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Health and Sericulture
A Sociological And Medical Analysis

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Anand Inbanathan
Project Director

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Executive Summary

1. With 2470 reeling units and about 9000 persons directly employed in them, Sidlaghatta is one of the largest reeling centres in Karnataka. It is also a producer of superior quality silk yarn, a fact which ensures that units producing such yarn are active throughout the year.

2. The present study surveyed reeling and grainage workers---with a purposive sample of 250. This sample included 125 men and 125 women. A larger number of respondents were included from the Scheduled Castes, and Muslims, both groups being represented in substantial numbers in the reeling sector of sericulture. Out of this sample of 250, the majority were from reeling units, including owners and labourers, for a total of 233. Of the remaining 17 respondents, 16 were from a government grainage, and one was an LSP owner. To guard against researcher bias, as well as highlight various factors involved in the study, a control group was incorporated, with a sample of 86 from a non-sericulture village.

3. Reeling and working in grainages were the two activities which have substantial health problems, well documented even in earlier studies. The present study, therefore, was meant to go beyond just describing the health problems, but to suggest possible remedial measures to reduce the health problems.

4. On the basis of several indices, the majority of reeling and grainage workers are poorly endowed with what may be considered as the basic necessities of life: proper and adequate nutrition, reasonably comfortable living space, and other necessities such as education. With no continuous employment for most of these workers, their wages (daily wages for most of them) provided for only a very modest life style. Under their present circumstances, their occupational opportunities too were severely limited. Relatively large families, particularly among the Muslim respondents, exacerbated the economic problems.

5. With their low income and associated situation of life, the reeling workers' health is also at risk from time to time, and 51.1 per cent of the sample have had various disorders during the past one year. These disorders, according to the respondents themselves, include chronic problems such as

asthma; tuberculosis; to the less life threatening problems such as skin diseases.

6. Our sample of grainage workers and LSP owner (total 17) indicates that 15 of them (88%) have/had health problems. However, this should not immediately be construed as being causally related to the fact of working in the grainage. A larger sample would need to be surveyed before definite conclusions can be drawn regarding the incidence of health problems among grainage workers.

7. Women reeling and grainage workers have more health problems compared to men. This, in various degrees in the case of different women, could be related to: i. Women work for several months over the whole year in reeling and grainage activities, ii. They work not only in reeling/grainages, but also in looking after their homes (i.e. domestic chores), which together continue through the whole day, iii. Over several years, pregnancy and child birth affect women's health, since they work hard, and also do not have sufficient nutrition during the period of their pregnancy, iv. Women who already have respiratory problems such as asthma have to take medicines, and the combination of pregnancy as well as asthma medication involve higher expenses--- which most of the women cannot afford.

8. Although our sample of owners (four) cannot be considered adequate to make categorical statements on the owners' health situation, in our sample the owners were relatively less affected by health problems. They were not always present in the reeling unit, being more involved in the marketing part of their enterprises rather than in producing silk yarn.

9. Labourers working in reeling units are affected in several ways, and a significant number suffer from cough, wheezing, and more severe respiratory problems. Medication is taken from time to time, whenever they feel the problems are severe. But a substantial proportion of the respondents claimed that alcohol helped them sleep, and therefore, in their view, it was beneficial in reducing their respiratory problems. While a physician would not endorse such claims, we have to recognize that respondents acted on their beliefs, and as such this is a significant fact to be considered. We have also to consider the possibility that they are providing themselves with some justification to consume alcohol.

10. Two forms of health problems can be identified in the reeling units and grainages: those from an objectively observed outside source---such as the working environment, i.e. in reeling units and grainages. The second is a self-inflicted source, such as smoking beedis and cigarettes, and the consumption of alcohol. The first is clearly involved in the asthma which some reeling and grainage workers suffer from, after working in these units for a few years (occupational asthma). It is not easy to implicate the second in each of the cases of health problems among reeling and grainage workers. However, it is known in medical science that tobacco smoking and alcohol abuse adversely affect the health of individuals in many ways. It should also be noted that women too were consumers of alcohol, though in a smaller number than men. We also observed that a few women consumed alcohol even when they were pregnant, with unknown effects on themselves and the fetus.

11. About three quarters of the reeling labourers stated that, in their opinion, the smoke from boiling cocoons caused the major health problems—particularly respiratory problems. Even from a clinical point of view, the labourers are fairly close in their assessment-----steam with the allergens is inhaled by workers, which causes allergic reactions in many persons, resulting in respiratory problems, including asthma.

12. From the point of view of immediately visible effectiveness, reeling and grainage workers prefer allopathic medicines, rather than ayurvedic, or, "folk" remedies. Certain allopathic medicines work much quicker. However, while they may feel that allopathic medicines are more effective, this could be due to the use of steroid based drugs---which give quick relief, but in the long run, continued use of these drugs would cause several harmful side effects on the persons taking them. Folk remedies are perceived as providing only limited and temporary relief, while allopathic medicines provide relief for longer periods of time. Notwithstanding their belief that folk remedies are less effective, a very substantial proportion of the respondents use this form of "medication."

13. Poverty restrains the reeling and grainage workers from going more often to physicians, to save on consultation fees. But, they continue with medicines prescribed by the doctor for periods beyond what he had

originally prescribed them for, without the physician's continued supervision. Local physicians are aware of the harmful effects of steroid based drugs, and have even confirmed that they have advised workers to desist from taking these drugs indiscriminately. Apparently, the workers are willing to take the risk if they also see that these medicines enable them to go for work, and without having to miss their wages.

14. Consulting government doctors is preferred since they do not need to pay any fee, or at the most a nominal fee. There is also the possibility that they can get free medicines.

15. Since reeling and grainage workers are frequently prone to falling sick, or suffer from chronic health problems, they would like to have a doctor visiting their colony on regular occasions. They are even willing to pay a fee for this facility. At present, visiting a doctor entails not only a monetary fee but also considerable expense of time, which they can ill afford.

