

**BUSINESS ANALYSIS OF SILK REELING UNITS IN
CHINTAMANI TALUK OF CHIKKABALLAPURA
DISTRICT, KARNATAKA**

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**DEPARTMENT OF AGRICULTURAL MARKETING,
CO-OPERATION AND BUSINESS MANAGEMENT
UNIVERSITY OF AGRICULTURAL SCIENCES
BANGALORE - 560 065**

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*Project Report submitted to the
University of Agricultural Sciences, Bangalore
in partial fulfillment of the requirements
for the award of the degree of*

MASTER OF BUSINESS ADMINISTRATION
(Agribusiness Management)

Bangalore

November, 2012



Affectionately dedicated to

My Beloved Parents,

Sisters

&

My Chairman

**DEPARTMENT OF AGRICULTURAL MARKETING,
CO-OPERATION AND BUSINESS MANAGEMENT
UNIVERSITY OF AGRICULTURAL SCIENCES
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CERTIFICATE

This is to certify that the Project Report entitled “**BUSINESS ANALYSIS OF SILK REELING UNITS IN CHINTAMANI TALUK OF CHIKKABALLAPURA DISTRICT, KARNATAKA**” submitted by **Mr. MAHESH, G., ID No. MBAL 0011** in partial fulfillment of the requirement for the degree of **MASTER OF BUSINESS ADMINISTRATION (Agribusiness Management)** to the University of Agricultural Sciences, Bangalore, is a record of bonafide research work done by him during the period of his study in this University under my guidance and supervision and the Project Report has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar titles.

Bangalore
November, 2012

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**BUSINESS ANALYSIS OF SILK REELING UNITS IN CHINTAMANI
TALUK OF CHIKKABALLAPURA DISTRICT, KARNATAKA**

MAHESH G

ABSTRACT

The study was undertaken in chikkaballapura district of Karnataka state to assess socio-economic characters, financial viability, employment generation capacity and constraints faced by reelers of various reeling systems. Four major reeling units viz, charaka, cottage basin, filature basin and multi-end basin were identified based on preliminary survey. The study based on primary data from 90 reelers covering a proportionate sample of charaka (60),cottage basin (3), filature basin (22) and multi-end basin (5) was elicited for 2011-12 through survey method. The data was analyzed using tabular, financial analysis, cost-return structure. Results revealed high investment and high risky technologies like filature and multi-end basin were practiced by relatively lower age group entrepreneurs. The literacy and organizational participation were high among multi-end reelers. The share of building cost in total establishment cost is relatively higher in charaka and cottage basin than filature and multi-end basin. Raw silk reeled per basin per year is least in charaka (661.44 kg's) and higher in multi-end (859.13 kg's). Net returns per basin per year realized is least in charaka (Rs. 54,546) and higher in multi-end (Rs. 3,05,405). The benefit-cost ratio was low in charaka (1.04) and high in multi-end (1.20). Multi-end basin was found to be efficient from the view of Renditta. The employment generation was high in charaka reeling units and reeling is the operation which generates maximum employment irrespective of reeling system. Working capital and labour shortage are the major constraints faced by reelers.

Signature of the student
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INTRODUCTION

CHAPTER I

INTRODUCTION

Silk industry plays a crucial role in shaping the rural economy of India by providing employment to more than 68 lakh persons and streamlining the regular flow of income to many rural and semi-urban masses. It is an important agro-based rural cottage industry, which covers the gamut of sericultural activities like moriculture, silkworm rearing and cocoon production, silk reeling and other post cocoon production stages. Superiority of the end product, 'silk' has been recognized as a natural textile fibre and as one of the high-value, low-volume commodities to trade between the continents from time immemorial. Even today no other fabric can match its luster, durability, lightness, elegance and luxury.

Sericulture is not new to India as references have been made in the epics of the Ramayana and Mahabharata. For more than 4000 years this sensuous cloth, conjured from the strand of a lowly worm has reigned supreme as the "Queen of textiles".

The production of raw silk and silk fabrics are limited to only a few countries in the world of which China (1,03,620 MT; 81.95%) occupies the first place and India (19,690 MT; 15.44%), the second. Other countries such as Brazil (811 MT; 0.6%), Uzbekistan (750 MT; 0.6%), Thailand (660 MT; 0.5%), Vietnam (550 MT; 0.4%), Korea Republic (135 MT; 0.1%), Japan (90 MT; 0.1%), Iran, Turkey, Bulgaria, Yugoslavia (totally 304 MT; 0.31%) also contribute to world silk production. Silk goods from India are exported to major countries like USA, Germany, UK, Italy, France, Spain, Canada, Australia, Switzerland, Greece, Netherland, UAE, Belgium, Denmark, Austria, Portugal and few others. There has been a strong market for the silk and silk goods in the international level.

The demand for silk goods is expected to exist as long as the human race appreciates its wearing (Muniraju, 2008; Anonymous, 2010a).

India has the unique distinction of being the only country in the world which cultures all the five known commercial varieties of silk namely mulberry, tropical tasar, oak tasar, eri and muga. The total annual production of raw silk in India was 19,690 MT, accounting for 15.44 per cent of the world raw silk production, of which, mulberry raw silk output aggregated to about 16,322 MT during 2009-10. The remaining 3,368 MT was from non-mulberry silks. Mulberry sericulture is practiced mainly in five states namely, Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal and Jammu & Kashmir, which collectively account for about 98 per cent of the total mulberry silk production in the country. India's raw silk demand was around 26,000 MT but produces only 19,690 MT. So Indian sericulture does not meet country's demand; hence the shortage was met by importing 8,000-9,000 MT of silk from China and other countries such as Uzbekistan, Brazil, Japan, Korea RP and others (Qadri *et al.*, 2011).

The traditional pattern of dress, weaving and raw silk consumption for manufacture of these fabrics, contribute for the bulk utilization. Hence there is sufficient domestic market for the silk produced in the country. India exported silk goods to the value of ` 364.40, 2278.29 and 2867.52 crores during 1978-79, 2002-03 and 2009-10, respectively and the value of import of silk goods from other countries was ` 80.11, 647.15 and 933.70 crores during 1978-79, 2002-03 and 2009-10, respectively. (Anonymous, 1976; Anantharaman and Khan, 2006; Anonymous, 2011).

There are 3.3 lakhs silk handlooms in India, of which the highest are located in Uttar Pradesh followed by Tamil Nadu and Andhra Pradesh, where as the highest powerlooms are in Karnataka (about 35,000) followed by Uttar Pradesh (5,000) and Bihar (750).

Maximum silk is produced in Karnataka though more handlooms are working in Uttar Pradesh and Tamil Nadu.

Sericulture was promoted by Tippu Sultan who needed high-value, low-volume commodities to trade with Europe in exchange of arms and ammunitions. The rulers succeeding him in Mysore also continued the royal patronage to sericulture activity. Later Britishers encouraged the production of mulberry silk in Mysore/Kollegal areas which later stabilized and even acquired fame as 'Mysore silk'. Jammu-Kashmir and West Bengal were leading states in sericulture in the past and later Karnataka became the top producer of silk and continued to be in forefront.

In Karnataka, the mulberry area declined from 1,66,000 ha in 1997-98 to 82,098 ha in 2009-10. About 1,41,528 farm families are engaged in mulberry cultivation and silkworm rearing in 11,735 villages with cocoon production of 54,282 MT and raw silk production of 7,359 MT (Nagambika Devi, 2011). At present, there are 23,210 charkas, 20,960 cottage basins, 104 multi-end reeling basins and 113 automatic reeling basins in Karnataka.

Silk exchanges in Karnataka also started functioning from 1979 with the objectives of minimizing the malpractices and irregularities vis-à-vis avoiding middlemen in the silk trading. Karnataka Silk Marketing Board, Limited was also established in the same year to minimise the price fluctuations of raw silk, by buying, whenever there is a slump in the market. Apart from these, Karnataka Silk Industries Corporation Limited also functions with the main objectives of carrying the business of manufacture and dealing in raw silk, import/export of raw silk and its byproducts besides controlling prices of both cocoons and raw silk. The state has set up a separate authority in 1984 known as Price

Stabilisation Fund Authority (PSFA), which has been assisting the Silk Reelers Industrial Co-operative Societies. These, in turn, help the reelers.

Despite increased raw silk production over the years in the country, there has been growth in the imports also. The domestic and export markets continue to show signs of excess demand implying lot of potential for expanding sericulture in general and silk reeling in particular.

Silk reeling industry in India has not made much qualitative and cost effective progress. Presently the cost of raw silk production in China is around ` 1000 per kg with fully controlled production and marketing by Government. The domestic demand in China is hardly 10-15 per cent. The cost of raw silk production in India is at a minimum of ` 1600 per kg and production is almost private and having more than 90 per cent domestic demand. Silk Industry in India is an unorganized sector.

The working atmosphere in the activities like silkworm rearing/ cocoon production and silk reeling is very unhygienic and creates health hazards besides poor wage rates and low standard of living of working class. There has been lot of engagement of women and children working in these activities. Children work in an adverse environment of abnoxious smell, decay and rotting of pupae, smoke of burning fire wood and so on. In general, the overall socio-economic profile of entrepreneurs and working class is low.

The manufacturers of the silk fabrics and ready-made garments also earn relatively high profit and work in a sophisticated environment without any health hazards. The ultimate consumers are also affluent/ elite group who enjoy the luxury of silk. It is assumed that no ritual is complete, unless one wears the silk dress. Silk has been used in most of the religious functions. The socio-economic status of those associated

with the reeling activities is in total abjection which in contrast to those who use silk so reeled.

If the production and the consumption pattern of silk in the global context are reviewed, the production of silk with all the hardships as mentioned earlier, is taken up by developing countries and mostly consumed by the rich countries.

Sericulture is a vital income and employment generating activity particularly to the most economically weaker sections of the society. Silk reeling is a main link in sericulture industry having backward linkage in terms of mulberry and cocoon production. Silk produced by reelers is a basic raw material to the weavers and fabric manufacturers. This forward linkage decides the expansion of silk fabric production and other associated activities. The production of silk yarn is about 50 per cent from charka, 40 per cent from cottage basin and five percent each from the multi-end basins and dupion silk. The technological improvements in pre cocoon production stage over the years led to a considerable increase in the production of cocoon with some quality. But the Indian silk reeling industry has not made satisfactory qualitative and cost effective progress due to the technological inertia and the poor economic status of people associated in reeling activity.

Thus, uneven growth in the industry will not only curtail the prospects and scope of pre-cocoon production stages but also weakens the required supply of quality silk yarn to the Indian silk weaving as well as fabric sectors. The silk reeling industry is largely traditional by nature. Among the three distinct devices of reeling, 'traditional charka' has been in use for many centuries and still dominates in terms of number as well as production. While the 'cottage basins' which produce better quality over charkas are also more in Karnataka. The recent 'multi-end basin technology' which is supposed to be better than the

above two technologies at the research level, is still not extensively adopted. Therefore, the advantage of this system needs to be evaluated.

Optimality of silk reeling sector reflects processing large quantities of good quality cocoons into finer quality yarn. This role gains added importance as the overall developmental issues in the sericultural sector revolves around utilizing anticipated increase in cocoon supply to produce more silk.

This can also improve the quality of life of the reelers, labourers especially women and children who are engaged substantially in reeling sector. The industry is expected to produce international quality yarn to fulfill the needs of the domestic as well as international markets and there by promote income redistribution in rural areas.

In the light of these development issues in the silk reeling sector, the economic viability of the technology employed in this unorganized sector needs to be empirically assessed. It appears that the low socio-economic profiles of reelers and unhealthy competition among them vis-à-vis high cost of silk production are impediments in the expansion and growth of silk reeling industry. In this context, the cost-return structures of different systems of reeling and socio-economic profiles of the people engaged in reeling units have to be examined.

Hitherto no Comprehensive and in-depth Business study on silk reeling has been made in Chintamani taluk of Chickaballapur District. Hence, the present study is an attempt to assess all the Business aspects of silk reeling industry in Chintamani taluk of Chikkaballapur District and to identify the constraints in silk reeling.

The specific objectives of the study are:

1. To examine the socio-economic characteristics of different group of silk reeler.
2. To estimate the financial viability of different silk reeling methods.
3. To assess the employment generation capacity of different silk reeling units.
4. To analyze the constraints in different silk reeling units.

Hypotheses

1. No significant divergence between the socio economic characteristics of different silk reeling units.
2. There are no differences in the financial positions of different silk reeling units.
3. No substantial difference in the employment generation of different silk reeling units
4. Constraints faced by the different reelers are same.

Scope of the study

There are various types silk reeling units existed in Chikkaballapur district of Karnataka. Till now, no comprehensive study has been made to know the financial viability, employment generation, constraints faced by different units of silk reeling households. This will help the planers and policy makers in formulating policy package and plan of action for increasing and stabilizing income of individual reelers which ultimately able to provide them their livelihood.

