandra Shekhara Reddy, *et al.*[71] reveal

that sericulture industry brings about rural economic development by providing gainful employment to family and also other wage earners of rural population not just by increasing the wages abnormally, but by providing employment to large number of persons with a moderate increase in wages over the years.

Dr. N. Kamalamma, *et al.*[72] identify sericulture as a viable rural industry mainly because it provides remunerative employment to families and labour throughout the year and also ensures periodical income even with small land holdings. H.G. Hanumappa and D. Rajasekhar[73] are of the view that sericulture is the most remunerative when compared to other crop activities in terms of income generation. According to Ismath Afshan[74] the economic gains of Sericulture industry are further enhanced due to the wide demand that the silk waste commands and the price it fetches.

Dr. R.K. Datta and Dr. C. Ravikumar[75] identified sericulture as a highly remunerative crop with minimum investment and rich dividends. According to K.V. Benchamin[76] mulberry sericulture is a rural based family enterprise, generating high levels of employment and a secure, stable income, at regular intervals, with comparatively low investment and short gestation. The study of S.Gregory[77] revealed that the recognition of women's labour is more pronounced in sericulture than in non-sericulture households.

According to G. Parameshwara[78] sericulture provides an ample opportunity for increased employability of human resource and can effectively check migration

of people to urban areas. The study of K. Vasanthi[79] shows that sericulture generates direct and indirect employment in various ways.

The study of Mrs. Prabhashekhar and Dr. C. Ravikumar[80] shows that sericulture generates high employment and income per unit of land area. S.S. Misra[81] is of the opinion that the sericulture industry provides opportunities for earning additional income during off-season of crops. The study of H.G. Hanumappa and S. Erappa[82] revealed that increased number of cottage basin units would correspondingly provide increased employment opportunities and hence there is no need of fear that the replacement of charka technology by cottage basin technology would result in depriving employment to those who are already engaged in these activities. A study conducted by G.N. Nagaraja, *et al.*[83] showed that the existing sericulture based farming system followed by small farmers are less efficient than farming system developed through normative farm plants that exhibit potential or higher income and employment.

2.5. Credit and Financing

Adequate and timely credit from a suitable agency is a precondition for the sustained growth of sericulture. According to M.G. Kerutagi and H.G. Sankara Murthy[84] there is a great scope for extending financial facilities to encourage cocoon production through institutional agencies.

The study of Ravindra Mattigatti, *et al.*[85] revealed that, when compared to the income derived from sericulture, the percentage of contribution of loan to the funds of the farm is very low. Jacob Thomas, *et al.*[86] observed that there is a big gap

between the requirement of credit and actual disbursement. H.A. Nagaraja Rao[87] has made an attempt to analyse the loans given by various agencies and suggested adequate credit flow to meet the working capital requirements.

According to Dr. V. Vigneshwara[88] to encourage production internally, a comprehensive programme of financing the various sectors should be evolved. He suggested a credit plan based on the loan requirement of the sectors and availability of resource with financing agencies.

The study of K. Ramesha, *et al.*[89] pointed out that in order to evolve a comprehensive policy on credit related aspects, it is imperative to have a reliable data base on vital aspects of sericulture as also the flow of credit from various sources. H.A. Nagaraja Rao[90] suggested that the credit flow should be free enough to meet the requirements and the interest on loans should be very marginal to support the rural artisans in the country.

K.V. Patel[91] expressed his view that the cost intensive nature of sericulture and its suitability for small producer indicate a clear-cut message for the involvement of the credit agencies. The study of H.G. Hanumappa and D. Rajasekhar[92] concluded that the loans from banks are neither timely nor adequate and the complicated procedures make bank credit costly in terms of both time and money. M.N. Ramesha[93] expressed his concern over the slow inflow of credit and the procedural constraints in availing credit. J. Acharya[94] reported that the credit must flow into the system; it must be made use of in a productive way and must

flow back as repayment so that credit can be renewed and made to operate as a sustainable system.

2.6. Extension, Training and Development

Sericulture comprises of a number of integrated activities. This creates strong needs for forward and backward linkages. Technical training followed by periodic on-farm guidance and trouble-shooting are, therefore, essential for the progress of the industry.

According to K. Kesavacharyulu, *et al.*[95] sericulture development depends not only on the technology generation but also largely on dissemination of technology into sericulture farming community. They are of the opinion that extension field workers play a vital role as a link in the process of technology transfer and in motivation of farmers for the adoption of new technologies. S.B. Dandin, *et al.*[96] are also of the same view that dissemination of technology is more vital than its development, as its success lies in effective adoption and use by the target user. Y.V. Ramanujaneyulu, *et.al.*[97] are of the opinion that the level of understanding and adoption of a technology at farmers' level will have a direct bearing on the quality and yield of the cocoon crop.

S.K. Panda[98] observes that the introduction of sericulture in new areas calls for diversion of land being used for other crops to sericulture. He says that with required planning and support, sericulture can be introduced in new areas and

would play an important role in the process of social and economic development of the backward regions of our country.

Dr. A.K. Dhote[99] is of the view that extension and management play an important role in the development of sericulture activities. He suggested that farmers should be educated regarding the management of mulberry plantations and silkworm rearing while the reelers should be educated in the management of reeling technology. According to Manjeet S. Jolly[100], tradition of sericulture and availability of handloom weaving play a significant role to develop sericulture in a country. It is suggested that, there is a need to develop a mechanism to consolidate the efforts of international agencies, so that the developing countries can get the maximum benefit from their inputs.

Ravindra Mattigatti, *et al.*[101] called for the introduction of co-operative societies in sericulture for higher productivity and well being of silk men in India. G. Sreerama Reddy[102] demanded to re-examine our strategies and priorities both in the sericultural organisation and in the development of new technologies. N.G. Hegde and G.G. Sohani[103] pointed out that Non-Government Organisations (NGOs) with their flexible and people centered extension style have an important role in providing infra-structural facilities and structural services to farmers. S.S. Sinha[104] suggested that NGOs should be brought into the mainstream of development.

A.L. Muthaiah[105] is of the view that our silk cannot survive without generic promotion much longer. K. Vijayan, *et al.*[106] observed that, since the growth pattern of mulberry varies distinctly with environment, adoption of temperate technique in

toto in tropical conditions may not help many of the field problems that Indian mulberry breeds face at present. They suggest a new progeny assessment of seedlings.

The study of Dr. N. Kamalamma, *et al.*[107] revealed that there is the need to evolve appropriate technologies for helping the farmers to perform difficult tasks with ease and comfort, and to increase the productivity. B.K. Gupta and Y.K. Gupta[108] observed that adoption of improved technologies and package of practices and methods as recommended by the research institutes for pursuing sericulture varies from farmers to farmers due to their heterogeneous compositions. Mohammed Moiruuddin[109] is of the opinion that the responsibilities that different promotional agencies have to shoulder to save the industry from extinction can be broadly categorized as those to be undertaken by government and those to be undertaken by research and other non-governmental agencies.

An account of the impact of the training programme for women presented by R.G. Geethadevi, *et al.*[110] indicates that skill teaching and training brought a lot of changes in the level of technical knowledge of staff and women sericulturists. The study of Lakshmi Raju, D. and Nataraju, M.S.[111] showed that more number of educational activities involving training have to be conducted in rural areas. The attempt made by Dayanand Bidari and M. Rajasekhar Reddy[112] to analyse the plans for increasing participation of women in sericulture, revealed that, a number of operational problems affect the proper implementation of the plans.

According to P.R. Koundinya, *et al.*[113] to adopt the new technologies for better results, all farmers should get themselves equipped with infrastructure facilities. B.L. Rame Gowda, *et al.*[114] are of the opinion that equipping sericulture farmers with scientific knowledge, favourable attitude, required skills and motivation to adopt recommended sericulture technology is the foundation on which rural development can be initiated in a planned manner. The study of Babulal, *et al.*[115] showed that transfer of technology certainly helps to minimize the yield gap between laboratory and field yield. Urs Heierli[116] remarked that extension services to the farmer are indeed areas for government involvement, and there is little doubt that the quality and usefulness of extension services is determinant for the quality of the silk production.

According to R. Dwarakinath[117] sericulture extension is to introduce locally useful new technology to a village and to get its rapid diffusion. He suggested that learning from experience is a critical input in progressively improving the effectiveness of the extension system. S.S. Sinha and M.K. Jha[118] also recognized the same idea. S.B. Dandin[119] called for a National Sericulture Policy and separate policies for leading States in line with the Centre and defines their development programmes. Sheela Bhide[120] suggested the organisation of productivity clubs of farmers under each Technical Service Centres, which would help faster dissemination of information in new technologies and help focus on productivity parameters. Gerard Chavancy[121] is of the view that the technologies already exist but the transfer of these technologies is posing problems. According to him, there are learning and implementing problems at the processing stage of silk. Saswati

Mookherjee[122] is of the opinion that introduction of sericulture in new areas is likely to face multiple constraints covering geographical, economic, cultural, political and administrative mechanisms.

2.7. Studies Related to Kerala

The study of M.D. Baby[123] is based on the cost, returns and employment aspects of mulberry cultivation and silkworm rearing. His findings revealed that sericulture has become most suitable to Kerala in its geographical, climatic and economic conditions. It is pointed out that sericulture can solve the unemployment and economic problems in Kerala to a great extent. A study made by Jalajakumari, L.[124] concluded that the sericulture activity in the State is highly labour intensive and generating reasonable rate of income to rural farmers.

A case study of Jayan, K.V. and Babu Ambat[125] revealed that the quality and productivity of sericulture in Kerala are far below than the standard. They isolated some problems like inadequate marketing facility, non-availability of quality seeds and lack of financial assistance. A comparative study of sericulture in Kerala and Karnataka conducted by Jothish Kumar, K.V. and Jayan, K.V.[126] found that the main drawback of Kerala cocoon is the poor reelability, which is responsible for the lower price fetched for Kerala cocoons.

Dr. K. Sasidharan Pillai, R. Krishnakumar and A.S. Anilkumar[127] observed that the expenses of the cocoon production are very high in Kerala when compared to other States. The main reason they identified is the excessive labour costs in the State. K. Sasidharan Pillai, *et al.*[128] revealed that sericulture should be practiced in

Kerala with minimum paid labour and maximum family labour since higher labour rates are prevailing in the State. T.K. Sunilkumar[129] expressed his view that mulberry can be cultivated successfully in the State as an intercrop in the coconut gardens. According to Tomy Philip, [130] there is a potential to propagate sericulture in the State as an avocation and to develop it as a remunerative industry. He identified problems like high labour cost, lack of land for cultivation and problems of marketing. The study of P.V. Susamma and P.S. Geethakutty[131] observed that subsidy orientation of the farmers, inadequate marketing facilities and lack of assured market price constitute serious drawbacks to the sericulture enterprise in Kerala.

The survey of R.S. Maruti and Suresh Balakrishnan[132] proved that the income per acre was considerably low in sericulture when compared to agriculture and a major portion of sericulturists are not willing to expand the mulberry acreage. The study of K.S. Menon, *et al.*[133] revealed that the farmers in Kerala have not taken up sericulture as an important livelihood occupation and could not realize the economic importance of the venture. They are of the view that the extension activities must be reoriented to project sericulture as an important economic activity. The study of P.Shaheena[134] revealed that the efforts of the extension agencies can come to reality only when there is an assured market and reasonable prices for cocoons.

2.8. Conclusion

From the forgone review of literature, it can be understood that a number of researchers have made their contributions on various aspects of development and

functioning of the sericulture and silk industry. The scholars generally agree on the fact that adequate backward and forward linkages, proper training of sericulturists and effective technology dissemination are inevitable for the healthy growth of the industry. But at the same time, studies on the development of the sericulture industry in association with the activities of a development agency were not found in the above readings. Therefore, the present study about the sericulture industry of Kerala based on the activities of SERIFED, which is the sericulture development agency for Kerala, seems to be extremely important and appropriate.

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CHAPTER III

SERICULTURE – A GLOBAL PERSPECTIVE

SERICULTURE - A GLOBAL PERSPECTIVE

This chapter is intended to provide an introduction about the history and development of sericulture, an account of the world production and trade of silk, a brief explanation about the different varieties of silk and the procedure involved in making silk, and also to present a view of the sericulture industry of India.

3.1. HISTORY AND DEVELOPMENT OF SILK

Silk, the mystical fibre has a fascinating history, with legends woven together. It is one of the oldest fibres known to man. The history of the silkworm, which is also the story of silk, goes back to ancient times in China. The historians believe that silk was discovered and used in China in 2700 B.C. Some of the stories of silk have been handed down through the generations and are based partly on fact and partly on legend and myth.

Chinese legend gives the title "Goddess of Silk" to Lady Hsi-Ling-Shih, wife of the mythical Yellow Emperor Huang-Ti, who was said to have ruled China in about 3000 BC. It was she who, from observing the effect of her hot tea on cocoon, which accidentally dropped from a mulberry tree into her cup, is credited with the discovery of silk. She is also recognized with the introduction of silkworm rearing and the invention of the loom.

References in the Old Testament indicate that silk was known in biblical times in western Asia, from where it was presumably transplanted to the Greek Islands of

the Aegean Sea. Archaeological excavations in 1927 from the loess soil astride of the Yellow River in Shanxi Province in northern China, has been dated between 2600 and 2300 BC. Another example is a group of ribbons, threads and woven fragments, dated about 3000 BC, and found at Qianshanyang in Zhejiang province. More recent archeological findings; a small ivory cup carved with a silkworm design and thought to be between 6000 and 7000 years old, and spinning tools, silk thread and fabric fragments from sites along the lower Yangzi River, reveal the origins of sericulture to be even earlier. [1]

Only the Chinese knew how to make silk for about 3000 years.[2] It was the most zealously guarded secret in history. Severe restrictions on the transfer of knowledge about sericulture preserved its secret within the Chinese Empire. Growing fascination with the fabric in other countries resulted in the attempts of industrial espionage and the acquisition of knowledge. The Chinese secret of silkworm culture is supposed to have been introduced into the Byzantine Empire in the 6th century A.D. by two missionaries. Soon afterward, Constantinople became a silk manufacturing center. Two centuries later, the industry spread to North Africa, Spain and Italy. From the 17th century, the silk industry flourished in Lyons and France. From there it was carried by French weavers to England.[3] Sericulture has also been attempted in the United States, but these endeavors have been sporadic and largely unsuccessful.[4]

3.1.1. Global Scenario

Silk is produced in about 30 countries in the world, of which 16 are situated in Asia. The Asian countries contribute more than 90 percent of global silk production. In the early phase of the 20th century, Japan was ruling the world silk market by producing about 70 percent of the world's total. But, from mid 70s the Japanese silk production started declining and the Chinese silk production increased steadily to bridge the gap created due to the withdrawal of Japan.[5] At present, China is the leading producer, producing more than 80 percent (year 2004) of the total global production followed by India (13.13 per cent). Traditionally, Japan is the largest consumer of silk fabrics in the world.[6]

At the end of the great depression of 1929-34, Japan dominated aggregate silk output with 75 percent of world production, followed at a wide distance by China and India. The destruction of World War II caused very major setbacks to sericulture in several traditional production centers. By 1961, aggregate global output amounted to only 57.5 percent of the output in the previous peak year of 1938. By 1971, the cocoon harvest in Japan had not reached even half of the production levels of the pre-war period but China had surpassed them by a wide margin. Rapid industrialization and the decline in rural relative wage levels pushed many national sericultural industries into decline and then total extinction, not only in Southern and South-Eastern Europe and Middle East but also in East Asia. Other producers increased their shares in world output and the proportion of Asian raw silk generation in global output, which had been over 95 per cent in 1938, began to

decline in relative terms, but only for a short while. By 1980, Asia's dominant position began to reaffirm itself very forcefully, mainly due to the determined production efforts of China and India.[7]

An account of the mulberry raw silk production among world countries for a period of 10 years beginning from 1995 till 2004 is given below.

TABLE 3.1

World Mulberry Raw Silk Production
(Tonnes)

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004 P
China	67113	68500	60300	57500	56959	61648	64567	68600	94600	102560 (81.64)
India	13909 (14.58)	14126 (14.73)	15236 (17.72)	15544 (19.19)	15214 (19.37)	15857 (18.79)	17351 (19.17)	16319 (17.02)	15742 (13.45)	16500 (13.13)
Japan	3240	2580	1920	1080	650	557	431	394	287	287
Brazil	2468	2270	2120	1821	1554	1389	1485	1607	1563	1512
Korea	946	506	272	210	200	165	157	154	150	150
Uzbekistan	1320	2500	2000	1500	923	1100	1260	1260	950	950
Thailand	1313	1144	1039	900	1000	955	1510	1510	1500	1420
Vietnam	2100	1500	1000	862	780	780	2035	2200	750	750
Others	2967	2766	2117	1572	1250	1952	1692	3814	1500	1500
Total	95376	95892	86004	80989	78530	84403	90488	95858	117042	125629

Source: Sericulture and Silk Industry Statistics-2003, Central Silk Board, Bangalore, http://texmin.nic.in/Sericulture Industry. PDF
Figures in bracket: Percentage to total. P=Provisional.

Table 3.1 gives a comparison of the production of mulberry silk in the important producing countries of the world and the percentage production of India to the total world production, in different years. It can be understood that China is the leading producer followed by India. The production of China comes to about 82 per cent of the world's total (year 2004). It is obvious that, though there is a decline

in the years 2003 and 2004, the production of silk in India is showing an increasing trend.

3.1.2. International Silk Market

In the global context, silk accounts for only 0.2 percent of all textile fibres. World trade in silk can be broadly classified into two groups, viz. (1) Basic raw materials such as raw silk, silk waste, silk yarn and gray fabrics and (2) Finished silk fabrics for clothing as well as furnishings, made up goods for interior decoration, ready made garments, accessories, etc. The trade has grown to a significant level in value terms as silk is a high valued item despite the comparatively low volume of trade.[8] The following Table gives a comparison of world production of silk and other natural and synthetic fibres during selected years.

TABLE 3.2

World Production of Textile Fibres

(Thousand Tonnes)

Years	Natural fibres			Man made fibres		
	Cotton	Wool	Silk	Cellulosic	Synthetics	Total
1975	11809	1502	49	2959	7346	23665
1985	17540	1673	59	2999	12515	34786
1995	19200 (43.6)	1600 (3.6)	100 (0.2)	3000 (6.8)	20200 (45.8)	44100 (100.0)
1999	19200	1400	76	2700	28300	51676

Source: Silk Review 1997 and 2001 - International Trade Center UNCTAD/WTO
(Figures in brackets: percentage to grand total

Table 3.2 shows a comparison of the world production of natural fibres like cotton, wool and silk and man made fibres like cellulosic and synthetics. It can be

understood that in the year 1995, when the production of silk marked the highest, the total production of textile fibres in the world comes to 44100 thousand tonnes of which the share of silk is 100 thousand tonnes, which is only 0.2 percent of the total production of textile fibres. The synthetic fibres have the largest share (45.8 percent) followed by cotton (43.6 per cent).

Raw silk has been transacted in the international market for a long time, since some countries in Europe processed silk but did not produce silk. China, Brazil and Japan are the major suppliers in the raw silk market. China enjoys a formidable monopolistic position in the world silk market controlling almost 80 percent of the world silk trade. China exports nearly 40 - 50 per cent of her total production of raw silk.[9]

Different varieties of clothes are produced from silk. Both handlooms and power looms are making silk products. In India and Thailand, large share of their production is from handlooms. In other countries products are mainly power loom based. The major types of products are silk garments, silk fabrics, silk furnishings and carpets. Garments for women account for 90 percent of these. Some traditional items like Kimono in Japan and Saree in India account for most of these shares in these countries. Asia, Western Europe and North America are the major markets for silk products.[10]

3.1.3. Varieties of Silk

Silk is an animal fibre produced by certain insects to build their cocoons and webs. Although many insects produce silk, only the filament produced by the

mulberry silk moth, Bombyx mori, and a few others in the same genus, is used by the commercial silk industry. Silk filament comes from the cocoons built by 'silk worms', which are not worms at all, but silk moth larvae.[11] There are four different types of silk exploited commercially, each of which is produced by a distinct variety of silkworm feeding on a host plant. The Table shown below gives information about the different varieties of silk.

TABLE 3.3

Varieties of Silk

Sl. No.	Variety of Silk	Name of Silkworm	Main Host Plants
1.	Mulberry silk	Mulberry silkworm	Mulberry
2.	Tasar silk	Tasar silkworm	Oak, Sal, Asan, Arjun
3.	Eri silk	Eri silkworm	Caster, Kesseru
4.	Muga silk	Muga silkworm	Som, Soalu

Source: Manuals on Sericulture ((FAO) CSB, Bangalore, 1987.

Table 3.3 shows the names of the different varieties of silk, the names of the silkworms producing the silk and the names of the plants on which they are fed. Thus, it can be understood that Mulberry, Tasar, Eri and Muga are the four commercially known varieties of silk.

Among the four varieties, mulberry silk is the most common type of silk manufactured all over the world. In the global parlance the term silk refers to the silk of mulberry origin, as 95 per cent of the world silk production is mulberry silk.[12]

3.1.4. Procedure of Making Silk

Sericulture is an agro industry which involves multi disciplinary programs like cultivation of food plants, silkworm rearing, cocoon production, silk reeling and silk weaving.[13]

The production of silk requires a series of processes. Since mulberry silk is predominating over other types, in this section a brief explanation about the processes of mulberry sericulture is provided. The entire sericultural activities can be classified in to two: viz., Mulberry Cultivation and Silkworm Rearing.

3.1.5. Mulberry Cultivation

Mulberry cultivation is the agricultural part of sericulture. It has a significant role in determining the production cost of cocoons and silk as it is estimated that 60 per cent of the cost of cocoons goes to mulberry.

Mulberry is a tropical plant belonging to the genus Morus under the family Moraceae. There are more than 20 varieties of mulbery.[14] It is a perennial crop which gives yield for a period of up to 20 years. For all practical purposes, mulberry leaves are the only feed for Bombyx mori, silkworm.[15] Mulberry can be propagated both by cuttings and saplings. The first harvest of leaves can be made after six months of planting. The leaf yield of mulberry varies according to the inputs of fertilizers and irrigation. It ranges from 3000 to 10000 Kgs. under rain fed conditions, and from 10000 to 40000 Kgs. under irrigated conditions per hectare.[16]

3.1.6. Silkworm Rearing

Rearing of silkworms is an art as well as a science performed by sericulturists. The rearing activities are performed in a shed called rearing house, usually built separately from the home of farmers.

The silkworm is the larva of the silk moth, which belongs to the species Bombyx mori, which has four distinct stages in its life cycle viz., egg, larva, pupa and moth. From the eggs laid by the moth, little worms hatch out and feed on mulberry leaves. This is the second stage called larva or caterpillar. The larva when fully grown spins silk into a cocoon around itself. Inside the cocoon, the worm is transformed into the pupa, which is the third stage. After some days, the pupa develops into a moth, which is the final stage.

The eggs of the silkworm are generally called Disease Free Layings (DFLs). The eggs may be availed by sericulturists from government grainages or other agencies. One DFL contains 450 to 500 eggs, which will hatch within nine or 10 days after their laying. Tiny ant-like worms come out of the eggs. They are fed on finely chopped mulberry leaves. Rearing of worms at this stage is called "Chawki Rearing". Appropriate rearing trays are used for this purpose. During the larva stage the silkworm moults, i.e., cast off their skin, four times. The period before or after moulting is called "instar". There are five instars in a silkworm's life. During the fourth and fifth instars the intake of mulberry is very high. By the end of the fifth instar the cater pillar increases its weight by 10000 times, with a weight of four to five grams. During the later instars the larvae can be fed with mulberry leaves along

with shoot. Caterpillars eat for about 26 days before spinning cocoons. Utmost cleanliness must be observed throughout these processes.

During the fifth instars the larvae become ripe for spinning cocoons between the fifth and seventh day. To facilitate spinning, the worms are transferred to a frame called mountage. The spinning of cocoons will be completed in two to three days. The worm inside the cocoon turns into the pupa on the fourth or fifth day depending upon silkworm variety. On this day the pupa is hard and the cocoon shell is dry and ready for marketing.

The average yield is 40 to 50 Kgs of cocoons for 100 DFLs. The yield depends on quality of egg and mulberry leaves, rearing conditions, climate and skill and care of the sericulturist.

The cocoons are reeled for producing silk fibres. After treating with hot water or steam for removing the gummy substance called sericin, the cocoons are unwound. Since a single filament is too thin to be used as a textile material, to have the required thickness, several filaments are joined together to produce silk yarn.[17] This process is called "reeling". This is done by using country charka or cottage basin or in modern filatures. These yarns are then woven in to silk fabrics.

In this framework, it is worthwhile to have a brief discussion on the state of the sericulture industry in India.

3.2. SERICULTURE IN INDIA

India, being a developing country, agriculture and agro-based industries play a vital role in the improvement of rural economy. The limited availability of land, the limited cash return and seasonal nature of agriculture have made villages to look for supporting rural industries, such as sericulture. The agriculturists in regions where the ecological conditions are favorable adopt agriculture and sericulture simultaneously. Recently, due to the advancement of technology in mulberry cultivation and silkworm rearing, the industry is now practiced as a main profession and as a major cash crop of the country.

India is the second largest producer of silk in the world, and has the unique distinction of manufacturing all four commercially known varieties of silk namely, Mulberry, Eri, Tasar and Muga silks. Mulberry accounts for 91 percent of the total production. Sericulture holds an important place in our national economy. It has played a very significant role in the socio-economic development of various States of the Country. Indian silks are well known for delicacy, vitality and versatility. The vibrant colours and wide spectrum of woven designs fascinate the fashion conscious world and bear testimony to the skill, artistry and aesthetic sense of Indian weavers.

Indian sericulture is an ancient industry dating back to second century B.C. According to some historians, raw silk was exported from India to Rome during the reign of Kanishka in 58 B.C. There is mention about silk in the Indian epics like Ramayana and Mahabharata. Silk had a fine blend with Indian heritage and culture, and consider it as a symbol of purity and a holy wear in all religious and ceremonial

occasions. However, one cannot deny the fact that sericulture and silk have been a part of Indian tradition and culture.[18]

The early historical references to silk in India relate largely to commerce. By the Mauryan period (Fourth to Second Century B.C.) there was a trade in Chinese silks and a few centuries later Indian silks, as deduced from sculptures, had much demand in the Roman Empire.[19]

In the post-independent era, the Government of India identified silk industry as an employment oriented industry suitable for the development of rural India. Government has been giving sericulture industry a prominent place in its developmental plans.

With the advent of economic planning in the country, sericulture industry accelerated its progress, through the consecutive Five Year Plans. Realizing the importance of sericulture as a rural industry and its capacity to generate greater employment opportunities in the villages the Government of India and State Governments have given emphasis to the development of sericulture industry. A brief description about the Plan wise allocation of funds and targets achieved are presented in the following few pages.

3.2.1. First Plan (1951-52 to 1955-56)

Sericulture did not find a separate place during the First Plan. It was included under the broad head "Other Village Industries." Central assistance was made available as grants and loans to States through the Central Silk Board. Against

Rs.60.30 lakhs allocated, the utilisation during the First Plan was Rs.33.60 lakhs (Rs.21.70 lakhs under States and Rs.11.90 lakhs under Central sector).[20]

3.2.2. Second Plan (1956-57 to 1960-61)

From the Second Plan onwards, a separate allocation both under Central and State sectors was approved by the Planning Commission for sericulture development. Against an allocation of Rs.379.25 lakhs in the State sector for implementation of 339 schemes, about Rs.224.49 lakhs representing nearly 60 percent of the provision were utilised by the States. In the Central sector, the expenditure was Rs.26.13 lakhs against the outlay of Rs.35.17 lakhs. Output of raw silk increased from 14.86 lakh Kgs., in the beginning of the Plan to 15.13 lakh Kgs., at the end of the Plan period.

Emphasis was laid on the development of the seed organization and improvement of silk reeling during the Second Plan. Passing of the legislation in Karnataka State to prevent the use of unexamined seed for commercial production and large scale introduction of improved cottage basins for improving the quality and output of raw silk, establishment of the Central Silkworm Seed Station at Pampore (Srinagar) and setting up of the All India Sericultural Training Institute at Mysore (later merged with the Central Sericultural Research and Training Institute) are the important achievements during this Plan.[21]

3.2.3. Third Plan (1961 - 62 to 1965 - 66)

A total outlay of Rs.702 lakhs was approved for development of the industry during the Third Plan period, of which Rs.552 lakhs related to State schemes and the

rest Rs.150 lakhs for Central schemes implemented through the Central Silk Board. The total expenditure incurred by the States was Rs.339.42 lakhs accounting for 61.48 percent of the allocation. An expenditure of Rs.72.32 lakhs was incurred in respect of Central Schemes. During the period, the raw silk production increased to 20.65 lakh Kgs from 15.13 lakh Kgs of the earlier Plan period. The Board organized the Central Sericultural Research and Training Institute at Mysore in 1961.[22]

3.2.4. Transitional Period (1966 - 67 to 1968 - 69)

During the period, the allocation for States was Rs. 482.28 lakhs, of which Rs. 218.98 lakhs was utilised. The allocation on Central schemes was Rs. 70.23 lakhs and utilisation was Rs. 62.75 lakhs. At the end of the Transitional Period, raw silk production was 23.20 lakh kgs.[23]

3.2.5. Fourth Plan (1969 - 70 to 1973 - 74)

During the period, the allocation to State and Central projects was Rs. 839 lakhs and Rs. 130 lakhs respectively, the corresponding utilisation being Rs. 593.38 lakhs and Rs. 81.61 lakhs. The broad objective envisaged in the Fourth Plan was attainment of self-sufficiency with regard to Country's demand for raw silk through increased productivity, reduced cost of production through rationalization of production techniques and creating additional employment opportunities to about four lakh persons. The raw silk production increased from 23.20 lakh Kgs to 28.94 lakh Kgs by the end of the Plan period.[24]

3.2.6. Fifth Plan (1974 - 75 to 1977 - 78)

The Planning Commission approved a total outlay of Rs. 2554 lakhs (Rs.1693 lakhs for State schemes and Rs. 861 lakhs for implementation of Central schemes) during the Vth Plan period. Out of this, Rs. 1109.06 lakhs were spent on State schemes and Rs. 586.17 lakhs on Central Schemes. A special scheme to promote sericulture in backward areas was launched under the Central program. By the end of the Plan period, production of raw silk reached a level of 37.11 lakh Kgs and export earnings touched Rs. 33.06 crores.[25]

3.2.7. Transitional Period (1978 - 79 to 1979 - 80)

In 1978-79 an allocation of Rs. 1248.05 lakhs (Rs. 728.05 lakhs for States and Rs. 520 lakhs for Central projects) was approved, of which total utilisation amounted to Rs. 985.39 lakhs (Rs. 510.36 lakhs on State and Rs. 475.03 lakhs on Central schemes). During the year the production of raw silk increased to 41.77 lakh Kgs. On the export front, the achievement was Rs. 43.67 crores.

In 1979-80 the total allocation was Rs. 1661.66 lakhs of which Rs. 861.66 lakh was for States and Rs. 800 lakhs for Central projects. The expenditure against this was Rs. 748.90 lakhs on State and Rs. 630.43 lakhs on Central schemes. Production of raw silk was 48.05 lakh Kgs and the export earnings amounted to Rs. 48.83 crores.[26]

3.2.8. Sixth Plan (1980 - 81 to 1984 - 85)

The Planning Commission approved an outlay of Rs. 16737 lakhs (Rs. 13637 lakhs under State Plan and Rs. 3100 lakhs under Central sector). An expenditure of

Rs. 8923 lakhs under State and Rs. 3715 lakhs under Central sector was incurred. The production of raw silk was 76.73 lakh Kgs. and export earnings were Rs. 129.05 crores. The important organizations set up in the Plan period were an International Centre for Training and Research in Tropical sericulture in 1980 at Mysore and a Central Silk Technological Research Institute at Bangalore. The National Silkworm Seed Project was also established in 1981.[27]

3.2.9. Seventh Plan (1985 - 86 to 1989 - 90)

Out of the total outlay of Rs. 310.78 crores, Rs. 240.78 crores was for State schemes and Rs. 70 crores was for Central schemes. The expenditure incurred under the State and Central sector programs was Rs. 206.80 crores and Rs. 88.16 crores respectively. By the end of the Plan period, production of raw silk reached the level of 12016 tonnes and silk export earnings amounted to Rs. 400.61 crores.[28]

3.2.10. Transitional Period (1990 - 92)

The allocation in 1990-91 was Rs. 106.19 crores for the development of sericulture both under State and Central sectors. During the year, production of raw silk increased to 12665 tonnes and export achievement was Rs. 440.53 crores.

For 1991-92, the allocation approved both under State and Central sectors were Rs. 124.66 crores. During this year, an amount of Rs. 675.57 crores was earned from export of silk goods.[29]

3.2.11. Eighth Plan (1992 - 97)

The Planning Commission approved an allocation of Rs. 901.05 crores both under State and Central sectors. The expenditure in the Central sector was Rs. 342.67 crores and in the State sector Rs. 430.95 crores. During this period, raw silk production increased to 14126 tonnes and the certified exports amounted to Rs. 880.44 crores.[30]

3.2.12. Ninth Plan (1997 - 2002)

The outlay for sericulture for the Ninth Plan was Rs. 350 crore.[31] During the Ninth Plan period, sericulture sub sector have been made more vibrant by focusing upon (i) bringing in new more productive and stable silkworm races, (ii) improved silkworm rearing practices, (iii) improvements in reeling by promoting installation of modern technology based machines, (iv) encouragement of plantations of new food plants for tasar, eri and muga silk, (v) utilisation of infrastructure and organizations created under NSP, (vi) increasing the area under mulberry plantation, (vii) enhancing value addition by improving designs, colour combinations, finishing methods, etc, (viii) increase in exports by diversifying into dress materials and made-ups, (ix) encouragement to bi-voltine silk and (x) by-product use development projects. A total of 34 schemes have been sanctioned for implementation during the Ninth Plan period. [32]

3.2.13. Tenth Plan (2002-07)

During the Tenth Plan an amount of Rs. 565 crores has been allocated for the development of sericulture.[33] During 2002-03 and 2003-04 an amount of Rs. 89.29

crores and Rs. 88.64 crores has been spent respectively. During 2004-05 an amount of Rs.85.85 crores was released. For 2005-06 an allocation of Rs. 110 crores has been made. The major sericultural schemes for which provisions are made in the Tenth Plan are R&D/Transfer of Technology/Training, Seed Support and Technical Assistance/HRD, Catalytic Development Program, IT initiatives, Quality Certification Systems and UNDP-Assisted Fibre Development Program. Expansion of sericulture in non-traditional areas, projects for post-cocoon technology induction and development project in North East Region are also proposed. Exports are envisaged to grow by 15 per cent during this Plan. [34] The Tenth Plan has a production target of 26450 MT of both mulberry and non-mulberry silk (cumulative) of which 6700 MT is of high quality bivoltine silk.[35]

The amounts allocated for the development of sericulture by the Planning Commission both under State and Central schemes and their utilisation are shown in the following Table.

TABLE 3.4

Plan Allocation and Expenditure of Sericulture

(Rs. In lakhs)

Plan	Allocation	Expenditure	Percentage of utilisation
I Plan (1951 - 56)	60.30	33.60	55.72
II Plan (1956 - 61)	414.42	250.62	60.47
III Plan (1961 - 66)	702.00	411.74	58.65
Transitional period (1966-69)	552.51	281.73	60.00
IV Plan (1969 - 74)	969.00	674.99	69.66
V Plan (1974 - 78)	2554.38	1695.23	66.37
Transitional Period (1978 - 80)	2909.71	2364.72	81.27
VI Plan (1980 - 85)	16737.00	12638.00	75.50
VII Plan (1985 - 90)	31078.00	29496.00	94.90
Transitional Period (1990 - 92)	23085.60	15844.59	68.63
VIII Plan (1992 - 97)	90105.00	77361.53	85.86
IX Plan (1997 - 2002)	350000.00	14987.36[P]	--
X Plan (2002 - 2007)	565000.00	17793.00*	_

Source: Central Silk Board - Compendium statistics of Silk Industry 1999 and The Hindu. http://www.thehindubusinessline.com/blnus/, 12th Aug. 2002.
P: provisional
*Up to 2003-04.