16. Working regularly is preferred, notwithstanding their health problems. They require a more steady income, which is immediately expended on their family, as well as for their personal expenses. Regular wages has a perceptible impact on the food they eat, in both quality as well as frequency of meals. When reeling units are closed, the workers face the necessity of reducing food intake. The additional expenditure on medicines, which the majority of workers need to buy, reduces the money for other necessities, even such basic requirements as more nutritious food.

17. With the relatively low wages, and also expenses which in some cases exceed their wages (the gap is usually made good through availing of advance against wages, from their unit owners), the possibility of building up savings is very limited. Under the circumstances, setting up their own units is also very difficult---although a few workers do manage this accomplishment. Therefore, upward social mobility through reeling activity is possible for only a few reeling labourers. One should note here that a few persons do, in fact, manage to save a modest amount. More men seem to be able to do this than women. We understand that these savings are effected through the insistence of women, who persuade men to spend what they want on alcohol etc., but keep aside at least a small amount as

savings. Most women spent virtually all their income on their families, so very few women could save anything from their income.

18. It is clearly seen that overall, the health problems are to a great extent related to the socio-economic conditions of the reeling and grainage workers. The fact that they have to take up these occupations, work in poor conditions, and also with poor nutrition, poor medical facilities (the facilities may be available, but are not always within the reach of the workers), and then, their poverty exacerbates the health problems.

19. A much longer term study has to be carried out not only to test the efficacy of clinical interventions but in the social sphere,

i) We have to be able to more clearly gauge how disabilities caused by occupational health problems affect the earning capacity of the individual, and more generally their quality of life. The effect on individuals and the families have to be examined separately over a relatively longer period of time, using well defined indicators.

ii) There is sufficient evidence to suggest that women are more severely affected when they are reeling/grainage workers. The fact that women work even when they are pregnant, in an environment which could cause health problems, would possibly affect the fetus--- and later, the infants. This could affect the physical and mental health of the child in both the short run and/or in the long run, and seriously affect his/her life chances.

Recommendations

This study has been carried out with the view to generate remedial measures that can control or reduce the health problems that are encountered through working in reeling and grainage activities. Social science and clinical methods have been utilized to highlight different aspects of the health problems. From the social perspective, it is clearly seen that poverty and associated factors are to a significant degree related to the health problems. Under the circumstances, what are the options available to address the health problems ?

Probably the most crucial factor which is related to the health problems is the technology which is being used, particularly in reeling. We are not concerned with any particular unit (such as charaka, or cottage basin), but almost all the reeling units are constructed in a manner, and using a level of technology where cooking and boiling the cocoons are carried out in an open oven, where the sericin-steam directly gets into the atmosphere. It seems probable that whatever other measures are taken, when the technology remains essentially the same, then the reduction in health problems would only be of a limited nature-----fire fighting measures, as it were. Considerably higher capital would be required to establish reeling units of a technology where closed ovens ensure that the sericin-steam is kept out of the working space of the units. And, if higher capital requirement becomes the norm, then the majority of people would not be able to set up their own reeling units, such as the small scale charaka units. Also, if higher level technologies are introduced on a large scale, then the poorer and less technically qualified people would not be able to get employment opportunities as at present, and as an anti-poverty programme sericulture would lose its viability. We suggest the following measures with these limitations in view.

Two broad options are available in controlling the health problems to workers in reeling units and grainages: one, is to improve the environmental conditions, reduce smoke, dust, etc. through improved ventilation etc., and the second option is to direct remedial measures at the workers themselves.

If the working environment was improved through a measure such as the introduction of the newly designed chute (tested in Ramnagaram and seems promising), to take out smoke from reeling units, the health problems too would be reduced.

A very large proportion of reeling units are built and run in extremely poor conditions, with virtually no ventilation, poor drainage, and in small congested surroundings. These aspects of the units' functioning could be improved through a sustained campaign, and also financial incentives, to persuade reeling owners to improve their units' working conditions. There is a perceptible lack of any sense of urgency or awareness of a need to change the working environment among reeling owners. Some of the health problems could certainly be reduced if these were done. NGOs could be involved in these exercises.

As allergy and resultant asthma affect only a proportion of the workers, perhaps financial and other forms of thrust may have to be directed towards treatment of the individual and monitoring his/her progress. A NGO could be entrusted with this responsibility, and reeling and grainage workers could be monitored over a period of about 1-2 years.

The present study emphasizes the degree of morbidity as assessed by clinical criteria in the form of symptoms and disability as well as by impaired lung functions. It was noted that the efficiency of the workers suffers due to the disease, as well as the cost of the treatment strains the already poor economic resources. A more serious dimension is the fact that many of these patients are placed on corticosteroids orally to control asthma symptoms. Steroids, undoubtedly, do cause significant reduction in asthma by a variety of biochemical mechanisms; but long term use of steroids can lead to systemic side effects; the more important of these are hypertension, diabetes, impaired immunity leading to frequent infections and loss of calcium from bones (osteoporosis). One of the most significant advances in the management of asthma in general has been the availability of inhaled steroids (namely, Beclomethasone, Budesonide and more recently, Fluticasone). These are extensively used in the treatment of asthma in our communities, wherever the patients can afford them. Inhaled steroids can cause reduction in asthma with minimal side effects. But the cost of these appear prohibitive in the context of the silk workers. Further, the inhalation devices and the proper use of them are difficult to teach even among educated people in the urban context; it would appear formidable in the field at large. One has to resort to large volume spacer devices which can deliver aerosol medications more effectively and can be taught easily. But the cost may again be an inhibiting factor, though the spacer device is a one-time investment. Unfortunately, there is a paucity of studies addressed towards the trials of inhaled steroids in the setting of common

occupational asthma models. Further, it is not known whether asthma in general responds more readily than the occupational variety.

In view of these observations, we decided to administer long acting theophyllin and non-sedating antihistamine to a group of asthmatic subjects. These were given as Theophyllin (Theolong) 100 mg once at bedtime or twice daily, depending on the severity of asthma; and cetirizine hydrochloride 10 mg was given at bedtime. After a period of four weeks, most patients reported some degree of reduction of symptoms, particularly nocturnal symptoms during the study period. Perhaps a controlled trial of inhaled steroids, in a study group can be very useful to answer the question of an alternative to oral steroids.