Limitations of the study

The present study mainly relied on the data collected through interview using a pre-tested schedule. Therefore, some amount of recall

bias is bound to be associated with the collected data since the reelers did not maintain any record about the expenses and returns on various aspects of reeling. However, efforts were made to minimize them through cross checks at the time of data collection. However, the degree of discrepancy if any would be negligible as the estimates presented are in averages. Since, the information was collected from reelers who practiced various reeling methods in Chikkaballapur district, generalization of the results to other areas should be made carefully.

Presentation of the study

This study is conducted in Chintamani taluk of Chikkaballapur district. This project is organized into **seven** chapters. The **first** chapter provides a brief introduction along with the specific objectives. In chapter **second**, important pertinent recent reviews are presented in consonance with the study objectives. Chapter **three** describes the main feature of the study area, sampling framework, database and analytical tools employed in the analysis of the data. The empirical results pertaining to study are presented in chapter **four** followed by critical discussion of results in chapter **five**. Chapter **six** summarizes the major findings of the study with policy implications. Finally Chapter **seven** provides the reference base of the studies used.



REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

Various studies have been conducted on the Business analysis of different farm enterprises, but hardly few studies are made on Business analysis of silk reeling. An attempt is made in the present study to investigate Business aspects of silk reeling industry. In the light of the objectives set for the study the relevant reviews are made and salient features are presented in this chapter under the following headings:

- 2.1 Relationship between Socio-economic characteristics and Production in Silk reeling Industry and related fields.
- 2.2 The financial viability of raw silk production.
- 2.3 Employment generation capacity of different silk reeling Industry.
- 2.4 The constraints of raw silk production by different silk reeling units.

2.1 Relationship between Socio-economic characteristics and Production in Silk reeling Industry and related fields.

The hazards experienced, perceived profitability, availability of inputs, farm size, farmers' education and extension exposures were some of the factors identified by Shan and Hoque (1977) as the constraints limiting the yields of modern rice varieties.

The factors that prevented farmers from achieving the yield potential of modern rice varieties were grouped under two main heads by De Datta *et al* (1978), namely, technological or biological constraints which were related to such things as the crop variety, soil type, disease, water management and weeds and the behavioral or socio-economic constraints related to such things as the farmer's behavior, his knowledge, perception of risk, institutional factors, credit and input supply and distribution.

Kalirajan and Shand (1985) found that farmers' formal schooling had a non-significant relationship with yields of crops. On the contrary, they found that non-formal education had a significant relationship with crop yields in Tamil Nadu, although they considered a number of other variables, which did not exhibit any significant relationship.

Subramanya (1986) considered seed variety and nutrients as the biological constraints and education, institutional participation, farm size, farmers' income, and credit availability as socio-economic factors that prevented farmers from attaining the potential yield. The author found that the use of local varieties and lower level of plant nutrients had largely contributed to the low productivity.

Singh and Yadav (1989) identified the various constraints in wheat productivity in Uttar Pradesh. Among biophysical, technological, socio-economic and communication constraints responsible for extension gap, the technological gap and socio-economic status were the highest and lowest contributing factors to the productivity respectively irrespective of the categories of farmers and regions.

Chikkanna *et al.* (1994) conducted study in Ramanagar, Kollegal and Sidlaghatta cocoon markets in Karnataka and indicated that a higher proportion of reelers were primary level education (50%) compared to the reelers with other category education levels like illiterate, secondary, college and post graduate.

Seshagiri and Rao (2002) studied the participation of rural youth in sericulture and found that 76 per cent of samples were of age group of 20-30 years with education level of secondary education. The participation of the rural youth both in the operations of sericulture and also the decision making capacity is highlighted.

Kumar *et al*, (2010) made an attempt to study awareness and pattern and level of adoption of various technologies among various socio economic groups, It was found that 50 per cent of the samples were of age 30-50 years and 96 per cent of the sample population having reeling as the main occupation Further it was also found that more than 90 per cent of sample population are having professional experience of more than 5 years.

Rao (2010) studied the socio economic background of entrepreneurs in small scale industries and found that women entrepreneurs were less than 10 per cent of total entrepreneurs, nearly one third of population were below 40 years of age and majority have studied only upto school level.

Reddy and Mahadevaiah (2011) highlighted that the socio and economic pattern of stakeholders does influence the practices adopted, feasibility of adoption of technologies and credit position in the sector. It was also revealed that most of the reelers studied upto matriculation and 70 per cent of the samples were having professional experience of about 30-40 years.

2.2 The financial viability of raw silk production

According to Vaidya (1960), production of raw silk per acre of mulberry in India varied from 4.90 kg in Mysore to 14.06 kg in West Bengal valued at ` 275 and ` 775, respectively. It was further observed that in Japan, cost of production of a kg of raw silk was ` 37 while it was ` 88 for a kg of Indian cottage raw silk. There by suggesting bringing down the costs in the different phases of silk processed in India.

Rangaswami (1974) suggested for a need to improve the technology of sericulture in India, since India utilizes 16 times more labour force

than that of Japan. Further, it was further stated that the cost of production of raw silk was higher in India than in Japan.

Aiyaswamy (1980), estimated the establishment cost of 10 basins reeling unit at ₹ 35,850, and the variable cost alone contributed 99.50 per cent of the total cost, of which the cost of cocoon alone contributed for 82.70 per cent. The total fixed cost accounted for 0.56 per cent of the total cost. The gross income was ₹ 5.68 lakhs, under the condition that the unit functions continuously throughout the year with a total silk production of 1,750 kg per year. The cost of production of kg silk was ₹ 302.43.

Sahabhaumik and Mukhopadhyay (1980) worked out the average cost of transformation of cocoons raised from an acre of mulberry land to silk fiber to ₹ 670 in West Bengal. It was also indicated that 10 kgs of cocoon was required for production of one kg. of yarn.

Rajpurohit and Govindraju (1981) compared the raw silk production of charka and cottage basin techniques in Karnataka. The fixed capital required was ₹ 395 per charka and ₹ 1902 per cottage basin. The value of cocoons needed per kg of raw silk was ₹ 232 for charka and cottage basin systems, respectively. The total cost incurred per kg of raw silk was ₹ 237 and ₹ 267 for charka and cottage basin, respectively which would enable to realise a gross return of ₹ 254 and ₹ 303, respectively. Thus, a net income of ₹ 23 and ₹ 54 from charka and cottage basin was possible per kg of raw silk produced. Further, returns per rupee of investment were ₹ 1.07 in charka and ₹ 1.13 in cottage basins. The renditta was more in charka than the cottage basins.

Jolly (1982), estimated the cost of silk production under charka and cottage basin systems. The cost of production of a kg of silk was ₹ 212 for charka and ₹ 226 for cottage basin. The share of raw material

(cocoon) in the total cost worked out to 90.52 and 90.32 per cent, respectively. The selling price per kg of raw silk was ₹ 225 to 230 for charka and ₹ 275 for cottage basin.

Das (1984) in the study in West Bengal reported that the average output per basin per day for different hand operated machines was 200-240 gms for filatures, 375-425 gms for cottage basin and 425-500 gms for country charka (Dupion).

Sonwalkar (1984), estimated the silk reeling efficiencies of Indian silk reeling devices viz., charka, cottage-basin and multi-end basins. Silk production was higher in charka (0.90 to 1.0 kg/day/reeler), followed by cottage basin (0.60 to 0.80 kg/day/reeler) and lowest in multi-end basin type (0.5 to 0.70 kg/day/reeler). Cost of production of raw silk was ₹ 15, ₹ 20.25 and ₹ 50.80 per kg of silk in charka, cottage basin and filature basin, respectively.

Afsan (1985) assessed the extent of water use in silk industry and also examined the management of recycle material. The proportion of silk waste generated was directly related to the improvement in the technique of reeling and the silk waste obtained at different stages in various forms in different degrees were re-utilized most effectively. The extent of recycling of silk waste depended on the technologies adopted to produce silk and effective recycling of various forms of silk waste would yield appreciable returns, which could help the reelers to keep the raw silk production at competitive levels.

Aziz and Shetty (1985) examined the productivity aspects of silk reeling industry with a view to arrive at inferences that will have some policy implications. The results of the study were used to make recommendations on the growth of salary earning component of the

employees and adding new capital and properly maintaining the old capital.

Hanumappa and Erappa (1985) in their study in Mysore, Bangalore and Kolar district of Karnataka found that the fixed capital requirement for establishment was ` 2100 for a two unit charka, ` 12,000 for a ten- unit charka and ` 10,000 to ` 25,000 for cottage basin. The study did not observe much variation in working capital needed. The results indicated that the employment generation from every kilo of raw silk yard reeled was on an average 2.02 mandays for charka and 2.16mandays for cottage basin units. The renditta obtained was 11.22 in charka and 9.42 kg in the cottage basin. The gross cost per kg of charka silk was ` 280.3 in Mysore region, ` 321.7 in Bangalore region and ` 294.6 in Kolar region. These corresponding costs for cottage basin in these three regions were ` 323.5, ` 325.2 and ` 298.4 respectively. The gross returns per kg of raw silk of charka was ` 307.10 in Mysore region, ` 352.4 in Bangalore region and 325.4 in Kolar region, while for cottage basin the gross returns per kg were ` 351.40, ` 385.40 and ` 353.70 for the three regions , respectively.

Chowdry *et al.* (1986) reported that about 50 per cent of the country's raw silk production was by traditional charka technique with a low cost compared to cottage basin system. The cost of fuel alone accounted for three per cent of total cost of production in charka which was ` 35 to ` 40 per kg of raw silk.

Babu and Reddy (1987) reported that the estimated loss per kg of raw silk was ` 31 in case of filature unit and ` 71 in semi-automatic reeling unit, while the private sector was making a profit of ` 40.68 per kg raw silk.

Thangamuthu and Venkataravi (1990) observed that inadequate expansion of reeling and twisting sectors to absorb and exploit the full potential of sericulture within the state was the major limiting factor of growth. On the analysis of various factors throttling this growth they projected that more than 6000 reeling units with a fixed investment of ₹ 1.20 crores is needed to process 164.7 lakh kg of cocoons in 2000 A.D. The study also emphasized the need for training, extension, infrastructural support and financial institution to foster this envisaged growth.

Mayoux (1992) estimated the level of investment required to install and operate a cottage basin unit of four basins. The results revealed that the capital requirement for machinery would amount to ₹ 26600 and the construction of reeling shed and other building components would require an additional ₹ 40,000. Further she reckoned that a minimum running capital of ₹ 66,600 would be required to operate the unit for about two weeks at a reasonable level of profit.

Chandra Reddy and Eswaraprasad (1993) estimated the cost of production of one kg of raw silk through the charka reeling at ₹ 403.69 of this 99.34 per cent was variable cost and rest was fixed cost. Gross returns per kg of raw silk were ₹ 432.32; while net returns worked out to ₹ 28.84 the labour requirement was 1.33 man days per kg, of which family men shared 22 per cent and women five per cent.

Kerutagi *et al.* (2002) reported that the overall size of the multi-end basin unit was eight basins per unit and functioned on an average, 308 days in a year. The renditta was 9 and on an average, two mandays as well as 611 quintals of fire were utilized per kg of silk production. An average 2,611 kg raw silk was obtained per year. The total cost of raw silk production per kg was ₹ 1,319, of which variable cost alone

accounted for about 95 per cent. Cocoon cost alone accounted for about 85.50 per cent of the total cost. Gross returns, net returns and returns to family labour and management per kg of silk reeled were ₹ 1,505, 186 and 190, respectively. The benefit-cost ratio was 2.56.

Rama Kumar *et al.* (2008) studied economics of 41 boilers, 26 reeling and 15 dyeing units in Andhra Pradesh. The average recurring expenditure of ₹ 12,500-37,500 per month was required to run a boiler in a reeling unit of 20-30 basin capacity. The average expenditure of all the 26 boilers in the area was around ₹ 31,200-36,400 (26 boilers x 600-700 kg of firewood @ ₹ 2 per kg) per day. The average annual expenditure on fire wood for running 26 boilers for reeling units in Andhra Pradesh was ₹ 93,60,000 to ₹ 1,09,20,000.

2.3 Employment generation capacity of silk reeling Industry

Gupta *et al.* (1976) estimated that 700 labour days were required for a hectare of mulberry cultivation per year, while 1,000 labour days were required for rearing silkworms and silk reeling, which could yield 150 kg raw silk from one hectare of mulberry. They further indicated that sericulture industry would require 2.70 ha of land to produce 60 kgs of raw silk, while only 0.50 ha was needed in Japan.

According to Urs (1976), there is a need for more intensive research in sericulture in India as the productivity of sericulture in India is very low, i.e. 20 kg raw silk per hectare of mulberry as against 120 kg in Japan and 70 kg in South Korea. He also enlightened the capacity of Indian sericulture to create more jobs with minimum capital investment. He opined that the average capital investment required to provide a job in sericulture industry is around ₹ 500 as against ₹ 10,000 in the organized textile industry and ₹ 3 to 10 lakhs in the cement/steel industries.