Table 3.4 shows that the allocation of funds for sericulture has gone up since 1951 to 2002. In the First Plan the amount allotted was only Rs. 60.30 lakhs, which has increased to Rs. 565000 lakhs in the 10th Plan. When we consider the vast employment opportunities and income generated from sericulture, it can be understood that the fund allocation during the earlier Plan periods were quite meager.

It can be seen from the above Table that the utilisation of funds allocated for sericulture is also not satisfactory. In the First Plan period the percentage of expenditure to the funds allocated was only about 56 percent. In the subsequent Plans also the rates of utilisation of funds show unsatisfactory performance.

Sericulture, a highly potential industry is being neglected both from the part of government to provide sufficient funds and from the part of people to take up the activity. Wide gap exists between the allocation of funds and their utilisation. This shows that the promotional agencies have also not taken appropriate steps to promote this industry. With adequate support, the sericulture industry can be a tool of poverty alleviation in India and also bring about overall economic development. However, from the Seventh Plan onwards, there is considerable increase in the allocation and utilisation of funds.

3.2.14. India Textile Policy 2000

Taking into account the market opportunities available in the free-trade regime, Govt. of India's new Textile Policy has laid down a five-point directive comprising productivity, quality, quantity, product diversification, and competitive pricing, for the overall development of Indian sericulture and silk industry. The focus is on achieving international standard in all varieties of silk. The steps included are:

- Improving Research & Development and the effective transfer of technology at all stages;
- Considerably improving the production of non-mulberry varieties of silk;

- Augmenting efforts for the spread of bivoltine sericulture;
- Encouraging clustering of activities of reeling and weaving and strengthen linkages between the producers and industry;
- Periodically reviewing the import policy for raw-silk taking into account the balanced interests of the sericulturists as well as the export manufacturers.[36]

Mulberry silk production in India is largely concentrated in southern Karnataka and in the districts of Andhra Pradesh and Tamil Nadu. Almost 90 per cent of the mulberry silk production of India comes from these areas. West Bengal and Jammu and Kashmir are other important producers. An account of the mulberry area, cocoon production and production of raw silk of these five traditional silk producing States and other States are given below:

TABLE 3.5

Mulberry Area, Production of Cocoon and Raw Silk

In the Five Traditional States and Others

(Year 2002-03)

State	Mulberry Area (Hectare)	Cocoons (Tonnes)	Raw Silk (Tonnes)	Percentage*
Karnataka	88903	55851	6760	46.25
Andhra Pradesh	54384	50664	5629	38.51
West Bengal	12569	15171	1450	09.92
Tamil Nadu	5394	4005	490	03.35
Jammu and Kashmir	5986	849	100	00.68
Others	27227	1641	188	01.29
Total	194463	128181	14617	100

Source: Sericulture and Silk Industry Statistics-2003, Central Silk Board, Bangalore.
* Percentage of raw silk production to the total.

Table 3.5 provides information about the area under mulberry cultivation, production of cocoon and raw silk and the percentage of raw silk production of each State in the year 2002-03. It can be understood that, the State of Karnataka with 46.25 per cent of the total production of raw silk in the country, ranks first. The State has the largest acreage of mulberry cultivation also. Andhra Pradesh, with 38.51 per cent, ranks second in the production of raw silk in the country.

India is endowed with all four kinds of commercial silks viz. Mulberry, Tasar, Eri and Muga. India is the only country in the world producing all these four kinds of silk. The following Table provides information about the production of these different varieties of silk for a period of 10 years.

TABLE 3.6

Production of Raw Silk in India
(Including non-mulberry silk) (In tons)

Year	Mulberry	Tasar	Eri	Muga	Total	% of mulberry to total	Growth index of mulberry 1994-95=100
1994-95	13450	257	798	74	14579	92.26	100
1995-96	12884	194	745	86	13909	92.63	96
1996-97	12927	231	861	74	14093	91.73	96
1997-98	14035	287	806	62	15190	92.40	104
1998-99	14260	242	970	72	15544	91.74	106
1999-00	13944	211	974	85	15214	91.65	104
2000-01	14432	237	1089	99	15857	91.01	107
2001-02	15848	249	1260	104	17461	90.76	118
2002-03	14617	250	1244	100	16211	90.17	109
2003-04	13930	314	1350	106	15700	88.73	104
Total	140327	2472	10097	862	153758	91.26	

Source: Compendium of Statistics of Silk Industry by CSB, 1999 and DGCIS

Table 3.6 shows the production of mulberry and other varieties of silk in India for a period of 10 years beginning from 1994-95. On an average, the mulberry raw silk production is about 91.26 per cent of the total silk production. When compared to 1994-95, there is four per cent increase in the production of raw silk in the year 2003-04.

The area under mulberry and production of cocoons for the last 10 years are given in the following Table along with the percentage changes considering the year 1994-95 as the base year.

TABLE 3.7

Area under Mulberry Cultivation and Production of Cocoons in India

Year	Mulberry Cultivation		Cocoon Production	
	Area ('000 hectare)	Growth Index (1994-95=100)	Cocoons ('000 tonnes)	Growth Index (1994-95=100)
1994-95	283	100	123	100
1995-96	289	102	116	94
1996-97	281	99	116	94
1997-98	282	100	127	103
1998-99	270	95	127	103
1999-00	227	80	125	102
2000-01	216	76	125	102
2001-02	232	82	140	114
2002-03	193	68	128	104
2003-04	185	65	117	95

Source: Compendium of Textile Statistics, 2003 & DGCIS.

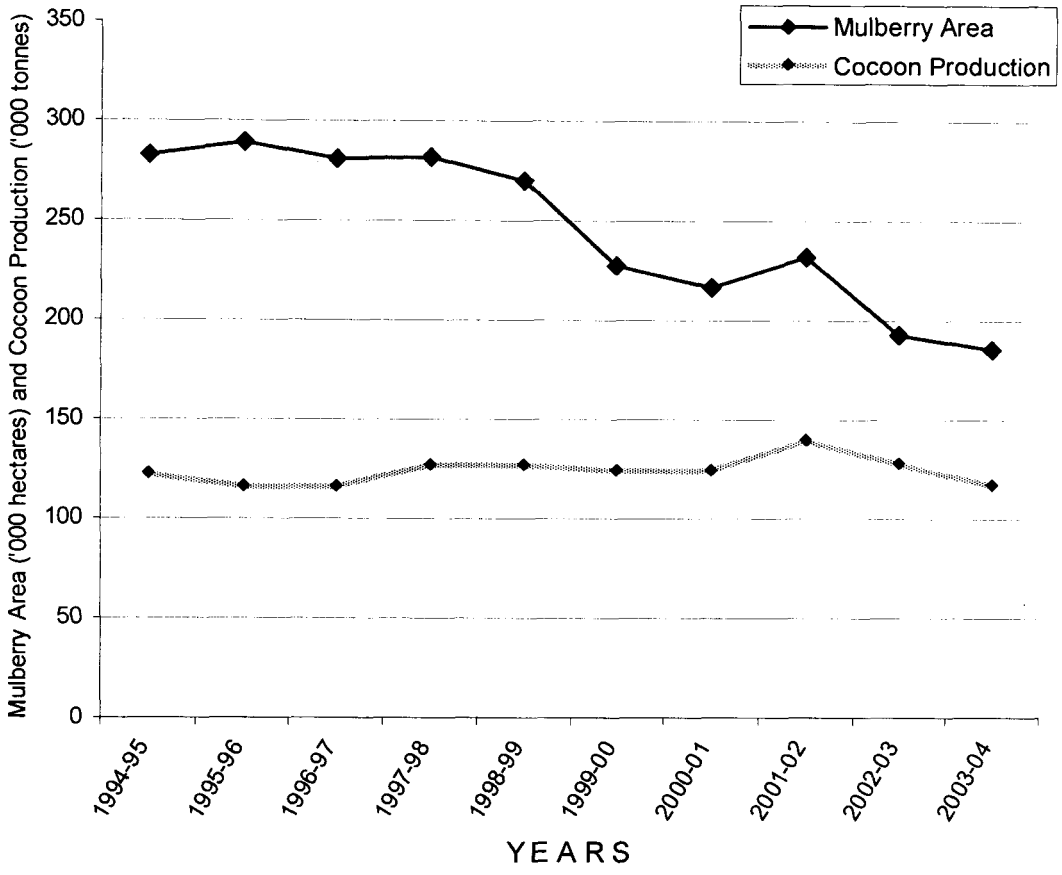

Figure 3.1 Growth of Mulberry Acreage and Cocoon Production

Table 3.7 and figure 3.1 give information about the mulberry acreage and cocoon production of India for a period of 10 years beginning from 1994-95 to 2003-04. It can be seen that, though the general tendency of mulberry acreage is to decline, the production of cocoon is more or less steady throughout these years.

3.2.15. Silk Imports of India

The domestic production of raw silk is not adequate to meet the internal and export requirements of India. It is estimated that against the demand of around 26000 tons per annum, the domestic production is around 16500 tons. The gap of nearly 9500 tons in demand is mainly on account of the fact that high grade quality

mulberry raw silk is not being produced in the Country to the extent required by the industry. This quality of mulberry raw silk is basically required in the power loom industry, for export purposes and to some extent in the handloom industry for warp purposes.[37] The imports of raw silk by India during the last eight years are given in the Table below.

TABLE 3.8

Import of Raw Silk by India in Terms of Quantity and Value

Year	Raw Silk Import		
	Quantity (in tone)	Value (Rs. in crores)	Growth Index (97-98=100)
1997-98	2346	218.33	100
1998-99	2824	259.36	118.79
1999-2000	5018	412.74	189.04
2000-01	4713	475.15	217.63
2001-02	6808	624.73	286.14
2002-03	9054	647.15	296.41
2003-04	9258	628.41	287.83
2004-05	7948	607.21	278.12

Source: http://texmin.nic.in/Sericulture Industry. PDF

Table 3.8 shows the import of raw silk of India both in terms of quantity and value for eight years commencing from 1997-98 till 2004-05. It can be understood that the import figures are showing a steady increase, which was the maximum in the year 2002-03. However, from the year 2003-04 onwards, the figures are showing a slight decline.

3.2.16. Silk Export of India

India is importing raw silk for its requirement of high quality raw fibres and at the same time she is an important exporter also of finished products of silk. About 75 per cent of Indian production is used domestically and 25 per cent is exported.[38] The export of silk products was only Rs.4 million in 1970-71. Recently, the export figures are showing considerable increase. The exports of silk textiles in comparison with the export of other textiles from 1991-92 to 2003-04 are given in the following Table.

TABLE 3.9

Exports of Silk and Other Textiles of India

Year	Export of Silk Textiles Rs. Crore	Growth Index (1991-92 = 100)	Total Textile Exports Rs. Crore	% of Silk to Total Textile Exports
1991-92	670.98	100	14409.50	5
1992-93	734.20	109	19114.20	4
1993-94	789.26	118	25010.70	3
1994-95	937.31	140	31336.30	3
1995-96	846.07	126	35526.10	2
1996-97	880.62	131	41828.20	2
1997-98	926.29	138	46092.50	2
1998-99	1036.28	154	52814.80	2
1999-2000	1274.53	190	57736.70	2
2000-2001	1449.60	216	55322.60	3
2001-2002	1363.50	203	51320.60	3
2002-2003	1523.50	227	60332.30	3
2003-2004	2454.89	366	60469.90	4

Source: Compendium of Textile Statistics 2003 & DGCIS

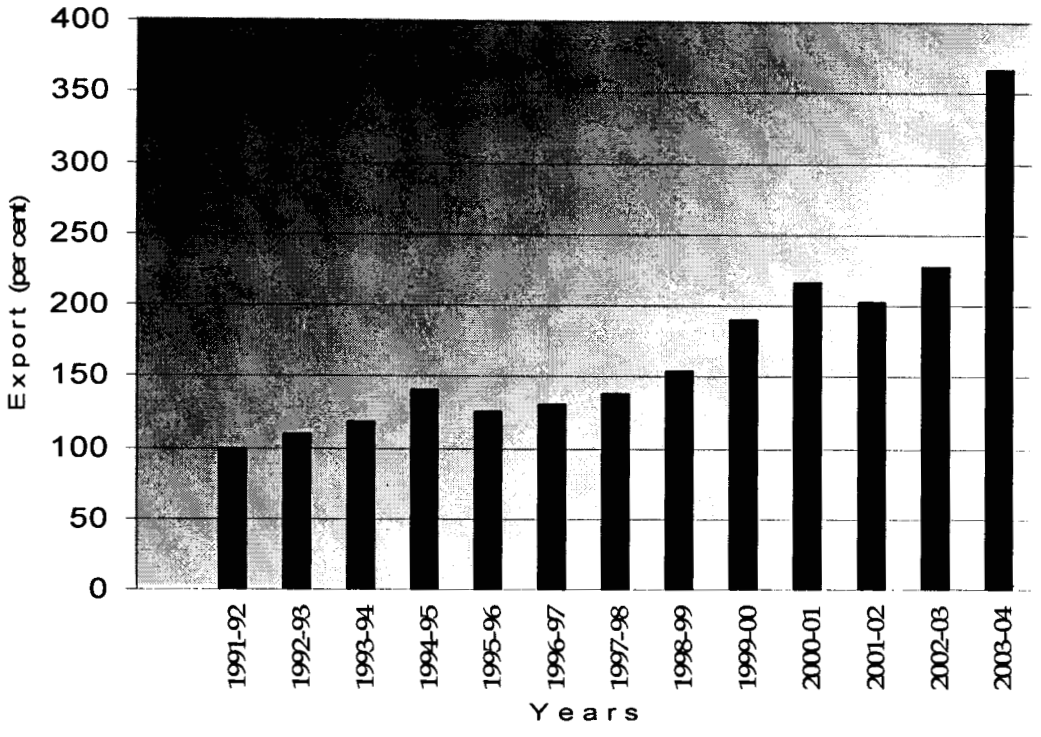

Figure 3.2 Exports of Silk Textiles of India

Table 3.9 provides a comparative analysis of exports of silk textiles and that of total textiles of India for the years 1991-92 to 2003-04. It can be seen that the exports of silk fabrics, though there was a decline in the year 1995-96, shows a steady increase during the later years. The export figure reached 366 per cent in the year 2003-04 when compared to the year 1991-92. It can also be understood that the exports of silk textiles on an average comes to about three per cent of the total textile exports. Figure 3.2 also shows the growth in silk exports of India.

3.2.17. Role of Promotional Agencies in Sericulture Development in India

In India, the role of sericulture in providing direct and indirect employment opportunities for the rural poor is well recognized. Sericulture in India is as old as Indian culture and silk has been a symbol of luxury throughout the ages. In its long

history, the industry has passed through periods of great prosperity as well as decline.[39]

The development of the industry requires a strong support from Government and other agencies. Though it is a prospective industry, it is characterized by low productivity, lack of technical knowledge and inadequacy of high yield varieties of mulberry and silkworm eggs. For the promotion of the industry, the Government of India had set up the Silk Development Directorate in 1945. A Silk Panel was also established to suggest measures for sericulture development. This Silk Panel recommended a fifteen-year perspective plan for the development of sericulture. It also suggested the establishment of Central Silk Board for the co-ordinated development of the industry.

3.2.18. Central Silk Board (CSB)

The Central Silk Board was set up in 1949 when Central Government assumed responsibility for the development of the silk industry, by Parliament passing the Central Silk Board Act, 1948. It has its headquarters at Bangalore.

The Board has 36 members including the Chairman, Vice-Chairman Member Secretary, representatives of the Lok Sabha and the Rajya Sabha, nominees of the Central and State Governments and representatives from among rearers, reelers, the trade and industry. Their term of office is three years.

The functions of the Central Silk Board are: Promotion and development of Silk industry; undertaking, assisting and encouraging scientific, technological and

economic research relating to silk; developing and distributing healthy silkworm seeds; devising means for improved methods of mulberry cultivation, silkworm rearing, silk reeling and spinning; initiating measures of standardization and quality control of silk and silk products; rationalization of marketing and stabilization of prices of silk cocoons and raw silk products for export; collection of statistics; preparing and furnishing relevant reports to the silk industry and to the Central Government; and advising the Central Government on all matters relating to the development of silk industry including the import of raw silk and export of silk products.[40]

The Central Silk Board has established several facilities to carryout the Research and Development, in all aspects of the industry.

The Central Silk Board has been implementing a project for Promotion of Popularizing the Practical Bivoltine Sericulture Technology (PPPBST) with the cooperation and assistance of Japanese International Cooperation Agency (JICA). This has helped in developing and introducing hardier and productive bivoltine silkworm races and appropriate package of practices for mulberry garden and silkworm rearing technology under tropical condition in Karnataka since 1997. The project was extended to Tamil Nadu and Andhra Pradesh in 1999. The Central Silk Board is engaged in transferring the bivoltine sericulture technology to the field, adopting it to Indian condition. The commercial exploitation of bivoltine races is expected to result in the production of raw silk of international standard in the country.[41]

3.2.19. Central Sericultural Research and Training Institute (CSRTI)

This Institute was established by the Central Silk Board. It was set up in 1961 in Channaptna and later shifted to Mysore in 1963 and has now drawn into a premier organization for research and development in the field of mulberry sericulture science and technology. It has developed a number of mulberry varieties utilizing the local and exotic races. The package of practices prescribed by this institute after sustained efforts have helped in doubling the per unit mulberry yield.[42]

The Institute is carrying out research projects aimed at developing technologies for increasing production of quality silk. The major areas of research include development of superior mulberry varieties that are region specific, cost effective cultivation practices, season specific silkworm races, developing technologies for detection and management of pests and diseases of mulberry and silkworm, improved rearing technologies, molecular approach to improve mulberry and silkworm strains, development of appropriate farm machinery for mechanized cultivation of mulberry etc. Major thrust is on finding solutions for problems faced by small and medium farmers.[43] The Institute has developed new technology of silkworm rearing suitable to tropical conditions. This has helped in stabilizing cocoon crops, spread of sericulture industry in non-traditional areas and introduction of high yielding silkworm races. It has developed several insecticides against the diseases of silkworms.

Besides sericultural research, human resource development is one of the objectives of CSRTI. The Institute is providing various long term and short term training courses and a number of sericulturists have benefited out of them.[44]

3.2.20. Central Silk Technological Research Institute (CSTRI)

The CSTRI founded in Bangalore in 1983, under the Central Silk Board, is involved with developing technology, imparting training and rendering other services relevant to the silk industry. The Institute has helped to set-up designer clubs in different parts of India. It has been helping in developing a design database. There is also a quarterly magazine that provides design and design-related information. The aim is to bring about meaningful interaction among the designers.[45]

3.2.21. National Sericulture Project with External Assistance (NSP)

The National Sericulture Project is a very important concept conceived by the Central Silk Board for the development of mulberry sericulture. The project was implemented during 1989-90 to 1995-96 with the assistance of World Bank and Swiss Development Co-operation. This project is of worth Rs.555.3 crores and has been implemented in five traditional silk producing States and 12 other States.

The objectives of the NSP as visualized by the Central Silk Board are: 1) Introduction of sericulture in new States. (2) Increasing the production of raw silk. (3) Improving the quality and productivity of Indian Silk. (4) Generating employment opportunity in rural areas. (5) Increasing the silk exports. (6) Strengthening the infrastructure. (7) Providing financial support to sericulturists and

(8) Strengthening socially desirable features such as development of women, improvement of water conservation and rain fed technology and involvement of Non-Governmental Organizations for promotion of sericulture. The CSB has built into the National Sericulture Project a special component of assistance to women and the Non-Government Organisations.[46]

TABLE 3.10

Financing Plan under National Sericulture Project

Funding Agency	Rs. in millions	Percentage Total
IBRD/IDA Loan	2832	51
SDC Grant	400	7
GOI/State Investment	657	12
Institutional Credit	1664	30
Total	5553	100

Source: Silkman's Companion 1992, CSB, 1992.

Table 3.10 shows that the total amount of Rs. 5553 millions under NSP as allocated through different financial agencies for sericulture development. It can be seen that most of the financial assistance is provided by IBRD/IDA and out of Institutional Credit.

3.2.22. Conclusion

Silk, the fibre of international reputation was used by the people all over the world from time immemorial. The influx of other natural fibres and man made synthetic fibres, in no way could reduce its luster. Chinese were mastering in the

manufacture and use of this excellent fibre for a long time in the history. Even now China continues to be the mighty leader of the world silk producing countries.

India also holds a prominent place among the world countries in the production of silk. She is the second largest producer of silk in the world. India has the unique position as the producer of all four commercial varieties of silk viz. mulberry, tasar, eri and muga. India is both an importer and exporter of silk. Central Silk Board, formed under Central Silk Board Act, 1948 is entrusted with the duty of developing sericulture in India.

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CHAPTER IV

SERICULTURE INDUSTRY IN KERALA

SERICULTURE INDUSTRY IN KERALA

In this chapter, an attempt is made to discuss about the growth and development of sericulture in Kerala along with an empirical analysis of the general structure of sericulture in the survey districts. For this purpose, the present chapter is divided in to two sections. In the first section, details of the introduction and development of sericultural activities in the State are provided. The second section is allotted for the analysis of the general status of sericulture in the three study districts.

SECTION - I

INDUCTION AND DEVELOPMENT

This section is intended to provide information on the introduction and development of sericulture in the State and to furnish the details of formation and functioning of the Kerala State Sericulture Co-operative Federation Ltd.

4.1.1. Profile of the State and the Study Districts

As it is felt appropriate, a brief description of the State of Kerala and the three study districts, viz., Alappuzha, Malappuram and Kannur is provided in the following few pages.

4.1.2. Kerala State

Kerala is a State on the southwestern coast of India. Kerala is bounded by the Arabian Sea on the west and the Western Ghats on the east. The States of Karnataka in the north and Tamil Nadu in the east are Kerala's immediate neighbours.[1] Kerala is located between north latitudes 8 degree 18' and 12 degree 48' and east longitudes 74 degree 52' and 77 degree 22'.[2]

Kerala represents only 1.18 per cent of the total area of India but 3.43 percent of the population of the country. Area wise, Kerala ranks 18th among the various States of India. The pressure on land in Kerala is the highest in India. The modern Kerala was created in first November 1956. The State is divided in to 14 districts. Thiruvananthapuram is the capital of the State. Malayalam is the official language of Kerala. There are 20 parliament constituecies and 140 assembly constituencies. Kerala is different from the rest of India in many ways. It has the highest literacy rate in the country, lowest infant mortality rate and the highest female to male population ratio. [3] Certain statistics connected with Kerala are given below:

Area (in sq.kms.)	38863
Total Population	31,838,619
Males	15,468,664
Females	16,369,955
Sex Ratio (females/1000)	1058
Density of population	819
Literacy rate	90.92 per cent (Male 94.20 Female 87.86) [4]

Geographically Kerala is divided into three regions (1) Highlands (2) Midlands (3) Lowlands. On highlands, major plantations like tea, coffee, rubber, cardamom and other spices are grown. The midland is an area of intensive cultivation of cashew, coconut, areca nuts, tapioca, banana, rice, ginger, pepper, sugarcane and vegetables. The low land is essentially a land of coconuts and rice. Fisheries and coir industry constitute the major industries of this area. Kerala has unique cropping pattern. It accounts for 92 per cent of India's rubber, 70% of coconut, 60% tapioca, almost 100 % of lemon grass oil. Kerala is the single largest producer of certain crops like banana and ginger.[5]

The average temperature in various parts of Kerala is between 21° C and 32° C. Rainfall is the maximum during monsoon season. The annual rainfall is about 3000mm.[6]

Kerala ranks highest in India with respect to social development indices such as elimination of poverty, primary education and healthcare. Kerala was declared the world's first "baby-friendly state" under WHO-UNICEF's Baby Friendly Hospital initiative. The State is well-known for Ayurveda, a traditional system of medicine which has found a new market in the growing tourist industry. As per the 2001 census, Kerala is the only State in India with a female-to-male ratio higher than 0.99 (the ratio for Kerala is 1.058 while the national figure is 0.933). The literacy rate in Kerala is the highest among Indian States, and so is the unemployment rate.[7]

Agriculture dominates the Keralite economy. Kerala lags behind many other Indian States and Territories in terms of per capita GDP and economic productivity.

However, Kerala's Human Development Index and standard of living statistics are the best in India. With respect to selected development indices, Kerala rivals many developed countries. This seeming paradox – low GDP and productivity figures juxtaposed with relatively high development figures – is often referred to as the "Kerala Phenomenon" or the "Kerala Model" of development by experts. This phenomenon arises mainly from Kerala's unusually strong service sector.[8]

Kerala's economy can be best described as a democratic socialist welfare economy. However, Kerala's emphasis on social welfare has resulted in slow economic progress compared to neighboring States.

Agriculture contributes most to the State's income in the primary sector. Kerala's major sources of exports are agro-based and traditional products like coir and cashew as well as marine products and manpower. In spices, pepper is the single most important product, Kerala being the largest producer and exporter of black pepper.[9] The livestock sector plays a vital role in the economy of Kerala, and offers great potential for alleviating poverty and unemployment in rural areas. Rice is the staple food of the people.

Kerala is well known for its traditional industries. These industries include coir, cashew, handlooms, handicrafts and bamboo. The traditional industries are one of the major sectors, which give employment to more than one million people in Kerala.[10] Kerala is rapidly becoming the most preferred industrial destination of the nation. The major industries found are seafood, garments, spices, electronics,

minerals, clay, biotechnology, herbal products, software and tourism. Kerala is a popular tourist destination for both domestic and foreign travellers.

The small-scale industrial units registered in Kerala as on 31st March 2003 was 2.70 lakhs with an investment of Rs.3911 crores, providing employment to 12.15 lakh persons. The registration during the year 2002-03 was 12334 units as against 18114 in 2001-02. In spite of the decline of the number of registration of units value of output recorded an increase of Rs.1869.35 crores during 2002-03.[11]

4.1.3. Alappuzha District

Alappuzha came into being as a district in the political map of Kerala on 27th of August 1957. Alappuzha has an excellent network of bridges and canals, the presence of which has given it the title the "Venice of the East". Alappuzha district stands foremost among the districts of Kerala in regard to the density of population. It also stands first among other districts of Kerala in respect of its literacy rate. Alappuzha is the smallest district in Kerala. The entire area of the district lies in the low land and the midland divisions, and is the only district in Kerala having no area under the high lands. Alappuzha is the most important centre in the State for coir industry. Almost 80 per cent of the coir factories in the State are in this district.[12] There are about four thousand production units including a few big factories for coir in the district.[13] As per the Population Census of India, 2001, the total population of the district was 2105349.

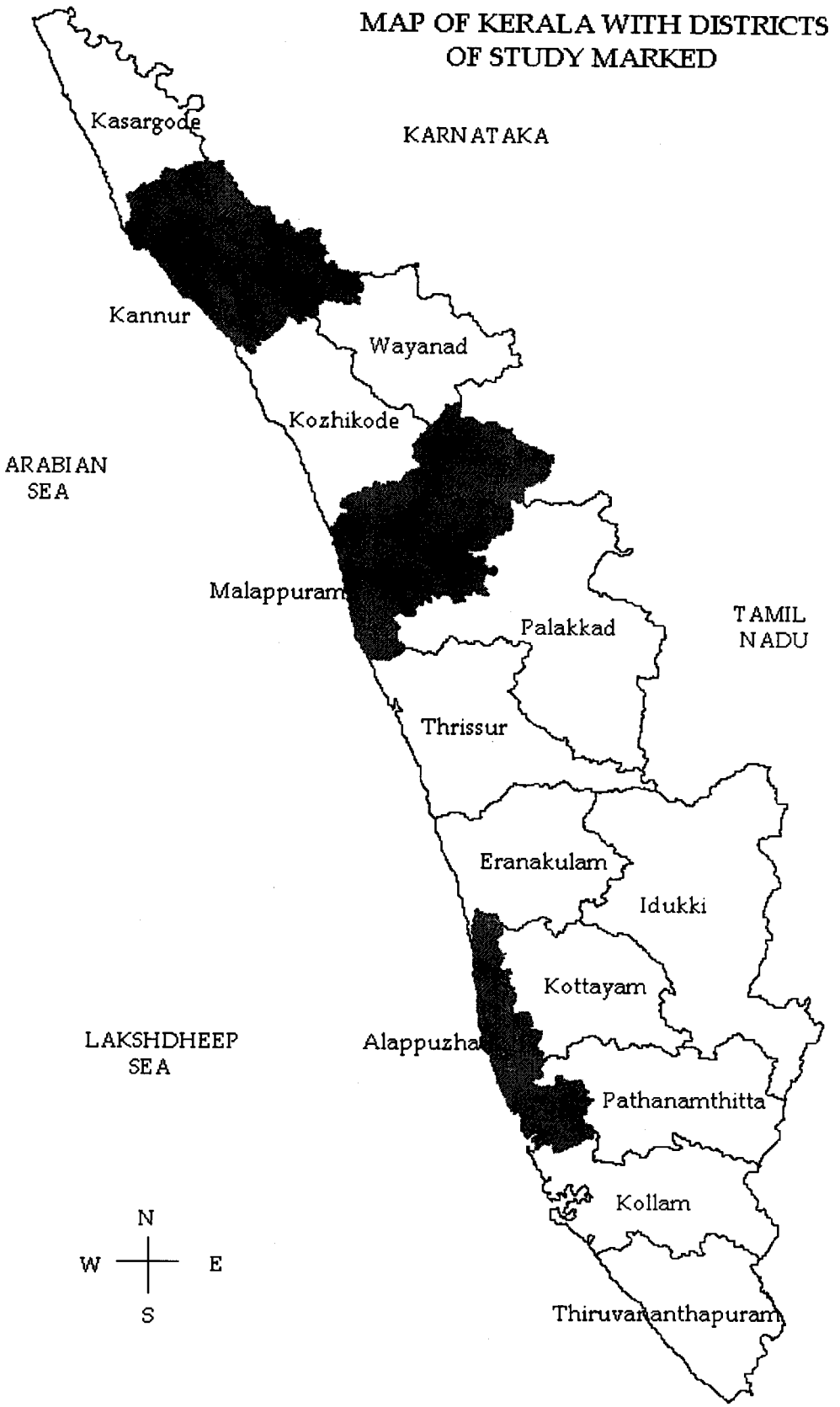
4.1.4. Malappuram District

Malappuram district was formed on 16th June 1969.[14] The district consists of two revenue divisions, six taluks, 135 villages, 14 blocks, five municipalities and 100 panchayats.[15] The topography of the district is highly undulating; starting from the hill tops covered with thick forests on the east along the Nilgiris, it gradually slopes down to the valleys and the small hills, before finally ending on the sandy flat of luxuriant coconut groves in the west.[16] Forests are the main source of raw material for a number of wood-based industrial units. Besides timber, firewood and green manure, forest produces like honey, medicinal herbs, spices etc. are also collected. Bamboo for pulp factories is mainly supplied from Nilambur forests.[17] According to the Population Census 2001, the total population of the district was 3629640.

4.1.5. Kannur District

Kannur District came in to existence on first January 1957. Now the district has three taluks, eight municipalities, 129 villages, nine blocks and 82 panchayats. The district is famous for its cultural heritage. Major part of the district comes under midland region with numerous hills and dales and it presents an undulating surface gradually ascending and merging into the slopes of Western Ghats.[18] The district is endowed with rich deposits of clay of which various types are mined at many places for potteries, tiles and ceramic industries. There are a number of tile manufacturing centres along the coastal areas. Various agricultural activities are performed in different parts of the district.[19] The total population of the district as per the Population Census 2001 was 2412365.

A map of Kerala with the three study districts marked is given below:



4.1.6. Sericulture in Kerala

The introduction of sericulture in Kerala was late as the farmers and administrators believed that it was not an industry suitable for Kerala. The first attempt to introduce sericulture in Kerala was started in Ambalavayal in Waynad District, way back in 1960s for the benefit of the economically weaker sections of the people. But, this did not make any impact. The attempt was a failure due to the inadequate technical knowledge, and lack of skill. Later, during 1970s few farmers here and there started silkworm rearing on their own. That attempts were also failed due to lack of marketing support.[20]

With the efforts of the district authorities and the technical assistance extended by the CSRTI, Mysore, mulberry plantation trials and introducing sericulture in some selected areas of Idukki District took place. As a result, during August, 1986, about 80 acres of mulberry cultivation covering 100 farmers was developed in the hilly areas of Idukki. The result was encouraging and within the next one year, more than 300 acres covering 400 farmers were brought under mulberry cultivation in the areas of Kanthaloor, Pallanadu and Vattavada Panchayats in the District.[21]

Consequently, many service organizations in the State like the Malanadu Development Society, Kanjirappally; Mitraniketan, Thiruvananthapuram; Wynad Social Service Society, Manantavady; Integrated Tribal Development Project, Attappady, Palakkad; Anchunadu Silk Yarn Producers Association, Kanthaloor; and sericultural farmers associations of Parippally, Alappuzha, Shertally, Irritty and

Kannur have come forward to take up sericulture for the benefit of the economically weaker sections of these areas.[22]

During the late 1980s, Central Silk Board had started its extension wing in Palakkad, Idukki and Kasargode districts with the whole-hearted support of the Collectors of these districts. It also established a Research and Extension Centre in Kanjirappally (Kottayam District) to cover development and extension activities in Kottayam, Alappuzha, Thiruvananthapuram and Kollam districts, which boosted the popularization efforts in the State.[23]

4.1.7. Landmarks in the Progress of Sericulture in Kerala

Sericulture is being implemented in the State on a modest scale in selected pockets of Idukki and Palakkad during 1980's. Since then the growth of the industry showed several ups and downs. The progress of the industry across the foregone years is explained below.

1983-84

Sericulture activities started in a few pockets of Kanthaloor and Marayoor in Idukki district. The State encouraged the activity under the Western Ghat Development Program.[24]

1987-88

Sericulture activity extended to Palakkad district.[25]

1988 - 89

At the end of 1988-89, an area of 467 ha. in different parts of the State had been brought under sericulture, involving 1555 farmers. In view of the high employment potentials, in rural areas, sericulture has been recognized as a major thrust area of development.[26] A Plan provision of Rs.20 lakhs was made under sericulture for the first time in 1988-89. During this year 585 acres of land were brought under mulberry cultivation involving 786 farmers.[27]

1989 - 90

A Plan outlay of Rs. 25 lakhs was provided for implementing the program. During the period, an area of 1532 acres involving 1795 farmers has been brought under sericulture. About 47.96 tonnes of cocoon have been produced and six chawki rearing centers started in 1989-90. Recognizing the importance of the industry, the State Planning Board constituted a Special Task Force to study the feasibility of sericulture and various infrastructural facilities required for the expansion of the industry. The Task Force recommended to take measures for mulberry farming in 28000 acres during the Five Year Plan 1990-95 taking all the 14 districts together and to establish silkworm rearing and related process.[28]

1990 - 91

Government declared sericulture as a Village Industry during 1990-91 and since then Khadi and Village Industries Board has been implementing the programs of sericulture in the State. During the year, an additional area of 4887 acres has been brought under mulberry cultivation involving 6018 farmers. 60 tonnes of cocoons

were produced and 1165 rearing units were established in this year. A major break-through in this year was the establishment of 540 sericulture co-operative societies for providing farmers with infrastructure facilities, credit support, marketing facility and price support for cocoons. A budget provision of Rs. 350 lakhs has been made for sericulture programs.[29]

1991 - 92

In the light of the new Industrial Policy announced by the State Government in 1991 and the decision to launch the Eighth Five Year Plan from 1992-93, a revised program for the development of sericulture during the Plan period has been formulated with a target of extending sericulture in 50000 acres and an ultimate perspective of creating self-employment opportunities for 2.5 lakh people in the rural areas. Nearly 13000 acres have been brought under mulberry cultivation up to the end of March 1992. The number of farmers engaged in mulberry cultivation increased from 6018 to 9660 during 1991-92 which shows an increase of 61 percent over the year 1990-91. KVIB has initiated various steps including subsidy for the development of the industry. Two grainages were established - one at Palakkad under Central Silk Board and another by a voluntary agency called Mithraniketan. A Plan budget of Rs. 500 lakhs has been provided for 1992-93.[30]

1992 - 93

In this year, an additional area of 4631 acres has been brought to sericulture engaging 5454 farmers. During this period 288.14 tonnes of cocoons were produced. More than 3000 farmers were benefited under the program for providing subsidies

for rearing equipment, rearing sheds and interest subsidy. The Government has approved a scheme to provide incentive bonus at the rate of Rs.10 per kg. of bivoltine reeling cocoons, with 50 percent re-imbursement from Central Silk Board. It has been found that though the area under mulberry cultivation is increasing, there was no corresponding increase in the production of cocoons. In view of this it has decided to initiate action to increase the productivity in the areas already brought under cultivation instead of expanding the area.[31]

4.1.8. Report on Rupees Thousand Crore Employment Program (ROTCEP) 1992

As a part of the employment generation strategy during the Eighth Five Year Plan, the State Planning Board has constituted a Rupees Thousand Crore Employment Program in 1992. Among the development of various small and villages industries, visualized under this plan, sericulture industry also found a prominent place. In order to achieve the objectives of generation of income and employment, with comparatively low investment and short gestation, sericulture development has been considered as a major promotional area in this program.[32]

1993 - 94

Up to the end of 1993-94, more than 5000 acres were under mulberry cultivation in about 6100 holdings. During this year 743 acres of mulberry cultivation was newly introduced involving 531 new farmers. The production of cocoon was about 100 tonnes.