Tuberculosis: It was noted during the study that as many as seven subjects had developed pulmonary tuberculosis and needed treatment. None of the control subjects (clinical) had pulmonary tuberculosis. Though definitive conclusions can perhaps not be drawn about this, one is intrigued by the rather high prevalence of tuberculosis in the silk setting. It is well known that oral corticosteroids impair cell mediated immunity and hence it is tempting to implicate steroids as the cause for reactivation of tuberculosis among some of the workers. But it has to be noted that the subjects with tuberculosis were not steroid dependent; it is, however, possible that occasional steroid use may have been resorted to by these asthmatics when asthma was severe. Also, it is noteworthy that there were non-asthmatic subjects who had contracted tuberculosis among the study group. It is hence more likely that the congested living conditions might have been conducive to the lateral spread of tubercular infection.

In this context, it is worth noting that some occupational pneumoconiosis such as silicosis can predispose some individuals to tuberculosis of the lungs. It is not clear whether asthma, in some complex way, reduces the local immune mechanisms and predispose to break-down of tuberculosis. Overall, it is felt that the higher prevalence of tuberculosis needs to be looked into in greater detail with epidemiologically controlled data documentation.

Pediatric Population: During the course of the study we noted that a large number of young children, including infants in arms, were exposed to silk environment. As noted earlier, sensitization is occurring at a young age. It is imperative that studies by pediatricians be conducted to see the extent of the

problem and the possible long term implications of the exposure.

In conclusion, the data obtained from this study, denote that there is substantial morbidity due to asthma in silk workers. The prevailing socio-economic conditions do not seem to favour environmental manipulation as the major alleviating factor. It would appear that provision of long term bronchodilators and perhaps anti inflammatory drugs such as inhaled steroids to the asthma subjects may be the viable option to mitigate the suffering as well as minimize side effects due to steroids.

Health and Sericulture: A Sociological and Medical Analysis

Chapter I

Introduction

Activities related to sericulture development in India, through government efforts as well as those of other agencies, are meant to raise the economic standards of the poor people, improve their employment and income prospects, and thereby improve their quality of life. When any development activity also has some negative impact on the beneficiaries, or those involved in such an activity, one should carefully consider the direction that development is taking, and whether such development is desirable in its present form, and what interventions are required to remove or reduce the negative aspects of development. Sericulture has some negative effects, on the health of reeling and grainage workers. And thus, when we think of encouraging sericulture development, the health aspects also have to be addressed, or else, we would in effect, also be encouraging health problems.

There are several facets involved in the economic lives of people, the ways in which they see things, the way they organize their lives depending on the social conditions around them, the government's interventions in development programmes etc. All these give them a means of deriving

sustenance from whatever economic activities that may be available to them. With sericulture being an important source of income and employment for a significant number of people in Sidlaghatta (Kolar district) the reeling and grainage workers organize their lives around these activities. However, the issue here is not that all of them uniformly organize their lives in any specific way, but that their adaptation to their environment, both social and economic, is in ways that they are already familiar with, and may be handed down from generations of reeling and grainage workers. In days past, where health problems were endured, without much possibility for medication or succour, health issues may not have received much attention. But now, with advances in technology, as well as in medicine, it should be possible to manipulate the work situation in such a way that the workers suffer the least harm on their health

The maximum adverse impact on health is felt by those working in reeling units, followed by those who work in grainages. Details to support this statement would be provided in the text of this report.

In the present study an effort has been made to study the health hazards of the reeling and grainage workers in the sericulture industry as these labourers are more prone to health problems compared to mulberry cultivation, silkworm rearing, silk weaving and other processing activities

in the industry. The present effort is not merely to assert that there are health problems, a fact well known already, but that there may be some means by which the problems can be minimized, and that the quality of life of the workers and others may be enhanced (from their present situation) even if they were adversely affected by working in a reeling unit or grainage.

Silk reeling involves working with hot water, dead pupae, and workers are exposed to smoke and hot and humid conditions in the reeling unit. It is already known that a chemical called sericin found in silk cocoons causes allergic reactions in some persons, and leads to respiratory problems as well as asthma. While cooking the cocoons, the chemical is released with the steam, and inhalation of this by the labourers leads to respiratory problems. The labourers are also prone to fungal and bacterial infections on their hands and feet, and blisters on their hands. Other health problems encountered in these units include eye irritation, stomach pain, irregular menstruation, etc. whose direct link with reeling is, at the moment, difficult to confirm. Tuberculosis has also been observed in some of the workers. Here again, it is difficult to see any causal link between sericulture and tuberculosis, but will be more fully dealt with in the clinical sections of this report.

It should be noted that this study follows another, earlier study which was done three years ago[1] in Ramnagaram, and the present one tries to go beyond what was observed in that study. Further, the Ramnagaram study was on a much smaller scale, and we expect the present study to confirm conclusions as well as highlight issues and facts which were not observed or reported through the earlier study. Having said this, there are bound to be some facts and information that *appear* to be "repetitions." This is inevitable, but as a study which has been carried out after a gap of three years, it has its own utility, when we can confirm and elaborate on matters which we had considered even earlier.

Terms of Reference

1. Study the health problems of reeling and grainage workers who are prone to occupation related health hazards, with a view of understanding and suggesting measures of controlling such problems.

2. Address the paucity of scientifically arrived at knowledge about sericulture and health.

3. Analyze the possibility of the health hazards being linked to the existing technology in practice.

4. Assist in designing a strategy to reduce the general level of ignorance about health aspect and sericulture, as well as improve their control, among the reeling and grainage workers.

5. Compiling of a data base, of reeling labourers, reeling unit of owners and workers in grainages. This includes social and clinical

[1] Anand Inbanathan, Om Prakash and others, "Sericulture and Health: Rearing, Reeling and Working in Grainages," a Beneficiary Assessment Report, December 1995, Document no: ISEC/BA/74.

indicators.