A study by Narayana and Laxminarayana (1978) revealed that the employment creation potential of sericulture industry is greater than the other industries. The gestation period of the sericulture industry is very short there by suggested to include this industry as employment oriented programme.

According to Iqbal (1981), over the period from 1968 to 1980, India's total silk production increased by 105 per cent. while silk exports had risen by 444 per cent, which was above the average of all the other exports. The labour employment and export potential could be effectively tapped by reducing the cost of production and improving the quality of raw silk.

Hanumappa and Erappa (1985) conducted sample survey of reeling units (charka and cottage basins) in the traditional three districts of Karnataka and ascertained that the charka and the cottage basins were largely found in the districts of Mysore, Kolar and Bangalore.

The labour absorption was higher in the cottage basins (2.16 man days/kg of silk) than in the charka (2.02 man days/kg of silk). In terms of capital labour ratio, the charka technology generated more employment per rupee of investment as compared to the cottage basins. Renditta was 11.22 kg in the charkas and 9.42 kg in the cottage basins. The value of by-products from reeling activity had an important place in determining the profit margin rather than the main product. The recovery rates were higher in the cottage basins due to its preference for improved variety of cocoons for reeling, where as in case of the charka system, it continued to suffer lower recovery rate. There is a need to help the charka reelers to make a change over to the cottage basin system to be viable, besides reducing the drudgery involved in the charka reeling and also to augument the efficiency for producing better quality and higher quality of raw silk.

Samuel and Erappa (1987) examined the impact of technological change in the silk reeling industry in Karnataka on the women labour force participation. It was revealed that though women workers had processed a higher silk output but received less daily wages compared to male workers.

Nair (1988) observed that sericulture as a cottage industry employed 15.62 lakh persons in the rural areas and of the total income generated 56.8 per cent went to the cocoon producers, 6.8 per cent to the reeler, 9.1 per cent to the twister, 10.7 per cent to the weaver and 16.6 per cent to the trader. Though raw silk production has increased from 2600 tonnes in 1972 to 7897 tonnes in 1985-86, the demand has outstripped supply and has affected the silk price. Hence it was concluded that the imports of raw silk should be liberalized so as to encourage the domestic industry to become more competitive in regard to the price and quality.

Reddy (1988) estimated the cost of production of one kg of raw silk in Chittoor district of Andhra Pradesh through charka reeling at ₹ 403.9 of which 99.4 per cent was variable cost and 0.66 per cent was fixed cost. The gross return per kg of raw silk was ₹ 43.322, while the net returns worked out to ₹ 28.84 per kg. He also estimated the labour employed for producing a kilo of raw silk at 1.33 mandays and of the total labour use, 22 per cent was family labour and 5 per cent was family female labour. It was further observed charka reeling was not only less capital intensive and more labour intensive, but also highly profitable. On these lines it was concluded that reeling activity could be vertically integrated with leaf and cocoon production.

Sinha (1990) identified some of the parameters relating to the production of Indian mulberry silk fabrics. It was concluded that one thousand disease free layings could be fed on mulberry leaf from 0.6 ha

of area to yield 400 kg of cocoons. At an average renditta of 9 kg about 45 kg of reeled silk was obtained from these cocoons and at 5 gms per square meter, 45 kg of raw silk was converted into 700 sq. meters of fabric. The fabric thus obtained could be either stitched into 80 western style dresses or woven into 130 sarees. As a result, employment upon 7 man years could be generated.

Mayoux (1992) reviewed the historical development of silk industry in Karnataka and suggested a poverty alleviation strategy where in the various developmental programmes in the industry are aimed at improvement in quality of raw silk, increasing overall production of raw silk, promotion of income re-distribution through encouragement of small scale entrepreneurship for the poor and to increase rural employment.

2.4 The Constraints of raw silk production by different silk reeling units

In order to reduce the cost of production and lower the renditta, the main constraints that inhibit the modernization of the reeling sector, Ramakrishnan (1989) suggested a model where in the future reeling plants could be vertically integrated. Such unit could consist of infrastructural facilities to commercially produce low renditta bivoltine cocoon and reeling in fully automated reeling plant. The new model suggested to bring down the raw material cost to 55 per cent from 85 per cent and the renditta will improve to 8 kg from its previous 9 kg. Thus, he concluded that adoption of such model could pave way for bringing in the much desired qualitative changes in the sericultural practices in the country.

Kerutagi (1991) noticed that the prices offered for the silk cocoons in the nearest markets like Bijapur and Mudhol were non-remunerative

due to informal cortails existed among buyers in the study area. Further, the existence of substantial number of silk units had resulted in low prices. The author expressed that the reelers encountered constraints such as non-availability of sufficient raw material (cocoons) and skilled labour vis-avis lack of availability of suitable reeling water.

Mayoux (1992) surveyed the problems of women labourers employed in the reeling industry in Mysore district of Karnataka. and recommended for consideration of the needs of women labourers not only for poverty alleviation but also for expansion of reeling industry. The existing legislation and the labour law need to be updated and implemented so that the working condition in the industry is improved and attention should be focused on family welfare and health improvement schemes.

According to Nijaguna (1992), about 40 per cent of total silk yarn produced in the state was sold outside the silk exchanges and stated that this over the years has been on the increasing trend, even though it is mandatory on the part of reelers to sell silk only through the silk exchange. The major marketing problems faced by the reelers were under weighment (200 g less for every 10 kg of raw silk) and unauthorized deductions in the silk exchanges as complained by 56 per cent of the respondents.

Hanumappa (1993) noticed that muslims were dominating as a single community group in reeling and operated across all scales of operations including the technologies. It was found that reelers in the study area had greater dependence on hired labourers than on family labourers. Author observed that the finance (working capital and fixed capital) was the major constraint for small scale reelers followed by the lower prices for the raw silk produced due to the import of raw silk at cheaper prices.

Rajaram *et al.* (2006) reported that the availability of sufficient land and manpower for expansion of sericulture activities, strong potential for silk consumption and silk weaving infrastructure facilities acceptance and quick adoption of improved new technologies by the sericulturists are considered as strength of sericulture industry. Lack of skilled manpower in the post-cocoon sector for quality maintenance, inadequate market facilities for the quality cocoons and raw silk particularly bivoltine, low rainfall / declining of ground water level are the major threats of sericulture industry in India.

Geetha and Devi (2008) studied the technology adoption and training needs of sericulture farmers and observed that majority of respondents were of middle age with medium level of knowledge and adoption. The constraints for not adopting technologies are lack of knowledge, non availability and high cost of the technology.

Khan *et al.*, (2008) Its weaknesses are related to a data base of poor reliability, the diverse range of practices leading to an incredible range of productivity and quality, quality consistency in production, poor transfer of technology to the decentralized sector both due to poor technology absorption and poor / inadequate follow up on laboratory findings, extension, poor market linkages outside Karnataka, a thriving and often unfair trade in the post yarn sector, use of low end technologies and reluctance to absorb technologies which would improve quality but which may not fetch the price required to meet the higher overhead and risk costs due to the higher investment. Thin margins and inadequate supportive systems for yarn disposal, absence of quality focused processing infrastructure for weavers, dyers and printers, which can upgrade quality without expectation of high individual investments are also some of the weakness. Other weakness are the inadequate emphasis on quality in the commercial seed sector (particularly in non

mulberry where even adequacy of quantity is major issue), neglect of marketing linkages, working of export promotion policies, need for a basic perspective for development of the sector which clearly defines the relative roles of CSB and the States in a federal set-up. Absence of a funding discipline which optimizes the use of existing infrastructure, encourages market links, and ensures technical norms and necessities are not ignored whatever be the source of funding also appears to be a weakness.

Ghosh *et al.*, (2009) identified perceived constraints faced by the client system in broad categories like mulberry garden management (lack of assured irrigation, lack of planting material of high yielding varieties, high cost of inputs, labour scarcity and lack of cultivation knowledge), rearing of silkworms (non- availability of quality DFL's, lack of rearing house and high incidence of pest and diseases), marketing of produce (distance cocoon market, fluctuating prices and lack of reeling machine) were determined.

Khan (2009) reported that a declining trend in the area under mulberry cultivation, which could be attributed to rapid urbanization in traditional mulberry growing regions like Devanahalli, Anekal, Vijayapura, Kolar and other areas, and also in Mysore district. The rising input and labour costs, besides competition with imported Chinese silk had forced thousands of farmers to uproot mulberry cultivation and abandon sericulture all together. The decline in area under mulberry cultivation and the consequent decline in cocoon production had put an estimated 3,500 silk reelers out of a job.

Teotia *et al.* (2010) conducted SWOT analysis of mulberry silk industry in Uttarakhand. Strengths identified are long tradition of mulberry sericulture in the state and favourable agro-climatic conditions for tropical bivoltine sericulture in Doon vally of the state. Weaknesses

observed are low adoption of new technologies and poor infrastructure facilities in potential support to the industry for credit facilities. Opportunities are favourable state government policies and infrastructure created through World Bank aided project and other schemes and threats are availability of cheap Chinese yarn and competition from other horticulture crops.

Singh (2011) reported that the Chinese silk industry is passing through many vital problems like high cost of production, scarcity of view of its major share are weakness and China dominates the sericulture industry internationally, it is a great strength.



METHODLOGY

CHAPTER III

METHODOLOGY

This chapter deals with the description of the study area, the sampling techniques adopted, the method of survey, the nature and sources of data and the various tools and techniques employed in analyzing the data and evaluating the problems. The methodology adopted has been presented under the following major headings:

- 3.1 Description of the study area
- 3.2 Sampling procedure
- 3.3 Nature and source of data
- 3.4 Analytical tools and techniques
- 3.5 Definition of terms and concepts

3.1 Description of the study area

Karnataka is the eighth largest state in India with an area of 190 lakh ha. It is situated between 11.5° and 19.0° N latitude and between 74° and 78° E longitude in the southern plateau. The state receives the average annual rainfall of about 1139 mm both from south-west and north-east monsoons. The important crops grown in the state are jowar, ragi, maize, bajra and wheat among cereals; red gram, green gram, tur and bengal gram among pulses; groundnut, sunflower and safflower among oilseed crops and cotton, sugarcane and tobacco among commercial crops. Karnataka comprises 30 districts of which 12 districts are located in northern part of the state and rest in southern part of the state. chikkaballapur district of Karnataka was chosen purposively for the present study (Fig 3.1) since 17004.30 hectare of cultivated area is under mulberry, where 19743 farming households are engaged in the occupation. Cocoon production of district during 2009-10 was 10826.284 tonnes with the value of silk produce ` 19487.30 lakh.

3.1.1 Chikkaballapur district

Chikkaballapur district is a newly created district in the state of Karnataka, India. Chikkaballapur is surrounded by hills and is 55 km from the state capital Bangalore. It was carved out of the existing Kolar district by including the taluks of Gauribidanur, Gudibanda, Bagepalli, Chikkaballapur, Sidlaghatta and Chintamani into the new district. It is an educational and business hub, and is known for grape and silk cultivation. The Chintamani taluk was purposively selected from district as it is known for high intensity of silk worm rearing, so the reeling of cocoon is main aspect to be considered.

Chikkaballapur district contains 26 hoblies and 150 gram panchayats. There are about 1321 inhabited and 193 uninhabited villages. There are 4 town municipalities and 2 city municipalities. There are about 509 hamlets. According to 2011 census the area in Chikkaballapur district is 4254 Sq.km. The total male population is 584516, female population is 564491 and hence the total population of the district is 1149007. It has 19,720 hectares of forest land and 4,215 hectares of agriculture land in Chikkaballapur district. The annual rainfall ranges from 679.1 to 888.9 mm and more than 50 per cent of it is received during the Kharif season. The elevation is 800-900 m and the soils are red loamy in major areas, lateritic in the remaining areas.

There are 363 reeling units of different types like Charaka, Cottage Basin, Filature Basin and Multiend Basin in Chintamani taluk of which 173 is under Chinnasandra followed by Venkatigirikote villages. Nimmakayapalli, Muragamalla, Suladenahalli, Kendanahalli, Kuruburu, Alambagiri and Gollahalli are having one unit in each village. Of the 363 units 329 units are Charaka units.