The target of the Eighth Plan was to cultivate mulberry in 50000 acres. But it was found that while mulberry cultivation was expanding, the production of

cocoons was not increasing accordingly. The low production rate was largely due to the inadequate infrastructure for marketing and processing. Hence, a cautious strategy was evolved, where stress was given to increase the productivity of the established mulberry gardens than to expand mulberry acreage.[33]

1994 - 95

Sericulture, being a new venture for the farmers in Kerala, required integrated technical attention and management on a continuous basis. The Kerala State Sericulture Co-operative Federation Ltd. (SERIFED) was formed in October 1994, exclusively to undertake the sericulture development program in the State. But the progress of the implementation of the program has been adversely affected due to lack of adequate field staff. Against the target of bringing 50000 acres of land under mulberry cultivation during Eighth Plan period, only 5494 acres could be covered till 31-3-1995. The Serifed started taking steps to rejuvenate the industry and offered a number of incentives to farmers to take up sericulture activities. The number of farmers engaged in the industry was 6552. In this year 65.32 tonnes of cocoons were produced. There were two silk reeling centers one at Patanakkad in Alappuzha and another at Uduma in Kasaragod District, under Government sector and 20 Silk reeling units under private sector.[34]

1995 - 96

Even though the Eighth Plan target was to bring 50000 acres of land under mulberry cultivation and to establish related industries with an ultimate aim of creating employment opportunities for 2.5 lakh persons in five years, the State could

not achieve any remarkable progress in this sector for various reasons. The area under mulberry cultivation came to only 1476 acres. It has been noticed that majority of the farmers engaged in mulberry cultivation are reluctant to undertake silkworm rearing. During the year only 92 acres were brought under mulberry cultivation by 148 farmers. The quantity of cocoon produced was 45.66 tonnes.[35]

1996 - 97

In this year, due to the effort of Serifed, the area of mulberry cultivation increased to 2776 acres and the number of farmers to 4225. The quantity of cocoon produced was only 16.17 tonnes. The district offices of Serifed were functioning as cocoon purchase centres also. There were four silk reeling units, two in the State sector and two in the private sector. One demonstration - cum - training centre was functioning at Palakkad under the Central Silk Board. During the year 92 primary societies have been affiliated.[36]

1997 - 98

The area under mulberry cultivation was 2910 acres with 4424 farmers engaged in the sericultural activities. The number of rearing units was 987. The production of cocoons during this year amounted to 31 tonnes. The production of raw silk yarn amounted to 1554 kg. and the co-operative societies newly organized were 130 numbers.[37]

1998 - 99

Serifed continued the promotional activities of sericulture. During the Ninth Plan, thrust has been given for implementing programs in selected areas which have potential for development. During 1998-99, a further area of 2492 acres was brought under mulberry cultivation covering 3645 farmers. The total area under mulberry cultivation reached 5402 acres. High yielding variety was also introduced for the first time in the State during this year. The cocoon production was 33.15 tonnes. An irrigation scheme was introduced and popularized during 1998-99 to improve mulberry productivity. About 220 acres involving 268 farmers were covered under this scheme. Various subsidy schemes were availed of more than 1000 farmers. Silk weaving was also initiated through the Kairali Harijan Weavers Industrial Co-operative Society.[38]

1999 - 2000

During this year, a total of 1152 acres were newly brought under mulberry cultivation covering 1187 farmers. Thereby, the total area under mulberry cultivation increased to 6584 acres and number of farmers increased to 9650. Serifed supplied a total of 120674 Disease Free Layings (DFLs) to produce 40,535 kgs. of cocoons during this period. There was an increase of 7 tonnes of cocoons over the previous year.[39]

2000 - 2001

The total area under mulberry cultivation was 1515.45 acres and the number of farmers was 2019 producing 37.99 MT of cocoons. In this year 288.38 acres of new

area were brought under mulberry cultivation by 445 new farmers. A total number of 125202 DFLs were supplied and total silk production amounted to 3168.47 kg.[40]

2001 - 2002

During this year, 380 acres of additional mulberry cultivation was carried out by covering 568 farmers. Number of DFLs supplied was 113286. A total volume of 29935 kg. of cocoon and 2561 kg. of silk were produced. A remarkable achievement of this year was Kerala has become 100% bivoltine rearing zone, producing 100% internationally gradable bivoltine silk. As a part of the efforts for developing silk industry, Serifed entered into commercial production of silk fabrics with the help of weavers at Kallanchira. The products were brand named as 'Keral Silk' and 'Serisilk'. In this year, a twisting unit with capacity to process 5 kg. silk yarn per day was established at the sericulture complex at Uduma, Kasargod. Efforts were also taken to make sericulture as a Village Industry, for which the concept of 'Entegramam Pattugramam' is contemplated. Under this program, all families in the village will have sericulture either as a major or as a subsidiary source of income. The attempt is supported by Serifed by giving all necessary technical guidance, training, etc. The Central Silk Board has selected two clusters - Chungathara of Malappuram district and Chenganoor of Alappuzha district under the National Program for Rural Industrialisation.[41]

2002 - 03

The total mulberry plantation acreage was 1414 and the number of farmers engaged in sericulture reached 2366. The number of DFLs supplied amounted to

113286, the cocoon production was 33229 kg. and the volume of silk production was 2602.52 kg.

In spite of the concerted efforts, the industry could not take off as envisaged. Hence, a new strategy for the development of sericulture was introduced during the Tenth Plan period. This involved three components namely, cluster based development, active involvement of local body and member societies and emphasis on post-cocoon technology sector.

As a part of cluster based sericulture development strategy, the sericulture activities in the State were confined to 125 Grama Punchayats spreading over 40 selected clusters during 2002-03. More emphasis is given on creating awareness and motivating people to adopt sericulture as means for increasing earnings.[42]

2003 -04

The mulberry plantation area reached 1981 acres and the number farmers engaged in sericulture increased to 3216. A total of 154125 DFLs were distributed during this year and the cocoon production was 59113 kg. The production of silk attained an amount of 4041 kg.

A cluster based approach for the development of sericulture has been adopted and is in operation in 125 Grama Punchayats covering 40 clusters. Silk fabric production was undertaken on experimental basis during 2003-04. A silk weaving unit has been set up at Mangalathukonam in Balaramapuram at an estimated cost of Rs. 17.40 lakhs.[43]

TABLE 4.1

Mulberry Acreage, Number of Farmers and Cocoon Production in Kerala

Year	Mulberry Cultivation (Acres)	Number of Farmers	Cocoon Production	
			Cocoon (tonnes)	Growth Index 1996-97=100
1996-97	2776	4225	16.17	100
1997-98	2910	4424	31.00	191.71
1998-99	5402	3645	33.15	205.01
1999-2000	6584	9650	40.54	250.71
2000-01	1515	2019	37.99	234.94
2001-02	1895	2587	29.94	185.16
2002-03	1414	2366	33.23	205.50
2003-04	1981	3216	59.11	365.55

Source: Compiled from Economic Reviews 1997-2004

Table 4.1 shows the progress of sericultural activities in Kerala during the last eight years. It can be understood that there is remarkable growth in the production of cocoon since the inception of Serifed, in the year 1994.

The Table given below gives a description of the area of mulberry cultivation, number of farmers engaged in the sericulture, DFLs. supplied, quantity of cocoon produced and the production of silk, in the year 2003-04 in 14 districts of Kerala.

TABLE 4.2

Physical Achievement of Sericulture for the year 2003-04

Sl. No	Districts	Mulberry Cultivation (Acres)	No. of Farmers	Percentage of Farmers	DFLs Supplied Nos.	Cocoon Production Kg.	Silk Production Kg.
1.	Thiruvananthapuram	96.73	180	5.60	4220	772.35	0
2.	Kollam	131.54	199	6.20	5965	1646.80	0
3.	Pathanamthitta	98.90	156	4.85	4095	1093.35	0
4.	Alappuzha	150.90	298	9.27	6275	1535.63	1394.20
5.	Kottayam	120.65	225	7.00	5070	1602.95	0
6.	Eranakulam	101.00	204	6.34	11340	4236.48	0
7.	Idukki	344.60	433	13.46	9830	3483.20	0
8.	Trissur	136.22	251	7.80	21645	10022.70	0
9.	Palakkad	187.00	222	6.90	21265	9338.83	974.00
10.	Malappuram	162.60	262	8.15	17275	6738.05	0
11.	Kozhikkode	88.45	170	5.29	4340	1789.90	0
12.	Kannur	125.40	264	8.21	17460	7090.25	0
13.	Wayanad	159.75	237	7.36	19500	7725.50	0
14.	Kasargod	77.15	115	3.57	5845	2037.40	1673.50
Total		1980.89	3216	100	154125	59113.39	4041.70

Source: Serifed, Thiruvananthapuram.

Table 4.2 shows that the number of farmers engaged in sericulture is the highest in Idukki district, which accounts for 13.46 per cent of the State's total. It is followed by Alappuzha district (9.27%) and Kannur district (8.21%). Idukki is also having the largest acreage under mulberry cultivation, which comes to 344.60 acres (17.40%). Regarding the production of cocoons Thrissur is the leading district. Its production of cocoon accounts for 10022.70 Kg., which is about 17 per cent of the State's total production. The utilisation of DFLs. is also the highest in Thrissur district. Among the three districts where silk production is carried out, Kasargod is

the leading district producing 1673.50 Kg. of raw silk, accounting for more than 41 per cent of the total quantity of silk produced in the State.

4.1.9. Kerala State Sericulture Co-operative Federation Ltd. (SERIFED)

Since the inception of sericulture in Kerala in 1986-87, its development activities were entrusted to the Khadi and Village Industries Board. But, for the integrated development of the industry and for its better management, the State Government formed the Kerala State Sericulture Co-operative Federation Ltd. (SERIFED) in 1994. It was established as an apex body of the taluk level primary co-operative societies. The head quarters of Serifed is at Thiruvananthapuram and it has offices in all 14 districts of the State. The district offices, in addition to implementing the development programs in districts, are acting as cocoon collection centers also. The funds for its operations are obtained from the State's budget and from Central Silk Board.

Serifed achieved considerable progress in the pre-cocoon sector. It is offering a number of incentives to farmers in order to induce them to take up sericulture development activities. Recently, it has entered the post-cocoon sector also. The entire quantities of cocoons procured by Serifed are reeled in the government reeling units of Serifed at Alappuzha and Kasargod and a reeling unit run by the co-operative society at Palakkad.

Serifed has initiated necessary steps for the installation of silk yarn twisting at Uduma and silk reeling units for ensuring uninterrupted supply of twisted yarn to weavers. Providing Master Reelers Service, training of craftsmen in silk loom

fabrication, training of weavers in silk weaving, etc. were the other programs organized by Serifed. With the support of Central Silk Board, Serifed arranged assistance to the master weavers so as to strengthen the weaving activities in the State. As a result, several industrial societies ventured into commercial silk weaving. The Serifed is supporting its affiliated primary co-operative societies by providing management grant, furniture and fixtures grant, etc. If also introduced schemes for crop insurance to bivoltine cocoons and award to the best farmer in the State and District.[44] Serifed has started the commercial production of silk fabrics named Keral Silk and Serisilk. A cluster based approach for the development of sericulture is in operation.

4.1.10. Conclusion

Sericultural activities are progressing in Kerala. The Government of Kerala has recognized this industry as a labour intensive and income generating industry quite suitable for rural areas. This industry is developing in all 14 districts of Kerala. The Kerala State Sericulture Co-operative Federation Ltd. was formed to take care of this industry. Since its inception in 1994, the industry is making good progress in Kerala.

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SECTION - II

GENERAL STATUS OF SERICULTURE

Though sericulture in Kerala is of recent origin, it is practiced all over the 14 districts of the State and the Serifed is having offices in all these districts. For the purpose of this study, three districts namely, Alappuzha, Malappuram and Kannur were considered so as to represent Kerala from its South, Central and North areas. This section provides a discussion about the general features of sericulture farmers of these districts. The basic details of sericulture families, their practices of mulberry cultivation, silkworm rearing and marketing of cocoons are analysed in this section.

4.2.1. Classification of Farmers

For the purpose of approaching the problem in a more systematic way, the farmers of the survey area are being divided into three classes, namely, Small, Medium and Large farmers. This classification is made on the basis of the quantity of cocoons produced by the farmers of these areas in the year of survey. Farmers who had a production of less than 100 kgs. of cocoons, are classified as Small farmers, farmers who had a production of cocoons 100 kgs. or more but less than 200 kgs. are grouped as Medium farmers and farmers who attained a production of 200 kgs. or more are included in the class of Large farmers.

TABLE 4.3

Class-wise Distribution of Farmers in the Three Districts

Class of Farmers	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Small (less than 100 kg)	65 (92.86)	86 (66.15)	75 (75)	226	75.33
Medium (100 to 200 kg)	4 (5.71)	28 (21.54)	18 (18)	50	16.67
Large (200 kg and above)	1 (1.43)	16 (12.31)	7 (7)	24	08.00
Total	70	130	100	300	100

Source: Field Survey
(Figures in bracket: percentage to appropriate totals)

Table 4.3 shows a class-wise distribution of sericulture farmers in the three districts under study. It can be seen that majority of the farmers (75.33 per cent) included in the survey belong to small class. 16.67 per cent of the farmers are in the medium class and only eight per cent is falling in the large class. Small class of farmers is predominant in all the three districts. In Alappuzha, 92.86 per cent, in Malappuram, 66.15 per cent and in Kannur, 75 per cent of the farmers belong to small class.

4.2.2. Religion and Caste-Wise Distribution of Respondents

Religion has played a crucial role in the civilization of Kerala. Kerala is a State where it can be well appreciated the symbiosis of the three cultures, namely, Hinduism, Islam and Christianity. The interdependence of these three religions is present in all activities whether it is agriculture, business or any other economic or social endeavor.

TABLE 4.4

Religion-wise Distribution of Respondents in the Three Districts

Religion	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Hindu	43	60	56	159	53.00
Muslim	3	37	1	41	13.67
Christian	24	33	43	100	33.33
Others	0	0	0	0	0
Total	70	130	100	300	100

Source: Field Survey

Table 4.4 gives an account of religion-wise distribution of respondents in the three districts. It can be understood that Hindus are the majority among the sericulture farmers accounting for 53 per cent of the total, followed by Christians (33.33 per cent) and Muslims (13.67 per cent). No other religious category was reported doing sericulture.

The survey revealed that there is no farmer belonging to scheduled caste or scheduled tribe doing sericulture in the districts of study. All farmers belonged to forward castes.

4.2.3. Family Members and their Participation in Sericulture

The structure of the family has got very important influence on the adoption of sericulture by a farmer. Since the entire processes are labour intensive, the involvement of family members is crucial for the profitable operation of the enterprise. Family is also a good source of training for sericulture.

TABLE 4.5

Family Members per Household and their Participation in Sericulture In the Three Districts

District	Number of families	Total Members		Number of members participating	Average Participation
		Number	Average		
Alappuzha	70	306	4	180	3
Malappuram	130	535	4	324	2
Kannur	100	392	4	258	3
Total	300	1233	4	762	3

Source: Field Survey

Table 4.5 provides a description about the total number of members in the households and the number of members taking part in the sericultural activities. It can be seen that on an average the families are having four members each. It can also be understood that in all the three districts, the rate of participation of family members is very high as average three members out of four are taking part in the sericultural activities.

4.2.4. Gender-wise Sericulture Entrepreneurship

Sericulture is an avocation where both men and women can play their own roles. Women can also take initiative in starting sericulture, and they can be very securely and effectively employed in this field.

TABLE 4.6

Gender-wise Sericultural Entrepreneurship in the Three Districts

District	Total Number of Farmers	Males		Females	
		Number	Percentage	Number	Percentage
Alappuzha	70	43	61.43	27	38.57
Malappuram	130	85	65.38	45	34.62
Kannur	100	81	81.00	19	19.00
Total	300	209	69.67	91	30.33

Source: Field Survey

Table 4.6 presents the male-female classification of the sericulture farmers. It can be seen that out of the total sericulturists, 69.67 per cent are males and the remaining 30.33 per cent are females. The male entrepreneurship is the highest in Kannur (81 per cent) while the female entrepreneurship is the highest in Alappuzha (38.57 per cent). It can be understood that there are a good number of female entrepreneurs engaged in sericulture.

4.2.5. Total Income-wise Distribution of Respondents

Annual income of the sericultural households from all sources is accounted and shown in the following table, so as to have an idea about the economic status of sericultural farmers of the study area. The farmers are divided into three classes on the basis of their annual income, viz. farmers earning less than Rs. 25000, those earning Rs. 25000 to Rs. 50000 and those earning more than Rs. 50000.

TABLE 4.7

Classification of Farmers in the Three Districts on the Basis of Annual Income from All Sources

District	Annual Income Rupees (from all sources)			Total Households
	Less than 25000	25000 - 50000	More than 50000	
Alappuzha	3	45	22	70
Malappuram	88	36	6	130
Kannur	15	64	21	100
Total	106 (35.33)	145 (48.33)	49 (16.34)	300 (100)

Source: Field Survey
(Figures in brackets: percentages to total)

Table 4.7 shows the income-wise distribution of the sericultural households. It can be understood that most of the farmers (48.33 per cent) belong to the annual income group of Rs. 25000 to 50000. Annual income, which is less than Rs. 25000, is reported by 35.33 per cent of the farmers and only 16.34 per cent of the farmers are having annual income more than Rs. 50000. Majority of the farmers of the Malappuram district belongs to the annual income class of less than Rs. 25000 while the farmers of Alappuzha and Kannur district mostly belong to the income class of Rs. 25000 to 50000.

4.2.6. Age of Respondents

An age-wise classification of the respondents is made in the following Table. The farmers are divided in to three groups according to their age, viz., those who are below 40 years, those who are 40 to 60 years and those who are above 60 years.

TABLE 4.8

Age-wise Distribution of Respondents in the Three Districts

District	Total Respondents	Age in years		
		Less than 40	Between 40 - 60	Above 60
Alappuzha	70	49	16	5
Malappuram	130	93	25	12
Kannur	100	47	46	7
Total	300 (100)	189 (63)	87 (29)	24 (08)

Source: Field Survey
(Figures in brackets: percentages to total)

Table 4.8 shows the age-wise distribution of sericulture farmers. It can be seen that the majority (63 per cent) of the farmers belong to the age group of less than 40, the age that is favorable to understand and adopt new technologies. Out of the remaining, 29 per cent are in the age group of 40 to 60 and only eight per cent belong to the age group of above 60.

4.2.7. Education and Occupation

Educational status is a criterion, which helps the farmers in understanding the technologies and complexities associated with the sericultural process. For analysing the educational status of farmers, they are classified into six groups, viz., Illiterate, below SSLC, SSLC, Pre-Degree, Degree and Others having technical qualifications.

Farmers are classified on the basis of their occupation also. Occupationally, it is found that farmers, who are predominantly agriculturists, are more motivated to

do sericulture. Therefore, farmers are classified into five groups viz., those who are agriculturists, wage earners, business people, others doing some technical jobs and those who have no occupation other than sericulture.

TABLE 4.9

Education-wise Distribution of Respondents in the Three Districts

District	No. of Respondents	Educational Status					
		Illiterate	Below SSLC	SSLC	Pre-Degree	Degree	Other
Alappuzha	70	0	17	33	7	3	10
Malappuram	130	0	55	37	18	14	6
Kannur	100	0	58	21	8	6	7
Total	300 (100)	0	130 (43.33)	91 (30.33)	33 (11)	23 (7.67)	23 (7.67)

Source: Field Survey (Figures in brackets indicate percentages to total)

It can be seen from Table 4.9 that 43.33 per cent of the farmers are having the educational status, which is below SSLC. Farmers having SSLC as their qualification are 30.33 per cent of the total. 11 per cent of the farmers have reported Pre-Degree as their qualification, 7.67 percent are Degree holders and the remaining 7.67 percent are having other qualifications like technical or otherwise. Most of the farmers of Alappuzha are having SSLC as their educational qualification while farmers of Malappuram and Kannur are mostly below SSLC. It can be seen that a good majority of the farmers (73.66 per cent) have either SSLC or below SSLC as their educational qualification which is enough to understand the sericultural technologies. Nobody is reported to be illiterate.

TABLE 4.10

Occupation-wise Distribution of Respondents in the Three Districts

District	No. of Respondents	Occupation				
		Agriculture	Wage Earners	Business	Others	None
Alappuzha	70	44	11	5	4	6
Malappuram	130	84	12	5	13	16
Kannur	100	58	8	4	6	24
Total	300	186 (62)	31 (10.33)	14 (4.67)	23 (7.67)	46 (15.33)

Source: Field Survey
(Figures in brackets indicate percentages to total)

Table 4.10 gives an account of the occupation of the respondents. It can be seen that the majority (62 per cent) are having agriculture as their main occupation. 15.33 per cent of the farmers have no occupation other than sericulture. 10.33 per cent are wage earners, 4.67 per cent are business people and 7.67 per cent are in the other category, which consists of technical workers. In all the three districts, sericulturists are mostly agriculturists who can perform better in sericultural activities.

4.2.8. Training and Experience in Sericulture

Sericulture is an activity, which requires special skill and knowledge for its successful implementation and operation. Since it involves a series of bio-technological process, it is indispensable for the farmers to acquire sufficient training and expertise in the various aspects of mulberry cultivation and silkworm rearing. Serifed, Government and Central Silk Board are the formal agencies for providing

training. Farmers are also getting training from their friends or relatives or from their family itself.

Experience of the sericulturists, is one of the criteria deciding the success and profitability in sericulture. On the basis of experience, the farmers are divided into four groups viz., those who are having less than three years of experience, those who are having three to five years of experience, those who are having five to 10 years of experience and those who are having more than 10 years of experience.

TABLE 4.11

Respondents Undergone Training in Sericulture in the Three Districts

Districts	Total No. of Respondents	No. of Trained Respondents	Percentage of Trained Respondents
Alappuzha	70	60	85.71
Malappuram	130	125	96.15
Kannur	100	88	88.00
Total	300	273	91.00

Source: Field Survey

Table 4.11 shows the number of respondents who have received training in sericultural activities. On an average, 91 per cent of the farmers have obtained training. It can be seen that the number of the trained farmers is the highest in Malappuram district (96.15 per cent). In Kannur, 88 per cent and in Alappuzha, 85.71 per cent of the farmers have obtained training. Variation is found among districts regarding the trained farmers. As training can improve the performance, there is the need for giving training to all farmers.

TABLE 4.12

Male-Female Classification of Trained Respondents in the Three Districts

District	Total No. of Trained Respondents	Males		Females	
		Number	Percentage	Number	Percentage
Alappuzha	60	37	61.67	23	38.33
Malappuram	125	83	66.40	42	33.60
Kannur	88	70	79.55	18	20.45
Total	273	190	69.60	83	30.40

Source: Field Survey

Table 4.12 gives the male-female classification of the respondents who obtained training in sericulture. It can be seen that out of the total trained farmers, 69.60 per cent are males and 30.40 per cent are females. The percentage of trained males is the highest in Kannur (79.55 per cent). In Malappuram it is 66 .40 per cent and in Alappuzha it is 61.67 per cent. The portion of trained females is the highest in Alappuzha (38.33 per cent). The same is 33.60 per cent in Malappuram and 20.45 per cent in Kannur.

TABLE 4.13

Classification of Respondents on the Basis of Source of Obtaining Training

Source of Training	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Serifed	42	103	66	211	77.29
Government	0	0	0	0	00
CSB	11	13	11	35	12.82
Family Training	4	9	6	19	6.96
Neighbor/Friends	3	0	5	8	2.93
Total	60	125	88	273	100

Source: Field Survey

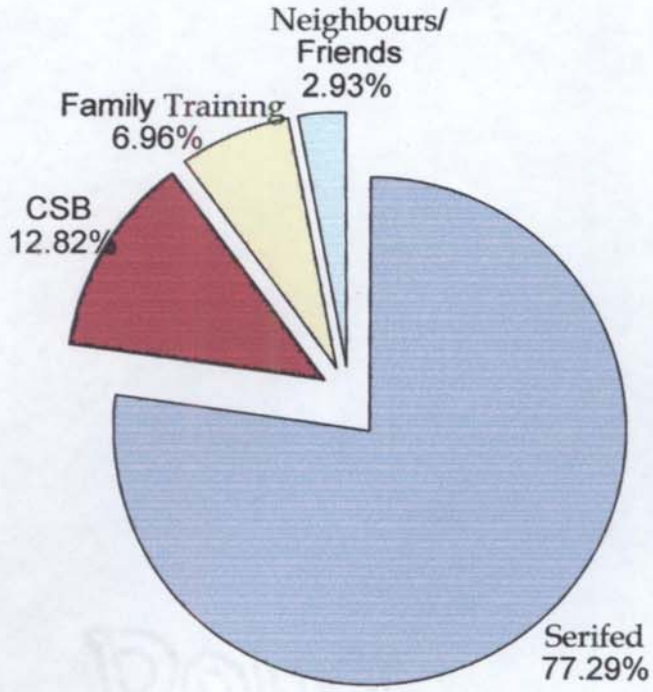

Figure 4.1 Various Sources of Training Received by Farmers

Table 4.13 and Figure 4.1 give information about the various sources from where the farmers have obtained their training. It is evident that 77.29 per cent of the farmers have obtained their training from Serifed, 12.82 percent received their training from Central Silk Board, 6.96 per cent are trained from their family itself and 2.93 per cent have got training from their neighbours or friends. No body has reported to have received training directly from Government. It can be understood that in all the three districts, Serifed is the major source of training.

TABLE 4.14

Classification of Trained Respondents According to Formal and Informal Training

Nature of Training	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Formal	53	116	77	246	90.11
Informal	7	9	11	27	9.89
Total	60	125	88	273	100

Source: Field Survey

From Table 4.14 it can be seen that out of the total trained farmers 90.11 per cent of the farmers have got training formally (from Serifed or from Central Silk Board) and 9.89 per cent have got informal training (from family, neighbours or friends).

TABLE 4.15

Classification of Respondents on the basis of Period of Training Undergone

Period of training (days)	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Less than 10	5	20	18	43	17.48
10 - 20	22	61	27	110	44.72
20 - 30	3	24	25	52	21.14
More than 30	23	11	7	41	16.66
Total	53	116	77	246	100

Source: Field Survey

Table 4.15 gives a description about the number of days of training obtained by the farmers. It can be understood that most of the farmers (44.72 per cent) who received training, had a training period of 10 to 20 days. 21.14 per cent received

training between 20 and 30 days. Farmers who received training days of less than 10 are 17.48 per cent and farmers who have received training period of more than 30 days are 16.66 per cent. It is a noticeable fact that though Serifed is offering a training period of 30 days, majority of the farmers have not utilised it to the fullest extent. It reveals the need for enhancing the incentives given to farmers to attend training and thereby attracting more farmers to the training program.

TABLE 4.16

Classification of Respondents on the basis of Experience in Sericulture

Experience (Years)	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Less than 3	28	59	43	130	43.33
3 - 5	29	44	36	109	36.33
5 - 10	10	27	21	58	19.34
More than 10	3	0	0	3	01
Total	70	130	100	300	100

Source: Field Survey

A classification of the respondents on the basis of experience in sericulture is given in Table 4.16. It shows that most of the farmers (43.33 per cent) are having less than three years of experience in the field of sericulture. This is the same in all the three districts. 36.33 per cent of the farmers have three to five years of experience, 19.34 per cent of the farmers are having five to 10 years of experience and only one per cent of the farmers are having more than 10 years of experience.

4.3. MULBERRY CULTIVATION PRACTICES

Mulberry is the basic food material for silkworms and the bulk of the silk produced in the world is from mulberry silkworms. Production of mulberry leaves by scientific methods is essential for organizing sericulture on sound economic line. It is estimated that one metric ton of mulberry leaves is necessary for the rearing of silkworms emerging from out of one ounce of eggs. Mulberry leaf protein is the source for the silkworm to bio-synthesize the silk. The cost of leaves works out to about 60 per cent of the total cost of production of silk. The production of mulberry leaves depends on the favorable climatic and soil conditions prevailing in a region and on the application of fertilizers and irrigation.

In this section, details of mulberry cultivation like area under mulberry, variety of mulberry, particulars of plantation, irrigation, leaf production, motivating factors for doing sericulture and farmers' plan for future expansion of mulberry are analysed.

4.3.1. Mulberry Area

Since mulberry leaf is the only food material for silkworms, the area under mulberry cultivation is having a direct bearing on the production of cocoons. An economical holding of 50 cents is required for the profitable operation of sericulture. Area of mulberry cultivation to the total land holdings of farmers and average mulberry area per household are analysed here. Also, according to the area of cultivation, the farmers are grouped into three viz., those who are having less than

50 cents of mulberry cultivation, those who are having 50 to 100 cents of cultivation and those who are having more than 100 cents of cultivation.

TABLE 4.17

District-wise Mulberry Area to total Land Holdings of the Respondents

District	Area of Land (acre)		Percentage of Mulberry Area to Total Land
	Total	Mulberry	
Alappuzha	165.65	32.20	19.44
Malappuram	242.10	81.25	33.56
Kannur	179.00	53.25	29.75
Total	586.75	166.70	28.41

Source: Field Survey

Table 4.17 gives information about the proportion of the area of mulberry cultivation to the total land holdings of the farmers. It is evident that, the district of Malappuram is having the largest area under mulberry cultivation (33.56 per cent) followed by Kannur (29.75 per cent) and Alappuzha (19.44 per cent) in comparison to the total land holdings. The overall mulberry area to the total land holding is 28.41 per cent.

TABLE 4.18

Average Area of Mulberry Cultivation per Household in the Three Districts

District	Number of farmers	Mulberry Area (acres)	
		Total	Average
Alappuzha	70	32.20	0.46 (0.22)
Malappuram	130	81.25	0.63 (0.37)
Kannur	100	53.25	0.53 (0.26)
Total	300	166.70	0.56 (0.31)

Source: Field Survey.
(Figures in bracket: standard deviation of mulberry area).

It can be seen from Table 4.18 that the average mulberry area possessed by each household is 0.56 acre with an average variation of 0.31 acre among households in the three districts. The average mulberry area in Alappuzha is 0.46 acre, in Malappuram it is 0.63 acre (which is the highest) and in Kannur it is 0.53 acre per household.

TABLE 4.19

Class-wise Distribution of Mulberry Area in the Three Districts

Class	Mulberry Area			Total	No. of Farmers	Average Area
	Alappuzha	Malappuram	Kannur			
Small	28.70	44.45	33.65	106.8	226	0.47
Medium	2.75	21.00	13.10	36.85	50	0.74
Large	0.75	15.80	6.50	23.05	24	0.96
Total	32.2	81.25	53.25	166.7	300	0.56

Source: Field Survey

Table 4.19 shows the class-wise distribution of mulberry area in the three districts of study. It can be seen that the average mulberry area possessed by small farmers is 0.47 acre, that of medium farmers is 0.74 acre and that of large farmers is 0.96 acre. Thus, it is clear that the mulberry area per farmer is the highest among large class of farmers.

TABLE 4.20

Classification of Respondents According to Area of Cultivation of Mulberry

Area of Cultivation (cents)	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Less than 50	27	29	27	83	27.67
50 - 100	37	62	57	156	52.00
More than 100	6	39	16	61	20.33
Total	70	130	100	300	100

Source: Field Survey

Table 4.20 provides information about the mulberry area-wise classification of the respondents. The majority of the farmers (52 per cent) possess mulberry area of 50 to 100 cents. 27.67 per cent of the farmers are having mulberry area less than 50 cents. Only 20.33 per cent of the farmers are having more than 100 cents of mulberry cultivation. However, it can be understood that most of the farmers are having economical holding.

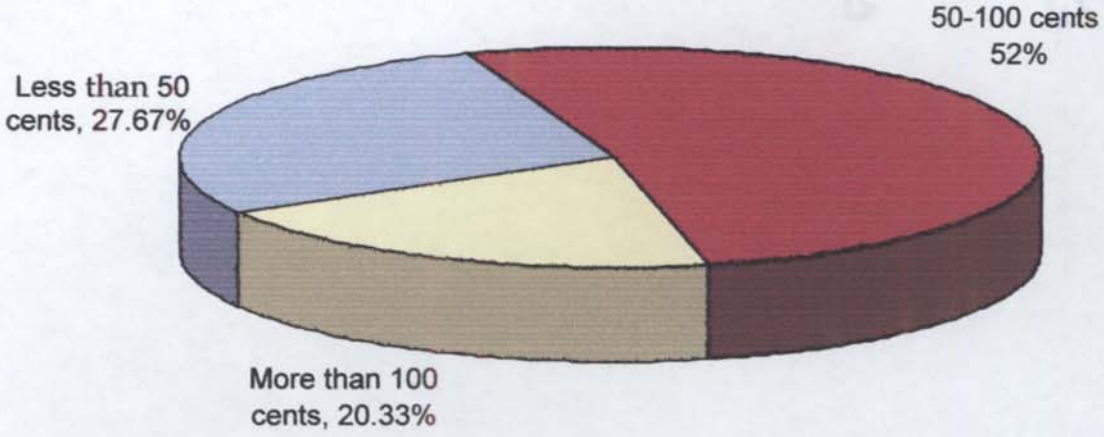

Figure 4.2 Classification of Farmers according to Area of Mulberry Cultivation

Figure 4.2 also shows the classification of farmers of the three districts on the basis of their mulberry area.

4.3.2. Variety of Mulberry

There are several varieties of mulberry suitable to varied soil and climatic conditions. Among those Kanva 2 and Victory 1 are popular in Kerala. Victory 1 is a better variety when compared to Kanva 2. The distribution of farmers on the basis variety of mulberry planted is examined here.

TABLE 4.21

Distribution of Farmers on the Basis of Variety of Mulberry Cultivated

Variety of Mulberry	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Kanva 2 (K2)	38 (54.28)	22 (16.92)	44 (44)	104	34.67
Victory 1 (V1)	27 (38.57)	96 (73.85)	42 (42)	165	55.00
Both (K2&V1)	5 (7.15)	12 (9.23)	14 (14)	31	10.33
Other	0	0	0	0	00
Total	70	130	100	300	100

Source: Field Survey
(Figures in brackets: percentages to appropriate total)

From Table 4.21 it can be seen that on an average, majority of the farmers (55 per cent) have planted the mulberry variety Victory 1, 34.67 per cent of the farmers have planted the variety Kanva 2 and both Victory 1 and Kanva 2 varieties are planted by 10.33 per cent of the farmers. No farmer is reported to be cultivating any other variety than the Victory 1 and Kanva 2. In Alappuzha and Kannur, most of the farmers are cultivating Kanva 2 while, in Malappuram majority of the farmers are cultivating Victory 1.

4.3.4. Planting Material

The planting material may be mulberry sapling, stem cuttings, seedling or grafted plants. Farmers generally use either stems or saplings because they are easily available and less costly when compared to other materials. Such materials are obtained from Serifed, neighbours or friends or relatives. This section discusses

about the type of planting materials used by farmers and their source of obtaining the same.