6. Preparation of status papers based on Primary and Secondary data.

7. Suggestions for further designing of action plans in the identified area based on the above.

Methodology

The study was carried out in Sidlaghatta town. The data for the present study were collected from primary and secondary sources. Documentary data were collected from the Department of Sericulture, Sidlaghatta, and census reports; and other published material too were utilized. The primary data at the household level were collected by canvassing pre-tested structured questionnaires specially prepared for the study.

Sidlaghatta was selected as the place where the study would be conducted since it is a large reeling centre, also has grainages in the town, and is known as an important area for superior quality of silk. The study focuses mainly on reeling labourers, but has also included owner labourers, small entrepreneurs, and grainage workers, as they are directly involved in the silk reeling, and the latter group in the production of seed. The crucial factor here is that these persons are physically present in the reeling unit/grainage, which could affect the health of individuals.

In addition to the above, qualitative data were collected to strengthen the

results which emerged from the quantitative analysis by using participant observation and case study methods. Additional information on sericulture was sought from municipal councilors, local physicians, and government sericulture staff.

As a study on health was earlier carried out in Ramanagaram, the next largest reeling centre, Sidlaghatta, was chosen for the purpose of the present study. For this study, we have a sample of 250, from 14 localities of the town. The information gathered from these 250 include not only facts about the respondents themselves, but also about their households. Data were collected using a pre-tested questionnaire specifically developed for the study. This was a purposive sample. A purely "random" sample was not considered appropriate, for various reasons. In the context of reeling, the majority of people working in reeling units are members of Scheduled Castes, and Muslims. For our sample, we decided that these two groups would need to be better represented in the study. Hence, they were located in the areas where they were living, predominantly in such colonies as Adi-Karnataka Colony, Kote, Karmiknagar, Gandhinagar and Azad Nagar, Filature quarters (near cocoon market). These were also colonies where there were substantially larger numbers of units, and therefore, also workers (details of number of units in these colonies were provided by the sericulture Technical Service Centre). Exact figures of the

number of functioning units as well as the total number of workers in reeling were not available. Hence, a certain limitation was imposed on us in trying to estimate how many from each group should be included within our sample. We had decided at the outset that there should be an equal number of men and women in our sample, and thus, there are 125 of each. Finding respondents was through locating them in their living quarters---interviewing them in their units was not feasible, because the administration of the questionnaire involved about two hours, which was not available while they worked. Moreover, they had to be contacted over several visits. An attempt was also made to take a "random" sample of respondents, but even here the limitation was that workers/labourers were not always available when we went to their homes. Hence, at times, we had to meet and interview only those we could find, and not wait until someone else, presumably selected on a more "random" basis was available. We must state that with people living in each colony being of more or less the same socio-economic background, an even more strict application of the principle of "random selection," would not have derived any significantly different result than we did. Ultimately, so far as a statement of prevalence or incidence of health problems is concerned, we should acknowledge that this study can only provide broad trends, and indications of the health problems in reeling units and grainages , and generate hypotheses. A more extensive, ***epidemiological*** survey would be

needed to confirm and validate our statements on this particular issue (i.e. prevalence).

A further factor which we have taken into consideration in this study is a "control group" of persons not in any way connected with reeling or grainages. This is a group which roughly corresponds to the Sidlaghatta sample, inasmuch as most of the sample are in a lower income group as in Sidlaghatta. Other than that, there are several differences, which we will highlight from time to time. In the presentation of data, we would try and include with each table, information about Sidlaghatta and also the "control" village i.e. Hosahalli (Tumkur district).

Though a "control group" was incorporated within the research design to answer the question whether the occupation alone was related to health problems, it does not provide all the answers. The dependent variable here is the state of health of the sericulture/agriculture labourers and the independent variable is their occupation. Ideally, the control group should be similar to the research group except for the occupation. Similarities in the general conditions should include geographical area, age, sex, health, quality of life[2] etc., to confirm the causality of the health problems in the

[2] This includes indicators such as food consumption, living conditions, water, sanitation, education, health, which we have included in our study.

sericulture industry. However, our major problem was in locating a suitable "control group." We tried to overcome this difficulty also through including case studies, that helped in a more in-depth understanding of the problems of health and sericulture. It should be noted here that a control group was clearly necessary for the clinical analysis of health problems----but the need for a control group in the social science section was less apparent.

Sidlagatta: A Profile:

Sidlagatta is one of the 11 taluks in Kolar district of Karnataka state. The Hindu population in Sidlaghatta is slightly higher than the Muslim population. Sericulture activities like silk reeling, silk twisting and production of silk worm eggs [disease free layings (DFLs)] are the major occupations of the people. Most of the town population depends on silk reeling activity for their livelihood. The villages surrounding Sidlaghatta also depend on sericulture, and agricultural activities are also related to sericulture.

Sidlagatta taluk has a population of 1,68,162 and Sidlaghatta town constitutes about 15 per cent of the taluk's population. Of the total urban population of 25,157 the male and female population comprise 51.63 and 48.37 per cent respectively. In the entire taluk, there are about 32,389

Scheduled Castes and 12,969 Scheduled Tribe population, of which 50.4 and 49.6 per cent of SCs are the male and female population respectively. Out of 12,969 STs, 50.24 and 49.76 per cent are males and females respectively. Of the total population in Sidlaghatta taluk 40.17 per cent are literate, which is much below the state average of 56.05 per cent. The literacy rate among the males is 50.64 per cent and among the females it is 28.72 per cent.

Reeling in Sidlaghatta Town:

Of the total reeling units, the cottage basin reeling technology constitutes the highest, 58.87 per cent of the total 2470 reeling units. Charka reeling units are 877 constituting 35.51 per cent. There are 135 dupion reeling units (5.47 per cent) and four multi end units in the study area. In addition to the above, four weaving units are found in Sidlaghatta town. The quality of raw silk produced for the Surat market fetches the highest price as these merchants are willing to pay even a higher price for the specified quality of silk. The reeling industry[3] in Sidlaghatta generates employment for about 9,000 people of which about 80 per cent work in filature units followed by charka (17.68 per cent) and dupion silk reeling (2.50 per cent). During 1990-91 the raw silk production was 658 tonnes in

[3] This information—on reeling, was provided by officials of the Department of Sericulture, based at Sidlaghatta.