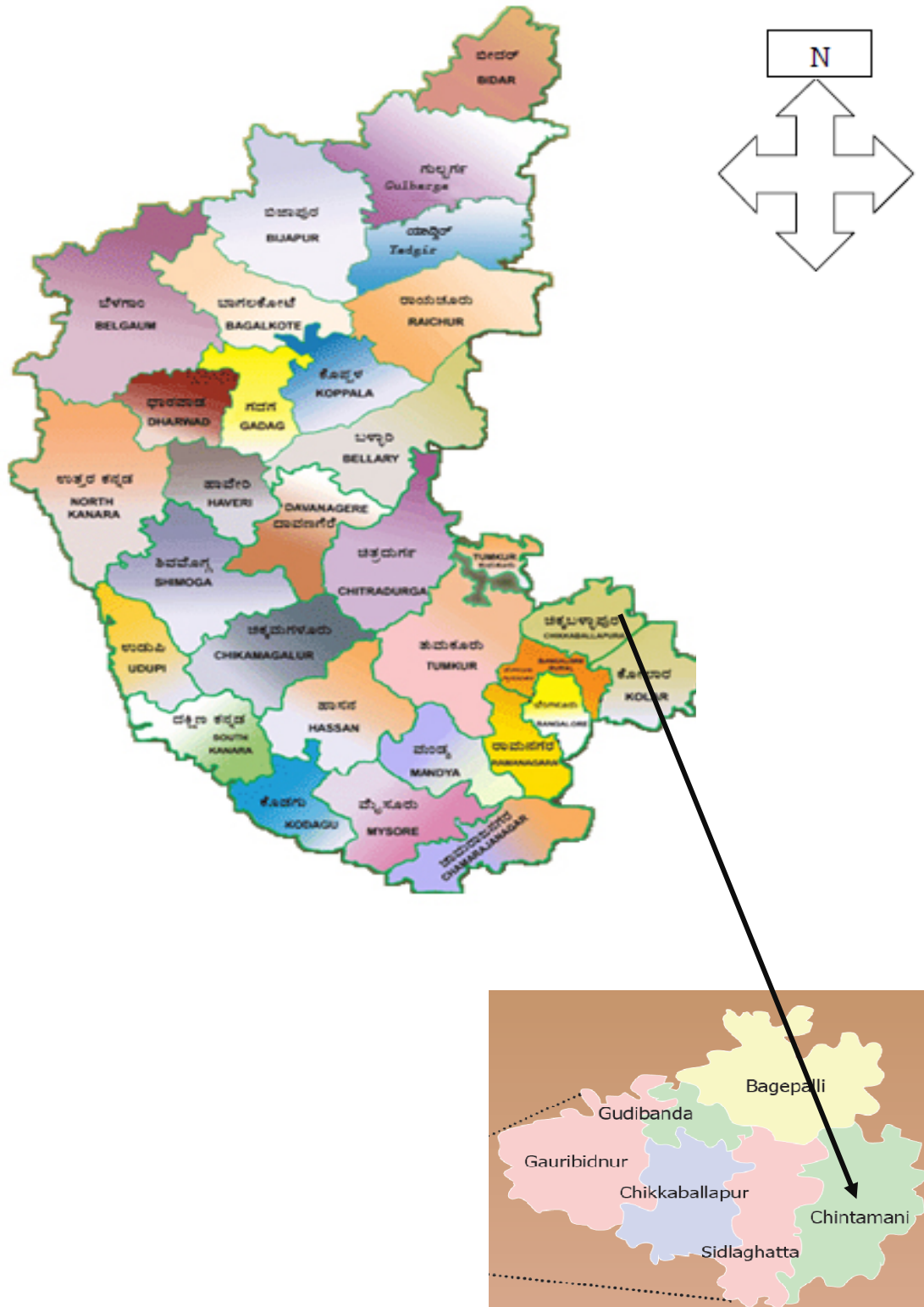


Fig. 3.1: Map showing the study area

Table 3.1 Sericulture in the study area

SI No.	Taluk	Area under mulberry (ha.)	Cocoon production (tonnes)	No. of farmers engaged in the occupation	Value of silk produced (₹ in lakhs)
1	Bagepalli	654.65	444.59	1691.00	800.25
2	Chikkaballapur	2194.38	1349.15	2830.00	2428.46
3	Chintamani	6045.17	3880.10	6165.00	6984.18
4	Gauribidanur	2232.01	1199.65	3262.00	2159.36
5	Gudibande	116.65	101.77	315.00	183.18
6	Shidlagatta	5761.44	3851.04	5480.00	6931.87
	Total	17004.30	10826.29	19743.00	19487.30

Source: Office of assistant director, Dept. of sericulture, Chikkaballapur

Table 3.2 Information on Silk Reeling units under Chintamani taluk (Panchayat wise)

SI No	Panchayat	Village	Charaka		Cottage Basin		Filature Basin		Multiend		Total (Units)
			Units	Basins	Units	Basins	Units	Basins	Units	Basins	
1	Chintamani town	Venkatagirikote	98	298	-	-	1	4	2	20	101
2	Chintamani town	Chintamani town	10	25	1	4	1	4	-	-	12
3	Nandiganahalli	Nimmakayapalli	1	6	-	-	-	-	-	-	1
4	Muragamalla	Muragamalla	-	-	1	3	-	-	-	-	1
5	Chinnasandra	Chinnasandra	168	633	-	-	5	32	-	-	173
6	Chinnasandra	Suladenahalli	1	4	-	-	-	-	-	-	1
7	Perumachanahalli	Kendanahalli	1	10	-	-	-	-	-	-	1
8	Kaiwara	Kaiwara	21	71	-	-	12	56	-	-	33
9	Talagawara	Talagawara	6	28	-	-	2	12	2	16	10
10	Kuruburu	Kuruburu	1	2	-	-	-	-	-	-	1
11	Munaganahalli	Alambagiri	1	6	-	-	-	-	-	-	1
12	Upparapete	Upparapete	9	26	1	3	5	26	1	6	16
13	Upparapete	Mohammadpura	3	6	-	-	-	-	-	-	3
14	Katriguppe	Usmanpura	4	10	-	-	-	-	-	-	4
15	Doddaganjuru	Gollahalli	1	2	-	-	-	-	-	-	1
16	Santhekallahalli	Santhekallahalli	4	7	-	-	-	-	-	-	4
Total			329	1134	3	10	26	134	5	42	363

Source: Technical Service Centre (Reeling), Chintamani

According to Technical Service Centre (Reeling), Chintamani there are 1228 labours are involved in silk reeling operation. It is very interesting to know that 58.71 per cent of total labor employed is female workers. When it comes to castewise labours it is the minor clauses involved maximum in reeling operation.

There are 363 silk reelers in Chintamani provision of which 306 are male entrepreneurial and 57 are female entrepreneurial. Only 4 silk reelers are belongs to SC and ST clauses. 336 of total 363 silk reelers were belongs to minor clauses (Technical Service Centre (Reeling), Chintamani).

3.2 Sampling procedure adopted

The present study was taken up in Chintamani taluk of Chikkaballapur district which comes under Eastern Dry Zone of Karnataka. Multi-stage purposive cum random sampling procedure is adopted in selection of reeling units. In the first stage Chintamani taluk is selected purposively as it has second highest reeling units after Siddlaghatta. In the second stage the list of villages in Chintamani taluk was prepared from information provided by Technical Service Centre (Reeling). From this list, seven villages were selected randomly (Table 3.2). Random sampling procedure is adopted in the selection Charaka (60) method of reeling and proportionate size is followed to select the sample in other three categories of silk reeling units like Cottage-Basin (3), Filature-Basin (22) and Multiend-Basin (5) from selected villages.

3.3 Nature and sources of data

To evaluate the objectives of the study, data was collected from both primary and secondary sources will be used.

Table 3.3 Details of villages selected for the study

SI No.	Village	Charaka	Cottage-Basin	Filature-Basin	Multi-end	Total
1	Chinnasandra	25 (41.66)	1 (33.33)	-	-	26 (28.88)
2	Venkatagirikote	15 (25)	-	2 (9.09)	2 (40)	19 (21.11)
3	Chintamani town	5 (8.33)	-	1 (4.54)	-	6 (6.66)
4	Kaiwara	5 (8.33)	-	12 (54.54)	-	17 (18.88)
5	Talagawara	5 (8.33)	-	2 (9.09)	2 (40)	9 (10.00)
6	Upparpete	5 (8.33)	1 (33.33)	5 (22.72)	1 (20)	12 (13.33)
7	Muragamalla	-	1 (33.33)	-	-	1 (1.11)
Total		60 (100)	3 (100)	22 (100)	5 (100)	90 (100)

Note: Figures in the parenthesis are percentage to the total

Primary data: The four reeling units identified for the study were charaka, cottage-basin, filature-basin and multi-end. The primary data required for the study was collected from the randomly selected reelers on the socio- economic characteristics, inventory of implements and machinery, cost and returns of silk reeling, constraints faced by reelers through personal interview using pre-tested structured schedule.

Secondary data: The data pertaining to Silk Reeling units, total labour employed in silk reeling, castewise reelers and gender wise reelers under Chintamani taluk and general information of district were collected from Technical Service Centre (Reeling), Chintamani and District Statistical Office, Chikkaballapur, respectively.

3.4 Analytical tools and techniques

In this study, based on the nature and extent of availability of data, the following analytical tools and techniques are employed to evaluate the specific objectives.

1. Tabular analysis
2. Financial analysis

3.4.1 Tabular analysis

This technique was employed to analyze socio-economic characteristics of reelers, estimation of cost of production of raw silk under different (charka, filature-basin, cottage-basin, multi-end basin) reeling systems, gross returns and net returns from these systems of reeling. The existing level of employment, inputs use pattern, problems faced by the reelers, estimation of available loss, etc. were also analyzed by adopting this technique. The data were compared, contrasted and interpreted with the aid of averages and percentages.

3.4.1.1 Concepts in cost-return analysis

1. Labour

The hired labour wages were computed by taking the wages paid per day (eight hours) in the study area by the reelers for men labour ,and women labour separately.

2. Purchase cost of cocoons

The market fee, facilitating charges in cocoon market, transportation, loading and unloading, conveyance (bus fare of person for buying the cocoons) and packing material were included.

3. Marketing cost of raw silk

It includes transportation cost of raw silk, facilitating charges in silk exchanges, loading and unloading of raw silk, bus fare of person for selling raw silk and cost of packing material.

4. Miscellaneous expenses

It comprised expenses incurred on boarding and lodging while transporting cocoons from market to their firms and while selling of silk at far off silk exchanges.

5. Interest on working capital

This working capital (variable cost) on an average, was replenished/recycled by the sale of raw silk yarn and its byproducts by most of the reelers once a week. This was treated as a cycle and the interest on working capital was computed on the variable cost required to run the units for a cycle (week). The interest was calculated at 11.75 percent per annum, for half the amount, since this investment was made at various stages of reeling operation. This interest rate charged is

commensurate with the prevailing lending rates of the commercial banks to the reelers in the study area.

6. Returns to investment in silk reeling

Most of the reelers sold the raw silk once a week. The working capital made in the beginning of the year was usually replenished after 7 days, keeping the fixed investment same throughout the year. Hence, each week was considered as one cycle and 48 such cycles were considered for both the costs and returns per year.

7. Benefit:Cost ratio analysis (B:C)

$$\text{Benefit cost ratio} = \frac{\text{Gross returns per year}}{\text{Investment during the year}}$$

Gross returns per year = Net returns during the year (for 48 cycles in a year) minus investment during the year.

Investment during the year = Total variable cost per cycle plus the fixed cost per year.

8. Return to family labour and management

It was calculated by deducting all costs excluding cost of family labour and management from gross returns.

3.5 Definition of terms and concepts used in the study

Bivoltine cocoons: Cocoons built by a silkworm race having only two generation (life cycles) in a year.

Books: After skeining about 30 hanks are bundled and pressed into a book, before marketing.

Brushing: Process of removal of floss from the cooked and boiled cocoons to pick up the true ends for reeling.

Charka: Charka is a simple crude indigenous device for reeling of raw silk which consists of a large cooking cum reeling pan and a hand/power operated large wooden wheel.

Charka silk: Raw silk reeled on charkas.

Cocoon (silk): The silken shell spun by the silkworm larvae that serves as a protective covering to the insect during its dormant stage (pupal).

Cocoon market: A market established under section 10, for the sale or purchase of cocoons of all kinds intended for reeling.

Cooking (silk): The process by which the silk cocoons are treated in boiling water for a short time with a view to softening the filament for easy unwinding during the subsequent reeling process.

Cocoon stifling: The cocoons are subjected to steam or hot air for three to five minutes so as to kill the silkworm pupae inside before they grow into moths and emerge by cutting the cocoon.

Cottage-Basin: A silk reeling system which is an improvement over charka each basin usually consists of six ends. It is normally operated by power driven source, however it can be operated by hand during power cut. Cocoons are cooked in a boiling water basin by open pan system and reeling is done in a hot water basin attached to the reeling.

Denier : It is the weight in gram of 9000 meter of silk yarn.

$$\text{Denier} = \frac{\text{Weight in gram}}{\text{Length in meter}} \times 9000$$

Defective cocoons: Cocoons that cannot be reeled in normal process. There are 13 types of defectives which are subjected to elimination in cottage/multi-end basin reeling. The most common ones are uzi pierced cocoons, jelly cocoons and double cocoons.

Double cocoons: A cocoon jointly spun by two silk worms. It serves as protective shell for both the worms during their pupal stage of existence. Such cocoons are readily distinguished by their abnormal size and toughness.

Dupion silk: It is a coarse raw silk yarn of 35-85 denier and is reeled from defective cocoons in dupion charka units.

Filature: An established in which cocoons are reeled for the production of raw silk is called filature. It is not a separate method of reeling system.

Hanks: The hanks are obtained after re-reeling and measures usually 150 cm in periphery.