TABLE 4.22

Classification of Farmers on the Basis of Type of Planting Material Used

Type of Planting Material	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Sapling	24	87	50	161	53.67
Stem	39	34	50	123	41.00
Seedling	7	9	0	16	05.33
Grafting	0	0	0	0	00
Total	70	130	100	300	100

Source: Field Survey

Table 4.22 provides information about the type of planting materials used by the farmers in their mulberry plantations. It is clear that majority of the farmers (53.67 per cent) used saplings as the planting material. Stems are used by 41 per cent. Only 5.33 per cent of the farmers have used seedling for their plantation. No farmer has used grafted planting material. In Alappuzha most of the farmers have used stems while in Malappuram most of the farmers have used saplings in their plantations. In Kannur, both stems and saplings are used equally by the farmers.

TABLE 4.23

Distribution of Farmers on the Basis of Source of Obtaining Planting Material

Source of Planting Material	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Serifed	27	55	30	112	37.33
Friends/Relatives	43	75	70	188	62.67
Other	0	0	0	0	00
Total	70	130	100	300	100

Source: Field Survey

Table 4.23 gives an idea about the source of obtaining planting materials by sericulturists. It is clear that the majority of the farmers (62.67 per cent) have obtained the planting material from either their friends or relatives. It can be understood that Serifed has provided planting material only to 37.33 per cent of the farmers. No farmer has reported to have received the planting material from any other source.

4.3.5. Method of Cultivation

Farmers cultivate their mulberry as a mono crop i.e. cultivating mulberry alone, or as an inter crop i.e. planting mulberry among coconut or areca nut gardens or as both. In this section, the method of mulberry cultivation by the farmers, the age of their plantation, additional area planted after the first plantation, number of plants per acre, soil fertility, methods of irrigation and leaf harvest are analysed and discussed.

TABLE 4.24

Distribution of Farmers According to Method of Cultivation

Method of Cultivation	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Inter Crop	51	35	72	158	52.67
Mono Crop	8	65	13	86	28.67
Both	11	30	15	56	18.66
Total	70	130	100	300	100

Source: Field Survey

From Table 4.24 it can be seen that the majority of the farmers (52.67 per cent) practice inter cropping for mulberry cultivation. Mono cropping is practiced only by

28.67 per cent of the farmers. 18.66 per cent of the farmers practice both intercropping and mono cropping. In Alappuzha and Kannur, majority of the farmers have adopted intercropping while in Malappuram, most of the farmers have adopted mono cropping.

4.3.6. Age of Plantation

TABLE 4.25

Classification of Farmers According to Age of Mulberry Plantation

Age of Plantation (Years)	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Less than 2	28	59	43	130	43.33
2 - 5	32	60	45	137	45.67
More than 5	10	11	12	33	11
Total	70	130	100	300	100

Source: Field Survey

Table 4.25 provides an idea about the age of mulberry plantations in the area under study. It can be understood that the major part of the plantations (45.67 per cent) are of the age group of two to five years, 43.33 per cent plantations belongs to the age group of less than two years and only 11 per cent of the plantations belongs to the age group of more than five years. When compared to the life span of 20 years, it can be realized that most of the plantations are at their young and growing stage.

4.3.7. Additional Area

TABLE 4.26

Additional Area of Mulberry Planted and the Number of Farmers

District	Mulberry Acreage				Number* of Farmers	Total Farmers
	Initial Area	Additional Area	Percentage#	Total Area		
Alappuzha	31.10	1.10	3.54	32.20	5(7.14)	70
Malappuram	68.25	12.25	17.95	80.50	25(19.23)	130
Kannur	45.25	7.75	17.13	53.00	18((18)	100
Total	144.35	21.10	14.62	165.70	48(16)	300

Source: Field Survey

Percentage of additional area to initial area.

* Number of farmers who made the additional planting of mulberry and their percentage to the total is given in brackets.

Table 4.26 gives information about the number of farmers and the additional area of mulberry cultivated by them after the first plantation. It can be seen that only 16 per cent of the total farmers have planted additional area of mulberry, which accounts for 14.62 per cent of the initial area. The additional area cultivated is the largest in Malappuram district (17.95 per cent), which is followed by Kannur district with 17.13 per cent. In Alappuzha district, the area added to the initial plantation is only 3.54 per cent. The number of farmers who made the additional cultivation of mulberry is also the largest in Malappuram (19.23 per cent). The same is 18 per cent in Kannur and 7.14 per cent in Alappuzha.

4.3.8. Plants per Acre

TABLE 4.27

Total Number of Mulberry Plants and Plants per Acre in the Three Districts

District	Total Plants Nos.	Total Area (acres)	Plants per Acre
Alappuzha	135180	32.20	4198
Malappuram	382750	80.50	4755
Kannur	248925	53.00	4697
Total	766855	165.70	4628

Source: Field Survey

From Table 4.27 it can be seen that the average number of mulberry plants in the three districts is 4628 plants per acre. It is the highest in Malappuram district (4755 plants per acre). Kannur is having 4697 plants per acre and Alappuzha is having 4198 plants in an acre. According to Serifed, the average number of plants per acre is 5000 plants in mono crop system. Since a good number of farmers practice inter crop method, it cannot be concluded that the average plants per acre is less than the standard.

4.3.9. Soil Fertility

TABLE 4.28

Classification of Respondents According Soil Fertility of Mulberry Cultivation

Soil Fertility	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
Most Fertile	43	107	67	217	72.33
Fertile	27	23	33	83	27.67
Not Fertile	0	0	0	0	00
Total	70	130	100	300	100

Source: Field Survey

Table 4.28 shows that 72.33 per cent of the farmers are cultivating their mulberry plants in the most fertile soil and 27.67 per cent of the farmers are cultivating mulberry in fertile lands. No farmer is reported to be cultivating mulberry in the land, which is not fertile.

4.3.10. Irrigation

TABLE 4.29

Irrigational Status of Mulberry Area in the Three Districts

District	Total Farmers	Total Area	Percentage of farmers irrigating	Percentage area irrigated
Alappuzha	70	32.20	100.00	100.00
Malappuram	130	80.50	91.54	90.99
Kannur	100	53.00	90.00	91.51
Total	300	165.70	93.00	92.91

Source: Field Survey

It can be seen from Table 4.29 that 93 per cent of the total farmers in the three districts are irrigating their mulberry lands. Of the total mulberry area, 92.91 per cent of the area is irrigated.

TABLE 4.30

Classification of the Respondents According to Type of Irrigation of Mulberry

Method of Irrigation	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Drip	0	1	0	1	00.36
Pumping	60	99	85	244	87.46
Manual	10	19	5	34	12.18
Other	0	0	0	0	00.00
Total	70	119	90	279	100.00

Source: Field Survey

As shown in Table 4.30 the majority of the farmers (87.46) are using pumping method for irrigation. 12.18 per cent of the farmers are adopting manual method for irrigation. Only one respondent (0.36 per cent) in Malappuram district has implemented the drip irrigation system. No other method is reported.

TABLE 4.31

Reason for not Irrigating Mulberry Lands

Reason for Not irrigating	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
No need	0	3	0	3	14.29
No water resource	0	1	2	3	14.29
Financial difficulties	0	5	4	9	42.85
Expensive to returns	0	2	4	6	28.57
No electricity	0	0	0	0	00
Scarcity of water	0	0	0	0	00
Scarcity of labour	0	0	0	0	00
Total	0	11	10	21	100

Source: Field Survey

From Table 4.31 it can be understood that among the farmers who are not irrigating their mulberry lands, most of them (42.85 per cent) do not irrigate because of their financial difficulties. 28.57 per cent of the farmers do not irrigate their mulberry land because it is expensive when compared to returns. For 14.29 per cent of the farmers, there is no need of irrigating their lands. The reason reported by the remaining 14.29 per cent of the farmers is that they have no water resource, which is readily accessible. Nobody had reported the problems of lack of electricity, scarcity of water and scarcity of labour.

4.3.11. Leaf Harvest

TABLE 4.32

Classification of Farmers According to the Number of Harvests of Mulberry Leaves during the Year 2004-05

Number of Harvests	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Less than 5	41 (58.57)	53 (40.77)	54 (54)	148	49.33
5 - 10	24 (34.29)	72 (55.38)	41 (41)	137	45.67
More than 10	5 (7.14)	5 (3.85)	5 (5)	15	05.00
Total	70	130	100	300	100

Source: Field Survey

Table 4.32 shows an account of the harvest of mulberry leaves done by the farmers for the purpose of silkworm rearing in the year of survey. Most of the farmers (49.33 per cent) have made a harvest of less than five times. 45.67 per cent of the farmers have harvested the mulberry leaves between five and 10 times and only five per cent have harvested more than 10 times in the year. Among the three districts, in Alappuzha and Kannur, most of the farmers have harvested their mulberry less than five times and in Malappuram most of the farmers have harvested five to 10 times. It can be understood that, generally the number of harvests is very few.

TABLE 4.33

Classification of Farmers According to the Mulberry Leaf Production

Leaf Produced Kgs.	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Less than 1000	56	28	35	119	39.67
1000 - 5000	14	81	44	139	46.33
More than 5000	0	21	21	42	14.00
Total	70	130	100	300	100

Source: Field Survey

The details of mulberry leaf production are given in Table 4.33. Most of the farmers (46.33 per cent) had a production of 1000 to 5000 kilograms of leaves. Less than 1000 kilograms are produced by 39.67 per cent of the farmers. Only 14 per cent of the farmers had a production of more than 5000 kilograms of leaves. Discrepancy can be seen among the districts regarding the leaf production. In Alappuzha, most of the farmers had a production of less than 1000 kg while in Malappuram and Kannur, most of the farmers had a production of 1000 to 5000 kg of mulberry leaf in the year 2004-05. The standard leaf yield per acre is 12000 Kg. When compared to this, it can be seen that the yield is very low in all the three districts.

TABLE 4.34

Mulberry Leaf Usage in the Three Districts

District	Leaf Produced Kgs.	Production Per Acre Kg.	Leaf Used Kgs.	Percentage usage
Alappuzha	48475	1505	48425	99.90
Malappuram	340175	4226	337375	99.18
Kannur	331110	6247	317355	95.85
Total	719760	4344	703155	97.69

Source: Field Survey

It can be seen from Table 4.34 that the average leaf productivity per acre in the three districts is 4344 Kg. The leaf productivity is the highest in Kannur (6247 Kg.) and lowest in Alappuzha (1505 Kg). Out of the total mulberry leaves produced in the three districts, 97.69 per cent are used for rearing cocoons. Therefore, the unused portion is only 2.31 per cent. The rate of utilisation of leaves is the highest in Alappuzha, where it comes to 99.90 per cent. 99.18 per cent of leaves produced are utilised for cocoon rearing in Malappuram district and in Kannur the rate of usage of leaves is 95.85 per cent.

4.3.12. Source of Information

Farmers are often persuaded to do sericulture by the information they get about the sericultural activities. The source from where the farmers get information is analysed here.

TABLE 4.35

Distribution of Respondents According to the Source of Information about Sericulture

Source of Information	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Serifed	5	23	11	39	13.00
Sericulture Co-op Society	0	19	0	19	06.33
Neighbours	21	22	36	79	26.33
Friends/Relatives	27	8	18	53	17.67
Newspapers/Journals	17	58	35	110	36.67
Total	70	130	100	300	100

Source: Field Survey

From Table 4.35 it can be understood that 36.67 per cent of the farmers have obtained information about doing sericulture from newspapers or journals. Neighbours were the source of information for 26.33 per cent of the farmers. 17.67 per cent of the respondents got information from friends or relatives, only 13 per cent had information from Serifed and 6.33 per cent got information from sericulture co-operative societies.

4.3.13. Motivating Factors

Several factors are influencing and motivating a farmer to start sericulture. Usually, farmers are motivated by their personal interest, need for additional income, subsidies and incentives, employment possibilities and failure of other crops. These factors are analysed in this section.

TABLE 4.36

Distribution of Farmers According to Motivating Factors For Doing Sericulture

Motivating Factor	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Personal Interest	7	32	12	51	17.00
Additional Income	31	28	20	79	26.33
Avail Subsidy	0	0	10	10	03.33
Incentives of Serifed	10	11	16	37	12.33
Low Gestation	0	0	0	0	00
Absorb Family Labour	0	7	7	14	04.67
Loss of other Crops	22	52	35	109	36.34
Total	70	130	100	300	100

Source: Field Survey

Table 4.36 gives information about the factors, which motivated the farmers to take up sericulture activities. It can be seen that for most of the farmers (36.34 per cent), loss of other crops is the main factor motivated them to take up sericulture. Additional income is the motivating factor for 26.33 per cent of the farmers, 17 per cent are motivated by their personal interest, 12.33 per cent are motivated by incentives of Serifed, 4.67 per cent adopted sericulture for absorbing their family labour and only 3.30 per cent started sericulture to avail subsidy.

4.3.14. Expansion Plan

The future plan of farmers for expanding their mulberry cultivation is examined here. The reasons mentioned by farmers for expanding their cultivation and reasons for not expanding by others are also analysed in this section.

TABLE 4.37

Number of Farmers in the Three Districts having Plan to Expand Mulberry Cultivation and the Area Planned

District	Total Farmers	Present Area	Expansion		Percentage	
			No. of farmers	Area	farmers	area
Alappuzha	70	32.20	6	1.80	08.57	05.59
Malappuram	130	80.50	20	11.50	15.38	14.29
Kannur	100	53.00	6	2.25	06.00	04.25
Total	300	165.70	32	15.55	10.67	09.38

Source: Field Survey

Table 4.37 gives information about future plan of farmers to expand their mulberry cultivation. It can be understood that on an average, only 10.67 per cent of the farmers are having plan to expand their mulberry cultivation. The total area

expected to be cultivated by them is only 9.38 per cent of the present area. In Malappuram district, 15.38 per cent of the farmers have planned to cultivate additional area of mulberry, which comes to 14.29 per cent of their present plantation. In Alappuzha district 8.57 per cent of the farmers have planned to cultivate additional area of mulberry, which is 5.59 per cent of their present area. In Kannur district six per cent of the farmers have planned to cultivate additional area of mulberry, which is 4.25 per cent of their present area.

TABLE 4.38

Classification of Farmers According to the Reason for Expanding Mulberry Cultivation

Reason	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Profitable	0	11	0	11	34.37
More income	3	4	2	9	28.13
Utilise Family Labour	0	1	0	1	03.13
Failure of Agriculture	3	4	4	11	34.37
Total	6	20	6	32	100

Source: Field Survey

Table 4.38 shows the reasons for the expansion of mulberry cultivation by the farmers. 34.37 per cent of the farmers expand the mulberry area because of the failure of their agriculture. 34.37 per cent of the farmers are planning to expand their plantation because sericulture is profitable, 28.13 per cent expand to earn more income and only 3.13 per cent expand for utilizing their family labour.

TABLE 4.39

Classification of Farmers According to the Reason for Not Expanding Mulberry Cultivation

Reason for Not expanding	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
No Land	17	51	35	103	38.43
No Family Labour	17	8	6	31	11.57
Not Profitable	9	8	7	24	08.96
Lack Finance	12	4	11	27	10.07
Silkworm Diseases	0	6	5	11	04.10
Inadequate helps	0	8	0	8	02.99
No reason	9	25	30	64	23.88
Total	64	110	94	268	100

Source: Field Survey

Table 4.39 gives an explanation about why farmers are not willing to expand their present mulberry plantation area. It can be noticed that 38.43 per cent of the farmers are not expanding their mulberry area because of non-availability of land for the cultivation. 11.57 per cent of the farmers do not expand their area as they have no family labour, 8.96 per cent reported it is not profitable, 10.07 per cent are lacking finance for the expansion, 4.10 per cent do not expand because of silkworm diseases, 2.99 per cent do not expand because of inadequate helps from agencies and 23.88 per cent of the farmers cited no specific reason about why they do not have any plan to expand their mulberry land.

4.4. SILKWORM REARING PRACTICES

Rearing is the breeding of silkworms for the production of cocoons. It consists of a series of activities from hatching of eggs till the harvesting of cocoons. In this section an examination is made about the rearing house, rearing methods and difficulties connected with rearing operations.

4.4.1. Rearing House

A silkworm rearing house with facilities for disinfection, ventilation, maintenance of hygiene and control of environment is essential for successful rearing operations. The area of the rearing house depends on the quantity of DFLs reared. To grow 250 DFLs at a time, a rearing space of 16′ x 34′ and a room of the area of 16′ x 12′ for keeping leaves are required. It is better to have a rearing house that is separate from the dwelling house. Rearing can also be done in houses attached to the dwelling house. The dwelling house can also be modified to provide a space for rearing within the house itself.

TABLE 4.40

Distribution of Farmers According to the Type of Rearing House

Type of Rearing House	Number of Houses			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Separate Room	59	84	68	211	70.34
Attached to House	11	45	32	88	29.33
Within House	0	1	0	1	00.33
Total	70	130	100	300	100

Source: Field Survey

Table 4.40 provides an account of types of rearing house possessed by sericulture farmers. It can be noticed that the majority of the farmers (70.34 per cent) are having separate rearing houses and 29.33 per cent of the farmers are having rearing houses attached to their dwelling houses. Only 0.33 per cent (one farmer) is reported to have been rearing in the dwelling house itself.

4.4.2. Area and Age of Rearing House

TABLE 4.41

Average Area of Rearing House of the Respondents in the Three Districts

District	No. of Houses	Area in sq. feet	
		Total	Average
Alappuzha	70	11785	168 (30)
Malappuram	129	20155	156 (46)
Kannur	100	14108	141 (26)
Total	299	46048	154 (38)

Source: Field Survey
(Figures in bracket: standard deviation of the area in sq. feet)

Table 4.41 gives information about the area of rearing houses. The overall average area of the rearing houses in the three districts is 154 sq. feet with an average variation of 38 sq. feet. In Alappuzha it is 168 sq. feet, in Malappuram it is 156 sq. feet and in Kannur the average area of rearing houses is 141 sq. feet.

TABLE 4.42

Classification of Rearing Houses in the Three Districts According to their Age

Age of Rearing House (Years)	Number of Houses			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Less than 2	11	17	5	33	11.04
2 - 5	46	89	75	210	70.23
More than 5	13	23	20	56	18.73
Total	70	129	100	299	100

Source: Field Survey

Table 4.42 shows an account of the age of rearing houses in the three districts under study. It can be understood that majority of the rearing houses (70.23 per cent) are in the age level of two to five years. 18.73 per cent of the houses are having more than 5 years of age and 11.04 per cent are having less than 2 years of age.

4.4.3. Silkworm Eggs (DFLs)

The silkworm eggs technically known as Disease Free Layings (DFLs) are produced in laboratories and supplied to farmers for rearing. Two varieties of eggs namely, Bivoltine and Multivoltine eggs are commonly used. Farmers may purchase these DFLs from sources like Serifed, grainages of Central Silk Board, from outside Kerala sources or from other agencies. In the survey districts, it is observed that all farmers are getting their DFLs from the offices of Serifed only. It is also observed that all farmers are using only the bivoltine variety of silkworm eggs.

TABLE 4.43

Number of Farmers Having Difficulty in Purchasing DFLs

District	Total Farmers	Farmers having Difficulty	
		Number	Percentage
Alappuzha	70	9	12.86
Malappuram	130	11	08.46
Kannur	100	19	19.00
Total	300	39	13.00

Source: Field Survey

Table 4.43 provides information about the number of farmers who experience difficulties in connection with purchasing DFLs. It can be understood that on an average 13 per cent of the farmers have reported that they have difficulties in getting the DFLs. In Kannur, 19 per cent of the farmers, in Alappuzha 12.86 per cent of the farmers and in Malappuram 8.46 per cent of the farmers are experiencing difficulties in obtaining the DFLs.

TABLE 4.44

Distribution of Farmers According to the Difficulties Experienced in Purchasing DFLs.

Difficulty	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Need for booking	0	4	0	4	10.26
Shortage of DFLs	0	0	0	0	00
High Price	0	0	0	0	00
Indifferent Agency	0	0	0	0	00
Long Traveling	9	7	19	35	89.74
Total	9	11	19	39	100

Source: Field Survey

From Table 4.44, it is clear that 89.74 per cent of the farmers, who had difficulties in getting DFLs., reported the need for long traveling as their main difficulty. Only 10.26 per cent stated that need for booking in advance is their main difficulty in purchasing DFLs. Other difficulties like shortage of DFLs, high price or indifferent attitude of the officials of Serifed were not reported.

4.4.4. Crop Loss

The loss of cocoon crop may happen due to climatic problems, silkworm diseases, poor attention from the part of farmers, lack technical knowledge about rearing practices, etc. The loss may be partial or complete. In this section, the frequency of losses and their reasons are analysed.

TABLE 4.45

Number of Farmers in the Three Districts Suffering Loss of Cocoon Crop

District	Total No. of Farmers	No. of farmers Suffered loss	Percentage
Alappuzha	70	22	31.43
Malappuram	130	36	27.69
Kannur	100	27	27.00
Total	300	85	28.33

Source: Field Survey

Table 4.45 shows information about the number of farmers suffered loss of cocoon crops. On an average 28.33 per cent of the farmers in the three districts reported that they have suffered crop loss. The number of farmers who suffered loss of crop is the highest in Alappuzha (31.43 per cent). In Malappuram it is 27.69 per cent and in Kannur it is 27 per cent.

TABLE 4.46

Distribution of Farmers According to the Frequency of Crop Losses

Frequency of Crop Losses	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
1	16	31	18	65	76.47
2	4	3	7	14	16.47
3	1	2	2	5	5.88
4	1	0	0	1	1.18
5 or more	0	0	0	0	0
Total	22	36	27	85	100

Source: Field Survey

Table 4.46 gives an account of the number crop losses suffered by farmers during the year 2004-05. It can be seen that among the farmers who had crop loss, 76.47 per cent have suffered one crop loss in the year, 16.47 per cent suffered two losses, 5.88 per cent had three losses and only 1.18 per cent of the farmers suffered loss four times in the year. There was no farmer who suffered losses five or more times. However, it is evident that a good number of farmers are experiencing crop loss which indicates the need for extending the crop insurance program of Serifed.

TABLE 4.47

Reason for Crop Losses Reported by Farmers of the Three Districts

Reason	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Inferior Quality DFLs	0	0	0	0	00
Climatic Problems	5	15	5	25	29.41
Lack of Technical Helps	0	0	0	0	00
Poor Attention	1	8	3	12	14.12
Silkworm Diseases	2	8	2	12	14.12
Cannot Specify	14	5	17	36	42.35
Total	22	36	27	85	100

Source: Field Survey

Table 4.47 reveals the reasons for crop losses. It can be realized that most of the farmers (42.35 per cent) are not in a position to specify the reason for the crop loss suffered by them. Climatic problems are the reason cited by 29.41 per cent of the farmers. The problems of poor attention and silkworm diseases are mentioned by 14.12 per cent each of the farmers. Nobody has reported inferior quality of DFLs or lack of technical helps as the reasons for the crop loss.

4.4.5. Rearing Equipment

Sufficient number of rearing equipment is required for successful rearing operations. The requirement is according to the number and frequency of DFLs reared. Rearing stand, rearing trays, mountages and a number of other equipments are required for this purpose. Farmers having shortage of rearing equipments are shown in the following table.

TABLE 4.48

Farmers in the Three Districts Having Shortage of Rearing Equipments

District	Total No. of Farmers	No. of Farmers having Shortage	Percentage
Alappuzha	70	3	04.29
Malappuram	130	5	03.85
Kannur	100	12	12.00
Total	300	20	06.67

Source: Field Survey

From Table 4.48 it can be known that 12 per cent of the farmers in Kannur, 4.29 per cent of the farmers in Alappuzha and 3.85 per cent of the farmers of Malappuram are having shortage of rearing equipments. On an average 6.67 per

cent of the farmers are having shortages of rearing equipments in the three districts. However, the number of farmers who suffer from shortage of rearing equipments is not considerable.

4.5. MARKETING OF COCOONS

Marketing facility is the most important factor of the infrastructure of sericulture industry. Existence of good cocoon market, timely marketing of cocoons and reasonable prices are essential for the growth of the industry. In this section, the method adopted by farmers for selling cocoons, the difficulties experienced by them in selling cocoons and their suggestions for an alternative method of marketing are analysed.

It is observed that Serifed is the only cocoon procurement agency in the study districts. But at the same time, farmers do not have a cocoon market in their local area. They have to travel long distances to sell their cocoons.

TABLE 4.49

Average Distance to the Cocoon Market

District	Total No. of Farmers	Distance to Cocoon Market	
		Total Kms.	Average Kms
Alappuzha	70	2075	30 (12)
Malappuram	130	2642	20 (7)
Kannur	100	5436	54 (11)
Total	300	10153	34 (18)

Source: Field Survey
(Figures in bracket: standard deviation of distance in kms)

Table 4.49 shows the distance traveled by farmers for selling their cocoons. It shows the farmers have to travel on an average 34 kilo metre to the nearest cocoon market (average variation of the distance being 18 km). This distance is the maximum in Kannur district (54 Kms.). The average distance traveled by farmers of Alappuzha to sell their cocoons is 30 kms and in Malappuram it is 20 kms.

TABLE 4.50

Farmers Reported Drawback in the System of Marketing of Cocoons by Serifed

District	Total No. of Farmers	Reported Yes		Reported No	
		Number	Percentage	Number	Percentage
Alappuzha	70	3	4.29	67	95.71
Malappuram	130	16	12.31	114	87.69
Kannur	100	9	09.00	91	91.00
Total	300	28	09.33	272	90.67

Source: Field Survey

It can be seen from Table 4.50 that 9.33 per cent of the farmers from the three districts reported drawback in the present system of marketing while 90.67 per cent reported no problems. 12.31 per cent of the farmers of Malappuram district, nine per cent of the farmers of Kannur district and 4.29 per cent of the farmers of Alappuzha district have stated that there is drawback in the present marketing system.

TABLE 4.51

Drawbacks Reported in the Cocoon Marketing System of Serifed

Drawback	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Delay in Payment	0	3	0	3	10.71
No Grading	0	0	0	0	00
No better price for Quality Cocoons	0	0	2	2	07.14
Fraudulent Practices	0	0	0	0	00
Distant Location of Collecting Centre	3	13	7	23	82.15
Total	3	16	9	28	100

Source: Field Survey

Table 4.51 gives information about the drawback reported by the farmers in the present system of marketing. It can be known that the majority of the farmers (82.15 per cent) pointed out the distant location of the cocoon collecting centre as the main drawback. 10.71 per cent cited delay in payment and 7.14 per cent reported that they are not getting better price for their good quality cocoons. No farmer has reported any fraudulent practices in marketing.

TABLE 4.52

Alternate Method Suggested by Farmers for Selling Cocoons

Alternate Method	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Market in Panchayats	35	62	81	178	59.33
Auction Method	0	7	6	13	04.33
Silk Exchanges	5	9	0	14	04.67
Collect at Home	30	52	13	95	31.67
Total	70	130	100	300	100

Source: Field Survey

Table 4.52 shows the alternative methods suggested by farmers for marketing of cocoons. The majority (59.33 per cent) made the suggestion that cocoon market should be established in every Panchayat. 31.67 per cent of the farmers suggested that cocoons must be collected at home by the authorized agents of Serifed. 4.67 per cent recommended the establishment of silk exchanges and 4.33 per cent suggested the auction method of sales.

4.6. Test of Hypothesis

The first hypothesis set for the study was:

Ho: *There is significant difference in the sericultural pattern of the three districts.*

This hypothesis is tested by analysing the related variables as shown below:

TABLE 4.53

Analysis of Variables Deciding the Sericultural Pattern of the Three Districts using Chi-square Values

Variables Considered	Chi-square Value	Degree of Freedom	Critical Value (5 %)	Refer Table No.	Remarks*
Area of mulberry cultivation	16.9891	4	9.488	4.20	R
Variety of mulberry	39.1378	4	9.488	4.21	R
Planting material used	30.8752	4	9.488	4.22	R
Source of planting material	3.7194	2	5.991	4.23	A
Method of cultivation	67.7323	4	9.488	4.24	R
Age of plantation	1.8643	4	9.488	4.25	A
Number of leaf harvest	9.7248	4	9.488	4.32	R
Leaf production	71.5117	4	9.488	4.33	R
Motivating factors	47.6053	10	18.307	4.36	R
Type of rearing house	9.8320	4	9.488	4.40	R
Frequency of crop loss	6.8129	6	12.592	4.46	A
Reason for crop loss	21.4150	6	12.592	4.47	R

*R=reject null hypothesis, A=accept null hypothesis, at five per cent level of significance

Table 4.53 reveals that except with regard to source of planting material, age of plantation and frequency of crop loss, the chi-square values of all other variables are found to be falling outside the acceptance region. Therefore, it can be inferred that most the factors affecting the sericultural pattern of the three districts, are identical. Hence, the hypothesis is proved to be false and it can be presumed that the farmers in the three study districts are following the same sericultural pattern.

The above discussions reveal a general picture of the sericultural activities of the three representative districts of Kerala selected for study. A detailed analysis of the financial structure of the sericulture industry in these areas is provided in the next chapter.

CHAPTER V

FINANCIAL ANALYSIS

FINANCIAL ANALYSIS

The general aspects of sericultural activities in the three districts selected for study have been discussed in the previous chapter. The present chapter is intended to have an analysis of the financial aspects of the various phases of sericulture, so as to form an opinion about the cost and income structure of sericulture in Kerala. Thus, the chapter includes the analysis of methods of financing the sericultural activities, labour costs, fixed and variable costs, role of subsidies in various costs, cocoon productivity and an analysis of sales and income.

5.1. FINANCING ASPECTS

Sericulture requires funds for its operation. Various fixed and variable costs are to be born by the sericulturists for the establishment and running of this enterprise. Mulberry plantation, rearing shed, rearing equipments, irrigation facilities are the major items on which initial investment is required. Rearing operations also require funds, which are recurring in nature. The details of financing the sericultural operations by the farmers of the study districts are analysed below.

5.1.1. Source of Finance

The source of finance may be own or borrowed. This depends on the quantum of activities and the financial capacity of the farmers. In this section, an analysis is made about the types of financing adopted by farmers, various sources

and amounts of loans, interest rates on loans, repayment of loans and reason for not availing loans.

TABLE 5.1

Distribution of Farmers According to the Type of Financing the Sericultural Activities

Type of Finance	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Own	56	69	83	208	69.33
Borrowed	14	61	17	92	30.67
Total	70	130	100	300	100

Source: Field Survey

Table 5.1 shows the types of financing reported by the farmers for their sericultural operations. It can be seen that the majority of the farmers (69.33 per cent) rely on own funds for their sericultural activities. Borrowed funds are utilised by the remaining 30.67 per cent of the farmers.

TABLE 5.2

Class-wise Distribution of Farmers According to the Source of Finance for Sericulture

Type of Farmers	Sources of Finance				Total Farmers
	Own		Borrowed		
	Number	Percentage	Number	Percentage	
Small	158	69.91	68	30.09	226
Medium	35	70.00	15	30.00	50
Large	15	62.5	9	37.50	24
Total	208	69.33	92	30.67	300

Source: Field Survey

Table 5.2 gives an account of the utilisation of own and borrowed funds by the small, medium and large classes of farmers. It can be seen that 69.91 per cent of the small farmers, 70 per cent of the medium farmers and 62.5 per cent of the large farmers depend on own funds rather than borrowed funds for their sericultural activities.

5.1.2. Borrowings

TABLE 5.3

Classification of Farmers Availed Loan According to Source

Source of Loan	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
Commercial Banks	2	18	8	28	30.43
Co-operative Banks	6	13	0	19	20.65
Land Development Banks	6	13	9	28	30.43
Money Lenders	0	8	0	8	08.70
Others(Ayalkkootam)	0	9	0	9	09.79
Total	14	61	17	92	100

Source: Field Survey

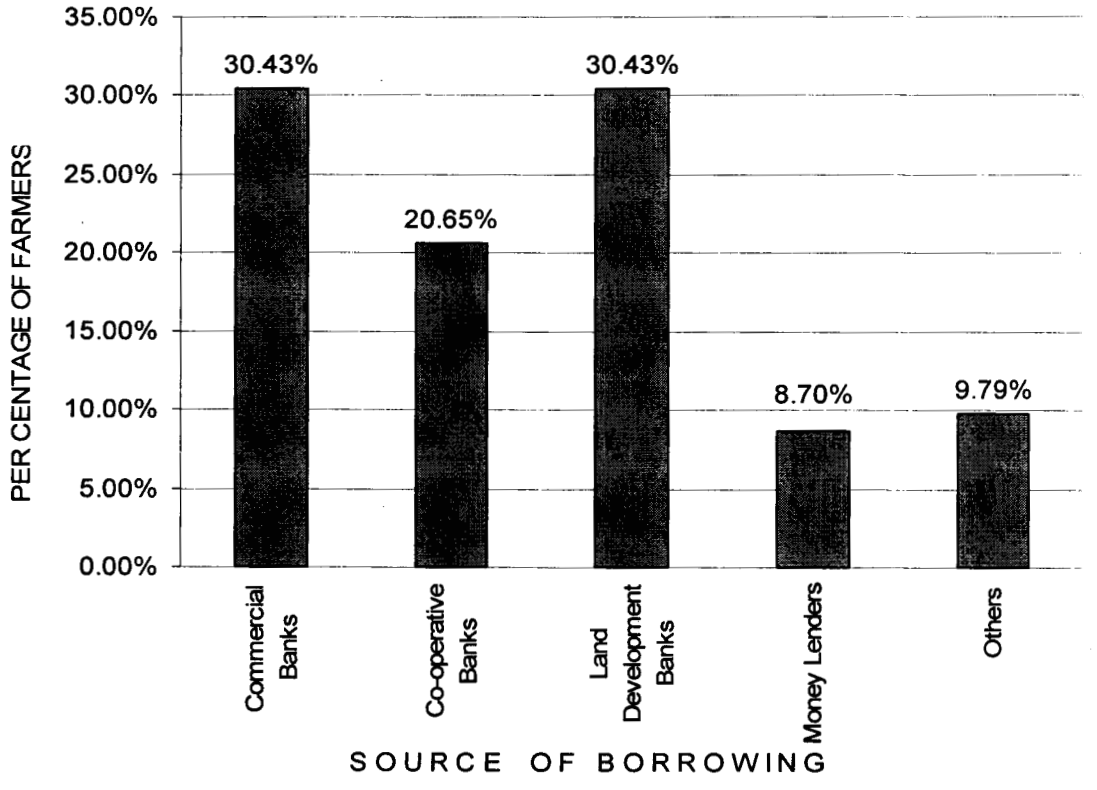

Figure 5.1 Percentages of Farmers Availed Loans from Various Sources

Table 5.3 and Figure 5.1 give an idea of different sources from where farmers borrow funds for their operations. It can be understood that majority of the farmers make their borrowings from commercial banks and land development banks (30.43 per cent each). Co-operative banks are the source of loans for 20.65 per cent of the farmers. 8.7 per cent borrow from moneylenders and 9.79 per cent borrow from other sources like "Ayalkkootam".

TABLE 5.4

Class-wise Distribution of Farmers who Availed Loan from Different Sources

Source of Loan	Number of Farmers			Total
	Small	Medium	Large	
Commercial Banks	24 (35.29)	3 (17.65)	1 (14.29)	28
Co-operative Banks	16 (23.53)	3 (17.65)	0 (0)	19
Land Development Banks	20 (29.42)	6 (35.29)	2 (28.57)	28
Money Lenders	3 (4.41)	2 (11.76)	3 (42.85)	8
Others(Ayalkkootam)	5 (7.35)	3 (17.65)	1 (14.29)	9
Total	68 (73.91)	17 (18.48)	7 (7.61)	92 (100)

Source: Field Survey
(Figures in brackets: percentage to the appropriate totals)

Table 5.4 gives an account of loans availed by different classes of farmers from various sources. It can be seen that among those who have availed loans from various sources, small farmers constitute the majority (73.91 per cent). It can also be seen from the Table that among the small class of farmers, most of them availed loan from commercial banks (35.29 per cent), among the medium class, most of them availed loan from land development banks (35.29 per cent) and among large class of farmers most of them availed loans from moneylenders (42.85 per cent).

The above discussions show that farmers generally borrow from commercial banks, co-operative banks or land development banks for their requirements in sericulture. It brings out the need for providing special financial assistance to sericultural farmers by establishing specialized financial agencies for the purpose.