Sidlaghatta which has increased to 917 tonnes in 1996-97. The annual growth of raw silk production in Sidlaghatta town is 6.57 per cent.

G. Hosahalli – A Profile

With a view to comparing the health situation of people who are in reeling and grainages with non-reeling/grainage workers, a village in Tumkur district, G. Hosahalli (Gubbi taluk) was selected. This is also intended to act as a "control," with the Sidlaghatta workers as the main part of the study. Finding a village which had no sericulture activity, in Kolar or in a neighbouring district was not very easy. Most villages in the vicinity of Sidlaghatta had sericulture as an important activity. As it happened, many parts of Tumkur had taken up sericulture too. Finally the village chosen had agriculture as the main occupation, but without anyone being involved in sericulture in a radius of about 5 kilometers. A "control" which had to be as similar as possible to the original group, and at the same time has some significant differences was also considered when this selection was made. In this sense what we had in mind was the overall economic activity of a place such as Sidlaghatta, which was essentially a single industry town. In comparison, G. Hosahalli is a village which has agriculture as its main occupation. Differences are clearly evident in the environment of the two places, the habitation, drainage and general

sanitation of the two places (Sidlaghatta being the worse off, and G. Hosahalli being far cleaner).

This is a multi-caste village with about 350 households, and a total population of 1922 persons. Around 48 per cent of this population are literate, with the male literacy rate higher than the female literacy rate. Around 29 per cent of the total population belong to SC/STs. The major castes in the village are Lingayats, SC/ST, and Tigalas, in addition to other castes like Madivala Shetti, and Brahmin. The total geographical area of the village is 725 hectares of which 416 hectares are cultivated land. The major crops grown in the village are paddy, ragi, coconut, arecanut, horse-gram, banana, pulses, and vegetables.

The sample from Hosahalli includes a majority of Hindus (98 per cent) and the rest are Muslims (2 per cent), with 85 per cent being married. Of the total respondents 82.6 per cent are healthy and only 17 per cent have health problems. This clearly indicates that, by their own perceptions, the respondents in Hosahalli are healthier than the respondents in Sidlagatta who are working in silk reeling, and in grainages.

The Labourers working in charka technology is 35, constituting 14 per cent. The respondents from cottage basin technology are a higher number, constituting 172 i.e. 68.8 per cent of the total sample. The sample also includes grainage workers, who constitute 6.8 per cent of the total sample.

The reeling and grainage workers in our sample had taken up this work from a relatively early age. About 22 per cent of the reeling labourers had taken up the profession when they were in the age group of 6-10 years. Just over 50 per cent were below 15 years of age when they joined reeling (Table-2). On the other hand, the age at joining grainages was comparatively higher than with reeling workers.

Table 2

Age When Joined Reeling/Grainage Activity (Sidlaghatta)

	Grainage				Reeling			
	6-10 years	11- 15 years	16 & above	Total	6-10 years	11- 15 years	16 & above	Total
Male			9 100.00%	9 100.00%	25 21.60%	44 37.90%	47 40.50%	116 100.0%
Female		1 12.50%	7 87.50%	8 100.00%	26 22.20%	31 26.50%	60 51.30%	117 100.00%
Total		1 5.90%	16 94.10%	17 100.00%	51 21.90%	75 32.20%	107 45.90%	233 100.00%

There were more males who joined sericulture activities before 15 years of age, as compared to females. Of the 126 reeling workers, 48.7% per cent of women, and 59.5 per cent of men joined before 15 years of age (Table –2). And, a larger proportion of Scheduled Caste workers in reeling had joined at the very young age of 6-10 years (See Table 3)

Table 3

Age when joined Reeling/Grainage Activity (Sidlaghatta)

	Grainage				Reeling			
Caste	6-10 years	11- 15 years	16 & above	Total	6-10 years	11- 15 years	16 & above	Total
SC & ST		1 14.30%	6 85.70%	7 100.00%	19 29.70%	18 28.1%	27 42.2%	64 100.0%
Muslim			4 100.00%	4 100.00%	23 19.0%	43 35.5%	55 45.5%	121 100.0%
Christians							1 100.0%	1 100.0%
Other			6 100.00%	6 100.00%	9 19.1%	14 29.8%	24 51.1%	47 100.0%
Total		1 5.90%	16 94.10%	17 100.00%	51 21.9%	75 32.2%	107 45.9%	233 100.0%

In Sidlaghatta town the family size of the Muslim families is generally higher than that of other communities (Table 4). While the labourers are poor, they are also aware that family size can have a bearing on education, for example, and that they are "condemned" to silk reeling.

Table 4

Family Size (Sidlaghatta)

Family size Group	SC & ST	Muslim	Christian	Other (Hindu)	Total
1-4	48 67.6%	68 54.4%	1 100.0%	34 64.2%	151 60.4%
5-7	20 28.2%	52 41.6%		17 32.1%	89 35.6%
8 and above	3 4.2%	5 4.0%		2 3.8%	10 4.0%
Total	71 100.0%	125 100.0%	1 100.0%	53 100.0%	250 100.0%

Around 52 and 45 per cent of the respondents' family size ranges between 5-7 and 1-4 persons respectively in Hosahalli (Table 4a)

Table 4 a

Family Size (Hosahalli)

Family Size	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
1-4	19 48.70%		13 48.10%	1 50.00%	2 28.60%	1 100.00%	3 42.90%		39 45.30%
5-7	18 46.20%	2 100.00%	14 51.90%	1 50.00%	5 71.40%		4 57.10%	1 100.00%	45 52.30%
8 & Above	2 5.10%								2 2.30%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

As Muslims are predominant in the reeling industry of Sidlaghatta town, greater representation was given to Muslims, followed by SC/ST labourers. Other castes (means Hindus other than SC & STs) constitute 21.20 per cent of the total sample. The lone Christian respondent is a woman who

was converted very recently from the SC community (Table –5).