Jelly cocoons: These are unreelable in cottage and other superior devices and burst open cocoons which come out during cooking and reeling, synonym is boiled off cocoons.

Multivoltine cocoons: Cocoons built by a silkworm race with more than two generations (life cycle) in a year.

Multi-end reeling machine: The multi-end reeling machine was evolved in Japan to make better and more economic quality of reeling. This machine with required modifications to suit local conditions has been adopted by most of the sericulturally progressive countries. In India, recently Central Silk Technological Research Institute, Bangalore has designed and developed multi-end reeling machine which can produce better quality raw silk compared to that of cottage basins.

Raw silk: It is a continuous filament or strands containing no twist as drawn off or reeled from silk cocoons.

Reelability: It is the ratio of the cocoons reeled without break and the total number of cocoons casted, expressed as a percentage.

Reeling (silk): The process of unwinding silk filament from the cocoons.

Renditta: It is the cocoons to raw silk i.e. the number of kilograms of cocoons required to yield one kg of raw silk.

Reeler: A person in charge of a reeling establishment and carrying on the business of reeling cocoons.

Re-reeling: The process of winding the yarn reeled on small reels on to standard reel to make hanks for marketing.

Silk: It is a protein accom secretion (fibrion + sericin) produced by the silkworm for spinning a cocoon.

Silk exchange: A silk exchange established under section 10A for the sale or purchase of silk yarn.

Skeining: The hanks are given an adequate twist by means of skeining device and made compact before packing them into a book. The standard weight of a hank is about 60-70 grams.

Silk waste: Silk from wild and cultivated cocoons which cannot be reeled and silk from the unreelable parts of the cocoons. It also includes the waste produced during the various process of silk reeling and throwing. It is used as a raw material for spun silk.

Stifling: The process of sun drying or air steaming of cocoons to kill the pupa to prevent the emergence of moth. So that such cocoons can be stored for relatively longer period.

Facilitating Charges: Payment made by the reelers to the concerned persons to favor their business transactions.



RESULTS

CHAPTER IV

RESULTS

The findings of the study are presented in this chapter under the following headings in consonance with the objectives of the study.

- 4.1 Socio-economic characteristics of different group of silk reelers.
- 4.2 Financial viability of different silk reeling methods.
- 4.3 Employment generation capacity of different silk reeling units.
- 4.4 Constraints faced by reelers of different silk reeling units.

4.1 Socio-economic characteristics of different group of silk reelers in Chikkaballapur district of Karnataka.

Information in respect of some of the important socio-economic characteristics of the selected reelers such as age, education level, family size, pattern of ownership, organizational participation and professional experience in reeling was collected, analysed and results are briefly highlighted in this section.

4.1.1 Age-wise classification of different group of silk reelers

The age distribution pattern of sample respondents presented in Table 4.1 and the results indicated that, majority of the respondents were middle age (61.66%) followed by old age (33.33%) and Young age group accounted to only 5.00 per cent in Charaka reelers. In Cottage-Basin reelers, nearly 66.66 per cent were in old age group and remaining belongs to middle age (33.33 %). In Filature-Basin reelers, 59.09, 36.36 per cent of the respondents were found in the middle age and old age group and just 4.54 per cent in young age group. Among Multi end reelers, majority of the respondents were found in the middle (60.00%) and old (40.00%) age groups and young age group is not represented.

Table 4.1: Age-wise classification of silk reeler

Sl. No.	Age(Years)	Charaka	Cottage-Basin	Filature-Basin	Multi-end Basin	Pooled
1	Young age (<31)	3 (5.00)	0 (0.00)	1 (4.54)	0 (0.00)	4 (4.44)
2	Middle age (31-50)	20 (33.33)	1 (33.33)	13 (59.09)	3 (60.00)	37 (41.11)
3	Old age (>51)	37 (61.66)	2 (66.66)	8 (36.36)	2 (40.00)	49 (54.44)
4	Total	60 (100)	3 (100)	22 (100)	5 (100)	90 (100)
5	Average age	55	53	45	46	49.75

Note: Figures in the parenthesis are percentages to the total

On an average, majority of the respondents found in the old age (54.44%) and middle (41.11%) age groups and youngsters accounted for just 4.44 per cent in the sample. The average age of the respondents irrespective of reeling system was 49.75 years.

4.1.2 Educational status of respondents

The educational status of the sample respondents is summarized in the Table 4.2. It is observed from the table that the minimum education level in multi-end basin is high school level and in case of cottage the education level is between middle school and Pre-university level. Nearly 45.45 and 60.00 per cent of the respondents were having education level of high school respectively in filature-basin, multi-end basin. About 28.33 per cent of the respondents were found to be illiterates in charaka reeler.

4.1.3. Average size of respondent families

Silk reeling requires relatively more human labour, an attempt has been made to study the family size of the selected reelers and presented in Table 4.3. It is observed from the table that the average size of family was highest in case of multi-end basin (7) and same in charaka (5), filature basin (5) and cottage basin (5) respectively. The availability of family labour is hindered in all reeling units except in multi-end basin.

4.1.4. Organizational participation of silk reelers

The organizational participation of the reelers is presented in Table 4.4. Amongst the organizations, participation in reeler's co-operative societies was higher in charaka (80.95%) followed by multi end basin (75.00%), reelers. In case of cottage basin and filature basin The participation in reeler's co-operative was same In case of cottage basin and filature basin (66.66%). The participation in self help groups was highest in filature basin (26.66%).

Table 4.2: Educational status of the respondents

SI No.	Particulars	Charaka	Cottage-Basin	Filature-Basin	Multi-end Basin
1	Illiterate	17 (28.33)	0 (0.00)	2 (9.09)	0 (0.00)
2	Primary School	12 (20.00)	0 (0.00)	0 (0.00)	0 (0.00)
3	Middle School	9 (15.00)	1 (33.33)	4 (18.18)	0 (0.00)
4	High School	14 (23.33)	1 (33.33)	10 (45.45)	3 (60.00)
5	Pre-University	6 (10.00)	1 (33.33)	3 (13.63)	1 (20.00)
6	Degree and above	2 (3.33)	0 (0.00)	3 (13.63)	1 (20.00)
	Total	60 (100)	3 (100)	22 (100)	5 (100)

Note: Figures in the parenthesis are percentages to the total

Table 4.3: Average family size of respondent

(Numbers)

SI No.	Particulars	Charaka	Cottage-Basin	Filature-Basin	Multi-end Basin
1	Men	1	1	2	2
2	Women	1	2	1	1
3	Children	3	2	2	4
	Total	5	5	5	7

Table 4.4: Organizational participation of the silk reelers

SI No.	Particulars	Charaka	Cottage - Basin	Filature - Basin	Multi-end Basin
1	Gram Panchayat	1 (2.38)	0 (0.00)	1 (6.66)	0 (0.00)
2	Reelers co-operative society	34 (80.95)	2 (66.66)	10 (66.66)	3 (75.00)
3	Self Help Groups	1 (2.38)	0 (0.00)	4 (26.66)	0 (0.00)
4	Others*	6 (14.28)	0 (0.00)	0 (0.00)	1 (25.00)
5	Total members participated in various organizations	42 (70.00)	2 (66.67)	15 (68.18)	4 (80.00)
6	Non organizational participation	18 (30.00)	1 (33.33)	7 (31.82)	1 (20.00)

Note: Figures in the parenthesis are percentages to the total

*Others include secretary in schools, members in dairy co-operative society etc...

The participation in more than one organizations is highest in multi-end (80.00%), followed by charaka (70.00%), filature-basin (68.18%) and cottage basin (66.67%),

4.1.5. Extent of professional experience in silk reeling

Experience in the silk reeling was mainly gauged by the year of establishment of their reeling units. It is evident from Table 4.5 that 48.33 per cent of charaka reelers were having a professional experience of more than 21 years in silk reeling. About 66.66 and 40.90 per cent of respondents in cottage-basin and filature-Basin units were having a professional experience of 11-15 years in silk reeling. Nearly 80.00 per cent of multi-end reelers were having a professional experience of 6-15 years in silk reeling.

4.1.6. Ownership pattern of reeling units

As indicated in Table 4.6, all the Reelers in charaka and cottage-basin reeling were having their own enterprise, where as in case of filature basin and multi-end basin reeling nearly 90.90 and 80.00 per cent of the sample reelers were possessing their own reeling units respectively remaining of them are having enterprise of partnership type.

4.2 Financial viability of different silk reeling methods in Chikkaballapur district, Karnataka.

To estimate the capital requirement for establishing a average size (5 in case of charaka, cottage-basin, filature-basin and 6 in case of multi-end basin) of reeling unit, the capital required for establishing the units was estimated at the prevailing prices. The results of this estimation are presented under following headings. The value of land is been excluded since it is assumed to be available with every one hence no extra investment are made on land.

Table 4.5: Extent of professional experience in silk reeling

SI No.	Experience (Yrs)	Charaka	Cottage Basin	Filature Basin	Multiend Basin
1	0 to 5	2 (3.34)	0 (0.00)	1 (4.55)	1 (20.00)
2	6 to 10	10 (16.66)	1 (33.33)	2 (9.11)	2 (40.00)
3	11 to 15	11 (18.33)	2 (66.67)	9 (40.90)	2 (40.00)
4	16 to 20	8 (13.34)	0 (0.00)	5 (22.72)	0 (0.00)
5	>21	29 (48.33)	0 (0.00)	5 (22.72)	0 (0.00)
	Total	60 (100)	3 (100)	22 (100)	5 (100)

Note: Figures in the parenthesis are percentages to the total

Table 4.6: Ownership pattern of reeling units

SI No.	Particulars	Charaka	Cottage Basin	Filature Basin	Multi-end Basin
1	Independent/Own	60 (100.00)	3 (100)	20 (90.90)	4 (80.00)
2	Partnership	0 (0.00)	0 (0.00)	2 (9.10)	1 (20.00)
	Total	60 (100)	3 (100)	22 (100)	5 (100)

Note: Figures in the parenthesis are percentages to the total

4.2.1 Capital requirement for establishing

Charaka reeling unit

The Capital requirement for establishing charaka reeling unit is been indicated in Table 4.7. The major requirements for establishing a average size (5) of charaka reeling unit are building area of about 500 sq ft,charaka reeling basins, one motor of 0.5 HP capacity, water storage tanks (2) and electrical and water connections. Other things are accounted under miscellaneous costs. On an average ` 3,62,610 required for establishing a charaka reeling unit of which 88.24 per cent is expended on building and 6.75 per cent on reeling machine.

Cottage-Basin reeling unit

The Capital requirement for establishing Cottage basin reeling unit is been indicated in Table 4.8. The major requirements for establishing a average size (5) of Cottage basin reeling unit are building area of about 600 square feet, reeling basins, two motors of 0.5 HP capacity, water storage tanks (3) and electrical and water connections. Other things are accounted under miscellaneous costs. On an average ` 5,92,350 required for establishing a cottage basin reeling unit of which 71.57 per cent is expended on building and 23.63 per cent on reeling basins.

Filature-Basin reeling unit

The capital requirement for establishing filature-basin reeling unit is presented in Table 4.9. The major requirements for establishing a average size (5) of filature basin reeling unit are building area of about 650 sqft, reeling basins, two motors of 0.5 HP capacity, a generator set, water storage tanks (3) and electrical and water connections. Other items are accounted under miscellaneous costs. On an average ` 6,78,225 is required for establishing a filature basin reeling unit of which 63.76 per cent is expended on building and 29.48 per cent on reeling basins.

Table 4.7: Capital requirement for establishing charaka reeling unit

(5 Charkas)

SI No	Item	Number	Cost per unit	life span	Total cost
1	Building (500 Sq ft)	-	3,20,000	45	3,20,000 (88.24)
2	Reeling Basins + Reeling unit	5	4,900	5	24,500 (6.75)
3	Motor (0.5 HP)	1	4,250	10	4,250 (1.17)
4	Water storage tank	2	3,000	10	6,000 (1.65)
5	Electrical and water connections	-	2,860	-	2,860 (0.78)
6	Miscellaneous	-	5,000	-	5,000 (1.37)
Grand total*					3,62,610 (100)

Note: * denotes excluding land value

Figures in the parenthesis are percentages to the total

Table 4.8: Capital requirement for establishing cottage basin reeling unit

(5 Basins)

SI No	Item	Number	Cost per unit	life span	Total cost
1	Building (600Sq. ft.)	-	4,24,000	45	4,24,000 (71.57)
2	Reeling Basins+Reeling unit	5	28,000	20	1,40,000 (23.63)
3	Motor (0.5 HP)	2	4,250	10	8,500 (1.43)
4	Water storage tank	3	3,000	10	9,000 (1.51)
5	Electrical and water connections	-	3,650	-	3,650 (0.61)
6	Miscellaneous	-	7,200	-	7,200 (1.21)
Grand total*					5,92,350 (100)

Note: * denotes excluding land value
 Figures in the parenthesis are percentages to the total

Table 4.9: Capital requirement for establishing filature basin reeling unit

(5 Basins)

SI No	Item	Number	Cost per unit	life span	Total cost
1	Building(650 Sq.ft)	-	4,32,500	45	4,32,500 (63.78)
2	Reeling Basins+Reeling unit	5	40,000	20	2,00,000 (29.50)
3	Motor (0.5 HP)	2	4,250	10	8,500 (1.25)
4	Generatot set	1	15,725	8	15,725 (2.32)
4	Water storage tank	3	3,000	10	9,000 (1.32)
5	Electrical and water connections	-	4,000	-	4,000 (0.58)
6	Misscellaneous	-	8,500		8,500 (1.25)
Grand total*					6,78,225 (100)

Note: * denotes excluding land value

Figures in the parenthesis are percentages to the total

Multi-end Basin reeling unit

The capital requirement for establishing multi-end basin reeling unit is been indicated in table 4.10. The major requirements for establishing a average size (6) of multi-end basin reeling unit are building area of about 750 sqft, reeling basins, two motors of 1 HP capacity, a generator set, water storage tanks (5) and electrical and water connections. Other items are accounted under miscellaneous costs. On an average ₹ 10,82,975 required for establishing a multi-end reeling unit of which 52.10 per cent is expended on building and 41.55 per cent on reeling basins.