TABLE 5.5

Amount of Loans Availed by Sericulturists from Various Sources in the Three Districts

Source of Loan	Amount of Loan (Rs.)			Total Rs.	Percentage to total
	Alappuzha	Malappuram	Kannur		
Commercial Banks	15000 (23.08)	141500 (32.05)	45500 (37.60)	202000	32.19
Co-operative Banks	26000 (40.00)	108000 (24.46)	0 (0)	134000	21.35
Land Development Banks	24000 (36.92)	63000 (14.27)	75500 (62.40)	162500	25.90
Money Lenders	0 (0)	67500 (15.29)	0 (0)	67500	10.76
Others(Ayalkkootam)	0 (0)	61500 (13.93)	0 (0)	61500	09.80
Total	65000	441500	121000	627500	100

Source: Field Survey
(Figures in bracket: percentage to appropriate totals)

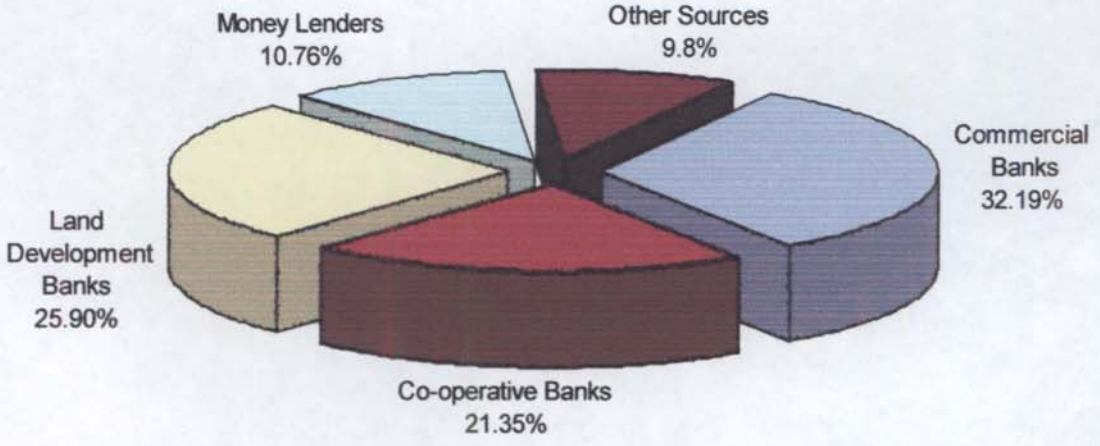

Figure 5.2 Shares of Different Sources of Loans in the Total Loan Structure

Table 5.5 and Figure 5.2 furnish details about the amounts of loan availed by the farmers of the three districts from various sources. It can be understood that loans taken from commercial banks is the highest (32.19 per cent) among the different sources of loans. The remaining 25.90 per cent of the loans are availed from the land development banks, 21.35 per cent are availed from co-operative banks, 10.76 per cent are availed from money lenders and 9.8 per cent are availed from other sources, mainly from "Ayalkkootam". It can also be understood from the Table that in Alappuzha most of the loans are taken from co-operative banks (40 per cent), in Malappuram most of the loans are taken from commercial banks (32.05 per cent) and in Kannur most of the loans are taken from land development banks (62.40 per cent).

TABLE 5.6

Average Amount Borrowed by Farmers in the Three Districts

District	Total Amount Borrowed Rs.	Number of Farmers Borrowed	Average Borrowings Rs.
Alappuzha	65000	14	4643
Malappuram	441500	61	7238
Kannur	121000	17	7118
Total	627500	92	6821

Source: Field Survey

Table 5.6 shows the average amount borrowed by sericulturists for sericultural purposes. It is clear that the average amount borrowed is Rs. 6821 in the three districts. The same is the highest in Malappuram (Rs. 7238) followed by Kannur (Rs. 7118) and Alappuzha Rs. (4643).

TABLE 5.7

Average Rate of Interest Incurred by Farmers of the Three Districts on Loans Borrowed for Sericulture

District	Number of Loans	Average Rate of Interest
Alappuzha	14	8.93 (4)
Malappuram	61	14.80 (9)
Kannur	17	10.00 (4)
Total	92	13.02 (7)

Source: Field Survey
(Figures in brackets: standard deviation of interest rates)

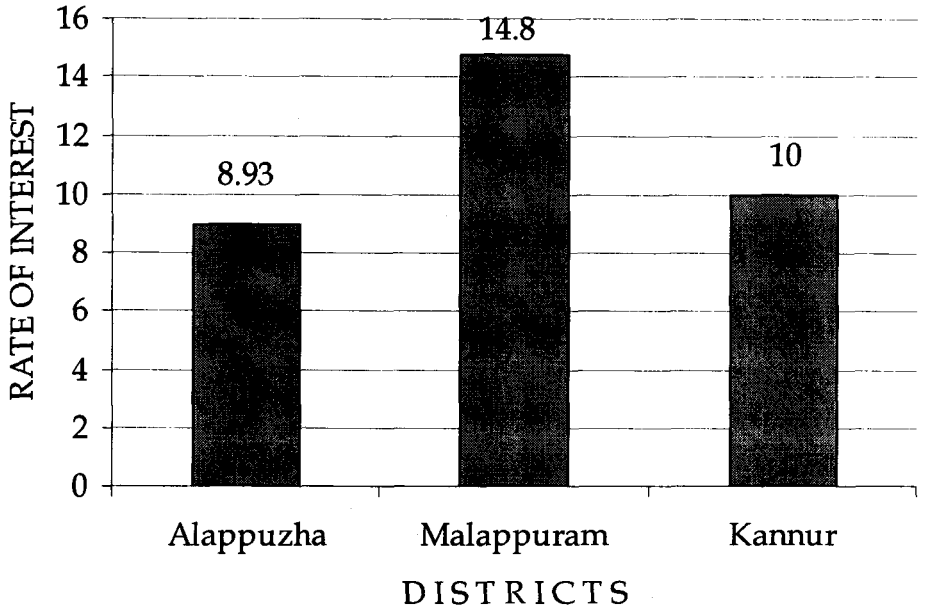

Figure 5.3 Average Rate Interest on Loans

From Table 5.7 and figure 5.3 it can be seen that on an average 13.02 per cent is the rate of interest (with an average variation of 7 per cent) paid by the farmers on loans taken by them from various sources. The average rate of interest is the highest

in Malappuram district (14.8 per cent). This is because of the dependence on village moneylenders for loan purposes who charge very high rate of interest. The average rate of interest is 10 per cent in Kannur and 8.93 per cent in Alappuzha.

TABLE 5.8

Average Rate of Repayment of Loan Borrowed for Sericulture by the Farmers of the Three Districts

District	Total Amount of Loan Rs.	Amount of Loan Repaid Rs.	Percentage Repaid
Alappuzha	65000	27000	41.54
Malappuram	441500	198920	45.05
Kannur	121000	56500	46.69
Total	627500	282420	45.00

Source: Field Survey

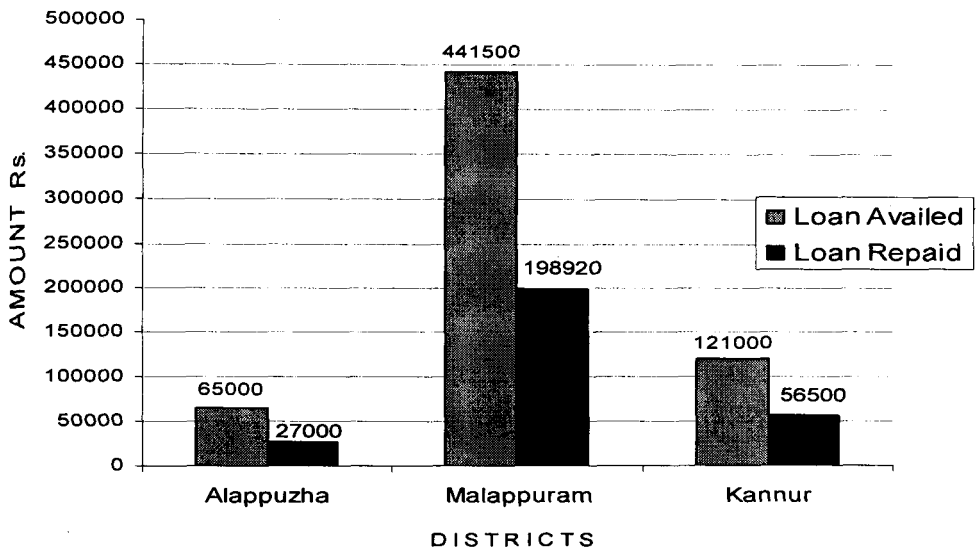

Figure 5.4 Loan Availed and Repaid by Farmers in the Three Districts

Table 5.8 and Figure 5.4 reveal the percentage of repayment of the loans taken by farmers in the three districts. It can be seen that the overall repayment rate is 45 per cent of the amount of loan. The rate of repayment is the highest in Kannur

district (46.69 per cent). In Malappuram district it is 45.05 per cent and in Alappuzha district the same is 41.54 per cent of the loan amount.

TABLE 5.9

Rate of Repayment of Loan Borrowed for Sericulture by Different Classes of Farmers.

Type of Farmers	Loan Availed Rs.	Loan Repaid Rs.	Percentage Repaid
Small	378000	179860	47.58
Medium	158000	64560	40.86
Large	91500	38000	41.53
Total	627500	282420	45.00

Source: Field Survey

It is evident from Table 5.9 that, among the farmers who repaid their loans taken for sericultural purposes, the rate of repayment is the highest (47.58 per cent) among small class of farmers. The repayment rate among medium farmers is the lowest (40.86) when compared to other classes. The same is 41.53 per cent among large class of farmers. However, the average rate of repayment (45 per cent) indicates that sericulturists are in a position to make a reasonable repayment of their loans.

TABLE 5.10

Reason Given by Farmers for not Availing Loan for Sericulture

Reason	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
No Need	8	17	16	41	19.52
Approached Not Given	6	26	28	60	28.57
Need for Security	4	7	12	23	10.95
Delay in Sanctioning	9	5	12	26	12.38
Indifferent Officials	17	0	3	20	09.52
Not Aware	5	0	0	5	02.38
No Capacity to Repay	7	16	12	35	16.68
Total	56	71	83	210	100

Source: Field Survey

Table 5.10 reveals the reason why some farmers did not avail any loans for their sericultural activities. It can be understood that most of the farmers (28.57 per cent) approached the authorities for loans but they could not get the same. 19.52 per cent of the farmers did not take any loans because they do not require loans. No capacity to repay loans is the reason for 16.68 per cent of the farmers. 12.38 per cent of the farmers did not avail any loan because of the undue delay in sanctioning loans. The reason for 10.95 per cent of the farmers was lack of collateral security. 9.52 per cent of the farmers reported the indifferent attitude of the officials towards sanctioning loans for sericulture. Only 2.38 per cent of the farmers mentioned that they are not aware of loans. It can be realized that farmers are generally experiencing difficulties in availing loans for sericulture.

5.2. LABOUR UTILISATION

Labour is a very important part of sericultural activities. Skilled and experienced labour is required for planting mulberry and rearing of cocoons. There is the involvement of both family and hired labour in sericultural operations. Similarly, both men and women are taking part in various activities of mulberry cultivation and silkworm rearing. A discussion is made in this part about the family and hired labour utilised by the farmers and their male-female composition. The number of family labour is decided on the basis of an estimation made by the farmers. The works done by the family members occasionally for various activities were combined and eight hours of work were treated as one workday. An average wage rate of Rs.150 for males and Rs.120 for females was considered for calculating the cost of labour for both family and hired labour.

5.2.1. Labour for Planting Mulberry: Family Labour

TABLE 5.11

Family Labour for Planting Mulberry and their Male and Female Composition

District	Total Number of Labour	Male Labour		Female Labour	
		Number	Percentage	Number	Percentage
Alappuzha	181	134	74.03	47	25.97
Malappuram	609	586	96.22	23	03.78
Kannur	195	158	81.02	37	18.98
Total	985	878	89.14	107	10.86

Source: Field Survey

Table 5.11 shows an account of family labour utilised for planting mulberry and their male and female composition. It can be seen that out of the total family

labour utilised for planting mulberry, 89.14 per cent are males and 10.86 per cent are females. The male component is highest in Malappuram (96.22 per cent) while the female component is highest in Alappuzha (25.97 per cent).

5.2.2. Labour for Planting Mulberry: Hired Labour

TABLE 5.12

Hired Labour for Planting Mulberry and their Male and Female Composition

District	Total Number of Labour	Male Labour		Female Labour	
		Number	Percentage	Number	Percentage
Alappuzha	177	129	72.88	48	27.12
Malappuram	240	225	93.75	15	06.25
Kannur	374	276	73.80	98	26.20
Total	791	630	79.65	161	20.35

Source: Field Survey

It can be seen from Table 5.12 that of the total hired labour employed in the three districts for planting mulberry, 79.65 per cent are males and 20.35 per cent are females. The male part is the highest in Malappuram (93.75 per cent) and the female part is highest in Alappuzha (27.12 per cent).

TABLE 5.13

Total Value of Family and Hired Labour for Planting Mulberry

District	Total Labour Rs.	Family Labour		Hired Labour	
		Amount Rs.	Percentage	Amount Rs.	Percentage
Alappuzha	50850	25740	50.62	25110	49.38
Malappuram	126210	90660	71.83	35550	28.17
Kannur	81300	28140	34.61	53160	65.39
Total	258360	144540	55.95	113820	44.05

Source: Field Survey

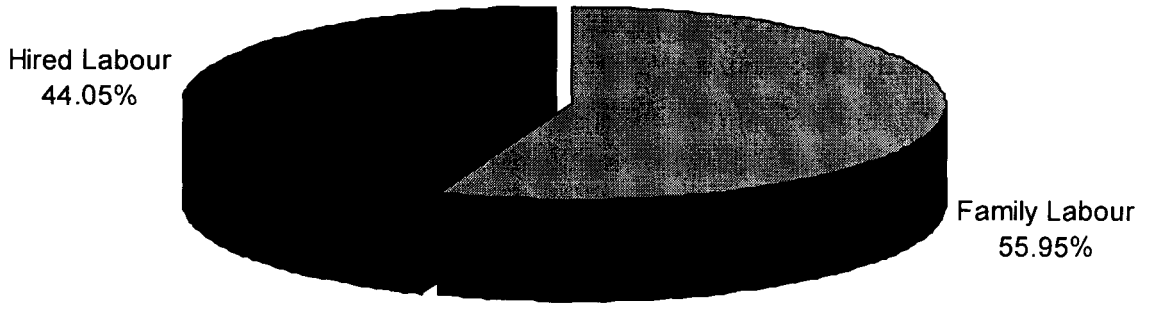

Figure 5.5 Composition of Hired and Family Labour in Planting Mulberry

Table 5.13 and Figure 5.5 reveal the composition of hired and family labour in the total cost of planting mulberry, in value terms. It can be seen that, in the total cost of labour for planting mulberry, 55.95 per cent is constituted by family labour and 44.05 per cent is composed of hired labour.

TABLE 5.14

Male and Female Components in the Total Labour Cost of Mulberry Plantation

District	Total Cost Rs.	Male		Female	
		Cost Rs.	Cost%	Cost Rs.	Cost%
Alappuzha	50850	39450	77.58	11400	22.42
Malappuram	126210	121650	96.39	4560	03.61
Kannur	81300	65100	80.07	16200	19.93
Total	258360	226200	87.55	32160	12.45

Source: Field Survey

An account of the male and female components in the total cost of labour for planting mulberry is given in Table 5.14. It can be understood that the total labour cost of planting mulberry is made of 87.55 per cent male labour and 12.45 per cent

female labour. The male labour portion is the highest in Malappuram (96.39 per cent) and the female labour portion is the highest in Alappuzha (22.42 per cent).

5.2.3. Labour for Rearing: Family Labour

TABLE 5.15

Family Labour for Rearing Operations and their Male and Female Composition

District	Total Number of Labour	Male Labour		Female Labour	
		Number	Percentage	Number	Percentage
Alappuzha	981	788	80.33	193	19.67
Malappuram	2420	1266	52.31	1154	47.69
Kannur	2235	1561	69.84	674	30.16
Total	5636	3615	64.14	2021	35.86

Source: Field Survey

Table 5.15 gives an idea about the number of family labour engaged in silkworm rearing operations and their male and female classification. It can be understood that in the total family labour for rearing operations, 64.14 per cent are males and 35.86 per cent are females. The participation of family male labour in rearing operations is the highest in Alappuzha (80.33 per cent). It is 69.84 per cent in Kannur and 52.31 per cent in Malappuram districts. The female participation is the highest in Malappuram (47.69 per cent) and lowest in Alappuzha (19.67 per cent). The same is 30.16 per cent in Kannur district.

5.2.4. Labour for Rearing: Hired Labour

TABLE 5.16

Hired Labour for Rearing Operations and their Male and Female Composition

District	Total Number of Labourers	Male Labour		Female Labour	
		Number	Percentage	Number	Percentage
Alappuzha	63	21	33.33	42	66.67
Malappuram	127	6	04.72	121	95.28
Kannur	295	47	15.93	248	84.07
Total	485	74	15.26	411	84.74

Source: Field Survey

The total number of hired labour used in rearing operations and their male and female division are given in Table 5.16. It can be seen that, the fraction of male labour in the total hired labour for rearing is 15.26 per cent and that of female labour is 84.74 per cent. The contribution of male labour is highest in Alappuzha (33.33 per cent). In Kannur it is 15.93 per cent and in Malappuram it is only 4.72 per cent. The participation of female labour in rearing operations is highest in Malappuram (95.28 per cent). The same is 84.07 per cent in Kannur and 66.67 per cent in Alappuzha.

TABLE 5.17

Total Value of Family and Hired Labour for Rearing Operations

District	Total Labour Rs.	Family Labour		Hired Labour	
		Amount Rs.	Percentage	Amount Rs.	Percentage
Alappuzha	149550	141360	94.52	8190	05.48
Malappuram	343800	328380	95.51	15420	04.49
Kannur	351840	315030	89.54	36810	10.46
Total	845190	784770	92.85	60420	07.15

Source: Field Survey

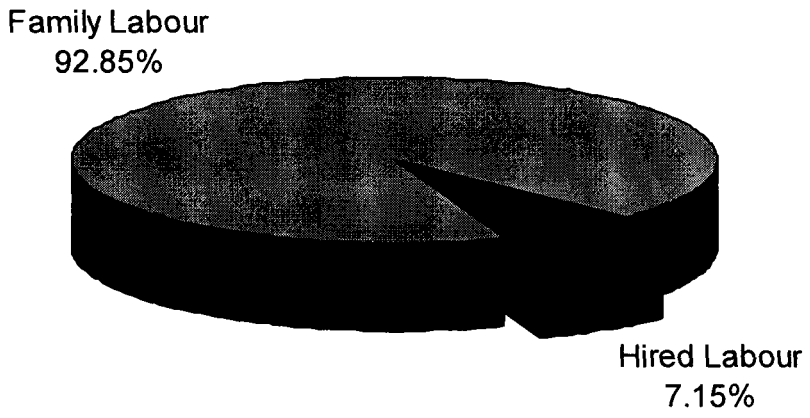

Figure 5.6 Family and Hired Labour Components in the Total Value of Labour for Rearing

Table 5.17 and Figure 5.6 give description about the composition of family and hired labour in the total value of labour for rearing. It can be seen that, the portion of family labour is 92.85 per cent and that of hired labour is 7.15 per cent of the total. The part of family labour is the highest (95.51 per cent) in Malappuram. It is 94.52 per cent in Alappuzha and 89.54 per cent in Kannur. The hired labour component in the total value of labour is highest (10.46 per cent) in Kannur. The same is 5.48 per cent in Alappuzha and 4.49 per cent in Malappuram.

TABLE 5.18

Male and Female Component in the Total Labour Cost for Rearing Operations

District	Total Cost Rs.	Male			Female		
		No.	Cost Rs.	%	No.	Cost Rs.	%
Alappuzha	149550	809	121350	81.14	235	28200	18.86
Malappuram	343800	1272	190800	55.50	1275	153000	44.50
Kannur	351840	1608	241200	68.55	922	110640	31.45
Total	845190	3689	553350	65.47	2432	291840	34.53

Source: Field Survey

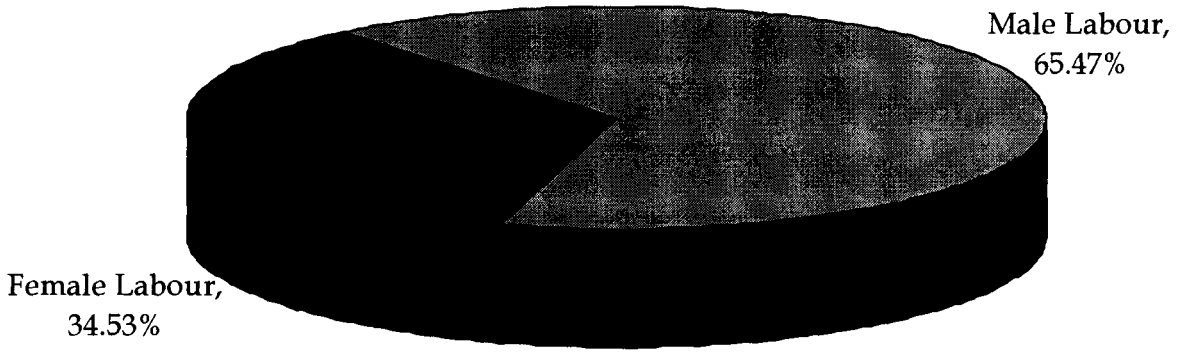

Figure 5.7 Male and Female Portion of Total Labour for Rearing

Table 5.18 and Figure 5.7 provide an account of the male and female labour component in the total cost of labour utilised for rearing operations. It can be understood that, the portion of male labour is 65.47 per cent and that of female labour is 34.53 per cent in the total cost of labour for rearing operations. The male labour component is highest in Alappuzha (81.14 per cent) and lowest in Malappuram (55.50 per cent). This value is 68.55 per cent in Kannur. The female participation in the total labour cost is highest in Malappuram (44.5 per cent) and lowest in Alappuzha (18.86 per cent). The same is 31.45 per cent in Kannur.

TABLE 5.19

Class wise Utilisation of Family Labour for Rearing

Type of Farmers	Labour for Rearing		Percentage
	Total Rs.	Family Rs.	
Small	449100	416910	92.83
Medium	232080	215040	92.65
Large	164010	152820	93.18
Total	845190	784770	92.85

Source: Field Survey

Table 5.19 gives information about the utilisation of the family labour among small, medium and large classes of farmers for their rearing operations. It can be seen that large type farmers have the maximum utilisation of family labour (93.18 per cent) when compared to medium and small classes of farmers. There is no significant difference between the small and medium type of farmers regarding the utilisation of family labour for rearing operations.

The above discussions reveal that in the total labour for planting mulberry and rearing activities, family labour is having a significant share. Also, there is good participation of women in rearing operations.

TABLE 5.20

Man Days Created in Planting and Rearing Operations in the Three Districts

Districts	Man days for Planting		Man days for Rearing	
	Number	Per Acre	Number	Per Acre
Alappuzha	358	11.12	1044	32.42
Malappuram	849	10.45	2547	31.35
Kannur	569	10.68	2530	47.51
Total	1776	10.65	6121	36.72

Source: Field Survey

Table 5.20 provides an account of the man-days created in planting mulberry and in rearing operations in the three districts. It can be seen that the planting of mulberry created a total of 1776 man-days in the three districts. The per acre man-days in planting mulberry is 10.65. The total of man-days created in rearing operations in the year of study is 6121 and per acre man-days in rearing are 36.72.

5.3. FIXED INVESTMENTS

Sericulture requires fixed investments on various items like mulberry plantation, rearing shed, rearing equipments and irrigation. As per the estimates of Serifed, the cost of planting mulberry in one acre of land comes to Rs. 12500 which includes Rs.2500 as the cost of planting material and Rs. 10000 for the preparation of land. The cost of constructing rearing house (area 800 sq.ft.) is estimated to be Rs. 30000 and the cost of acquiring rearing equipments (to rear 200 dfls at a time) is estimated at Rs. 30000. The cost of establishing irrigation facilities in one acre of land is estimated at Rs.20000. (As farmers are sharing their irrigation facilities for irrigating other crops also only a portion applicable to mulberry cultivation is considered as cost of irrigation for the purpose of this analysis).

TABLE 5.21

Investment in Various Fixed Assets for Sericulture

Item	Amount Invested (Rs.)			Total Rs.	Percentage to total
	Alappuzha	Malappuram	Kannur		
Plantation	68700	172510	141940	383150	04.77
Rearing Shed	930000	1311750	1467000	3708750	46.14
Rearing Equipments	419300	1493400	1245200	3157900	39.28
Irrigation	134000	374000	281000	789000	09.81
Total	1552000 (22171)	3351660 (25782)	3135140 (31351)	8038800 (26796)	100

Source: Field Survey
(Figures in brackets: average per farmer)

Table 5.21 gives an account of the total investment made in fixed assets in the three districts. It can be seen that, out of the total investments, investment in rearing

shed has the major share (46.14 per cent). Of the remaining, 39.28 per cent is made in rearing equipments, 9.81 per cent is in irrigation and 4.77 per cent is in mulberry plantation. It is also evident that the average fixed cost per farmer comes to Rs. 26796. The average cost is highest in Kannur (Rs. 31351) and lowest in Alappuzha (Rs. 22171).

TABLE 5.22

Total Cost of Mulberry Plantation in the Three Districts

Costs	District			Total	Percentage
	Alappuzha	Malappuram	Kannur		
Labour	50850	126210	81300	258360	67.43
Material	17850	46300	60640	124790	32.57
Total	68700	172510	141940	383150	100.00

Source: Field Survey

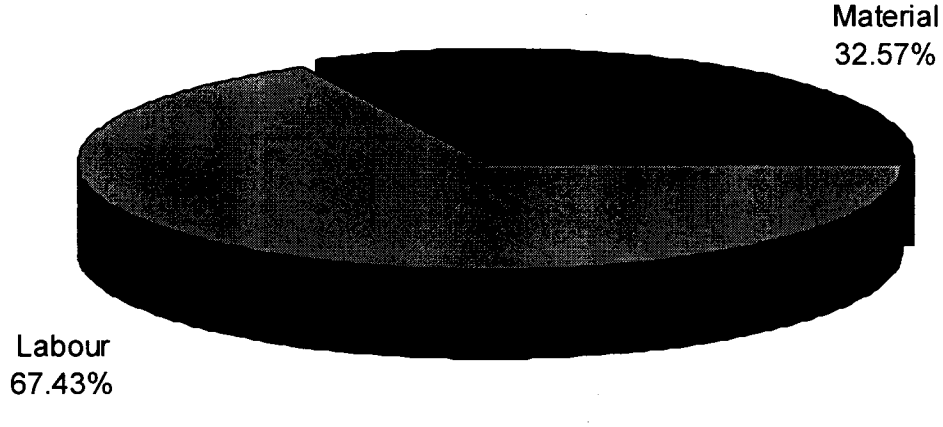

Figure 5.8 Labour and Material Portion in the Cost of Mulberry Plantation

Table 5.22 and Figure 5.8 provide information about the labour and material portion in the total cost of mulberry plantation. It can be seen that, in the total cost

of plantation, 67.43 per cent is on account of labour and the remaining 32.57 per cent is incurred by way of material cost.

TABLE 5.23

Average Cost of Mulberry Plantation per Farmer in the Three Districts

District	Total Cost Rs.	Number of Farmers	Average Cost Rs.
Alappuzha	68700	70	981 (492)
Malappuram	172510	130	1327 (629)
Kannur	141940	100	1419 (382)
Total	383150	300	1277 (551)

Source: Field Survey
(Figures in bracket: standard deviation of cost)

Table 5.23 gives information about the average cost of mulberry plantation per farmer in the three districts. It can be understood that, on an average, the cost of mulberry plantation comes to Rs. 1277 (with an average variation of Rs. 551). The average cost of plantation is the highest in Kannur (Rs.1419). The same is Rs.1327 in Malappuram and Rs.981 in Alappuzha.

TABLE 5.24

Cost of Mulberry Plantation per Acre in the Three Districts

District	Total Cost Rs.	Number of Acres	Cost per Acre Rs.
Alappuzha	68700	32.20	2134
Malappuram	172510	80.50	2143
Kannur	141940	53.00	2678
Total	383150	165.70	2312

Source: Field Survey

Table 5.24 shows that, on an average, the cost of plantation of mulberry per acre comes to Rs.2312. The average cost per acre is highest in Kannur (Rs.2678). It is Rs.2143 in Malappuram and Rs.2134 in Alappuzha.

TABLE 5.25

Cost Structure of Mulberry Plantation among Different Classes of Farmers

Type of Farmers	Mulberry Area (Acre)	Labour Cost		Material Cost		Total Cost	
		Rs.	Average* Cost Rs.	Rs.	Average* Cost Rs.	Rs.	Average* Cost Rs.
Small	106.80	171150	1603	80950	758	252100	2360
Medium	36.85	54780	1487	28490	773	83270	2260
Large	23.05	32430	1407	15350	666	47780	2073
Total	166.7	258360	1550	124790	749	383150	2298

Source: Field Survey * Average cost per acre.

Table 5.25 gives information about the costs of mulberry plantation incurred by small, medium and large classes of farmers and their average per acre of mulberry. It can be understood that the average cost of labour per acre is the highest among small class of farmers (Rs.1603), while the average material cost is the highest among medium class farmers (Rs.773). The total cost of mulberry plantation also is the highest among small class of farmers (Rs. 2360 per acre).

TABLE 5.26

Total Cost and Average Cost of Rearing Houses in the Three Districts

District	Total Cost Rs.	Number of Houses	Average Cost Rs.
Alappuzha	930000	70	13286 (5628)
Malappuram	1311750	129	10169 (7079)
Kannur	1467000	100	14670 (9211)
Total	3708750	299	12404 (7826)

Source: Field Survey (Figures in brackets: standard deviation of costs)

Table 5.26 gives a description about the total cost and average cost of rearing houses in the three districts. It can be understood that on an average, the cost of a rearing house comes to Rs. 12404 with an average variation of Rs. 7826. The average cost of rearing house is the highest in Kannur (Rs.14670) and lowest in Malappuram (Rs.10169). In Alappuzha, it is Rs. 13286.

TABLE 5.27

Total Cost and Average Cost of Rearing Equipments in the Three Districts

District	Total Cost Rs.	Number of Farmers	Average Cost Rs.
Alappuzha	419300	70	5990 (2280)
Malappuram	1489400	130	11457 (9940)
Kannur	1245200	100	12452 (5021)
Total	3153900	300	10513 (8000)

Source: Field Survey
(Figures in brackets: standard deviation of cost)

Table 5.27 gives an account of total cost and average cost of rearing equipments in the three districts. It can be seen that, the average cost for rearing equipments comes to Rs. 10513 with an average variation of Rs. 8000 among farmers. The average amount spent for rearing equipments is the highest in Kannur (Rs.12452) and lowest in Alappuzha (Rs.5990). This amount is Rs. 11457 in Malappuram.

TABLE 5.28

Total Cost and Average Cost of Irrigation in the Three Districts

District	Total Cost Rs.	No. of * Farmers	Average Cost Rs.
Alappuzha	134000	60	2233 (932)
Malappuram	374000	100	3740 (2075)
Kannur	281000	85	3306 (1713)
Total	789000	245	3220 (1785)

Source: Field Survey
* Number of farmers invested for irrigation.
(Figures in brackets: standard deviation of cost)

Table 5.28 gives an account of amounts invested by farmers for irrigation facilities and their averages. It can be seen that, on an average, the cost of irrigation is Rs.3220 in the three districts having an average variation of Rs. 1785 among farmers. The average cost is highest in Malappuram (Rs.3740). It is Rs.3306 in Kannur and Rs.2233 in Alappuzha.

From the above discussion it can be understood that generally the various investment costs are highest in Kannur and lowest in Alappuzha.

5.4. MATERIALS UTILISATION

Different materials are used for maintenance of mulberry plantation and silkworm rearing operations. They mainly include farmyard manure, chemical fertilizers, disinfectants and disease free layings (DFLs). The usage of these materials and their analysis are provided below.

TABLE 5.29

Usage of Farm Yard Manure in Mulberry Plantations in the Three Districts

District	Number of Acres	Total FYM Kg.	Kg. Per Acre	Cost of FYM Rs.	Cost per Acre Rs.
Alappuzha	32.20	15850	492	15850	492
Malappuram	80.50	67150	834	67150	834
Kannur	53.00	32920	621	32920	621
Total	165.70	115920	700	115920	700

Source: Field Survey

Table 5.29 gives idea about the usage of farmyard manure in mulberry plantations. It can be seen that on an average 700 kgs. of farm yard manure is used per acre. This is the highest in Malappuram (834 Kgs.) and lowest in Alappuzha (492 Kgs.). The average cost of farmyard manure per acre of mulberry garden comes to Rs.700. This cost is the highest in Malappuram (Rs. 834) and lowest in Alappuzha (Rs. 492).

TABLE 5.30

Usage of Chemical Fertilizers in Mulberry Plantations in the Three Districts

District	Number of Acres	Total Kg.	Kg. Per Acre	Cost Rs.	Cost per Acre Rs.
Alappuzha	32.20	8770	272	52620	1634
Malappuram	80.50	9885	123	59310	737
Kannur	53.00	29861	563	179163	3380
Total	165.70	48516	293	291093	1757

Source: Field Survey

Table 5.30 shows that on an average, 293 Kgs. of chemical fertilizers have been used by the farmers of the three districts having an average cost of Rs. 1757. The usage of chemical fertilizers is the highest in Kannur (563 Kgs. per acre) having an average cost of Rs. 3380. The same is lowest in Malappuram (123 Kgs.).

TABLE 5.31

Usage of Disinfectants in Rearing of Silkworms in the Three Districts

District	Number of Rearing	Total Kg.	Kg. Per Rearing	Cost Rs.	Cost per Rearing Rs.
Alappuzha	341	733	2	33718	99
Malappuram	665	3751	6	172546	259
Kannur	484	1500	3	69115	143
Total	1490	5984	4	275379	185

Source: Field Survey

The usage of disinfectants in rearing operations and their cost per rearing are given in Table 5.31. It can be seen that on an average, four kilograms of disinfectants having an average cost of Rs.185 are used by the farmers of the three districts, per rearing. The usage of disinfectants is the highest in Malappuram (6 kg. per rearing) and lowest in Alappuzha (2 kg. per rearing).

TABLE 5.32

Usage of Disease Free Layings in Rearing of Silkworms in the Three Districts

District	Number of Rearing	Number of DFLs	Number Per Rearing	Cost of DFLs. Rs.	Cost per Rearing Rs.
Alappuzha	341	7331	21	17760	52
Malappuram	665	26685	40	60045	90
Kannur	484	15520	32	34920	72
Total	1490	49536	33	112725	76

Source: Field Survey

Table 5.32 gives an idea about the usage of disease free layings (DFLs) in rearing operations. It can be seen that on an average, 33 DFLs having an average cost of Rs.76 are used by farmers per rearing. The DFLs usage is the highest in Malappuram (40 DFLs per rearing) and lowest in Alappuzha (21 DFLs per rearing).

It can be understood from the above analysis that the usage of various materials in rearing operations is the highest in Malappuram and lowest in Alappuzha.

5.5. SUBSIDIES FROM SERIFED

Subsidies form a part of the finance for sericultural activities. Serifed is granting various subsidies for planting mulberry, construction of rearing shed, for purchasing rearing equipments and disinfectants and for irrigation facilities. Rs. 2500 is given as plantation subsidy for planting mulberry in one acre of land. For constructing rearing house and purchasing rearing equipments, 50 per cent of the total cost is given as subsidy. Rs. 18000 is given for implementing irrigation facilities. An amount of Rs. 2870 is given for purchasing disinfectants. All these subsidies are subject to the conditions enforced by the Serifed from time to time.

(Serifed is supplying mulberry saplings and silkworm eggs (DFLs) at 50 per cent subsidy. 80 per cent of the crop insurance premium is born by the Serifed. Such subsidies are not considered here for analysis, as the farmers could not identify them).