Table 5

Respondents and Religion/Caste (Sidlaghatta)

Communities	Frequency	Percent
Hindus		
SC & ST	71	28.4
Other	53	21.2
Muslim	125	50
Christian	1	0.4
Total	250	100

Table 5a

Distribution by caste/religion (Hosahalli)

Communities	Frequency	Percent
Madiga	39	45.3
ST	2	2.3
Lingayats	27	31.4
Muslims	2	2.3
Tigalaru	7	8.1
Brahmin	1	1.2
Madivala Shetti	7	8.1
Other castes	1	1.2
Total	86	100

Owners who are directly involved in their family's reeling (small units) and owner labourers (who own the units but reel for wages) are also considered (Table 6). However, the reeling labourers were the major section of the sample.

Table 6

Respondents and occupational status (Sidlaghatta)

Occupation	Frequency	Percent
Reeling Owner	4	1.6
Owner Labourer	46	18.4
Reeling labourers	183	73.20
Grainage Workers	17	6.8
Total	250	100

Table 6a

Respondents and Occupational Status (Hosahalli)

Occupation	Frequency	Percent
Land Owner	12	14
Owner Cultivator	52	60.5
Agricultural Labourer	22	25.6
Total	86	100

Education of the Respondents:

Of the total 250 respondents 63 per cent were illiterate, and 21 per cent of the respondents were in the category of minimum education i.e. lower primary to middle school, and the remaining 16 per cent had studied upto high school and above (Table – 7). The SCs had the poorest levels of education, closely followed by Muslims. In considering the possibility of

social mobility and also whether the labourers can find other employment, the fact that such a high proportion of workers were illiterate greatly reduces their opportunities for alternative employment. In this context, respondents stated that if they were to study upto high school, they may be able to find a government job, which was considered as the most preferred form of employment. We bring up this matter because alternative employment may reduce the impact of occupational health problems particularly among the more severely afflicted cases of occupational asthma.

Table 7

Education and Caste/Religion of the Respondents (Sidlaghatta)

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Illiterate	51 71.80%	83 66.40%		24 45.30%	158 63.20%
Less than 4 years	2 2.80%	2 1.60%			4 1.60%
Primary	4 5.60%	11 8.80%	1 100.00%	4 7.50%	20 8.00%
Middle	7 9.90%	17 13.60%		7 13.20%	31 12.40%
High School	6 8.50%	12 9.60%		15 28.30%	33 13.20%
PUC				3 5.70%	3 1.20%
Any Degree	1 1.40%				1 0.40%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Most of the illiterate people of this village (Hosahalli) belong to SCs comprising 68 per cent (Table 7a). The highest literacy rate is found among Lingayats which is a forward community (Table-7a).

Table 7a

Education and Caste/Religion of the Respondents (Hosahalli)

Particulars	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madiva Shetti	Other castes	Total
Illiterate	27 69.20%	1 50.00%	6 22.20%		2 28.60%		3 42.90%	1 100.00%	40 46.50%
Less than 4 years	1 2.60%		1 3.70%						2 2.30%
Primary	2 5.10%	1 50.00%		1 50.00%	2 28.60%		1 14.30%		7 8.10%
Middle	2 5.10%		6 22.20%		2 28.60%		1 14.30%		11 12.80%
High School /SSLC	3 7.70%		9 33.30%	1 50.00%	1 14.30%	1 100.00%	1 14.30%		16 18.60%
PUC	2 5.10%		2 7.40%				1 14.30%		5 5.80%
Diploma			1 3.70%						1 1.20%
Any Degree	2 5.10%		2 7.40%						4 4.70%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

Several males have studied up to high school and beyond, but the educational levels of women in reeling and grainages are not as high (Table-8)

Table 8

Gender and Educational Level (Sidlaghatta and Hosahalli)

Sample	Gender	Illiterate	Less than 4 years	Primary	Middle	High School	PUC	Diploma	Any Degree	Total
Sidlaghatta	Male	62 49.60%	4 3.20%	9 7.20%	20 16.00%	27 21.60%	2 1.60%		1 0.80%	125 100.00%
Hosahalli	Male	24 35.80%	1 1.50%	6 9.00%	11 16.40%	15 22.40%	5 7.50%	1 1.50%	4 6.00%	67 100.00%
Sidlaghatta	Female	96 76.80%		11 8.80%	11 8.80%	6 4.80%	1 0.80%			125 100.00%
Hosahalli	Female	16 84.20%	1 5.30%	1 5.30%		1 5.30%				19 100.00%
Total		198 63.20%	6 1.60%	27 8.00%	42 12.40%	49 13.20%	8 1.20%	1	6 0.40%	336 100.00%

Among the female respondents (Hosahalli) 84 per cent were illiterate but only 36 per cent of the males were illiterate (Table-8).

All the reeling owners have studied upto high school, while owner labourers have a range of educational levels from those who were illiterate to one who was a graduate. Grainage labourers in our sample were mostly illiterate. This may be because the silk reeling labourers were a relatively younger group and may have had better educational opportunities than grainage, workers whose average age was higher. They (grainage workers) may have had poorer educational facilities in their younger years (Table 9).

Table 9

Education and Occupational Status (Sidlaghatta)

Particulars	Reeling Owner	Reeling Owner labourer	Reeling Labourer	Grainage Labourer	Total
Illiterate		22 47.80%	123 67.20%	13 76.47%	158 63.20%
Less than 4 years		2 4.30%	2 1.10%		4 1.60%
Primary		5 10.90%	15 8.20%		20 8.00%
Middle		9 19.60%	22 12.00%		31 12.40%
High school / SSLC	4 100.00%	7 15.20%	19 10.40%	3 17.64%	33 13.20%
PUC			2 1.10%	1 5.88%	3 1.20%
Any Degree		1 2.20%			1 0.40%
Total	4 100.00%	46 100.00%	183 100.00%	17 100.00%	250 100.00%

Table 9a

Education and Occupational Status (Hosahalli)

Particulars	Agriculturist	Owner Cultivator	Agricultural Labourer	Total
Illiterate	1 8.30%	24 46.20%	15 68.20%	40 46.50%
Less than 4 years		1 1.90%	1 4.50%	2 2.30%
Primary		5 9.60%	2 9.10%	7 8.10%
Middle	3 25.00%	7 13.50%	1 4.50%	11 12.80%
High School/SSLC	4 33.30%	10 19.20%	2 9.10%	16 18.60%
PUC	2 16.70%	2 3.80%	1 4.50%	5 5.80%
Diploma	1 8.30%			1 1.20%
Any Degree	1 8.30%	3 5.80%		4 4.70%
Total	12 100.00%	52 100.00%	22 100.00%	86 100.00%

In the course of interviewing reeling and grainage workers, we had also asked why they chose to take up these occupations. Several reasons were given in answer to that question. In many respects reeling labour, for example, is tedious, the work is in a poor environment, and the possibilities of occupational advancement are limited. Therefore, there should be compelling reasons for anyone to take up employment as reeling labourers.