4.2.2 Working Expenses or Annual average cost of production of raw silk yarn per basin

Silk reeling is undertaken by the charaka, cottage-basin, filature-basin and recently multi-end basin units. Since the size and handling capacity are different in these units, the costs and returns are dealt under separate heads. Again this analysis is done for the individual basins per year to compare the economic under each reeling systems. These units on an average worked for 288 days in a year. Later these annual results were also compared to understand the difference in cost-return structure of these reeling systems.

The total costs of silk reeling were broadly classified into recurring and non-recurring costs which is presented in table 4.11. The total cost of silk reeling was estimated to be highest in multi-end basin (₹ 15,78,444 of which 82.05 per cent is expended on purchase of cocoons) for reeling 5928 Kg's of cocoons and least in charaka (₹ 13,67,100 of which 82.05 per cent is expended on purchase of cocoons) for reeling 5341.92 Kg's of cocoon. Cost incurred in producing one Kg of raw silk is highest in charaka (₹ 2066.55) and least in multi-end basin (₹ 1837.25). The fixed costs were accounted for only 0.47

Table 4.10: Capital requirement for establishing multi-end basin reeling unit

(6 Basins)

SI No	Item	Number	Cost per unit	life span	Total cost
1	Building (750 Sq.ft)	-	5,64,250	45	5,64,250 (52.12)
2	Reeling Basins+Reeling unit	6	75,000	27	4,50,000 (41.56)
3	Motor (1 HP)	2	8,000	10	16,000 (1.47)
4	Generator set	1	20,000	8	15,725 (1.45)
4	Water storage tank	5	3,000	10	15,000 (1.38)
5	Electrical and water connections	-	7,000		7,000 (0.64)
6	Miscellaneous	-	15,000		15,000 (1.38)
Grand total*					10,82,975 (100)

Note: * denotes excluding land value
 Figures in the parenthesis are percentages to the total

Table 4.11: Annual average cost for production of raw silk yarn per basin under different silk reeling units in Chikkaballapur district, Karnataka

SI No.	Items	Charaka		Cottage-Basin		Filature-Basin		Multi-end Basin	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
A	Recurring cost								
1	Cocoons (kg)	5341.9	11,21,803 (82.05)	5436.4	11,68,843 (80.30)	5626.0	12,37,738 (80.63)	5928	12,95,268 (82.05)
2	Labour (Mandays)	407.82	61,173	615.36	92,304	564.46	84,669	330.70	49,605
3	Fuel (litres)	51.36	2,824.8	43.2	2,376	45.12	2,481.6	126.24	6,951.84
4	Water (litres)	72945	9,482.866	65760	8,548.8	98474	12,801.61	99369	12917.92
5	Electricity		1,821.12		1,992		4,404		5,019.68
6	Marketing cost		19,706.88		18,768		19,768.44		24,639.6
7	Miscellaneous expenses		893.28		1,440		1,088.64		1,928
8	Interest on working capital @ 11.75%		1,43,080		152077		1,60,147		1,64,069
	Total variable cost		13,60,785 (99.53)		14,46,349 (99.37)		15,23,098 (99.21)		15,60,399 (98.85)
B	Non-recurring cost								
1	License		120		120		120		120
2	Depreciation		1,087.83		1,185		2,034.67		3,248.95
3	Repairs and maintenance		576		720		1,680		1,680
4	Interest on fixed capital @ 6%		4,531.32		7,108		8,138.7		12,995.7
	Total fixed cost		6,315.15 (0.47)		9,133.20 (0.63)		11,973.40 (0.79)		18,044.6 (1.15)
C	Total cost		13,67,100 (100)		14,55,482 (100)		15,35,072 (100)		15,78,444 (100)
D	Cost per Kg of reeled silk		2,066.85		2,088.26		1,947.66		1,837.25

Note: Figures in the parenthesis are percentages to the total

per cent of total cost in charaka, 0.63, 0.79 and 1.15 per cent in Cottage, Filature and multi-end basin respectively.

4.2.3 Annual average yield of raw silk and by product per basin

The average quantity of raw silk reeled and there after returns obtained are presented in Table 4.12. Raw silk is the main product irrespective of reeling unit and by-products constitutes silk waste (jute), double cocoon, jelly and pierced cocoon and dead pupae. The raw silk reeled per basin per year is least in charaka (661.44 Kg's) reeler and highest incase of multi-end (859.13 Kg's) reeler.

Among the by-products silk waste is most economical as the silk waste generated is highest in case of charaka (67.2 Kg's) and least in multi-end (11.04 Kg's).

4.2.4 Annual average Gross returns from sale of raw silk and by-products per basin

The average annual gross returns from sale of raw silk and by-products per basin are indicated in Table 4.13. The gross returns realized form reeling is highest in case of multi-end basin (₹ 18,83,849) and least in case of charaka (₹ 14,21,646) reeler. The total cost also accounted to be highest in multi-end basin (₹ 15,78,444) and least in case of charaka (₹ 13,67,100) reeler. When it comes to net returns multi-end basin (₹ 3,05,405) realized highest and charaka (₹ 54,546) least. The benefit cost ratio which is the main indicator of the financial performance of reeling units is found to be highest in case of multi-end basin (1.20) and least in charaka reeler (1.04).

4.2.5 Renditta in different reeling units on per year per unit basis

Renditta is the ratio of cocoons to raw silk i.e. the number of kilograms of cocoons required to yield one kg of raw silk which is

Table 4.12: Annual average yield of raw silk and by product per basin

SI No	Item	Charaka		Cottage-Basin		Filature-Basin		Multi-end Basin	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value
A	Main product								
1	Raw silk (kg)	661.44	13,89,024	696.98	1515932	788.16	16,94,544	859.13	18,68,609
B	By products								
1	Silk waste (kg)	67.2	20,160	33.6	10,080	26.88	8,064	11.04	3,360
2	Double cocoon (kg)	24	4,320	14.4	2,592	25.92	4,665.6	14.4	2,592
3	Jelly & pierced (kg)	25.44	763.2	19.2	576	18.72	561.6	7.68	240
4	Dead pupae (kg)	3689.28	7,378.56	4272	8,544	3962.4	7,924.8	4524	9,048

Table 4.13: Annual average Gross returns from sale of raw silk and byproducts per basin in Chikkaballapur district, Karnataka

SI No	Item	Charaka	Cottage Basin	Filature Basin	Multiend Basin
1	Gross returns (₹)	14,21,646	15,37,724	17,15,760	18,83,849
2	Total cost (₹)	13,67,100	14,55,482	15,35,072	15,78,444
3	Net returns (₹)	54,546	82,242	1,80,688	3,05,405
4	Benefit cost ratio	1.04	1.06	1.12	1.20

presented in Table 4.14. Renditta is important factor to be considered from the point of efficiency which is found to be very efficient in multi-end (6.90 Kg's) and least efficient in charaka reeler (8.07 Kg's).

4.3 Employment generation capacity of different silk reeling units.

Silk reeling being a highly labour intensive processing activity, its potential has been recognized by the central and state government as a thrust area in solving the unemployment problem in rural and semi-urban areas. In the light of this, an attempt was made to estimate the quantum of employment provided by the different silk reeling units. Again this analysis is done for the individual basins per year to compare the employment generating capacity under each reeling systems.

4.3.1 Employment generation in Charaka unit

Activity wise of labour employment in charaka reeling units is summarized in Table 4.15 The charka basin method of reeling has generated about 407.82 labour days comprising of 103.64 men days and 304.17 women days. Family man labour component is higher in men labour (17.07%) while hired labour is the major component in women labour (64.01%) was hired. Purchase of cocoons and sale of produce was attended by only family men (38.74 man days in a year). Out of total labour is generated in case of charaka reeling per year 42.28 per cent is for reeling operation and 12.68 per cent from cocoon cooking operation.

4.3.2 Employment generation per Cottage-Basin

Activity wise of labour employment in cottage basin is summarized in Table 4.16 purchase of cocoons and sale of produce was attended by only family men (46.96 man days in a year). 615.36 man days of labour is generated in case of cottage basin per year of which 59.60 per cent is from reeling operation and 10.16 per cent from supervision. Of the total

Table 4.14: Renditta in different reeling units on per year per unit basis

SI No.	Reeling unit	Raw Material (Kg)	Raw silk (Kg)	Renditta* (Kg)
1	Charaka	5341.92	661.44	8.07
2	Cottage basin	5436.48	696.98	7.80
3	Filature basin	5626.08	788.16	7.13
4	Multiend basin	5928.00	859.13	6.90

Note: Renditta* is the number of Kg's of raw material (Cocoon) required for producing 1 Kg of raw silk

Table 4.15: Employment generation per Charaka (mandays/year)

SI No.	Type of operation	Men			Women			Overall
		Family	Hired	Total	Family	Hired	Total	
1	Purchase of cocoon	24.20	0	24.20	0	0	0	24.20 (5.93)
2	Cleaning/deflossing	0.56	1.57	2.13	7.63	12.40	20.04	22.17 (5.43)
3	Sorting/stifling	0.07	0.24	0.31	0.09	14.43	14.52	14.84 (3.63)
4	Brushing	0	0.15	0.15	0.05	12.62	12.67	12.82 (3.14)
5	Cooking	0	2.11	2.11	0.59	49.02	49.62	51.74 (12.68)
6	Reeling	0	19.60	19.60	14.54	138.31	152.85	172.45 (42.28)
7	Dead pupae collection Jute (silk waste) extraction	0	0	0	6.20	19.21	25.41	25.41 (6.23)
8	Rewinding	0	6.23	6.23	3.63	12.40	16.03	22.27 (5.46)
9	Skeining	2.88	2.58	5.47	0	0	0	5.47 (1.34)
10	Packing reeling yarn	7.71	1.44	9.16	0.24	2.58	2.83	12 (2.94)
11	Sale of produce	14.54	0	14.54	0	0	0	14.54 (3.56)
12	Overall supervision	19.65	0.046	19.69	10.09	0.07	10.17	29.87 (7.32)
Overall		69.63 (17.07)	34.01 (8.34)	103.64 (25.41)	43.09 (10.56)	261.08 (64.01)	304.17 (74.58)	407.82 (100)

Note: Figures in the parenthesis are percentages to the total

Table 4.16: Employment generation per Cottage-Basin (mandays/year)

SI No.	Type of operation	Men			Women			Overall
		Family	Hired	Total	Family	Hired	Total	
1	Purchase of cocoon	32.72	0.00	32.72	0.00	0.00	0.00	32.72 (5.31)
2	Cleaning/deflossing	0.00	0.00	0.00	8.96	8.96	17.92	17.91 (2.91)
3	Sorting/stifling	0.00	0.00	0.00	0.00	10.76	10.76	10.75 (1.74)
4	Brushing	0.00	0.00	0.00	0.00	12.10	12.10	12.10 (1.96)
5	Cooking	0.00	0.00	0.00	0.00	45.74	45.74	45.73 (7.43)
6	Reeling	18.37	91.92	110.30	8.07	248.42	256.49	366.78 (59.60)
7	Dead pupae collection Jute (silk waste) extraction	0.00	0.00	0.00	3.14	8.07	11.21	11.19 (1.81)
8	Rewinding	0.00	6.27	6.27	0.00	15.24	15.24	21.51 (3.49)
9	Skeining	3.14	4.04	7.17	0.00	0.00	0.00	7.16 (1.16)
10	Packing reeling yarn	8.07	0.00	8.07	0.00	4.48	4.48	12.55 (2.03)
11	Sale of produce	14.34	0.00	14.34	0.00	0.00	0.00	14.33 (2.32)
12	Overall supervision	32.28	10.98	43.27	19.28	0.00	19.28	62.53 (10.16)
Overall		108.93 (17.70)	113.20 (18.39)	222.14 (36.09)	39.43 (6.40)	353.75 (57.48)	393.21 (63.90)	615.36 (100)

Note: Figures in the parenthesis are percentages to the total

labour 63.90 per cent of labour work is attended by women and remaining is by men labour. 24.10 per cent of the work is attended by family labour itself.