TABLE 5.33

Awareness of Farmers about Subsidies Granted by Serifed in the Three Districts

Districts	Total	Yes		No	
		Number	%	Number	%
Alappuzha	70	64	91.43	6	08.57
Malappuram	130	121	93.08	9	06.92
Kannur	100	91	91.00	9	09.00
Total	300	276	92.00	24	08.00

Source: Field Survey

Table 5.33 shows the awareness of farmers of the three districts about the subsidies available. It can be understood that on an average, 92 per cent of the farmers are aware of the subsidies granted by Serifed and only eight per cent are not aware of this. In Alappuzha 91.43 percent of the farmers, in Malappuram 93.08 percent and in Kannur 91 percent are aware about subsidies.

TABLE 5.34

Number and Percentage of Farmers Received Subsidies from Serifed

Districts	Total	Received		Not Received	
		Number	%	Number	%
Alappuzha	70	14	20.00	56	80.00
Malappuram	130	41	31.54	89	68.46
Kannur	100	36	36.00	64	64.00
Total	300	91	30.33	209	69.67

Source: Field Survey

Table 5.34 gives information about the farmers who availed subsidies in the three districts. It can be seen that only 30.33 per cent of the farmers have received some kind of subsidies provided by Serifed and the majority of the farmers (69.67

per cent) have not received any subsidies. Among the three districts, in Kannur, 36 per cent of the farmers, in Malappuram 31.54 percent of the farmers and in Alappuzha 20 percent of the farmers have received one or more type of subsidies.

TABLE 5.35

Total of Different Subsidies Availed by the Farmers from Serifed

Item	Amount of Subsidy Rs.			Total Rs.	Percen-tage
	Alappuzha	Malappuram	Kannur		
Plantation	7125	45000	9250	61375	04.62
Rearing Shed	70000	329625	242500	642125	48.34
Rearing Equipment	79375	251255	147571	478201	36.00
Disinfectants	10763	50225	31572	92560	06.97
Irrigation	7000	41100	6000	54100	04.07
Total	174263	717205	436893	1328361	100

Source: Field Survey

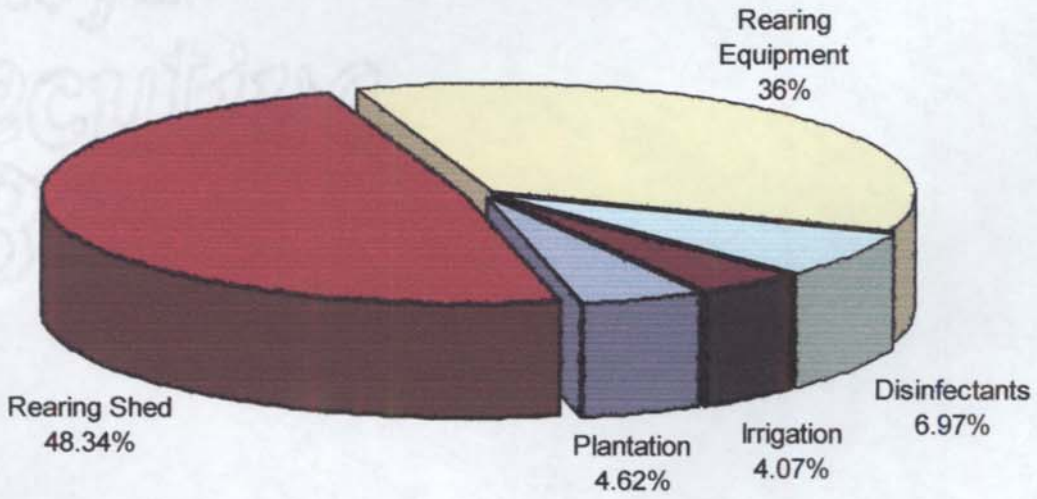

Figure 5.9: Percentage of Total Subsidies for Various Items

Table 5.35 and Figure 5.9 give an account of subsidies received by the farmers in the three districts, for various requirements of sericulture. It is obvious that the largest share of the total subsidies received from Serifed in the three districts is for the construction of rearing shed (48.34 per cent). The second largest portion of subsidies is received for the purchase of rearing equipments (36 per cent). Disinfectants share 6.97 per cent; plantation share 4.62 per cent and irrigation share 4.07 per cent of the total subsidies received by farmers.

TABLE 5.36

Total Cost of Planting Mulberry and Subsidy Received from Serifed

Districts	Cost of Plantation Rs.	Subsidy Received		Percentage of Subsidy to Cost
		Amount Rs.	No. of Farmers	
Alappuzha	10800	7125	12	65.97
Malappuram	50590	45000	26	88.95
Kannur	18640	9250	12	49.62
Total	80030	61375	50	76.69

Source: Field Survey

Table 5.36 gives a description of total cost of plantation of mulberry and amount of subsidy received thereon. It can be seen that, in the three districts, on an average, the total subsidy for plantation of mulberry constitutes 76.69 per cent of the amount invested for the same. This subsidy is the highest (88.95 per cent) in the district of Malappuram and lowest (49.62 per cent) in the district of Kannur. It is 65.97 per cent in the district of Alappuzha.

TABLE 5.37

Total Cost of Construction of Rearing Shed and Subsidy Received from Serifed

Districts	Cost of Rearing Shed Rs.	Subsidy Received		Percentage of Subsidy to Cost
		Amount Rs.	No. of Farmers	
Alappuzha	182000	70000	13	38.46
Malappuram	526600	329625	35	62.59
Kannur	667800	242500	32	36.31
Total	1376400	642125	80	46.65

Source: Field Survey

Table 5.37 illustrates about the cost of construction of rearing shed and the portion of subsidy received for the same. It can be understood that, on an average, 46.65 per cent is the rate of subsidy granted for the construction of rearing shed. This subsidy is the highest in Malappuram (62.59 per cent) and lowest in Kannur (36.31 per cent). It is 38.46 per cent in Alappuzha.

TABLE 5.38

Total Cost of Rearing Equipments and Subsidy Received from Serifed

Districts	Cost of Rearing Equipments Rs.	Subsidy Received		Percentage of Subsidy to Cost
		Amount Rs.	No. of Farmers	
Alappuzha	135500	79375	13	58.58
Malappuram	590000	251255	35	42.59
Kannur	456500	147571	26	32.33
Total	1182000	478201	74	40.46

Source: Field Survey

Table 5.38 reveals information about the cost of rearing equipments and subsidy received by farmers towards this. On an average, 40.46 per cent is the share of subsidy to the total cost of rearing equipments. The percentage of this subsidy is the highest in Alappuzha (58.58 per cent) and lowest in Kannur (32.33 per cent). It is 42.59 per cent in Malappuram.

TABLE 5.39

Amount Spent for Disinfectants and Subsidy Received from Serifed

Districts	Cost of Disinfectants Rs.	Subsidy Received		Percentage of Subsidy to Cost
		Amount Rs.	No. of Farmers	
Alappuzha	16302	10763	8	66.02
Malappuram	58332	50225	22	86.10
Kannur	38619	31572	19	81.75
Total	113253	92560	49	81.73

Source: Field Survey

Table 5.39 shows the total amount spent for the purchase of disinfectants and the amount of subsidies received by farmers on account of this. The overall average percentage of subsidy for disinfectants amounts to 81.73 per cent of the total expenditure. The rate of subsidy is the highest in Malappuram (86.10 per cent). It is 66.02 per cent in Alappuzha and 81.75 per cent in Kannur.

TABLE 5.40

Amount Invested for Irrigation and Subsidy Received from Serifed

Districts	Investment for Irrigation Rs.	Subsidy Received		Percentage of Subsidy to Cost
		Amount Rs.	No. of Farmers	
Alappuzha	32000	7000	4	21.88
Malappuram	92500	41100	6	44.43
Kannur	36000	6000	4	16.67
Total	160500	54100	14	33.71

Source: Field Survey

Table 5.40 gives information about the cost of irrigation and subsidy received by farmers towards this. The portion of subsidy to the total cost of irrigation in the three districts comes to 33.71 per cent. It is 44.43 per cent in Malappuram, 21.88 per cent in Alappuzha and only 16.67 per cent in Kannur. This subsidy of Serifed can be considered inadequate in all the three districts when compared to the importance of irrigation of mulberry lands. Again, most of the farmers reported financial difficulties for not irrigating; all these demand enhanced subsidy for irrigation.

TABLE 5.41

Total Subsidy Received and Corresponding Costs

Investment	Total Cost Rs.	Subsidy Received Rs.	Percentage of subsidy
Mulberry Plantation	80030	61375	76.69
Rearing Shed	1376400	642125	46.65
Rearing Equipments	1182000	478201	40.46
Disinfectants	113253	92560	81.73
Irrigation	160500	54100	33.71
Total	2912183	1328361	45.61

Source: Field Survey

An account of the total subsidy received for various items and their corresponding costs are given in Table 5.41. It can be seen that out the total cost, the share of subsidy is 45.61 per cent. Among the different subsidies, subsidy for disinfectants is having the highest share (81.73 per cent) and subsidy for irrigation facilities is having the least share (33.71 per cent).

5.6. COSTS OF REARING AND MARKETING

The total cost of rearing and marketing is composed of variable costs, fixed overheads and marketing overheads. Among these, variable costs are made of labour, materials and variable overheads. Labour for these calculations includes hired labour only. The component of family labour is ignored from calculations of rearing costs; as such expenditure is not actually incurred. Variable overheads include repairs, electricity or diesel charges and insurance premium. Fixed overheads include interest on loans and depreciation on assets. Marketing overheads include transportation charges and luggage. An analysis of these costs is provided below.

TABLE 5.42

Total Cost of Various Materials in Rearing Operations in the Three Districts

District	Material Cost (Rs.)				Total Rs.	No. of Rearing	Cost per Rearing Rs.
	Farm Yard Manure	Chemical Fertilizers	Disinfectants	DFLs.			
Alappuzha	15850	52620	33718	17760	119948	341	352
Malappuram	67150	59310	172546	60045	359051	665	540
Kannur	32920	179163	69115	34920	316118	484	653
Total	115920 (14.58)	291093 (36.61)	275379 (34.63)	112725 (14.18)	795117 (100)	1490	534

Source: Field Survey (Figures in brackets: percentage to grand total)

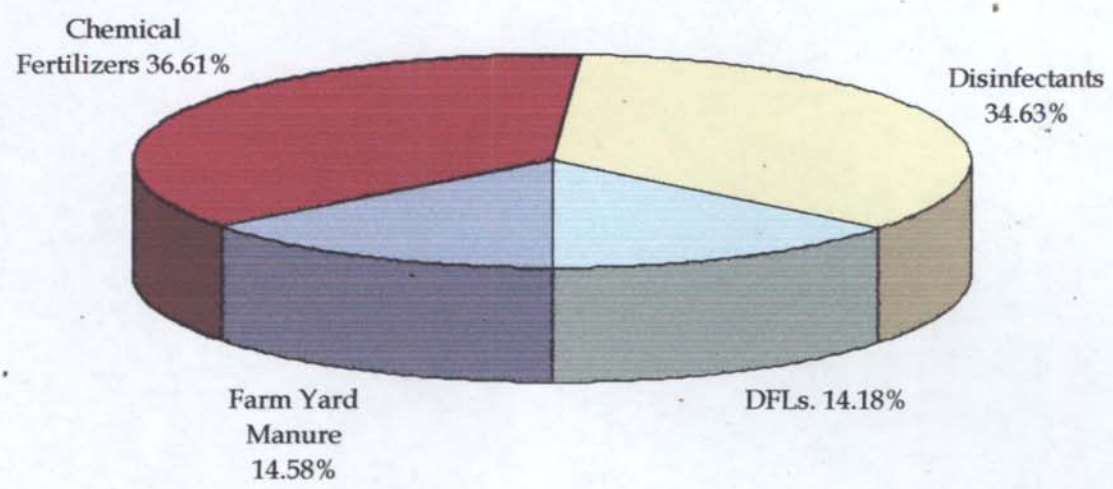

Figure 5.10 Proportions of Materials Costs in Rearing

Table 5.42 gives an account of the total cost of materials used for rearing operations in the three districts. It can be seen that on an average, the material cost per rearing comes to Rs.534. The material cost per rearing is the highest in Kannur (Rs.653). It is the lowest in Alappuzha (Rs.352). The same is Rs.540 in Malappuram. The Table also shows that among the cost of different materials used in rearing, chemical fertilizer has the major share (36.61 per cent). Disinfectants account for 34.63 per cent, farmyard manure 14.58 per cent and DFLs. share 14.18 per cent. Figure 5.10 also gives an idea about the cost proportion of different materials used in rearing.

TABLE 5.43

Total of Direct Charges (Variable Overheads) Incurred for Rearing Operations in the Three Districts

Charges	Amount (Rs.)			Total Rs.	Percentage to total
	Alappuzha	Malappuram	Kannur		
Repair to Equipment	14750	23450	18850	57050	30.62
Electricity/Diesel	7265	20250	28745	56260	30.19
Insurance Premium	670	7502	2338	10510	05.64
Miscellaneous	17350	33500	11675	62525	33.55
Total	40035 (572)	84702 (652)	61608 (616)	186345 (621)	100

Source: Field Survey
(Figures in bracket: average per farmer)

Table 5.43 gives information about various charges like repairs to rearing equipments, electricity or diesel charges, crop insurance premium, and other miscellaneous expenses incurred in connection with rearing operations. It can be seen that majority of these charges are constituted by miscellaneous expenses (33.55 per cent) which include wages and transportation. The share of repairs is 30.62 percent, electricity or diesel 30.19 per cent and insurance premium 5.64 per cent. The table also shows that the average of these costs is lowest in Alappuzha (Rs. 572) and highest in Malappuram (Rs. 652).

5.6.1. Depreciation

Depreciation is calculated on each asset used in sericulture on the basis expected life of the asset. The estimated life span of mulberry plantation and rearing

shed are 20 years and that of rearing equipment and investment for irrigation are 10 years.

TABLE 5.44

Depreciation to Various Assets Used in Sericulture in the Three Districts

Items	Amount of Depreciation (Rs.)			Total Rs.	Percentage to total
	Alappuzha	Malappuram	Kannur		
Plantation	3435	8626	7097	19158	03.20
Rearing Shed	46500	65588	73350	185438	30.94
Rearing Equipments	41930	149340	124520	315790	52.69
Cost of Irrigation	13400	37400	28100	78900	13.17
Total	105265 (1504)	260954 (2007)	233067 (2331)	599286 (1998)	100

Source: Field Survey
(Figures in bracket: average per farmer)

Table 5.44 gives an idea about depreciation written off during the year 2004-05 on various assets involved in the sericultural activities. It can be seen that maximum depreciation is for rearing equipments (52.69 per cent). The share of depreciation is 30.94 per cent for rearing shed, 13.17 per cent for cost of irrigation and 3.2 per cent for plantation. It is also evident that the average depreciation is lowest in Alappuzha (Rs. 1504) and highest in Kannur (Rs. 2331).

TABLE 5.45

Fixed Overheads for Rearing Operations in the Three Districts

Items	Amount (Rs.)			Total Rs.	Percentage to total
	Alappuzha	Malappuram	Kannur		
Interest on Loans	4120	23020	7850	34990	05.52
Depreciation	105265	260954	233067	599286	94.48
Total	109385 (1563)	283974 (2184)	240917 (2409)	634276 (2114)	100

Source: Field Survey
(Figures in bracket: average per farmer)

Table 5.45 gives information about the fixed overheads like interest on loans and depreciation incurred for rearing operations. It can be seen that, of the total fixed overheads, depreciation accounts for 94.48 per cent of the total and interest on loans share 5.52 per cent of the total. Average of these fixed overheads are lowest in Alappuzha (Rs. 1563) and highest in Kannur (Rs. 2409).

TABLE 5.46

Marketing Overheads Incurred for the Sale of Cocoons in the Three Districts

District	Item (Rs.)		Total Rs.	Cocoon Quantity Kg.	Cost per Kg.(Rs.)
	Transportation	Luggage			
Alappuzha	14550	700	15250	2659	5.74
Malappuram	27020	3400	30420	12262	2.48
Kannur	43400	800	44200	7487	5.90
Total	84970 (94.55)	4900 (5.45)	89870 (100)	22408	4.00

Source: Field Survey
(Figures in brackets: percentage to grand total)

Details about the cost of marketing of cocoons are provided in Table 5.46. It can be seen that among the marketing costs, cost of transportation accounts for 94.55 per cent and luggage accounts for 5.45 per cent of the total. On an average, the cost of marketing per kilogram of cocoon comes to rupees four. The cost of marketing is the highest in Kannur (Rs.5.90 per kg.) and lowest in Malappuram (Rs.2.48 per kg.). The same is Rs.5.74 per kg. in Alappuzha.

TABLE 5.47

Variable Cost of Rearing Operations in the Three Districts

District	Costs (Rs.)			Total Rs.	No. of Rearing	Cost per Rearing Rs.
	Labour	Materials	Direct Charges			
Alappuzha	8190	119948	40035	168173	341	493
Malappuram	15420	359051	84702	459173	665	690
Kannur	36810	316118	61608	414536	484	856
Total	60420 (5.8)	795117 (76.32)	186345 (17.88)	1041882 (100)	1490	699

Source: Field Survey
(Figures in brackets: percentage to grand total)

Table 5.47 gives a description about the variable costs like labour, materials and direct charges incurred in connection with rearing operations. It can be noticed that materials account for the major part of the total variable costs (76.32 per cent). Labour costs 5.8 per cent and direct charges cost 17.88 per cent of the total variable costs. It can also be seen that on an average, the variable cost per rearing is Rs.699. The variable cost on rearing is the maximum in Kannur district (Rs.856) and minimum in Alappuzha district (Rs.493). The same is Rs.690 in Malappuram district.

TABLE 5.48

Total Expenses for Cocoon Rearing and Marketing in the Three Districts

District	Costs (Rs.)			Total Rs.	No. of Rearing	Cost per Rearing Rs.
	Variable Cost	Fixed Overheads	Marketing Overheads			
Alappuzha	168173	109385	15250	292808	341	859
Malappuram	459173	283974	30420	773567	665	1163
Kannur	414536	240917	44200	699653	484	1446
Total	1041882 (59.00)	634276 (36.00)	89870 (5.00)	1766028 (100)	1490	1185

Source: Field Survey
(Figures in brackets percentage to grand total)

Figure 5.11 Cost Structure of Rearing and Marketing

An account of the total cost of rearing and marketing of cocoons is given in Table 5.48 and in Figure 5.11. It can be seen that among the total cost, variable cost is 59 per cent, fixed overheads comes to 36 per cent and marketing overheads is five per cent. It can also be understood that, the average cost of rearing in the three

districts comes to Rs.1185. The average cost per rearing is the highest in Kannur district (Rs.1446) followed by Malappuram (Rs.1163) and Alappuzha (Rs.859).

The above analysis reveals that cost of rearing is the highest in Kannur and lowest in Alappuzha.

5.7. COCOON PRODUCTION AND SALES

In this part, an assessment is made about the cocoon production in the three districts. The cocoon productivity is analysed with regard to the number of batches reared and DFLs used. The sales of cocoon are compared to their costs. An analysis of the income from sericultural operations is also made here.

TABLE 5.49

Quantity of Cocoon Produced and Average Production of Cocoon per Farmer in the Three Districts

District	Quantity of Cocoon Kgs.	No. of Farmers	Average Production Kg.
Alappuzha	2659	70	37.99 (51)
Malappuram	12262	130	94.32 (96)
Kannur	7487	100	74.87 (79)
Total	22408	300	74.69 (85)

Source: Field Survey
(Figures in brackets: standard deviation of production)

Table 5.49 provides information about the total and average production of cocoons in the three districts. It can be understood that the average production of cocoon per farmer is 74.69 Kg. in the three districts with an average variation of 85

Kg among farmers. The average production per farmer is the highest in Malappuram (94.32 Kg.) and lowest in Alappuzha (37.99 Kg.).

TABLE 5.50

Cocoon Production by Different Classes of Farmers in the Three Districts

Type of Farmers	Production of Cocoon Kgs.	Percentage	No. of Farmers	Average Production Kg.
Small	8580	38.28	226	37.96
Medium	6653	29.70	50	133.06
Large	7175	32.02	24	299.00
Total	22408	100	300	74.69

Source: Field Survey

Table 5.50 shows the production of cocoon among small, medium and large class of farmers. It can be seen that out of the total production of cocoons, the maximum production is done by small class of farmers (38.28 per cent). The medium class farmers contribute 29.70 per cent of the total. The share of large class farmers is 32.02 per cent. It is also evident that the production per farmer is the highest among large class of farmers (299kg.) and lowest among small class of farmers (37.96kg).

TABLE 5.51

Total Number of Batches Reared and Number of Successful Batches

District	Number of Batches	Number of Successful Batches	Percentage of Success
Alappuzha	341	313	91.79
Malappuram	665	622	93.53
Kannur	484	446	92.15
Total	1490	1381	92.68

Source: Field Survey

Table 5.51 gives information about the number of batches of cocoon reared by farmers and the number successful batches. It can be seen that, on an average, 92.68 per cent of the batches are successful in the three districts. The success rate is the highest in Malappuram (93.53 per cent). The same is 92.15 per cent in Kannur and 91.79 per cent in Alappuzha.

TABLE 5.52

Average Quantity of Cocoon to the Number of Successful Batches Reared

District	Quantity of Cocoon Kgs.	Number of Batches	Mulberry Acre	Average Cocoon (Kg)	
				Per Batch	Per Acre
Alappuzha	2659	313	32.20	08	82.58
Malappuram	12262	622	81.25	20	150.92
Kannur	7487	446	53.25	17	140.61
Total	22408	1381	166.70	16	134.42

Source: Field Survey

From Table 5.52 it can be seen that on an average, 16 kilograms is the productivity of cocoon per successful batch. This cocoon productivity is the highest in Malappuram (20 kg.). The same is 17 kg. in Kannur and eight kg. in Alappuzha. It can also be seen from the Table that the average cocoon productivity per acre of mulberry is 134.42 kg. The productivity per acre is the highest in Malappuram (150.92 kg). In Kannur, it is 140.61 kg. and in Alappuzha it is 82.58 kg.

TABLE 5.53

Cocoon Production and Usage of Disease Free Layings in the Three Districts

District	Quantity of Cocoon Kgs.	DFLs Used Nos.	Quantity Per DFL Kg.
Alappuzha	2659	7331	0.36
Malappuram	12262	26685	0.46
Kannur	7487	15520	0.48
Total	22408	49536	0.45

Source: Field Survey

Table 5.53 gives information about the cocoon productivity per DFL used. It is clear that on an average, the cocoon productivity to DFLs used is 0.45 (45 per cent). This productivity is the highest in Kannur (0.48) followed Malappuram (0.46) and Alappuzha (0.36).

It can be realized from the above discussion that among the three districts, the cocoon productivity is the lowest in Alappuzha and highest in Malappuram.

TABLE 5.54

Total Sales of Cocoon and Frequency of Sales in the Three Districts

District	Quantity of Sales		Frequency of Sales		Average Sales Rs
	Amount Rs	Percentage	Number	Percentage	
Alappuzha	390416	11.78	310	22.50	1259 (7635)
Malappuram	1801854	54.35	622	45.14	2897 (14460)
Kannur	1123095	33.87	446	32.36	2518 (11779)
Total	3315365	100	1378	100	2406 (12651)

Source: Field Survey (Figures in brackets: standard deviation of sales)

Table 5.54 gives information about the quantity and frequency of sales of cocoons in the three districts. It is clear that the district of Malappuram is having the maximum sales both in terms of quantity and number (54.35 per cent and 45.14 per cent respectively). The sale of Kannur is 33.87 per cent and that of Alappuzha is 11.78 per cent of the total sales in the three districts. It can also be seen that the average sales in the three districts is Rs.2406 with a variation of Rs. 12651 among sales. The average sale is the highest in Malappuram district (Rs.2897) followed by Kannur (Rs.2518) and Alappuzha (Rs.1259).

TABLE 5.55

Percentage of the Costs to the Total Sales of Cocoons in the Three Districts

District	Total Cost Rs.	Sales Rs.	Cost percentage to Sales
Alappuzha	292808	390416	75.00
Malappuram	773567	1801854	42.93
Kannur	699653	1123095	62.30
Total	1766028	3315365	53.27

Source: Field Survey

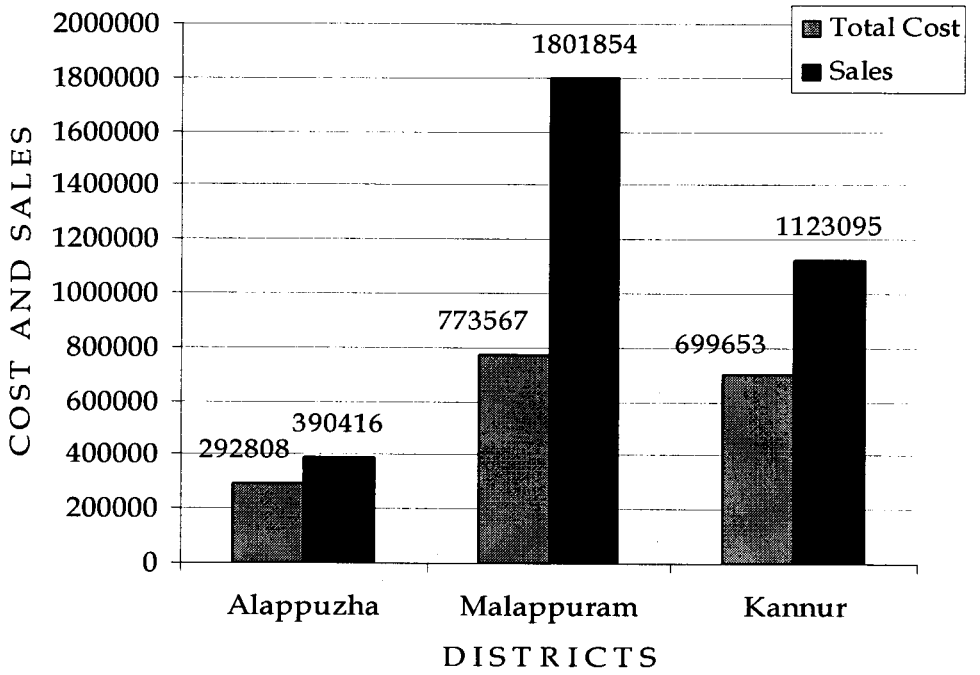

Figure 5.12 Total Costs of Cocoon Production and Sales

Table 5.55 and Figure 5.12 give a comparison of the total cost of cocoon production and amount of sales in the three districts. It can be seen that, on an average the cost of production comes to 53.27 per cent of the total sales. The cost of production is the lowest (42.93 per cent) in Malappuram district. It is 62.30 per cent in Kannur and 75 per cent in Alappuzha.

TABLE 5.56

Average Cost of Cocoon Sold in the Three Districts

District	Cost of Production and Sales Rs.	Quantity of Cocoon Kg.	Cost per Kg. Rs.
Alappuzha	292808	2659	110.12
Malappuram	773567	12262	63.09
Kannur	699653	7487	93.45
Total	1766028	22408	78.81

Source: Field Data

Table 5.56 shows the average cost of production and sale of cocoons. It can be understood that the overall average cost comes to Rs. 78.81 per kg. of cocoon. The average cost is highest in Alappuzha (Rs. 110.12) and lowest in Malappuram (63.09).

TABLE 5.57

Average Cost of Cocoons Sold for Different Classes of Farmers

Type of Farmers	No. of Farmers	Cost of Production and Sales Rs.	Quantity of Cocoon Kg.	Cost per Kg. Rs.
Small	226	1505538	8580	175.47
Medium	50	182343	6653	27.41
Large	24	78147	7175	10.89
Total	300	1766028	22408	78.81

Source: Field Data

Table 5.57 reveals the cost of production and sales and cost per kilogram of cocoon produced among small, medium and large classes of farmers. It can be understood that the cost per kilogram is very high for small farmers, which comes to Rs. 175.47 for a kilogram. The cost per kg. is the lowest for large type of farmers (Rs. 10.89). The same is Rs. 27.41 among medium class of farmers.

TABLE 5.58

Per Farmer and Per Acre Income from Sericulture

District	Net Income From Sericulture Rs.	Income per Farmer Rs.	Income per Acre Rs.
Alappuzha	102458	1464	3182
Malappuram	1056987	8131	13009
Kannur	446656	4467	8388
Total	1606101	5354	9635

Source: Field Data

Table 5.58 shows the distribution of income from sericulture among farmers and among mulberry acreage. It can be seen that, on an average, the income per farmer is Rs. 5354 and income per acre of mulberry area is Rs. 9635. The income per farmer and per acre is the highest in Malappuram, (Rs. 8131 and Rs. 13009) and lowest in Alappuzha (Rs. 1464 and Rs. 3182).

The above discussions reveal that when compared to other districts, production and sales of cocoons and income thereof are lowest in Alappuzha. These figures are the highest in Malappuram.

TABLE 5.59

Sericulture Income-wise Distribution of Farmers in the Three Districts

Income from Sericulture Rs.	No. of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
Less than 10000	68	95	84	247	82.34
10000-25000	1	29	12	42	14.00
25000-50000	1	5	4	10	3.33
More than 50000	0	1	0	1	0.33
Total	70	130	100	300	100

Source: Field Data

Table 5.59 provides a classification of the income from sericultural activities and distribution of farmers accordingly in the three districts. It can be understood that 82.34 per cent of the farmers are making only a nominal income of less than Rs.10000; 14 per cent of the farmers are making an income of Rs.10000-25000; 3.33 per cent are making an income of Rs.25000-50000 and only one farmer (0.33 per cent) in the three districts is making an income exceeding Rs. 50000.

TABLE 5.60

Sericulture Income wise Distribution of Different Classes of Farmers

Income from Sericulture Rs.	No. of Farmers		
	Small	Medium	Large
Less than 10000	226 (100)	21 (42)	0
10000-25000	0	29 (58)	13 (54.17)
25000-50000	0	0	10 (41.67)
More than 50000	0	0	1 (4.16)
Total	226	50	24

Source: Field Data Figures in brackets: percentage to the appropriate totals

It can be seen from Table 5.60 that all the small class of farmers are earning an income less than Rs. 10000. Among medium class of farmers, 42 per cent are making an income of less than Rs. 10000 and 58 per cent are making income between Rs.10000-25000. Among large class of farmers, 54.17 per cent are making income between Rs.10000-25000; 41.67 per cent are making an income between Rs.25000-50000 and 4.16 per cent (only one farmer) is making income more than Rs.50000.

5.8. Test of Hypothesis:

The second hypothesis formulated for the study was;

Ho: *There is considerable difference in the financial assistance provided by Serifed in the three districts.*

To test this hypothesis, the following variables related to the problem were analysed as under:

TABLE 5.61

Analysis of Variables Deciding the Financial Assistance of Serifed in the Three Districts using Chi-square Values

Variable Considered	Chi-square Value	Degree of Freedom	Critical Value (5 %)	Refer Table No.	Remarks*
Awareness of Subsidy	0.3718	2	5.991	5.33	A
Subsidy availed	5.1459	2	5.991	5.34	A
Plantation subsidy	2.6194	2	5.991	5.36	A
Rearing shed subsidy	3.8047	2	5.991	5.37	A
Rearing equipment subsidy	1.8514	2	5.991	5.38	A
Disinfection subsidy	1.7857	2	5.991	5.39	A
Irrigation subsidy	0.2734	2	5.991	5.40	A

*A=Accept null hypothesis at 5 % level of significance.

Table 5.61 shows the test results of the factors connected with financial assistance of Serifed. The results are in favour of the hypothesis and therefore, it can be concluded that there is considerable difference in the financial assistance provided by the Serifed in the three districts.

The above discussion provides information about the financial structure of sericulture in the three districts under study. The type and source of financing, labour utilisation, investment on various assets, fixed and variable costs incurred, production and sale of cocoon and income from sericultural activities are discussed in this chapter. An examination of the activities of Serifed and the problems faced by sericulturists is made in the next chapter.

CHAPTER VI

ROLE OF SERIFED – AN EVALUATION

ROLE OF SERIFED - AN EVALUATION

The cost and income aspects of sericulture in the three study districts have been analysed in Chapter V. The present chapter is aimed at a discussion on the role of Serifed in the developmental activities of sericulture in Kerala. The whole activities of sericulture in Kerala are looked after by this governmental organization. Therefore, it will be appropriate to make an analysis of the opinions of the seri-farmers of Kerala about the various functions of this organization. This chapter deals with the analysis of the assessment given by the farmers on the different activities of Serifed. The chapter also contains a discussion on the problems experienced by sericulture farmers of the study area.

6.1. ASSISTANCE TO FARMERS

Serifed is giving various helps to sericulture farmers like technical assistance, training, subsidies, supply of various necessities, marketing of cocoons and crop insurance.

Technical helps at the time of planting mulberry, Manuring, application of insecticides, leaf harvesting, construction of rearing house, rearing of silkworms, etc., are provided by Serifed. One month's training is given on various aspects of mulberry, silkworm rearing practices, etc., to all farmers. Various subsidies are given for planting mulberry, construction of rearing house, purchase of rearing equipments, against the cost of disinfectants and for the installation of irrigation facilities. Mulberry planting material, silkworm eggs, etc are supplied at subsidised

rates. Crop insurance scheme is implemented at subsidised rates of premium. It also undertakes the marketing of cocoons produced by farmers.

The perceptions of the farmers of the three study districts regarding the different activities of Serifed were collected by providing a five point rating scale. These perceptions are tabulated, analysed and presented below. Weights are assigned to different ratings of farmers as given below:

Rating	Weight
Very Poor	1
Poor	2
Good	3
Very Good	4
Excellent	5

6.1.1. Technical Assistance

Technical assistance provided by Serifed includes assistance for the preparation of land for planting mulberry, manuring the mulberry gardens, construction of rearing shed, rearing of silkworms and disinfection. The opinions of farmers on these aspects are discussed in this section.

TABLE 6.1

Perception of Farmers about the Technical Assistance Provided by Serifed for the Preparation of Land

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	11	11	0.96
2 Poor	28	0	28	56	4.81
3 Good	15	33	66	114	9.85
4 Very Good	140	276	136	552	47.68
5 Excellent	80	250	95	425	36.70
Total	263	559	336	1158	100

Source: Field Survey

From Table 6.1 it can be seen that most of the farmers (47.68 per cent) evaluated the technical assistance given by Serifed for preparation of land as very good. Out of the remaining farmers, 36.70 per cent evaluated as excellent, 9.85 per cent evaluated as good, 4.81 per cent evaluated as poor and 0.96 per cent evaluated as very poor. It can be understood that the general perception of the farmers about the technical assistance given by Serifed for preparing land is either very good or excellent. This is more or less the same in all the three districts.

TABLE 6.2

Perception of Farmers about the Technical Assistance given by Serifed for Planting Mulberry

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	12	12	1.02
2 Poor	28	8	16	52	4.40
3 Good	15	12	84	111	9.41
4 Very Good	140	152	188	480	40.68
5 Excellent	80	420	25	525	44.49
Total	263	592	325	1180	100

Source: Field Survey

Table 6.2 shows the opinion of the farmers about the technical assistance received by them for planting mulberry. It is clear that most of the farmers (44.49 per cent) assessed it as excellent. 40.68 per cent of the farmers assessed as very good, 9.41 per cent assessed as good, 4.40 per cent assessed as poor and 1.02 per cent assessed as very poor. It can be understood that the general assessment is either very good or excellent.

TABLE 6.3

Perception of Farmers about the Technical Assistance Provided by Serifed for Manuring Mulberry Gardens

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	11	11	0.98
2 Poor	30	6	40	76	6.74
3 Good	12	63	69	144	12.77
4 Very Good	136	208	128	472	41.84
5 Excellent	85	270	70	425	37.67
Total	263	547	318	1128	100

Source: Field Survey

Table 6.3 shows the evaluation of the farmers on technical assistance for manuring the plantations. Most of the farmers (41.84 per cent) evaluated as very good, 37.67 per cent evaluated as excellent, 12.77 per cent evaluated as good, 6.74 per cent evaluated as poor and 0.98 per cent evaluated as very poor. Most of the farmers evaluated as very good or excellent.