Our data (Table – 11) reveal that of the 10 reasons to take up reeling activity, *No other alternative* is the major reason for taking up reeling activity by the labourers, where 65.20 per cent have said they had no other alternative. In the context of why anyone should choose to take up reeling or grainage activities, we should also consider the fact that three fourths (75.2%) of the reeling and grainage workers were born in Sidlaghatta town or neighbouring villages. One fourth had migrated from elsewhere, either within Karnataka or another state. An immediate point that occurs here is that most people prefer to remain near their place of birth, and look for employment within this area itself. If occupational opportunities are limited then we would find them concentrated in types of work which to an outsider, may appear a poor means of earning a livelihood. An additional factor is that a significant number of respondents (43 per cent) stated that their parents (one or both) had also been/or still are, working in reeling.

This, in many ways, also predisposes them to take up reeling work (Table-10).

Table 10

Parents working in Reeling/Grainage

Parents in reeling/ Grainage	Grainage	Reeling	Total
Yes		101 43.30%	101 40.40%
No	17 100.00%	132 56.70%	144 57.60%
Total	17 100.00%	233 100.00%	250 100.00%

Among the relatively negative features of reeling/grainages is that a significant proportion of reeling and grainage workers suffer from health problems after working in these activities for a few years. However, we should also note that to the reeling labourers themselves, reeling work has advantages over agriculture, and with all its problems, things could have been worse.

Table 11

Reasons for opting to work in reeling/grainage, across caste/religion

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Easy to get job	1 1.40%	2 1.60%		3 5.70%	6 2.40%
Family problems	8 11.30%	11 8.80%		3 5.70%	22 8.80%
Can make money	3 4.20%	13 10.40%	1 100.00%	7 13.20%	24 9.60%
No other alternative	48 67.60%	86 68.80%		29 54.70%	163 65.20%
Continuous work		1 0.80%		1 1.90%	2 0.80%
Parents insisted on work	1 1.40%	4 3.20%		1 1.90%	6 2.40%
Work is easier	5 7.00%	6 4.80%		2 3.80%	13 5.20%
Safety of Government Job	3 4.20%	1 0.80%		6 11.30%	10 4.00%
Know only this job	2 2.80%			1 1.90%	3 1.20%
Nearness to the residence		1 0.80%			1 0.40%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

On the other hand, if a permanent job materializes, or a loan is given to establish some other business, the labourers are ready to leave the reeling job. The gender-wise breakup for the reason that reeling and grainage workers take up this kind of work is given in (Table-12). A much larger

number of men, compared to women, have claimed that they can make money by taking up reeling work. This may be due to the manner in which family life and gender values manifest themselves in these occupations. Men can set up units, seek loans and carry out marketing activities in a far more facile manner than women. Though men too would have difficulties in setting up and running reeling units, it is still more realistic for men to consider the possibility of setting up their own units.

Table 12

Gender-wise Reasons for Taking up reeling/grainage work (Sidlaghatta)

	Easy to get job	Family problems	Can make money	No other alternative	Continuous Work	Parents insisted on work	Work is easier	Safety of Government Job	Know only this job	Nearness to the residence	Total
Male	3	8	21	74	1	2	7	7	1	1	125
	2.40%	6.40%	16.80%	59.20%	0.80%	1.60%	5.60%	5.60%	0.80%	0.80%	100.00%
Female	3	14	3	89	1	4	6	3	2		125
	2.40%	11.20%	2.40%	71.20%	0.80%	3.20%	4.80%	2.40%	1.60%		100.00%
Total	6	22	24	163	2	6	13	10	3	1	250
	2.40%	8.80%	9.60%	65.20%	0.80%	2.40%	5.20%	4.00%	1.20%	0.40%	100.00%

A working day in a reeling unit:

The number of hours that a worker puts in varies from time to time. When cocoon prices are low, then more cocoons are bought, and workers work longer hours (including over time). However, the figures we have presented are meant to indicate very roughly, an average working day for a reeling worker (Table 13). There are a few persons who may work for a shorter

period in a reeling unit and then take up selling vegetables, ice cream, groundnuts or green peas.

Table 13

Hours of work per day

Number of Hours	SC & ST	Muslim	Christian	Other (Hindu)	Total
1-5	5 7.00%	7 5.60%		3 5.70%	15 6.00%
6- 8	27 38.00%	57 45.60%	1 100.00%	33 62.30%	118 47.20%
9 and above	39 54.90%	61 48.80%		17 32.10%	117 46.80%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

The number of days a worker is involved in reeling activities (Table 14) over a year is difficult to confirm with any great degree of confidence. We had to depend on the respondents' memory, and their ability to estimate the number of days in a week they worked, the number of days in a month etc., over a year, and without the help of any written records. In a very general manner we can say that a substantial number of people have many days in a year when they do not get any income from reeling or grainages (i.e if they are not permanent employees). A few of our respondents have, in these circumstances, taken up petty business activities to earn something to support themselves and their families.

Table-14

Number of days worked in a year

Range of Time in Days	SC & ST	Muslim	Christian	Other (Hindu)	Total
1 – 150 days	5 7.00%	3 2.40%		2 3.80%	10 4.00%
151 – 200 days	17 23.90%	28 22.40%		4 7.50%	49 19.60%
201 – 250 days	22 31.00%	58 46.40%	1 100.00%	23 43.40%	104 41.60%
251 – 300 days	12 16.90%	22 17.60%		9 17.00%	43 17.20%
300 & above	15 21.10%	14 11.20%		15 28.30%	44 17.60%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

In the course of a year, many factors could intervene to reduce the number of days that a person can work. These factors are listed in Table- 15. Closure of units is one of the major problems in reeling, and another major problem is illness. Female labourers appear to be more prone to illness, which we will discuss later (Table 16).