4.3.3 Employment generation per Filature-Basin

Activity wise of labour employment in filature-basin is summarized in Table 4.17. The filature basin method of reeling has generated about 564.46 labour days comprising of 462.68 men days and 101.78 women days. Hired men labour component is higher in men labour (70.58%) while hired labour is the component in women labour (15.20%) was hired. Purchase of cocoons and sale of produce was attended by only family men (25.95 man days in a year). Out of total labour generated in case of filature basin per year of which 63.77 per cent is from reeling operation and 10.85 per cent from rewinding.

4.3.4 Employment generation per Multi-end Basin

Activity wise of labour employment in multi-end basin is summarized in Table 4.18 purchase of cocoons and sale of produce was attended by only family men (14.30 man days in a year). 330.7 man days of labour is generated in case of multi-end basin per year of which 49.65 per cent is from reeling operation and 19.98 per cent from rewinding. Of the total labour 75.86 per cent of labour work is attended by women and remaining is by men labour. 7.24 per cent of the work is attended by family labour itself.

4.4 The constraints faced by reelers of different silk reeling units.

The major problems faced by the respondents under the four reeling systems in the study area were elicited through opinion survey. These problems were expressed as the percentage of the opinion of the total number of respondents. Many respondents were expressed more than one problem are shown in table 4.19.

**Table 4.17: Employment generation per Filature-Basin (mandays/
year)**

SI No.	Type of operation	Men			Women			Overall
		Family	Hired	Total	Family	Hired	Total	
1	Purchase of cocoon	15.74	0.00	15.74	0.00	0.00	0.00	15.73 (2.78)
2	Cleaning/deflossing	0.00	0.00	0.00	0.30	10.35	10.65	10.65 (1.88)
3	Sorting/stifling	0.00	0.00	0.00	0.19	7.55	7.75	7.74 (1.37)
4	Brushing	0.00	0.00	0.00	0.12	9.16	9.29	9.28 (1.64)
5	Cooking	0.00	0.00	0.00	0.68	25.91	26.59	26.59 (4.71)
6	Reeling	43.07	316.91	359.98	0.00	0.00	0.00	359.97 (63.77)
7	Dead pupae collection Jute (silk waste) extraction	0.00	0.00	0.00	3.90	15.00	18.90	18.9 (3.34)
8	Rewinding	0.61	50.95	51.56	0.00	9.72	9.72	61.28 (10.85)
9	Skeining	3.59	0.00	3.59	0.00	8.11	8.11	11.7 (2.07)
10	Packing reeling yarn	0.37	13.25	13.62	0.25	0.00	0.25	13.86 (2.45)
11	Sale of produce	10.23	0.00	10.23	0.00	0.00	0.00	10.22 (1.81)
12	Overall supervision	0.86	17.35	18.20	0.30	0.00	0.30	18.50 (3.27)
Overall		64.23 (11.37)	398.45 (70.58)	462.68 (81.96)	15.96 (2.82)	85.81 (15.20)	101.78 (18.03)	564.46 (100)

Note: Figures in the parenthesis are percentages to the total

**Table 4.18: Employment generation per Multi-end Basin (mandays/
year)**

SI No.	Type of operation	Men			Women			Overall
		Family	Hired	Total	Family	Hired	Total	
1	Purchase of cocoon	9.70	0.00	9.70	0.00	0.00	0.00	9.7 (2.93)
2	Cleaning/ deflossing	0.00	1.20	1.20	1.30	5.50	6.80	8 (2.41)
3	Sorting/stifling	0.00	1.20	1.20	1.30	6.90	8.20	9.4 (2.84)
4	Brushing	0.00	2.10	2.10	0.00	7.10	7.10	9.2 (2.78)
5	Cooking	0.00	3.50	3.50	0.00	14.20	14.20	17.7 (5.35)
6	Reeling	0.00	28.40	28.40	0.00	135.80	135.80	164.2 (49.65)
7	Dead pupae collection Jute (silk waste) extraction	0.00	0.00	0.00	1.70	5.90	7.60	7.6 (2.29)
8	Rewinding	0.00	11.80	11.80	0.00	54.30	54.30	66.1 (19.98)
9	Skeining	1.70	0.00	1.70	0.00	7.40	7.40	9.1 (2.75)
10	Packing reeling yarn	1.10	2.30	3.40	0.80	8.70	9.50	12.9 (3.90)
11	Sale of produce	2.70	1.90	4.60	0.00	0.00	0.00	4.6 (1.39)
12	Overall supervision	3.70	8.50	12.20	0.00	0.00	0.00	12.2 (3.68)
Overall		18.9 (5.70)	60.9 (18.44)	79.8 (24.14)	5.1 (1.54)	245.8 (74.32)	250.9 (75.86)	330.7 (100)

Note: Figures in the parenthesis are percentages to the total

Table 4.19. Problems encountered by the reelers of Chintamani

SI No.	Particulars	Charaka (n=60)	Filature Basin (n=22)	Cottage Basin (n=3)	Multiend Basin (n=5)	Overall (N=90)
1	Working capital requirement	60 (100.00)	22 (100.00)	3 (100.00)	5 (100.00)	90 (100)
2	Procurement of cocoon	24 (40.00)	4 (18.18)	1 (33.33)	3 (60.00)	32 (35.55)
3	Building and storage	11 (18.33)	3 (13.63)	1 (33.33)	0 (0.00)	15 (16.66)
4	Water for reeling availability	22 (36.66)	7 (31.81)	2 (66.66)	3 (60.00)	34 (37.77)
5	Continuous supply of Electricity	15 (25.00)	4 (18.18)	2 (66.66)	2 (40.00)	23 (25.55)
6	Labour	59 (98.33)	21 (95.45)	3 (100.00)	5 (100.00)	88 (97.77)
7	Marketing	9 (15.00)	3 (13.63)	1 (33.33)	0 (0.00)	13 (14.44)
8	Machinery	7 (11.66)	3 (13.63)	0 (0.00)	1 (20.00)	11 (12.22)
9	Technical advice	3 (5.00)	2 (09.09)	0 (0.00)	0 (0.00)	5 (5.55)
10	Government policies	21 (35.00)	8 (36.36)	0 (0.00)	2 (40.00)	31 (34.44)
11	Institutional subsidy	11 (18.33)	5 (22.72)	1 (33.33)	1 (20.00)	18 (20.00)

Note: Figures in the parenthesis are percentages to the total sample size

Working capital problems like lack of institutional credit especially short-term credit availability faced by all reelers irrespective of reeling units. Labour is the important factor influencing any activity of production. Shortage of skilled labour especially women labour and also prohibition of child labour is considered as another major problem faced by in silk reeling as 97.77 per cent of reelers opined. 37.77 per cent of reelers opined Lack of water for reeling is another problem. 35.55 per cent of reelers opined procurement problems like malpractices during weighment of cocoons, lack of quality cocoons regularly. The other problems encountered by reelers are electricity, Institutional subsidy, building and storage facility, marketing, machinery and technical advice.



DISCUSSION

CHAPTER V

DISCUSSION

The results of the study are discussed in this chapter under the following headings.

5.1 Socio-economic characteristics of different group of silk reelers.

5.2 Financial viability of different silk reeling methods.

5.3 Employment generation capacity of different silk reeling units.

5.4 Constraints faced by reelers of different silk reeling units.

5.1 Socio-economic characteristics of different group of silk reelers.

The socio-economic parameters of the different reelers will likely to influence the different activities of reeling process in one or other way, thus it is very essential to understand the socio-economic profile of the reelers. The socio-economic features of the respondents such as age, education level, family size, pattern of ownership, organizational participation and professional experience in reeling are discussed in the light of their influence or bearing on the enterprise and in adoption of new technologies.

5.1.1 Age of the respondents

The distribution of the respondents age-wise was almost similar in both charaka and cottage basin units and majority of them were in old aged group indicating that the entrepreneurs prefer and continue the traditional technology itself (Table 4.1). As filature-basin and multi-end basin involves higher investment and higher risk compare to other two reeling systems practiced by relatively lower age group (Middle age)

entrepreneurs. Thus we can see a clear polarity between age groups and the recent technologies adopted.

5.1.2 Educational status of respondents

As the 28.33 per cent of respondents in the charaka reeling system were found to be illiterate the level of technology adopted by them was primitive (Table 4.2). When it comes to cottage and filature basin the educational status is on par with each other. Cent per cent of the respondents in multi-end basin were literate and the minimum educational level in is high school level. These statements boosts the statement of higher educated respondents were practicing advanced technologies like multi-end basin.

5.1.3. Family size of the respondents

The family size is an important decisive factor that indicates the availability of family labour and the capacity to save and re-invest in reeling. In the present study, the average family size among 4 categories of reeling was almost same with the type of reeling unit and quantity of cocoons reeled. The marginally higher family size in case of multi-end basin (Table 4.3).

5.1.4. Organizational participation of silk reelers

The participation in organizations like panchayat, reelers co-operative society, SHG'S and others is another factor influencing the level of adoption of technologies as the social participation is high in households of multi-end reeling system. Nearly 80.95 per cent of the households of the charaka reeling system are member of reeling co-operative society which may be due to their higher age and professional experience. The organizational participation is almost similar in cottage (66.67 %) and filature-basin (68.68 %) systems (Table 4.4).

5.1.5. Extent of professional experience

The higher level of experience in charaka reelers was mainly due to their continuation of the same traditional profession as 48.33 per cent of households were having professional experience of more than 21 years in silk reeling (Table 4.5) The lower level of experience among multi-end reelers mainly due to the establishment of the unit is happened recently, since this technology is evolved in recent years.

4.1.6. Ownership pattern of reeling units

The level of investment is the factor which influences the pattern of ownership of particular reeling unit. As seen in the table 4.6 in charaka and cottage basin units all were owned since lower level of investment and the converse happened in case of filature and multi-end basin reeling unit.

The findings of the present study are in line with that of previous study of Kumar *et al*, (2010) studied the awareness and pattern and level of adoption of various technologies among various socio economic groups, It was found that 50 per cent of the samples were of age 30-50 years and 96 per cent of the sample population having reeling as the main occupation Further it was also found that more than 90 per cent of sample population are having professional experience of more than 5 years.

5.2 Financial viability of different silk reeling methods.

5.2.1 Capital requirement for establishing reeling unit

The capital requirement for establishing a reeling unit is directly related with the level of technology. Higher the level of technology adopted for reeling, high will be the cost of establishment. As seen from the tables 4.7, 4.8, 4.9 and 4.10 The cost of establishing an charaka unit

with capacity of 5 charakas requires on an average Rs. 3,62,610 of which 88.24 per cent should expend on building and 6.75 per cent on reeling machine.

For establishing a multi-end basin reeling unit of average size of six multi-end basins requires on an average Rs. 10,82,975 of which 52.10 per cent should expend on building and 41.55 per cent on reeling basins. The capital required for establishing multi-end basins is almost thrice of capital required for establishing a charaka unit which is mainly due to higher cost of advanced technology.

So capital is a necessary input in economic development. Besides extension efforts, the government and financial institutions must come forward to help the charaka units to change over to improved technologies like filature and multi-end technology by providing financial support to acquire requisite training and establish improved units. Such a change over would not only augment the standard of living of reelers but also helps to meet the broader developmental objective of providing employment to the rural mass and reducing their income imbalances.

5.2.2 Annual average cost of production of raw silk yarn

Since the size and handling capacity are different in the charaka, cottage-basin, filature-basin and recently multi-end basin units, The annual average cost of production of raw silk yarn is also different so, the per basin cost is calculated and discussed (Table 4.11).

The higher total cost in multi-end basin (Rs 15,78,444) is mainly due to higher capacity which in turn requires more quantity of cocoons for reeling so the cocoons cost itself accounted for 82.05 per cent of total cost and the converse holds good in charaka. The higher cost (Rs 2066) in producing one Kg of raw silk in charaka is mainly due to lower input (cocoons) to output (raw silk) ratio i.e., 8.07 and the converse holds good

in multi-end basin. The fixed costs were accounted for 1.15 per cent in multi-end basin since higher investment on reeling unit.

The findings of the present study are in line with that of previous study of Jolly (1982), estimated the cost of silk production under charka and cottage basin systems. The cost of production of a kg of silk was Rs. 212 for charka and Rs. 226 for cottage basin. The share of raw material (cocoon) in the total cost worked out to 90.52 and 90.32 per cent, respectively.