TABLE 6.4

Perception of Farmers about the Technical Assistance Provided by Serifed in the Construction of Rearing House

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	12	12	1.03
2 Poor	0	0	22	22	1.89
3 Good	33	60	72	165	14.15
4 Very Good	120	304	148	572	49.06
5 Excellent	145	170	80	395	33.87
Total	298	534	334	1166	100

Source: Field Survey

Table 6.4 shows the evaluation of farmers regarding the technical assistance given by Serifed for construction of rearing house. Most of the farmers (49.06 per cent) evaluated as very good. 33.87 per cent rated as excellent, 14.15 per cent rated as good, 1.89 per cent rated as poor and 1.03 per cent rated as very poor. Since, majority of the farmers evaluated as either good or excellent, it can be concluded that the assistance of Serifed in the construction of rearing houses is commendable.

TABLE 6.5

Perception of Farmers about the Technical Assistance Given by Serifed in the Silkworm Rearing Operations

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	0	0	0
2 Poor	0	0	20	20	1.59
3 Good	30	15	84	129	10.25
4 Very Good	128	220	156	504	40.07
5 Excellent	140	350	115	605	48.09
Total	298	585	375	1258	100

Source: Field Survey

Table 6.5 gives the evaluation on technical assistance for rearing operations. 48.09 per cent of the farmers evaluated as excellent, 40.07 per cent evaluated as very good, 10.25 per cent evaluated as good, 1.59 per cent evaluated as poor and no farmer is evaluated as very poor. Thus it can be presumed that the service of Serifed during the rearing operations is worthy of praising.

TABLE 6.6

Perception of Farmers about the Technical Assistance Given by Serifed for Cleaning and Disinfection

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	0	0	0
2 Poor	0	10	20	30	2.42
3 Good	45	0	84	129	10.39
4 Very Good	156	244	208	608	48.95
5 Excellent	105	320	50	475	38.24
Total	306	574	362	1242	100

Source: Field Survey

Table 6.6 shows the opinion of farmers on technical assistance regarding disinfection of rearing equipments and rearing shed. 48.95 per cent of the farmers reported that it is very good, 38.24 per cent marked their opinion as excellent, 10.39 per cent reported as good and 2.42 per cent evaluated as poor. No body evaluated as very poor. This service is also rated as either very good or excellent by most of the farmers.

6.1.2. Technical Training

Various aspects of training given by Serifed regarding mulberry cultivation and silkworm rearing are appraised in this section. One month's training is given for planting mulberry, leaf harvesting, cleaning and disinfection of rearing shed and equipments, feeding of silk worms and harvesting of cocoons. Out of the total 300 farmers, 246 farmers have reported that they have received formal training. Among the farmers who have received formal training, 211 farmers have got training from Serifed and 35 got training from Central Silk Board. Only the training received from Serifed is evaluated here.

TABLE 6.7

Perception of Farmers about the Training Provided by Serifed for Planting Mulberry

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	5	5	0.65
2 Poor	14	8	14	36	4.71
3 Good	21	72	54	147	19.22
4 Very Good	108	280	84	472	61.70
5 Excellent	5	25	75	105	13.72
Total	148	385	232	765	100

Source: Field Survey

Table 6.7 shows that 61.70 per cent of the farmers who obtained training from Serifed evaluated the training they received for planting mulberry as very good. 19.22 per cent rated as good, 13.72 per cent rated as excellent, 4.71 per rated as poor

and only 0.65 per cent rated as very poor. The general evaluation is either good or very good. It can be seen that only a few farmers evaluated this function as excellent.

TABLE 6.8

Perception of Farmers about the Training Provided by Serifed in Mulberry Leaf Harvesting

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	3	3	0.39
2 Poor	10	8	16	34	4.47
3 Good	24	90	78	192	25.26
4 Very Good	84	244	88	416	54.75
5 Excellent	40	40	35	115	15.13
Total	158	382	220	760	100

Source: Field Survey

Table 6.8 reveals that most of the farmers (54.75 per cent) rated training received for leaf harvesting as very good. 25.26 per cent rated as good, 15.13 per cent rated as excellent, 4.47 per cent rated as poor and only 0.39 per cent rated as very poor. Thus, the general assessment is either good or very good.

TABLE 6.9

Perception of Farmers about the Training Provided by Serifed in Cleaning and Disinfection

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	4	0	4	0.46
2 Poor	8	0	12	20	2.28
3 Good	21	3	18	42	4.78
4 Very Good	92	172	148	412	46.92
5 Excellent	40	275	85	400	45.56
Total	161	454	263	878	100

Source: Field Survey

It can be seen from Table 6.9 that most of the farmers (46.92 per cent) evaluated the training they received in cleaning and disinfection as very good. 45.56 per cent rated as excellent, 4.78 per cent rated as good, 2.28 per cent rated as poor and only 0.46 per cent assessed as very poor. Thus, it can be understood that the majority opinion is either very good or excellent.

TABLE 6.10

Perception of Farmers about the Training Provided by Serifed in Feeding of Silkworms

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	4	0	4	0.45
2 Poor	14	0	20	34	3.83
3 Good	24	6	33	63	7.10
4 Very Good	64	60	108	232	26.12
5 Excellent	55	410	90	555	62.50
Total	157	480	251	888	100

Source: Field Survey

Table 6.10 shows the rating of farmers about the training in feeding silkworms. The majority of the farmers (62.50 per cent) rated as excellent. 26.12 per cent of the farmers rated as very good, 7.10 per cent rated as good, 3.83 per cent evaluated as poor and only 0.45 per cent assessed as very poor.

TABLE 6.11

Perception of Farmers about the Training Provided by Serifed in Harvesting of Cocoons

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	3	0	0	3	0.35
2 Poor	18	0	10	28	3.26
3 Good	21	45	30	96	11.18
4 Very Good	72	164	76	312	36.32
5 Excellent	25	235	160	420	48.89
Total	139	444	276	859	100

Source: Field Survey

Table 6.11 shows the evaluation made by the sericulturists about the training for harvesting cocoons. It can be seen that most of the farmers (48.89 per cent) evaluated as excellent. 36.32 per cent evaluated as very good, 11.18 per cent evaluated as good, 3.26 per cent rated as poor and only 0.35 per cent assessed as very poor. It can be understood that most of the farmers are having either excellent or very good opinion in this matter.

6.1.3. Procurement of Cocoon

This section evaluates the marketing function of Serifed. This function includes grading of cocoon, weighing, pricing and making payment. Cocoons are graded on the basis quality which is decided by testing a few samples of cocoons brought by the farmers. Price is decided according to the grade. In all districts of Kerala the offices of the Serifed are acting as cocoon procurement centres. In some districts, there are special cocoon collection centres working for the convenience of

the farmers. In addition to the price of cocoons farmers are given production incentives also.

TABLE 6.12

Perception of Farmers about Grading of Cocoons in Procurement

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	8	8	0.64
2 Poor	0	8	14	22	1.75
3 Good	9	27	39	75	5.97
4 Very Good	80	208	228	516	41.08
5 Excellent	235	325	75	635	50.56
Total	324	568	364	1256	100

Source: Field Survey

Table 6.12 indicates that 50.56 per cent of the farmers evaluated the grading function as excellent. 41.08 per cent rated as very good, 5.97 per cent rated as good, 1.75 per cent rated as poor and only 0.64 per cent rated as very poor. Thus, generally, it can be presumed that the grading function of Serifed is appreciable.

TABLE 6.13

Perception of Farmers about Weighing of Cocoons in Procurement

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	4	0	4	0.31
2 Poor	0	0	20	20	1.55
3 Good	9	0	48	57	4.41
4 Very Good	28	184	252	456	35.29
5 Excellent	300	400	55	755	58.44
Total	337	588	375	1292	100

Source: Field Survey

Table 6.13 shows the opinion of the farmers regarding the weighing of cocoons. Most of the farmers (58.44 per cent) rated this function as excellent. 35.29 per cent rated as very good, 4.41 per cent rated as good, 1.55 per cent rated as poor and only 0.31 per cent rated as very poor.

TABLE 6.14

Perception of Farmers about the Pricing of Cocoons

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	3	3	0.22
2 Poor	0	8	10	18	1.34
3 Good	12	24	21	57	4.26
4 Very Good	128	200	208	536	40.03
5 Excellent	170	340	215	725	54.15
Total	310	572	457	1339	100

Source: Field Survey

The pricing of cocoon by Serifed is evaluated by farmers as shown in Table 6.14. Most of the farmers (54.15 per cent) expressed their opinion as excellent. 40.03 per cent rated as very good, 4.26 per cent evaluated as good, 1.34 per cent evaluated as poor and only 0.22 per cent assessed as very poor.

TABLE 6.15

Perception of Farmers about the Payment for Cocoons by Serifed

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	4	5	9	0.70
2 Poor	0	0	28	28	2.18
3 Good	12	9	24	45	3.50
4 Very Good	64	172	196	432	33.65
5 Excellent	250	400	120	770	59.97
Total	326	585	373	1284	100

Source: Field Survey

Table 6.15 gives the assessment given by farmers regarding the payments for cocoons. Majority (59.97 per cent) rated as excellent. 33.65 per cent evaluated as very good, 3.50 per cent evaluated as good, 2.18 per cent evaluated as poor and only 0.70 per cent evaluated as very poor. Thus majority have expressed high opinion on this function.

TABLE 6.16

Perception of Farmers about the Incentives and Bonus Given by Serifed

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	0	0	14	14	1.45
2 Poor	24	44	46	114	11.90
3 Good	72	156	132	360	37.58
4 Very Good	76	172	52	300	31.32
5 Excellent	75	65	30	170	17.75
Total	247	437	274	958	100

Source: Field Survey

Table 6.16 shows the evaluation of incentives and bonus given by Serifed. Most of the farmers (37.58 per cent) expressed their opinion as good. 31.32 per cent rated as very good, 17.75 per cent rated as excellent, 11.90 per cent rated as poor, and 1.45 per cent evaluated as very poor. Though most of the farmers have good opinion, it can be seen that this function of Serifed is not so satisfactory since a number of farmers rated as poor and only few rated as excellent.

6.2. CROP INSURANCE SCHEME

There is the possibility of crop loss during the rearing of silkworms due to many reasons. It may be because of adverse climatic conditions, silkworm diseases, ignorance of the farmers, poor quality of DFLs, improper attention, etc. Crop insurance scheme is implemented by Serifed to protect the farmers from loss of crop due to reasonable causes. But, this scheme is available only for the farmers who rear a minimum of 25 DFLs. at a time. In addition to protection against crop loss, the insurance scheme also includes a personal accident policy to farmers. This section discusses about the participation of farmers in the scheme, number of batches insured and the amount of compensation received by farmers out of this scheme.

TABLE 6.17

Participation of Farmers in the Crop Insurance Scheme of Serifed

District	Total number of farmers	No. of farmer joined the scheme	No. of farmers not joined the scheme
Alappuzha	70	25 (35.71)	45 (64.29)
Malappuram	130	119 (91.54)	11 (08.46)
Kannur	100	67 (67.00)	33 (33)
Total	300	211 (70.33)	89 (29.67)

Source: Field Survey
(Figures in brackets percentage to respective totals)

Table 6.17 shows information regarding the rate of participation of farmers in the three districts in the crop insurance scheme of Serifed. It can be understood that on an average, 70.33 per cent of the farmers are participating in the scheme. The rate of participation is highest in Malappuram district (91.54 per cent) and lowest in Alappuzha (35.71 per cent). In Kannur, the rate of participation is 67 per cent.

TABLE 6.18

Reason for Farmers not Joining the Crop Insurance Scheme of Serifed

Reason	Number of Farmers			Total	Percentage to total
	Alappuzha	Malappuram	Kannur		
High rate of Premium	0	0	0	0	0
Not available for Small producers	40	8	26	74	83.15
No timely settlement of claims	0	0	0	0	0
No specific Reason	5	3	7	15	16.85
Total	45	11	33	89	100

Source: Field Survey

Table 6.18 reveals why some farmers are not joining the crop insurance scheme of Serifed. It can be understood that 83.15 per cent of the farmers, who do not join the scheme reported the reason that the scheme is not available for small producers. The remaining 16.85 per cent of the farmers did not report any specific reason for the same. It can be presumed that majority of the farmers do not participate the scheme because of the condition of minimum rearing prescribed by Serifed.

TABLE 6.19

Total Number of Batches Reared, Number of Batches Insured and Number of Failed Batches

District	Total No. of batches reared	Insured batches		Failed batches	
		Number	% to total batches	Number	% to insured batches
Alappuzha	341	88	25.81	28	31.82
Malappuram	665	469	70.53	43	09.17
Kannur	484	303	62.60	38	12.54
Total	1490	860	57.72	109	12.67

Source: Field Survey

Table 6.19 gives an account of total number batches reared, number of insured batches and number of failed batches. It can be understood that, on an average, in the three districts, 57.72 per cent of the total number of batches are insured. The percentage of the insured batches is the highest in Malappuram district (70.53 per cent) and lowest in Alappuzha district (25.81 per cent). The insured portion is 62.60 per cent in the Kannur district. It can also be seen that out of the insured batches, on an average, 12.67 per cent of the batches are failed batches. This rate of failure is the

highest in Alappuzha (31.82 per cent) and lowest in Malappuram district (9.17 per cent). The same is 12.54 per cent in Kannur district.

TABLE 6.20

Farmers Received Compensation out of the Crop Insurance Scheme of Serifed

District	No. of farmers Suffered Crop Loss	No. of Farmers Received Compensation	Percentage
Alappuzha	22	5	22.73
Malappuram	36	19	52.78
Kannur	27	16	59.26
Total	85	40	47.06

Source: Field Survey

Table 6.20 gives information about the number of farmers suffered crop loss and the number of farmers who have received compensation out of crop insurance scheme. On an average, 47.06 per cent of the farmers who suffered crop losses have received the compensation. The percentage of farmers who have received compensation is the highest in Kannur (59.26 per cent) and lowest in Alappuzha (22.73 per cent). It is 52.78 per cent in Malappuram district. It can be understood that majority of the farmers suffer crop loss because of their own negligence, which will not be covered by the insurance scheme.

TABLE 6.21

Amount of Compensation Received and Time Taken to Receive Compensation Out of the Crop Insurance Scheme of Serifed

District	No. of Farmers	Compensation		Time Taken	
		Amount Rs.	Average Rs.	Days	Average
Alappuzha	5	4850	970	195	39
Malappuram	19	25500	1342	770	41
Kannur	16	11974	748	675	42
Total	40	42324	1058	1640	41

Source: Field Survey

The amount of compensation received by farmers who suffered crop losses and the time taken for receiving compensation are provided in Table 6.21. It is evident that on an average, a lost farmer has received a compensation of Rs.1058. In Malappuram, Rs.1342, in Alappuzha Rs.970 and in Kannur Rs.748, are the average amounts of compensation received by farmers who suffered crop losses. On an average 41 days are taken for the receipt of compensation. This period is 42 days in Kannur, 41 days in Malappuram and 39 days in Alappuzha.

TABLE 6.22

Opinion of Farmers about the Financial Support and Subsidies Given by Serifed

Rating	Number of Farmers			Total	Percentage
	Alappuzha	Malappuram	Kannur		
1 Very Poor	51	49	52	152	51
2 Poor	10	38	13	61	20
3 Good	3	11	8	22	7
4 Very Good	5	24	16	45	15
5 Excellent	1	8	11	20	7
Total	70	130	100	300	100

Source: Field Survey

Table 6.22 reveals the opinion of farmers on the financial support and subsidies provides by the Serifed. It can be noticed that majority of the farmers (51 per cent) expressed their opinion as very poor. 20 per cent rated as poor, 15 per cent rated as very good and seven per cent each evaluated as good and excellent. It can be understood that the general opinion about the financial incentives and subsidies of Serifed is very poor.

6.3. PROBLEMS OF SERICULTURE INDUSTRY IN KERALA

This section is allotted to the discussion of the problems reported by sericulturists on various instances of their sericultural activities and the suggestions made by them to improve the industry. The sericulture industry is suffering from many problems relating to the cultivation of mulberry, rearing of cocoons, marketing and financing. According to the intensity of the problems confronted by respondents, their grievances are collected, analysed, ranked and presented in the following tables.

TABLE 6.23

Problems of Mulberry Cultivation Experienced by Farmers in the Three Districts

Problems	No. of Farmers Reported			Total	%	Rank
	Alappuzha	Malappuram	Kannur			
Lack of Irrigation	20	40	32	92	30.67	IV
No land	18	34	26	78	26.00	V
High Fertilizer cost	70	130	100	300	100.00	I
Scarcity of planting material	10	12	12	34	11.33	VI
High cost of labour	60	100	90	250	83.33	II
Natural hazards	2	3	0	5	01.67	VII
Diseases of mulberry	28	37	30	95	31.67	III

Source: Field Survey

Table 6.23 is an account of problems reported by sericulturists regarding the cultivation of mulberry. Among the various problems of mulberry cultivation, high cost of fertilizers is reported by all farmers of all the three districts. 83.33 per cent felt high cost of labour as the problem in the cultivation of mulberry. Out of the

remaining, 31.67 per cent felt diseases of mulberry, 30.67 experienced lack of irrigation, 26 per cent reported no land, 11.33 per cent stated scarcity of planting material, and 1.67 per cent reported natural calamities as their problems. It can be inferred that high cost of fertilizers and high cost of labour are the main problems experienced by farmers in the cultivation of mulberry.

TABLE 6.24

Problems of Cocoon Production Experienced by the Farmers in the Three Districts

Problems	No. of Farmers Reported			Total	%	Rank
	Alappuzha	Malappuram	Kannur			
Scarcity of DFLs	10	12	12	34	11.33	V
Silkworm Diseases	45	72	68	185	61.67	III
Frequent Crop Failure	58	89	80	227	75.67	II
Shortage of Rearing appliances	10	18	12	40	13.33	IV
Irregular Moulting of Silkworms	62	105	92	259	86.33	I
Poor quality Mulberry Leaves	11	12	10	33	11.00	VI
Limited Technical Assistance	10	12	8	30	10.00	VII
Lack of electricity	10	10	8	28	09.33	VIII

Source: Field Survey

An analysis of the problems related to the production of cocoons is given in Table 6.24. It is obvious from the table that irregular moulting of the silkworms is the problem experienced by the majority of the farmers (86.33 per cent) in connection with cocoon production. Frequent crop failure is another major problem which is reported by 75.67 per cent of the farmers. The problem of silkworm diseases is also

significant, which is experienced by 61.67 per cent of the farmers. Other problems like shortage of rearing appliances, scarcity of DFLs., poor quality of mulberry leaves, limited technical assistance and lack of electricity are reported by 13.33 per cent, 11.33 per cent, 11 per cent, 10 per cent and 9.33 per cent of the farmers respectively. It can be understood that irregular moulting of silkworms, frequent crop failures and silkworm diseases are major problems encountered by the farmers as far as production of cocoon is concerned.

TABLE 6.25

Problems of Marketing Experienced by the Farmers in the Three Districts

Problems	No. of Farmers Reported			Total	%	Rank
	Alappuzha	Malappuram	Kannur			
Exploitation of Middlemen	0	0	0	0	0	VI
Absence of Local buyers	65	120	95	280	93.33	II
Difficulties of Transportation	70	130	100	300	100	I
No spot payment	5	12	8	25	8.33	IV
No price for inferior Quality cocoons	12	15	12	39	13.00	III
Fraudulent practices of buyers	2	2	1	5	1.67	V

Source: Field Survey

Table 6.25 shows the problems experienced by farmers in connection with the marketing of the silk cocoons. It can be noticed that 100 per cent of the farmers from all the three districts, reported difficulties of transportation as their problem in selling cocoons. Absence of local buyers is another important problem in marketing stated by 93.33 per cent of the farmers. Other problems cited are no price for inferior quality cocoons (13 per cent), not getting spot payment (8.33 per cent), and

fraudulent practices of buyers (1.67 per cent). However, no farmer had reported exploitation of middle men. It can be presumed that difficulties of transportation and absence of local buyers are the two important problems suffered by farmers in the process of marketing of cocoons.

TABLE 6.26

Problems of Financing Experienced by the Farmers in the Three Districts

Problems	No. of Farmers Reported			Total	%	Rank
	Alappuzha	Malappuram	Kannur			
Indifferent attitude of bank authorities	50	100	85	235	78.33	II
Cumbersome procedure	60	95	88	243	81.00	I
Inordinate delay in availing loans	40	60	55	155	51.67	III
Ignorance of bank about prospects of sericulture	30	55	52	137	45.67	IV

Source: Field Survey

Table 6.26 discloses the problems faced by farmers in connection with availing loans and financial assistance for sericultural activities. It is clear that 81 per cent of the farmers have complaint regarding the cumbersome procedure in getting financial assistance. Indifferent attitude of bank authorities is another problem expressed by 78.33 per cent of the farmers. Inordinate delay in getting loans and ignorance of bank about prospects of sericulture are also reported by a good number of farmers (51.67 per cent and 45.67 per cent respectively). It can be understood that, the cumbersome procedure in sanctioning loans and the indifferent attitude of the bank authorities are the major problems in financing sericulture.

TABLE 6.27

Training and Cocoon Productivity

Training Status	Average Cocoon Quantity in Kg.			Combined Average Kg.
	Alappuzha	Malappuram	Kannur	
Trained from Serifed	45.63	89.50	62.75	72.32
Not Trained	7.92	10.16	71.06	36.40

Source: Field Data

The effect of training given by Serifed on cocoon production when compared to farmers those who have not obtained any training is given in Table 6.27. It can be seen that, in the three districts, the trained farmers have an average cocoon production of 72.32 Kg while the farmers who are not trained have an average cocoon production of only 36.40 Kg. The average cocoon quantity is very low among farmers who have not received any training except in Kannur district, where the cocoon production is less for trained farmers when compared to farmers who are not received any training. However, it can be concluded that the training given by Serifed is effective.

6.4. Test of Hypotheses

The third hypothesis set for the study was:

Ho: *The perceptions of the farmers about the functions of the Serifed are different in the three districts.*

To test this hypothesis, the following variables related to the problem were analysed as under:

TABLE 6.28

Analysis of Variables Deciding the Perceptions of Farmers about Serifed In the Three Districts Using Chi-square Values

Variables Considered	Chi-square Value	Degree of Freedom	Critical Value (5 %)	Refer Table No.	Remarks*
Technical Assistance for:					
Preparation of Land	68.6896	8	15.507	6.1	R
Planting Mulberry	137.5581	8	15.507	6.2	R
Manuring	67.7517	8	15.507	6.3	R
Rearing House	64.6483	8	15.507	6.4	R
Rearing	56.7896	6	12.592	6.5	R
Disinfection	70.8204	6	12.592	6.6	R
Technical Training for:					
Planting Mulberry	44.4111	8	15.507	6.7	R
Leaf Harvesting	23.5081	8	15.507	6.8	R
Disinfection	40.7885	8	15.507	6.9	R
Feeding worms	73.8072	8	15.507	6.10	R
Harvesting Cocoons	45.0864	8	15.507	6.11	R
Procurement of Cocoon:					
Grading	63.8074	8	15.507	6.12	R
Weighing	130.6237	8	15.507	6.13	R
Pricing	11.1644	8	15.507	6.14	A
Payment	66.2518	8	15.507	6.15	R
Incentives	48.5250	8	15.507	6.16	R

*R=Reject null hypothesis, A=Accept null hypothesis, at 5 % level of significance

From Table 6.28 it can be seen that among the different factors analysed to test the hypothesis, except the pricing function, significant difference is observed in all other factors. Therefore, the hypothesis is proved to be false and it can be concluded that the perceptions of the farmers about the functions of the Serifed are same in all the three districts.

The fourth hypothesis set for the study was:

Ho: *The problems experienced by the sericulturists are not the same in all the three districts.*

To test this hypothesis, the following variables related to the problem were analysed as under:

TABLE 6.29

Analysis of Variables Deciding the Problems of Sericulturists In the Three Districts using Chi-square Values

Variable Considered	Chi-square Value	Degree of Freedom	Critical Value (5 %)	Refer Table No.	Remarks*
Mulberry Cultivation	5.9876	12	21.026	6.23	A
Cocoon Production	5.4739	14	23.685	6.24	A
Cocoon Marketing	2.3086	8	15.507	6.25	A
Financing	1.7570	6	12.592	6.26	A

*A=Accept null hypothesis at 5 % level of significance.

Table 6.29 reveals that there is no significant difference among the districts regarding the various factors affecting the problems of sericulturists and therefore, the null hypothesis is found to be true and hence accepted. It can be concluded that the problems experienced by the farmers are different in the three districts.

In this chapter, a discussion is made about the opinions of farmers on the different functions of Serifed, like general and technical functions, insurance scheme, subsidies, etc. and the problems faced by farmers during the sericultural activities. It can be concluded that most of the functions of Serifed are well appreciated by farmers.

CHAPTER VII

SUMMARY, FINDINGS, SUGGESTIONS AND CONCLUSION

SUMMARY, FINDINGS, SUGGESTIONS AND CONCLUSION

Sericulture is an agro-based cottage industry having vast potential for generating income and employment opportunities in rural areas. This is an industry very much suitable for the countries having an agricultural base and problems of providing employment to rural labourers. It is one of the crop enterprises identified as the most appropriate labour intensive cottage industry for backward regions.

The most important feature of the sericulture technology is that it is more labour intensive rather than capital intensive. Hence, this industry is very much suitable for small and marginal farmers who have got more labour than land and capital.

The technology of sericulture is simple, which can be followed even by less educated persons. It requires only a small initial investment and can yield income within a very short period of time. Silk, the end product of this industry, is having great reputation and demand all over the world. There are many varieties of silk, but generally the term silk refers to the silk of mulberry origin because almost 95 per cent of the world silk production is mulberry silk.

This industry was first developed in China and at present it is practiced in about 30 countries of the world. The Asian countries contribute more than 90 percent of global silk production. China is the leading producer of silk in the world producing more than 80 per cent of the total production of all the countries.

India is the second largest producer of silk and is the only country in the world producing all types of commercially known silks, viz., mulberry, eri, muga and tasar silks. Mulberry silk production in India is largely concentrated in southern Karnataka and in the districts of Andhra Pradesh and Tamil Nadu. Almost 90 per cent of the mulberry silk production of India comes from these areas. West Bengal and Jammu and Kashmir are other important producers. At present the industry is spread to almost all States of the Country. Sericulture holds an important place in our national economy. It has played a very significant role in the socio-economic development of various States of the Country. India is an exporter of finished silk garments and at the same time an importer of raw silk.

The Government has recognized this industry as an employment oriented industry for rural areas and is giving an important place in the Plan allocations. Government has set up the Central Silk Board under the Central Silk Board Act, 1948 to look after the sericultural program in the Country.

Sericulture industry is growing in Kerala also. The soil and climatic conditions of the State are very much suitable for the development of this industry. The Government of Kerala has set up the Kerala State Sericulture Co-operative Federation Ltd. (Serifed) in 1994 and entrusted them with the task of promoting sericultural activities in the State.

The present study was intended to assess the progress of the sericulture industry in Kerala by giving due importance to the role of Serifed. The study had been conducted among the sericultural farmers of the three districts of Kerala, viz.,

Alappuzha, Malappuram and Kannur. These three districts were selected as the representative districts of the South, Central and North zones of Kerala. A total of 300 farmers doing sericulture, consisted of 70 farmers from Alappuzha, 130 farmers from Malappuram and 100 farmers from Kannur were interviewed. Proper interactions were also made with the officials of Serifed at the three district offices and those of the head office of Serifed at Thiruvananthapuram. The findings of the study are given below:

7.1. GENERAL

◇ In order to have a systematic approach to the problem, the sericulture farmers of the study area were divided in to three classes namely, Small, Medium and Large classes on the basis of their cocoon production. Out of the 300 farmers interviewed, 226 farmers (75.33 per cent) were small class of farmers who had a cocoon production of less than 100 Kgs, 50 farmers (16.67 per cent) were medium class who had a production between 100 and 200 Kgs and 24 farmers (eight per cent) were large class of farmers who had a production of more than 200 Kgs of cocoons in the financial year 2004-05. It is observed that, small class of farmers is predominant in all the three districts.

◇ The participation of family members in sericultural activities is important from the point of view of profitable operation of the enterprise. It is observed that in all the three districts, the rate of participation of family members in sericultural activities is very high (75 per cent). The level of age and education of the farmers are found to be favorable for understanding and adopting sericulture technologies as it

is observed that, majority of the farmers belong to the age group of less than 40 and most of them have the educational status SSLC or below and nobody is reported to be illiterate. It is found that women have a prominent role in sericulture, as 30.33 per cent of the total farmers interviewed were women. It is noticed that all the farmers of the study area belonged to the forward casts and no farmer is reported to be in the Scheduled Caste or Scheduled Tribe.

◇ The income-wise classification of the farmers showed that most of the farmers (48.33 per cent) in the three districts belong to the annual income group of Rs.25000 to 50000. Majority of them (62 per cent) are basically agriculturists, which would enable them to perform better in sericultural activities. Some 15 per cent of the farmers have reported that they have no occupation other than sericulture.

◇ The level of training in sericulture in the three districts is found to be 91 per cent, which indicates the need for extending training to the remaining farmers also. Serifed was the major source of training in all the three districts. Most of the farmers (44.72 per cent) had a training period of 10 to 20 days. This shows that a good number of farmers have not utilised the full training period of 30 days provided by Serifed. Out of the trained farmers 70 per cent are males and the remaining 30 per cent are females. Most of the farmers (43.33 per cent) are having less than 3 years of experience in sericulture. Only one per cent of the farmers are reported to be having more than 10 years of experience.

7.2. MULBERRY CULTIVATION

◇ Since mulberry leaf is the only food for silkworms, the cultivation of mulberry is the basic requirement for sericulture. The overall mulberry acreage to the total land holdings of the sample farmers is found to be 28.41 per cent. In this respect, the Malappuram district is having the highest share (33.56 per cent) and Alappuzha is having the lowest share (19.44 per cent). The average mulberry area per household is 0.56 acre in the three districts. Variation is found in the average area per household among the three districts. It is 0.63 acre in Malappuram, 0.53 acre in Kannur and 0.46 acre in Alappuzha. Majority of the farmers in the three districts (52 per cent) possess a mulberry area of 50 to 100 cents. About 28 per cent of the farmers are having less than 50 cents and only 20 per cent are having more than one acre of mulberry land. The average area of mulberry possessed by small class of farmers is 0.47 acre, that of medium class is 0.74 acre and that of large class of farmers is 0.96 acre. It can be presumed that the average mulberry area per farmer is enough to conduct sericulture profitably.

◇ There are several varieties of mulberry, which can be cultivated according to the suitability of climate and soil. It is found that, majority of the farmers in the three districts (55 per cent) are cultivating the variety Victory 1. The variety Kanva 2 is cultivated by about 35 per cent of the farmers and the remaining (10 per cent) cultivate both these varieties. Both Victory 1 and Kanva 2 are regarded as better varieties of mulberry. In Malappuram district, majority of the farmers (73.85 per cent) have planted Victory 1 where as in Alappuzha and Kannur most of the farmers

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have planted Kanva 2. Farmers mostly use mulberry saplings as the planting material (53.67 per cent). Majority of the farmers (52.67 per cent) obtained the planting materials from their friends or relatives. It is observed that Serifed has provided planting material only to 37.33 per cent of the farmers.

◇ Mulberry can be cultivated either as a mono crop or as an inter crop. It is found that majority of the farmers (53 per cent) practice inter cropping for the cultivation of mulberry. Only 29 per cent practice mono cropping. In Alappuzha and Kannur, majority of the farmers have adopted inter cropping whereas in Malappuram most of the farmers have adopted mono cropping.

◇ Mulberry plantations in the study area are found to be at their young and growing stage, as it is observed that most of the plantations (89 per cent) are less than five years old. It is noticed that farmers have made only limited addition to their mulberry cultivation since only 16 per cent of the farmers have made an additional plantation of mulberry after their first planting, accounting for only 14.62 per cent of the initial area. The additional area of mulberry cultivated is the highest in Malappuram (17.95 per cent) and lowest in Alappuzha (3.54 per cent).

◇ As per the standards, 5000 mulberry plants can be cultivated in one acre of land. It is observed that, on an average, farmers are planting 4628 plants in one acre. The number of plants per acre is 4775 plants in Malappuram, 4697 plants in Kannur and 4198 plants in Alappuzha. Since most of the cultivations are intercrops, this number can be treated as adequate when compared to the standard of 5000 plants per acre. Majority of the farmers (72.33 per cent) are cultivating mulberry in the

most fertile soils. 93 per cent of the farmers are irrigating their mulberry lands. Among the farmers who do not irrigate, most of them (42.85 per cent) reported financial difficulties as the reason.

◇ Even though there are sufficient mulberry area and adequate number of plants, as far as harvesting is concerned, it is observed that most of the farmers (49 per cent) harvested their mulberry less than five times in the year 2004-05. Only five per cent of the farmers harvested more than 10 times. In Alappuzha and Kannur districts, most of the farmers harvested their mulberry less than five times while in Malappuram district, most of the farmers harvested five to 10 times.

◇ The general leaf productivity per acre is also found to be very low (4344 Kg. per acre). Most of the farmers (46.33 per cent) produced 1000 to 5000 kg of mulberry leaves in the year. 39.67 per cent of the farmers had a production of less than 1000 kg. Only 14 per cent of the farmers had a production of more than 5000 kg. In Alappuzha, most of the farmers had a production of less than 1000 kg of mulberry leaves, while in Malappuram and Kannur most of the farmers had a production of 1000 to 5000 kg of mulberry leaves. The leaf productivity in all the three districts is found to be very poor when compared to the standard norm of 12000 Kg. per acre. All these show lack of efficient farm management practices and poor supervision. However, out of the total leaves produced, 97.69 per cent were utilised for silkworm rearing.

◇ It is observed that most of the farmers (36.67 per cent) had information about starting sericulture from newspapers or journals. The role of Serifed in this

matter is found to be only 13 per cent. The important factor which motivated to start sericulture to most of the farmers (36.34 per cent) was the loss of other crops.

◇ Regarding the expansion of mulberry cultivation, it is noticed that only 10.67 per cent of the present farmers have plan to expand. The total area planned to be cultivated by them is only 9.38 per cent of the present area. Most of the farmers (34.37 per cent) reported failure of the agriculture as the main reason, which compelled them to expand their mulberry area. Another 34.37 per cent of the farmers expand their cultivation, as they think sericulture is profitable. Non-availability of land is the main reason indicated by most of the farmers (38.43 per cent) who do not have plan to expand their mulberry area. It is understood that generally farmers are reluctant to invest more in mulberry plantation.

7.3. SILKWORM REARING

◇ Silkworm rearing requires a good rearing house, which is protected from infection and other disturbances. It is found that, majority of the farmers (70.34 per cent) in the three districts have rearing houses separately built for the purpose. Some 29.33 per cent of the farmers have rearing houses attached to their home. Only one farmer is reported to be doing rearing inside the dwelling house. On an average, the rearing houses are having an area of 154 sq.feet. This can be regarded as sufficient. Most of the rearing houses (70.23 per cent) are of two to five years old. About 93 per cent of the farmers have the required rearing equipments.

◇ Regular supply of good quality silkworm eggs (DFLs) is essential for conducting sericultural activities. It is observed that, all farmers in the three districts

are getting DFLs only from Serifed. All the farmers use the Bivoltine variety of silkworm eggs, which is regarded as the best variety. On an average, 13 per cent of the farmers have reported that they are experiencing difficulties in getting DFLs. As Serifed offices are located at distant places, the need for long traveling is the most important difficulty reported by majority (89.74 per cent) of these farmers.

◇ The productivity of sericulture to a great extent is affected by failure of crops, which occurs mainly due to silkworm diseases and climatic problems. On an average, 28.33 per cent of the farmers of the study districts are experiencing the problem of crop loss. The number of farmers who suffered loss of crop is the highest in Alappuzha (31.43 per cent). However, it is observed that majority of the farmers (76.47 per cent) suffered only one loss in the year of survey. Most of the farmers (42.35 per cent) who suffered crop loss are not in a position to specify the reason for the same. It is evident that a good number of farmers are experiencing crop loss signifying the need for extending the crop insurance coverage of Serifed.

7.4. MARKETING OF COCOONS

◇ Marketing facility for cocoons is inevitable for the development of sericulture. The farmers of the study area reported that they do not have any cocoon market in their local areas. They have to travel on an average 34 kms to the nearest cocoon market. The average distance to the cocoon market is the maximum in Kannur district (54 kms) and minimum in Malappuram district (20 kms). This indicates, at present Serifed is having only limited cocoon procurement facility.