5.2.3 Annual average yield of raw silk and by products per basin

Raw silk is the main product irrespective of reeling unit and by-products constitutes silk waste (jute), double cocoon, jelly and pierced cocoon and dead pupae. The differences in output (raw silk) reeled per basin per year is mainly due to their variation in efficiency and capacity, that's why the gross returns, net returns and the benefit cost ratio realized from reeling is highest in case of multi-end basin and least in case of charaka reeler eventhough the total cost is high in multi-end basin. The value of by-products generated was very low when compared to main product (raw silk) irrespective of reeling system. Among the by-products silk waste is most economical. So we can easily conclude the multi-end basin reeling system is most viable in all aspects when compare to other reeling systems.

5.2.4 Annual average gross and net returns and B:C ratio per basin

The gross returns realized from reeling is highest in multi-end basin since the capacity of this reeling system is relatively higher compared to other reeling systems. Apart from which the cocoon to raw silk (renditta) is also low is the main indicator of efficiency of production. The silk yarn reeled from this method is fine quality and good staple length, so which fetches relatively higher price in market. Hence the net

returns were also found to be highest in this reeling system. The B:C ratio indicator of viability was also found to be highest in this system since higher gross returns.

5.3 Employment generation capacity of different silk reeling units

Employment generation through rural work programmes cannot be sustained for long without economic development in rural areas. The expansion of agro-based industries which have direct developmental linkages with agriculture and allied activities is perhaps the most viable strategy for rural development.

Silk reeling industry is one such agro-based industry which provides an effective linkage between agriculture and industry. This industry has the capacity to tap the hidden potentialities of the rural industrial sector in the shape of traditional skills and crafts to provide remunerative employment opportunities to absorb the growing surplus labour in the rural areas. However, the employment generation potential of this industry needs to be empirically assessed. In this context, an attempt is made to estimate the quantum of employment generated and the labour employment pattern in these reeling systems.

Silk reeling being a highly labour intensive activity was found to generate about 407.82 man days of labour per year per charaka. It is very interesting to know that about 27.63 per cent employment is generated for family labour in charaka reeling system.

This reveals the traditional nature of charaka reeling system, where substantial amount of family labour is employed owing to limited resource endowment, unlike the other reeling systems who have better resource endowment are more commercial and hence hire skilled labour to increase productivity.

It was the reeling operation generated maximum employment in all reeling systems, since it is the most common and important operation irrespective of reeling system. It is the women labour played a crucial role in all reeling systems except in filature basin system, since in this system the men labour is most preferred as the heat generated is more and which is unsustainable by women labours.

As the operations like purchase of cocoons and sale of produce require out most care and market skill so these operations were attended fully by family men only in all reeling systems.

5.4 The constraints faced by reelers of different silk reeling units

The major problem faced by reelers irrespective of reeling system is working capital problems like lack of institutional credit especially short-term credit availability since the majority of the working capital includes expense on cocoon purchase. Labour is another important factor which includes crucial elements like Shortage of skilled labour especially women labour and also prohibition of child labour.

As the study area is placing chronic problem of drinking water itself, water for reeling is becoming one of the emerging problem. The malpractices during weighment of cocoons, lack of quality cocoons regularly is another problem faced at the market level. The other important problem is government policies as reelers not aware of imports of silk from china, changes in import tariffs and lack of remunerative price for domestic silk.

The other problems encountered by reelers are electricity, Institutional subsidy, building and storage facility, marketing, machinery and technical advice which are of less problematic.

The findings of the present study are in line with that of previous study of Hanumappa (1993) observed that the finance (working capital and fixed capital) was the major constraint for small scale reelers followed by the lower prices for the raw silk produced due to the import of raw silk at cheaper prices. Author also found that reelers in the study area had greater dependence on hired labourers than on family labourers.



**SUMMARY & POLICY
IMPLICATIONS**

CHAPTER VI

SUMMARY AND CONCLUSION

A brief summary of the research along with the salient findings is presented in this chapter. Also based on the conclusions drawn from this study, policy options are suggested for planners and administrators.

6.1: Introduction

Silk industry plays a crucial role in shaping the rural economy of India by providing employment to more than 68 lakh persons and streamlining the regular flow of income to many rural and semi-urban masses. It is an important agro-based rural cottage industry, which covers the gamut of sericultural activities like moriculture, silkworm rearing and cocoon production, silk reeling and other post cocoon production stages. Superiority of the end product, 'silk' has been recognized as a natural textile fibre and as one of the high-value, low-volume commodities to trade between the continents from time immemorial. Even today no other fabric can match its luster, durability, lightness, elegance and luxury.

Sericulture is a vital income and employment generating activity particularly to the most economically weaker sections of the society. Silk reeling is a main link in sericulture industry having backward linkage in terms of mulberry and cocoon production. The production of silk yarn is about 50 percent from charka, 40 percent from cottage basin and five percent each from the multi-end basins and dupion silk. The technological improvements in pre cocoon production stage over the years led to a considerable increase in the production of cocoon with some quality. But the Indian silk reeling industry has not made satisfactory qualitative and cost effective progress due to the

technological inertia and the poor economic status of people associated in reeling activity.

Silk reeling industry in India has not made much qualitative and cost effective progress. Presently the cost of raw silk production in China is around Rs.1000 per kg with fully controlled production and marketing by Government. The domestic demand in China is hardly 10-15 per cent. The cost of raw silk production in India is at a minimum of Rs.1600 per kg and production is almost private and having more than 90 per cent domestic demand. Silk Industry in India is an unorganized sector.

Therefore the present study was undertaken in Chikkaballapur district of Karnataka, with the general objective to know the various economic aspects and employment generating capacity and problems existed among reelers of various reeling systems.

6.2: Specific objectives of the study are:

1. To examine the socio-economic characteristics of different group of silk reelers.
2. To estimate the financial viability of different silk reeling methods.
3. To assess the employment generation capacity of different silk reeling units.
4. To analyze the constraints in different silk reeling units.

6.3: Methodology

The present study was taken up in Chintamani taluk of Chikkaballapur district which comes under Eastern Dry Zone of Karnataka. Multi-stage purposive cum random sampling procedure is adopted in selection of reeling units. In the first stage Chintamani taluk is selected purposively as it has second highest reeling units after

Siddlaghatta. In the second stage the list of villages in Chintamani taluk was prepared from information provided by Technical Service Centre (Reeling). From this list, seven villages were selected randomly (Table 3.2). Random sampling procedure is adopted in the selection Charaka (60) method of reeling and proportionate size is followed to select the sample in other three categories of silk reeling units like cottage-basin (3), filature-basin (22) and multiend-basin (5) from selected villages.

The primary data required for the study was collected from the randomly selected reelers on the socio- economic characteristics, inventory of implements and machinery, cost and returns of silk reeling, constraints faced by reelers through personal interview using pre-tested structured schedule. The data regarding silk reeling units, total labour employed in silk reeling, caste wise reelers and gender wise reelers under Chintamani taluk and general information of district were collected from Technical Service Centre (Reeling), Chintamani and District Statistical Office, Chikkaballapur.

6.4: Analytical techniques employed

For the purpose of achieving the objectives of the study, the data collected were subjected to statistical analyses. Tabular analysis was employed to analyze socio-economic characteristics of reelers, estimation of cost of production of raw silk under different (charka, filature basin, cottage basin, multi-end basin) reeling systems, gross returns and net returns from these systems of reeling. The existing level of employment, inputs use pattern, problems faced by the reelers, estimation of available loss, etc. were also analyzed by adopting this technique. The data were compared, contrasted and interpreted with the aid of averages and percentages.

6.5: Major findings

The important findings of the study are listed below:

- As filature basin and multi-end basin involves higher investment and higher risk compare to other two reeling systems practiced by relatively lower age group (Middle age) entrepreneurs.
- There is a clear polarity between age groups and the recent technologies adopted.
- As the 28.33 per cent of respondents in the charaka reeling system were found to be illiterate the level of technology adopted by them was traditional.
- Cent per cent of the respondents in multi-end basin were literate and the minimum educational level in is high school level.
- Most of the households irrespective of reeling system participated in reeler's co-operative societies.
- The organizational participation is high in households of multi-end reeling system.
- The higher level of experience in charaka reelers was mainly due to their continuation of the same profession for long time as 48.33 per cent of households were having professional experience of more than 21 years in silk reeling.
- The lower level of experience among multi-end reelers mainly due to the establishment of the unit is happened recently, since this technology is evolved in recent years.

- In charaka and cottage basin units all reeling units were owned since lower level of investment and the converse happened in case of filature and multi-end basin reeling unit.
- On an average Rs. 3,62,610 required for establishing a charaka reeling unit of which 88.24 per cent is expended on building and 6.75 per cent on reeling machine.
- On an average Rs. 5,92,350 required for establishing a cottage basin reeling unit of which 71.57 per cent is expended on building and 23.63 per cent on reeling basins.
- On an average Rs. 6,78,225 required for establishing a filature basin reeling unit of which 63.76 per cent is expended on building and 29.48 per cent on reeling basins.
- On an average Rs. 10,82,975 required for establishing a multi-end reeling unit of which 52.10 per cent is expended on building and 41.55 per cent on reeling basins.
- The higher cost (Rs. 15,78,444) in multi-end basin is mainly due to higher capacity which in turn requires more quantity of cocoons for reeling. The cocoons cost itself accounted for 82.05 per cent of total cost and the converse holds good in charaka.
- The higher cost in producing one kg of raw silk in charaka is mainly due to lower input (cocoons) to output (raw silk) ratio and the converse holds good in multi-end basin.
- The raw silk reeled per basin per year is least in Charaka (661.44 Kg's) reeler and highest in case of multi-end (859.13 Kg's) reeler.

- Among the by-products silk waste is most economical as the silk waste generated is highest in case of charaka (67.2 Kg's) and least in multi-end (11.04 Kg's).
- The gross returns realized form reeling is highest in case of multi-end basin (Rs. 18,83,849) and least in case of charaka (Rs. 14,21,646) reeler.
- Net returns realized is highest in multi-end basin (Rs. 3,05,405) and least in charaka (Rs. 54,546).
- The benefit cost ratio which is the main indicator of the financial performance of reeling units is found to be highest in case of multi-end basin (1.20) and least in charaka reeler (1.04).
- Renditta is important factor to be considered from the point of efficiency which is found to be very efficient in multi-end (6.90 Kg's) and least efficient in charaka reeler (8.07 Kg's).
- 407.82 man days of labour is generated in case of charaka per year of which 42.28 per cent is from reeling operation.
- It is the women labour played a crucial role in all reeling systems except in filature basin system.
- 25.63 per cent of the work is attended by family labour itself.
- It was the reeling operation generated maximum employment in all reeling systems, since it is the most common and important operation irrespective of reeling system.
- As the operations like purchase of cocoons and sale of produce require out most care and market skill so these operations were attended fully by family men only in all reeling systems.

- 330.7 man days of labour is generated in case of multi-end basin per year of which 49.65 per cent is from reeling operation and 19.98 per cent from rewinding.
- The major problem faced by reelers irrespective of reeling system is working capital problems like lack of institutional credit especially short-term credit availability since the majority of the working capital includes expense on cocoon purchase.
- Labour is another important factor which includes crucial elements like Shortage of skilled labour especially women labour and also prohibition of child labour.
- The malpractices during weighment of cocoons, lack of quality cocoons regularly is another problem faced at the market level.
- The other important problem is government policies as reelers not aware of imports of silk from china, changes in import tariffs and lack of remunerative price for domestic silk.

6.6: Conclusions

The following conclusions are drawn from the results of the present study.

1. The major problem faced by reelers irrespective of reeling system is working capital requirement like lack of institutional credit especially short-term credit availability since the majority of the working capital includes expense on cocoon purchase.
2. Socio-economic parameters like educational level, family size and organizational participation are having a direct bearing on the adoption of the innovative technology.while age and technology has inverse relationship.

3. Renditta is important factor to be considered from the point of efficiency which is found to be very efficient in multi-end followed by filature-basin,cottage-basin and charaka.
4. Although average annual net returns realized per basin is higher in multi-end basin and also benefit cost ratio is also more in multi-end basin followed by filature-basin,cottage-basin and charaka.
5. More women labours were employed for silk reeling systems in charaka, cottage-basin,multi-end basin were in filature-basin reeling system labour work is attended by men since the heat generated is more and which is unsustainable by women labours.

6.7: Policy Implications

From the findings of the study the following implications are drawn:

1. Besides extension efforts, the government and financial institutions must come forward to help the charaka units to change over to improved technologies like filature and multi-end technology by providing financial support to acquire requisite training and establish improved units.
2. Since the cocoon is the basic raw material accounted for above 80.00 per cent of the total cost of reeled silk, the cost-efficiency can be achieved more by reducing the cost of production of cocoon and improving its quality as there is no scope to reduce the cost of reeling.
3. As the all reelers irrespective of reeling units facing the problem of Working capital so institutional credit should be made available at reasonable interest rates.

4. The labours who are working with reeling machines were more prone to health hazards, so they should be brought under health insurance schemes like yashasvini scheme.
5. The fishery enterprise should be encouraged among reelers for efficient use of dead pupae and other waste as it also provides an additional income for their sustenance.
6. The authorities concerned and the policy makers should take appropriate steps to ensure less market charges and control of mal practices.



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CHAPTER VII

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