◇ It is observed that the farmers in the study area are selling their cocoons produced, only to the Serifed. No farmer is reported to be selling the cocoons outside Kerala or selling to intermediaries or to any other agencies. This shows that Serifed is the only cocoon procurement agency in these areas. The major problem experienced by farmers in marketing cocoon is the distant location of the Serifed offices. To make the marketing of cocoons convenient, majority of the farmers (59.33 per cent) made the suggestion that cocoon markets are to be established in every Panchayat.

◇ In most of the cases, the sericultural pattern of the three districts is found to be identical. Therefore, it can be presumed that all farmers in the three districts are following the same sericultural practices.

7.5. SOURCES OF FINANCE

◇ Like any other commercial activity, sericulture also requires funds for its operation. As far as financing the sericultural activities are concerned, it is found that majority of the farmers (69.33 per cent) rely on their own funds. The remaining farmers (30.67 per cent) depend on borrowed funds. Among the various classes of farmers, 69.91 per cent of the small farmers, 70 per cent of the medium farmers and 62.5 per cent of the large farmers depend on their own funds for financing sericultural activities.

◇ Those who borrow funds for sericultural activities, majority make their borrowings from Commercial Banks and Land Development Banks (30.43 per cent each). About nine per cent of the farmers reported that they have availed loan from

local moneylenders. Most of the loans in the three districts for sericulture are availed from Commercial Banks (32.19 per cent).

◇ A class-wise analysis of the farmers who borrowed money for sericulture showed that, 73.91 per cent of them are small farmers, 18.48 per cent of them are medium farmers and 7.61 per cent of them are large farmers. Among the small class of farmers, most of them availed loan from commercial banks (35.29 per cent), among the medium class, most of them availed loan from land development banks (35.29 per cent) and among the large class of farmers, most of them availed loans from local moneylenders (42.85 per cent). All these reveal that Serifed do not have any arrangement for granting loans to sericulturists.

◇ It is realized that farmers are paying higher rates of interest on loans borrowed by them. On an average, 13.02 per cent is the rate of interest paid by the farmers on loans taken from various sources. The rate of interest is the highest in Malappuram district (14.8 per cent), and lowest in Alappuzha district (8.93 per cent). The overall rate of repayment of loan is 45 per cent, which can be considered as reasonable. The rate of repayment of loans is the highest among small class of farmers (47.58 per cent). The important reasons reported by farmers for not availing loans are lack of required security and indifferent attitude of officials.

7.6. LABOUR UTILISATION

◇ The sericultural activities are labour intensive and the cost of labour has a significant share in the total cost of cocoon production. The involvement of family labour can reduce the cost to a great extent. It is found that in the total value of

labour for planting mulberry, 55.95 per cent is constituted by family labour and 44.05 per cent is by hired labour. Utilisation of family labour for planting mulberry is the highest in Malappuram (71.83 per cent), while employment of the hired labour in planting mulberry is the highest in Kannur (65.39 per cent). The total labour cost of planting mulberry is composed of 87.55 per cent of male labour and 12.45 per cent of female labour.

◇ In the total value of labour for rearing operations, family labour accounts for 92.85 per cent and hired labour accounts for only 7.15 per cent in the three districts. The utilisation of family labour in rearing operations is the highest in Malappuram (95.51 per cent) and the employment of hired labour in rearing operations is the highest in Kannur (10.46 per cent). The portion of male labour is 65.47 per cent and that of female labour is 34.53 per cent in rearing operations. It is found that, large class of farmers has the maximum utilisation of family labour (93.18 per cent) when compared to medium and small classes of farmers. It is obvious that family labour is having a prominent role in the sericultural activities of the three districts and the same has reduced the costs to a significant extent. The role of women in the total labour for rearing is also significant.

◇ The planting of mulberry had created a total of 1776 man-days in the three districts. Per acre man days created in planting mulberry were 10.65. The total of man-days created in rearing operations in the year of study was 6121 and per acre man days created in rearing were 36.72.

7.7. INVESTMENTS IN SERICULTURE

◇ Sericulture demands some initial investments in mulberry plantation, in rearing shed, in rearing implements and in irrigation facilities. An analysis of the investment pattern in the three districts showed that out of the total investment in fixed assets, investment in rearing shed has the major share (46.14 per cent). The cost of establishing mulberry plantations showed that out of the total cost, 67.43 per cent is on account of labour and the remaining 32.57 per cent is incurred by way of material cost. On an average, the cost mulberry plantation per farmer comes to Rs.1277. The average cost of plantation per farmer is the highest in Kannur (Rs.1419) and lowest in Alappuzha (Rs.981). It is Rs.1327 in Malappuram district.

◇ The average cost of mulberry plantation per acre comes to Rs.2312 in the three districts. This is the highest in Kannur (Rs.2678) and lowest in Alappuzha (Rs.2134). It is Rs.2143 in Malappuram district. The average cost of mulberry plantation per acre is the highest among small class of farmers (Rs.2360) and lowest among large class of farmers (Rs.2073).

◇ On an average, the cost of a rearing house per farmer comes to Rs.12404. The same is the highest in Kannur (Rs.14670) and lowest Malappuram (Rs.10169). The average cost of rearing equipments per farmer comes to Rs.10513. This is highest in Kannur (Rs.12452) and lowest in Alappuzha (Rs.5990). The average cost of irrigation per farmer is Rs.3220. This is highest in Malappuram (Rs.3740) and lowest in Alappuzha (Rs.2233). It is found that sericulture requires higher initial investment. Generally, the investment costs are found to be lowest in Alappuzha.

◇ The analysis of various materials used in rearing operations showed that, the average application of farmyard manure in one acre of mulberry land is 700 kg having a cost of Rs.700. The amount spent on account of farmyard manure is highest in Malappuram (Rs.834 per acre) and lowest in Alappuzha (Rs.492). On an average 293 kg of chemical fertilizers are applied in the mulberry farms having a cost of Rs.1757. The amount spent on this account is highest in Kannur (Rs. 3380) and lowest in Malappuram (Rs.737). Average four kilograms of disinfectants having a value of Rs.185 are used per rearing. This expenditure is highest in Malappuram (Rs.259) and lowest in Alappuzha (Rs.99). The average usage of DFLs per rearing is 33 DFLs having a cost of Rs.76. DFL usage is highest in Malappuram (40 DFLs. at a cost of Rs.90) and lowest in Alappuzha (21 DFLs at a cost of Rs. 52). Generally, the usage of various materials in rearing operations is found to be highest in Malappuram and lowest in Alappuzha.

7.8. SUBSIDIES

◇ Serifed is granting subsidies to farmers for planting mulberry, for constructing rearing houses, for purchasing rearing equipments, for purchasing disinfectants and for implementing irrigation facilities. It is observed that majority of the farmers (92 per cent) are aware of the subsidies granted by Serifed. But, it is found that only 30.33 per cent of the farmers have received some kind of subsidies provided by Serifed. Out of the total subsidies received for various purposes, 48.34 per cent is for the construction of rearing shed, 36 per cent is for the purchase of

rearing equipments, 6.97 per cent is for disinfectants, 4.62 per cent is for mulberry plantation and 4.07 per cent is for irrigation.

◇ It is observed that, the share of subsidy in the total expenditure is 45.61 per cent. Out of the total expenditure of different items, 76.69 per cent of the cost of mulberry plantation, 46.65 per cent of the cost of rearing shed, 40.46 per cent of the cost of rearing equipments, 81.73 per cent of the amount spent on disinfectants and 33.71 per cent of the amount invested for irrigation are met out of subsidy. However, significant difference is observed across the three districts regarding the financial assistance given by Serifed. The subsidy for irrigation is found to be inadequate in all the three districts when compared to the importance of irrigation of mulberry lands. Since most of the farmers reported financial difficulties for not irrigating, there is the need for enhancing the irrigation subsidies.

7.9. COST, PRODUCTIVITY AND INCOME

◇ A comparison of the different material costs in rearing operations showed that, in the total cost, chemical fertilizers have the major share (36.61 per cent). The share of disinfectants is 34.63 percent, farmyard manure is 14.58 percent and DFLs is 14.18 per cent. On an average, the total material cost per rearing comes to Rs.534. The material cost per rearing is the highest in Kannur district (Rs.653) and lowest in Alappuzha district (Rs. 352). The average variable cost per rearing is Rs. 699. The variable cost per rearing is the highest in Kannur district (Rs. 856) and lowest in Alappuzha (Rs. 493).

◇ The average cost of cocoon production and marketing per farmer in the three districts comes to Rs. 1185. This cost is the highest in Kannur (Rs. 1446) and lowest in Alappuzha (Rs. 859). The total cost of cocoon production and marketing, is made of: variable cost 59 per cent, fixed overheads 36 per cent and marketing overheads 5 per cent.

◇ The average production of cocoon per farmer is 74.79 kg in the three districts. This is the highest in Malappuram district (94.32 kg) and lowest in Alappuzha (37.99 kg). The same is 74.87 kg in Kannur district. The class-wise analysis of production showed that most of the cocoons (38.28 per cent) in the three districts are produced by small class of farmers. The production of medium class is 29.7 per cent and that of large class of farmers is 32.02 per cent.

◇ The analysis of cocoon productivity showed that, on an average, 92.68 per cent of the batches of cocoon rearing are successful in the three districts. Significant variation is not found among districts regarding this. The average productivity of cocoon per batch is 16 kg. The average cocoon productivity to DFLs used is found to be 45 per cent. This is the highest in Kannur (48 per cent) and lowest in Alappuzha (36 per cent). It is 46 per cent in Malappuram district. The average productivity of cocoon per acre of mulberry is found to be 134.42 kilograms. It is the highest in Malappuram (150.92 kg) and lowest in Alappuzha (82.58 kg). The same is 140.61 kg. in Kannur. Generally, the cocoon productivity is found to be very low.

◇ The average cost of production of cocoons comes to 53.27 per cent of the total sales. This is 42.93 per cent in Malappuram and 62.30 per cent in Kannur and

75 per cent in Alappuzha. The average cost of cocoon comes to Rs. 78.81 for a kilogram. This is the highest in Alappuzha (Rs. 110.12) and lowest in Malappuram (63.09). A class-wise analysis of the cost of production of cocoon showed that cost per kilogram is very high for small class of farmers.

◇ On an average, the sericulture income per farmer is Rs. 5354 and income per acre of mulberry area is Rs. 9635. The income per farmer and per acre is the highest in Malappuram, (Rs. 8131 and Rs. 13009) and lowest in Alappuzha (Rs. 1464 and Rs. 3182).

◇ An income-wise distribution of the farmers showed that 82.34 per cent of the farmers are making only a nominal income of less than Rs. 10000; 14 per cent of the farmers are making an income of Rs. 10000-25000; 3.33 per cent are making an income of Rs. 25000-50000 and only one farmer (0.33 per cent) in the three districts is making an income exceeding Rs. 50000. The class-wise distribution of income showed that all the small class of farmers is earning an income less than Rs. 10000.

◇ The observations of the analysis of cost and income aspects of the three districts indicate that the reason for poor income in Alappuzha district is not because of higher cost of production but because of low cocoon productivity associated with low level of operations.

7.10. ROLE OF SERIFED

◇ The role of Serifed is evaluated by way of collecting the perceptions of farmers about its various activities. The analysis of the assessments made by farmers

about the technical assistance rendered by Serifed on mulberry planting and silkworm rearing operations, revealed that most of the farmers are having high opinion about such services of Serifed. Most of them rated these services either as excellent or as very good. Similarly, the technical training given to farmers and the procurement of cocoon are also rated very high. But, farmers do not have high opinion about the financial incentives and subsidies provided by Serifed.

◇ It is found that the cocoon production of trained farmers is higher when compared to that of farmers who have not received any training. It signifies that the full session of training must be provided to all farmers.

◇ As far as the crop insurance scheme of Serifed is concerned, on an average, 70.33 per cent of the farmers have joined the scheme in the year of study. Majority who did not join the scheme reported that the scheme is not available for small producers. It is because of the condition prescribed by the Serifed to rear minimum 25 DFLs. at a time to avail insurance protection. This signifies the need for extending the scheme to small rearers also. In the three districts, on an average, 57.72 per cent of the batches were insured. On an average, 47.06 per cent of the farmers who suffered crop loss have received compensation. It is understood that majority of the farmers suffer crop loss because of their own negligence, which will not be covered by the insurance scheme. The average compensation received per farmer was Rs.1058. The compensations were disbursed within an average period of 41 days.

◇ It is observed that farmers in the three districts are having the same perceptions about the functions of the Serifed.

7.11. PROBLEMS OF SERICULTURE

◇ The farmers are experiencing several problems in connection with the sericultural operations. The analysis of those problems reported by farmers showed that in the cultivation of mulberry, the most important problem is the high cost of fertilizers. It is also found that among the material costs, cost of fertilizer is having the largest share. At the same time Serifed is not having any effective scheme to supply fertilizers at subsidized rates.

◇ High cost of labour and diseases of mulberry are also the other important problems reported in mulberry cultivation. It shows the inadequacy from the part of Serifed in giving proper orientation to farmers regarding the cost effectiveness and farm management. Regarding the production of cocoons, irregular moulting of silkworms is the most important problem reported. Frequent crop failure and silkworm diseases are also problems. It indicates insufficiency of managerial attention and technical supervision.

◇ Difficulty of transportation is the major problem experienced in marketing of cocoons. It shows that Serifed is having only limited cocoon procurement facility. In getting financial assistance, cumbersome procedure and indifferent attitude of the authorities are the major problems. It reveals that Serifed at present is having no arrangements to provide farmers with better credit facilities. It is observed that the problems experienced by the farmers regarding sericultural operations are different in the three districts.

◇ The observations of the study show that among the three districts, Malappuram is having the most advantageous position in sericultural activities, followed by Kannur and Alappuzha. As these districts were selected as the representative districts of Central, North and South Zones of Kerala respectively, it can be presumed that the Central Zone of Kerala is leading in sericultural activities followed by North and South Zones.

7.12. SUGGESTIONS

Kerala is a new entrant in the field of sericulture. Individual farmers practice sericulture in isolated pockets mostly as a subsidiary occupation. Based on the findings of the present study, the following suggestions are made for the improvement of the functions of Serifed and for the overall development of the industry.

◇ In all the three districts, it is found that only farmers belonging to forward casts are engaged in sericulture. There was no farmer belonging to Scheduled Caste/Tribe. As sericulture is an enterprise, which can generate rural employment opportunities, there is great scope for promoting sericulture among the backward classes by introducing special programs for the purpose. The welfare organizations formed for the upliftment of these classes can introduce some schemes or packages for the promotion of sericulture among these classes. Serifed may think on these lines in consultation with the SC/ST Corporation.

◇ It is observed that, among the sericulturists, women entrepreneurs have a significant part. Sericulture is an area where women can be safely employed within

their homes itself. But they have limitations in establishing the required set up especially with regard to financial matters. Therefore, a special program exclusively for women entrepreneurs will be of paramount significance especially in the context of women empowerment. Serifed may introduce special schemes in consultation with women organizations, like "Kudumbasree", towards this effect. Agencies like SEWA and programs of DWCRA can also take lead roles to promote sericulture among women entrepreneurs in rural areas and thus supplement their income.

◇ Marketing facility for cocoons is the most important requirement for the sustenance of the industry. At present, only the district offices of Serifed are acting as cocoon procurement centres, except a few other collection centres established in some districts. The most important problem experienced by farmers in marketing cocoon is the distant location of the collecting centres. This poses difficulties of transportation, especially when the cocoon is a bulky commodity. Establishment of required number of cocoon outlets or common facility centres, at least one in every Panchayat can solve this problem to a great extent.

◇ Sericulture activities are generally taken up by rural farmers who have a weak financial background. For fulfilling their financial needs, most of them are approaching commercial banks, land development banks and co-operative societies. Most of the farmers experience difficulties in availing loans from these organizations, for want of security, indifferent attitude of the officials, etc. The rates of interest charged by these institutions are high, which cannot be afforded by the rural poor farmers. Even there are farmers who depend on village moneylenders for

their financial needs who charge exorbitant rate of interest. All these focus on the need for a specialized agency for financing the sericultural requirements in the State. Serifed may take initiative to draw attention of the Government on this matter, which will be of great significance in the development of this industry.

◇ It is possible to strengthen the sericultural resources of the farmers by way of sharing the rearing houses, equipments, irrigation facilities and above all the sericultural knowledge among the farmers. This can be done by way of a cluster-based approach to the problem. Serifed may motivate the farmers to organize in to groups, by way of forming Self Help Groups, Sericulture Clubs, etc. to achieve the advantages of collective enterprise. This will also act as effective source for micro-finance and effective delivery channels for adoption and transfer of technologies.

◇ Though the training period offered by the Serifed is 30 days, it is found that majority of the farmers have not utilised it to the fullest extent. Since training is essential in understanding the intricacies of sericulture and which will, in turn reflect on the productivity, the farmers must be motivated to attend the full training session. This is especially needed when sericulture is a new venture in Kerala and most of the farmers are less experienced.

◇ Coconut farms are the integral part of the landscape of Kerala. There are nearly two million hectares of coconut plantations in the State. The most important problem cited by farmers in the extension of mulberry plantation is the non-availability of cultivable land. Since, mulberry can be cultivated as an inter crop, the

coconut farms of Kerala can be maximum utilised for expanding the cultivable area of mulberry.

◇ Most of the farmers in the three districts have reported that they are getting the required planting materials for the cultivation of mulberry from their friends or relatives. In such cases, there is the possibility for using poor quality planting materials, which will result in low leaf productivity. Therefore, it would be better if the Serifed can arrange for the supply of high quality planting material to all farmers.

◇ Since mulberry can be harvested once in every 45 days, up to eight harvests are possible in a year. As most of the farmers have made a harvest of less than five, this clearly shows the underutilisation of mulberry plantations. The situation is graver in Alappuzha followed by Kannur, when compared to Malappuram. Serifed has to adopt necessary measures to induce such farmers to make the fullest utilisation of their mulberry gardens and increase the number of rearing.

◇ Though there are adequate mulberry plantations in the study areas, the leaf productivity was found to be very low. This indicates very poor farm management practices. Serifed has to convey to the farmers the necessity of efficient management of mulberry farms, which is very essential for the development of the industry as mulberry leaf is the only food for silkworms.

◇ It is found that all of the small classes of farmers are earning only nominal income out of their sericultural activities. Their cost of production is found to be

very high when compared to returns. This indicates that sericultural activity at a very low level is not at all profitable. Serifed has to persuade such farmers to operate at higher levels and enjoy the economies of sericulture.

◇ Farmers start sericulture to cover the loss of other crops or to earn additional income from their land. Hence, if the income generated out of the sericultural activities would not justify the capital invested, it may adversely affect the expansion of the industry in new areas. Therefore, while motivating the farmers to take up sericulture, it is essential to create awareness on the need for reducing costs in every phase of operation, by insisting them to use locally available materials for the construction of rearing sheds and to utilise family labour instead of hired labour.

◇ There are two stages in the rearing of silkworms, viz., chawki rearing and late age rearing. Chawki rearing is the rearing of silkworms at their earlier stages. It is relatively difficult and the possibility of crop loss is very high during this stage. In other States, there is a system of undertaking chawki rearing by some specialized agencies and farmers are supplied with chawki worms instead of silkworm eggs. This method has the advantages of reduced risk and less cost of production. Serifed may introduce this method in Kerala also so that the possibility of crop failure can be avoided to a great extent and in turn it will increase the productivity and profit of farmers.

◇ Farmers who are predominantly agriculturists, and who have enough family labour, are more inclined to sericulture. Above all, it is an occupation, which

requires sincerity, creativity and keen interest from the part of farmers. Therefore, the selection of farmers by Serifed for sericultural programs must be based on the suitability and viability of the farming families instead of spreading it everywhere. Among the three districts studied, sericultural activities in Malappuram are found to be typical, and therefore, the same model may be followed in other districts also.

◇ Among the various suggestions made by the farmers for the improvement of sericulture, the most important was to make available financial assistance from banks. Improvement of marketing facilities, enhancing infrastructural facilities, timely supply of DFLs, supply of chawki worms and provision for more training were the other important proposals.

◇ Subsidiary nature of the occupation, absence of a suitable funding agency, lack of market driven development and lack of forward linkages are the main problems faced by the sericulture industry in Kerala. The whole sericultural operations of the State must be streamlined and restructured wherever necessary so as to have a meaningful diversification of the agricultural sector in the State.

7.13. CONCLUSION

Sericulture, a novel idea for the enterprising farmers of Kerala is growing in the State with all its expectations. This eco-friendly and economically feasible activity has spread its roots in all the 14 districts of Kerala within a short period of time. The Serifed is being functioning as the promotional agency of this industry and providing technical and other services to this sector. Serifed has been succeeded

in building the basic infrastructure required for the industry. At present the industry is having an organized set up with the required extension network.

Despite all the efforts, it is found that majority of the farmers are making only nominal incomes from their sericultural operations. It is understood that sericulture remains as a very low income generating activity among majority of the farmers who could not realize the economic advantages of sericulture. It is very clear that most of the farmers have not taken up sericulture seriously. Therefore, sincere effort is needed from the part of Serifed to motivate the farmers to make economic utilisation of their farms and facilities.

Sericulture industry in Kerala is having several advantages and also many problems. But problems are common with any developing industry and what is required for its growth and sustenance is the committed involvement of the farming community with dedicated support extended by Serifed. Therefore, sincere efforts are required both from the part of the farmers and from the part of Serifed so as to make sericulture a practical and viable occupation for the agriculturists of Kerala.

APPENDICES

Table A: Districts, Blocks and Panchayats Selected for Sample Survey

District	Block	Panchayat	Sample Size
Alappuzha	1. Chengannur	Ala, Puliyoor, Bhudhanoor, Venmony	70
	2. Kanjikuzhi	Kanjikuzhi, Cherthala South	
	3. Patanakkad	Kodamthuruth	
Malappuram	1. Nilambur	Vazhikkadavu, Edakkara, Chungathara, Pothukal, Chaliyar, Moothedam	130
	2. Areekode	Oorngattiri	
	3. Wandoor	Thrikalangodu, Mampad, Wandoor, Thiruvali	
	4. Kuttipuram	Edayur	
	5. Perinthalmanna	Melattur	
Kannur	1. Irikkur	Ulikkal, Payyavur, Sreekandapuram	100
	2. Iritty	Payam, Ayyankunnu	
	3. Payyannur	Karivellur-Peralam, Eramam-kuttur, Kadannappally-Panappuzha	
	4. Peravoor	Peravoor, Kelakam	
Total	12	30	300

Table B: Division of the Districts of Kerala in to Three Zones

Zone No.	Name of the Zone	Representative District	Districts Included in the Zone
1	South	Alappuzha	Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha and Kottayam
2	Central	Malappuram	Ernakulam, Idukki, Thrissur, Palakkad and Malappuram
3	North	Kannur	Kozhikkode, Kannur, Wayanad and Kasargod

Table C Statement of Income from Sericulture

Item	DISTRICT			Total
	Alappuzha	Malappuram	Kannur	
Income	Rs.	Rs.	Rs.	Rs.
Sale of Cocoon	390416	1801854	1123095	3315365
Other Income*	4850	28700	23214	56764
Total Income	395266	1830554	1146309	3372129
Expenditure				
Labour	8190	15420	36810	60420
Materials	119948	359051	316118	795117
Variable Overheads	40035	84702	61608	186345
Fixed Overheads	109385	283974	240917	634276
Marketing Overheads	15250	30420	44200	89870
Total Expenditure	292808	773567	699653	1766028
Net Income	102458	1056987	446656	1606101

*Income from sale of mulberry cuttings and compensation received out of crop insurance.

A CRITICAL EVALUATION OF THE ACTIVITIES OF SERIFED FOR THE DEVELOPMENT OF SERICULTURE INDUSTRY IN KERALA

INTERVIEW SCHEDULE FOR THE FARMERS

Survey No:
Date:

1. Name of the Sericulture Farmer:
2. Address:
   Panchayat:
   Block:
   District:
3. Religion:
   a) Hindu
   b) Christian
   c) Muslim
   d) Other
4. Caste:
   a) Scheduled Caste
   b) Scheduled Tribe
   c) Others (specify)
5. Total Number of Members in the Family:
6. Number of Members Participating in Sericulture Activities:
7. Total Area of Agricultural Land Possessed: .....acres.....cents.
   (Including leased land if any)
8. Annual Income of the Family from all Sources: Rs.
9. Details of the Sericulturist:
   a. Male/Female
   b. Age:
   c. Education:
   d. Occupation:
   e. Training in Sericulture: Yes/No
   f. Source of Training in Sericulture:
      a. Serifed
      b. Government
      c. Central Silk Board
      d. Family Training
      e. Neighbours/Friends
   g. Period of Training (Official):
   h. Experience in Sericulture (Years):

II. INFORMATION ABOUT MULBERRY CULTIVATION:

A. Mulberry Planting Details:

1. Total Area under Mulberry:
   (Including leased land if any)
2. Variety of Crop:
   a. Kanva 2
   b. Victory 1
   c. Others (specify):
3. Planting Material Used:
   a. Sapling
   b. Stem
   c. Seedling
   d. Grafting
4. Source of Planting Material:
   a. Serifed
   b. Friends/Relatives
   c. Others (specify):
5. Type of Crop:
   a. Inter crop
   b. Mono crop
   c. Both
6. Details of Plantation:

First Planting			Subsequent Planting			Total	
Year	Area	No. of Plants	Year	Area	No. of Plants	Area	No. of Plants

7. Fertility of Land:
   a. Fertile
   b. Most Fertile
   c. Not Fertile

B. Details of Irrigation:

1. Do Your Irrigate Mulberry Plants: Yes/No
2. If yes, Type of Irrigation:
   a) Drip
   b) Pumping
   c) Manual
   d) Other (specify)

3. If no, Specify Reason:

a) No Need
b) No Accessible Water Resource
c) Financial Difficulties
d) Expensive when compared to Returns
e) No Electricity
f) Scarcity of Water
g) No Labour to Spare

C. Particulars of Mulberry Leaf Production (during 2004-05)

Number of Harvests	Total Leaf Produced Kgs.	Leaf Used for Rearing Kgs.

D. Source Information of Sericulture:

a) Serifed
b) Sericulture Co-operative Society
c) Neighbours
d) Friends/Relatives
e) Newspapers/Journals

E. Motivating Factor:

a) Personal Interest
b) Additional Income from Land
c) To Avail Loan and Subsidy
d) Incentives of Serifed
e) Low Gestation
f) Absorbing Family Labour
g) Compensate Loss of other Crops

F. Plan to Expand

1. Have you got any plan to expand your Mulberry Cultivation? Yes / No
2. If yes, state the following:

Approximate area planned	Probable date	Reason for expansion*

*Reason for expansion: 1.Profitable 2.More income 3.Utilise family labour and land 4.Failure of agriculture.

3. If no, state the reason:

a) No more Land
b) No enough Family Labour
c) Not Profitable
d) Lack of Finance
e) Mulberry/Silkworm Diseases
f) Inadequate helps from Serifed
g) No Specific Reason

III INFORMATION OF SILKWORM REARING

1. Particulars of Rearing House:

Nature of rearing house (✓mark)	Area (sq.feet)	Year of construction	Cost Rs.
a) Separate room b) Attached to the dwelling house c) Rearing in the house itself d) Other (specify)			

2. Source of Purchasing DFLs.:
   a) Serifed
   b) Agencies outside Kerala
   c) Grainages of CSB
   d) Others (specify)
3. Variety of Silkworm:
   a) Bivoltine
   b) Multivoltine
   c) Others (specify)
4. Do you Experience any Difficulty in getting DFLs? Yes / No

5. If yes, specify the reason:
   a) Need for booking
   b) Shortage of DFLs.
   c) High Price
   d) Indifferent Attitude of Serifed
   e) Need for long Traveling

6. Do you suffer from Crop Loss? Yes / No
7. If yes, number of losses (2004-05): 1 2 3 4 5

8. Specify Reason for Loss:
    a) Inferior Quality of DFLs.
    b) Climatic Problems
    c) Lack of Technical Assistance
    d) Poor Attention
    e) Silkworm Diseases
    f) Cannot Specify
9. Do you suffer from Shortage of Rearing Equipments? Yes / No

IV. INFORMATION ABOUT MARKETING OF COCOON

1. Does a Cocoon Market exist in your Village? Yes / No
2. How do you Market the Cocoons?
    a) Selling directly to the Serifed
    b) Selling Outside Kerala
    c) Selling to Intermediaries
    d) Selling to other Agencies (specify)

3. Distance to the nearest Cocoon Market: .....Km.
4. Do you find any drawback in the present system of purchasing of cocoons by Serifed? Yes / No
5. If yes, specify the drawbacks:
    a) Delay in payment of cash
    b) No system of Grading
    c) No better price for quality cocoons
    d) Fraudulent practices in weighing
    e) Distant location of collecting centre
    f) Others (specify)
6. Suggest an alternative method for selling cocoons:
    a) Establish cocoon market in every Panchayat
    b) Auction method of sales
    c) Establish Silk Exchanges
    d) Authorized agents must collect cocoons at home
    e) Others (specify)

V. INFORMATION ON FINANCING

1. Source of Fund for doing Sericulture:
    a) Own Funds
    b) Borrowed Funds

2. Source of Borrowed funds and their details:

Source of loan	Year/s	Amount Rs.	Rate of Interest	Loan repaid Rs.
a) Commercial bank				
b) Co-operative bank				
c) Land Development Bank				
d) Money Lenders				
e) Others (specify)				

3. If loan is not availed, specify reason:

a) No need
b) Approached but not given
c) Need of Security
d) Delay in sanctioning
e) Indifferent Officials
f) Not aware of Loans
g) No capacity of repay

VI. INFORMATION ON COST AND INCOME

A. Labour Cost:

Operation	Family labour			Hired labour			Total		
	Male No.	Female No.	Value Rs.	Male No.	Female No.	Value Rs.	Male No.	Female No.	Value Rs.
Planting mulberry									
Rearing operation									

B. Investment Costs:

Item	Cost Rs.
Mulberry Plantation: Labour: Rs. Planting Material: Rs.	
Rearing House	
Rearing Equipments	
Irrigation	
Total	

C. Cost of Rearing:

i) Material Cost

Item	Quantity	Price	Value Rs.
Farm Yard Manure			
Chemical Fertilizers			
Disinfectants			
DFLs.			
Others			
Total			

ii) Charges:

Item	Amount Rs.
Repairs/Replacements	
Electricity/Oil	
Interest on Loans	
Crop Insurance Premium	
Others	
Total	

iii) Variable Cost of Rearing: Rs..... (Labour for rearing+Material cost+Charges)

iv) Fixed Costs:

Item	Amount Rs.
Annual Cost of Mulberry Plantation	
Annual Cost of Rearing House	
Annual Cost of Equipments	
Total	

v) Total Cost of Cocoon Production: (iii + iv): Rs.....

vi) Cost of Marketing:

a. Transportation: Rs.....
b. Luggage: Rs.....
c. Others: Rs.....

vii) Sales Income from Cocoon:

Frequency of Sales	No. of DFLs used	Output Kgs.	Average Price Rs.	Value Rs.

viii) Net Income from Sericulture Activity:

Item	Amount Rs	Total Rs
1.**Total receipts**: i) Sale of cocoon ii) Comp. received from insurance co. iii) Income from family labour iv) Other receipts 2.**Total expenditure**: i) Cost of production ii) Cost of marketing 3.**Net income** (1 - 2)		

VII. EVALUATION OF THE ACTIVITIES OF SERIFED

Rate the following using a 5 point rating scale (✓ Mark):

	Poor				Excellent
1. Evaluation of Technical Assistance					
a) Preparation of land					
b) Planting mulberry					
c) Manuring					
d) Construction of rearing house					
e) Rearing					
f) Disinfection					

2. **Evaluation of Training:**

a) Planting mulberry					
b) Leaf harvesting					
c) Cleaning and disinfection					
d) Feeding worms					
e) Harvesting cocoons					

3. **Evaluation of Marketing**

a) Grading of cocoon					
b) Weighing					
c) Pricing					
d) Payment					
e) Incentives/bonus					
f) Subsidies					

4. Evaluation of Crop Insurance Scheme:

i) Do you join the Crop Insurance Scheme of Serifed? Yes / No

ii) If yes, give the following details:

a) Number of batches reared:
b) Number of insured batches:
c) Number of failed batches:
d) Amount of claim admitted:
e) Time taken to settle claim:

iii) If no, state reason:

1. High rate of premium
2. Not available for small producers
3. No timely settlement of losses
4. No specific reason

5. **Evaluation of Various Subsidies**:

a) Are you aware of the subsidies provided by the Serifed? Yes / No
b) Have you ever received any subsidy for sericultural operations? Yes / No
c) Provide the following information if you have availed subsidies:

Item of subsidy	Subsidy Received Rs
a) Planting Mulberry	
b) Rearing shed	
c) Rearing equipments	
d) Disinfectants	
e) Irrigation	
f) Others	
Total	

VIII. PROBLEMS OF SERICULTURE IN KERALA

(√ the most important as you experience)

1. **Mulberry Cultivation:**

    1. Lack of irrigation facilities
    2. High cost of maintenance
    3. Increased cost of fertilizers
    4. Diseases of mulberry
    5. Non-availability of land
    6. Natural hazards/draught
    7. High cost of labour
    8. Scarcity of labour

2. **Cocoon Production:**

    1. Scarcity of DFLs
    2. Silkworm diseases
    3. Frequent crop failure
    4. Shortage of rearing appliances
    5. Irregular moulting of silkworms
    6. Poor quality of mulberry leaves
    7. Limited technical assistance
    8. Lack of electricity

3. **Marketing:**

    1. Exploitation of middlemen
    2. Absence of local buyers
    3. Difficulties of transportation
    4. No spot payment
    5. No price for inferior quality cocoons
    6. Fraudulent practices by buyers

4. **Finance:**

1. Indifferent attitude of bank authorities
2. Cumbersome procedure
3. Inordinate delay in availing loans
4. Ignorance of bank about the prospects of sericulture

IX. SUGGESTION FOR THE PROMOTION OF SERICULTURE INDUSTRY IN KERALA

1. Timely supply of DFLs/Mulberry cuttings
2. Supply of Chawki worms
3. Improvement of marketing facility
4. Financial assistance from banks
5. Fulfillment of the promises made by the Serifed
6. Providing more practical training to farmers
7. Enhancing infrastructure for the processing of raw silk
8. Research wing for sericulture
9. Price for inferior quality cocoons
10. Any other suggestion (specify)

INTERVIEW SCHEDULE FOR INFORMATION FROM HEAD OFFICE /DISTRICT OFFICES OF SERIFED

FROM HEAD OFFICE:

1. Corporate Profile:
   - Formation
   - Objectives
   - Organization Structure
2. State Profile:
   - Mulberry Acreage
   - Number of Farmers
   - Cocoon Production
   - Supply of DFLs
   - Sericulture Co-operative Societies
3. District Profile:
   - Mulberry Acreage
   - Number of Farmers
   - Cocoon Production
   - Supply of DFLs
   - Reeling Units
   - Weaving Units

FROM DISTRICT OFFICES:

1. District:
2. Functions:
   - Technical Service
   - Training
   - Subsidies
   - Marketing
   - Supply of Equipments
   - Supply of DFLs
   - Promotion Activities
3. Technical Assistance:
   - Preparation of Land
   - Planting Mulberry
   - Manuring
   - Construction of Rearing House
   - Rearing
   - Disinfection

4. Training given for:	Planting Mulberry Leaf Harvesting Cleaning and Disinfection Feeding silk worms Harvesting cocoons
5. Various Subsidies:	Planting Mulberry Construction of Rearing House Purchase of Rearing Equipments Purchase of Disinfectants Purchase of DFLs Insurance Premium Irrigation
6. Cocoon Procurement:	Grading of Cocoons Price Fixation Incentives/Bonus Payment
7. Area Covered:	Entire District Selected Panchayats Selected Taluks Selected Blocks
8. Technical Specification:	Planting Mulberry Construction of Rearing Shed Rearing Equipment
9. Crop Insurance:	Conditions Premium Compensation

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