Table-15

Reasons for stopping work

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Closure of Unit	28 39.40%	44 35.20%		20 37.70%	92 36.80%
Unfavourable weather conditions		2 1.60%			2 0.80%
Unfavourable prices		6 4.80%		1 1.90%	7 2.80%
Raw materials not available	2 2.80%	5 4.00%			7 2.80%
The owner incurred losses	1 1.40%	2 1.60%			3 1.20%
Illness	19 26.80%	29 23.20%		2 3.80%	50 20.00%
Maternity		1 0.80%			1 0.40%
Others	2 2.80%	8 6.40%		1 1.90%	11 4.40%
Not stopped	19 26.80%	28 22.40%	1 100.00%	29 54.70%	77 30.80%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table 16

Gender and reasons for stopping work

Gender	Closure of Unit	Unfavourable weather conditions	Unfavourable prices	Raw materials was not available	The owner incurred losses	Illness	others	Maternity	Not stopped	Total
Male	45	1	5	4	2	19	4		45	125
	36.00%	0.80%	4.00%	3.20%	1.60%	15.20%	3.20%		36.00%	100.00%
Female	47	1	2	3	1	31	7	1	32	125
	37.60%	0.80%	1.60%	2.40%	0.80%	24.80%	5.60%	0.80%	25.60%	100.00%
Total	92	2	7	7	3	50	11	1	77	250
	36.80%	0.80%	2.80%	2.80%	1.20%	20.00%	4.40%	0.40%	30.80%	100.00%

Chapter III

Economic Conditions of Reeling and Grainage Workers

We have tried to ascertain the economic conditions of reeling and grainage workers in Sidlaghatta with a view to gauging their life style and its relation to health. Within this, we have asked whether they have any lands, types of houses in which they live, assets they own, their borrowing, etc. As expected, very few persons of our sample own any significant area of land (Table 17). None of the female respondents owns land.

Table –17

Caste and ownership of Land (Sidlaghatta)

Land Size	SC & ST	Muslim	Christian	Other (Hindu)	Total
1-2.50 acres	3 4.20%	1 0.80%		1 1.90%	5 2.00%
2.51 – 5 acres	1 1.40%	1 0.80%		2 3.80%	4 1.60%
Nil	67 94.40%	123 98.40%	1 100.00%	50 94.30%	241 96.40%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table 17a

Land Ownership (Hosahalli)

Land Size	Frequency	Percent
0.01-2.50 acres	42	48.8
2.51 - 5 acres	12	14
5.01 - 10 acres	11	12.8
10 and above	3	3.5
Nil	18	20.9
Total	86	100

To indicate the economic conditions of the respondents we have considered their ownership of assets, including a house. Obviously, with the predominant segment of our sample being from the group of 'poor' or low income, the majority do not own any house. Even those who own a house (and 44% do), the majority live in kaccha[4] and semi-pucca[5] houses (see tables 18 &19). When we see that the majority live in "rented" houses, the indication is that they live in houses that they do not own. Most of these people live in quarters provided by reeling owners. Even here, we find that the quarters are of a poorer kind, with kaccha and semi-pucca houses being the predominant kinds. Just 15 respondents (6%) live in pucca houses, and only 11 of them own these houses.

Table- 18

House ownership across caste/religion

Ownership	SC & ST	Muslim	Christian	Other (Hindu)	Total
Own	37 52.10%	48 38.40%		25 47.20%	110 44.00%
Rented	34 47.90%	77 61.60%	1 100.00%	28 52.80%	140 56.00%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

[4] We have classified those houses as kaccha, which have mud and brick walls, and mud floors. The inhabitants have the floor covered with cow dung. Roofs are of thatch, or tiles.

[5] Semi-pucca houses have cement floors, brick walls, and roofs of tiles/sheets. Pucca houses are those with RCC roofs, cement and brick walls, and cement floors.

Table 19

Type of House

Ownership	Kaccha	Semi-pucca	Pucca	Total
Own	55 50.0%	44 40.00%	11 10.00%	110 100.00%
Rented	89 63.57%	47 33.57%	4 2.86%	140 100.00%
Total	144 57.6%	91 36.4%	15 6.00%	250 100%

With the poor condition of the houses, when it rains the houses are usually flooded, leading to health problems. It is particularly in the Adi-Karnataka (SCs) colony, that houses and drainage are in a poor condition, and when it rains the houses invariably get flooded. The size and congested surroundings of the AK colony also have associated problems. For instance, one of the respondents had been afflicted with asthma, and later he was also diagnosed as having tuberculosis. Shortly after, his wife was also diagnosed with tuberculosis. Living in a small space makes it possible for the TB to spread from person to person. They are now worried that their son may also get TB. Many families in this colony (also among our respondents) have similar problems.

In addition to houses, several respondents also possessed other assets, as indicated in Table 20. Table 21 reveals that, generally, as income increases, the assets also increase. However, among the income group of

24,001 to 30,000, information about assets were only reluctantly revealed, and it is possible that assets have been understated. Larger family incomes were usually related to several members in the family being employed. But, there is no clear relationship between higher incomes and more assets. People's spending habits too differed. As we observed, there were several respondents (particularly in grainages) who were earning reasonably high incomes, but had very few assets (Table-21). We were told that these were also the persons who spent considerable amounts on liquor. Table 22 represents assets across ownership/occupation.

Table 20

Other assets across caste/religion (Sidlaghatta)

Assets	SC & ST	Muslim	Christian	Other (Hindu)	Total
Bullock cart	1 1.40%	1 0.80%			2 0.80%
Cycle	5 7.00%	20 16.00%		9 17.00%	34 13.60%
Motorbike		2 1.60%			2 0.80%
Radio	26 36.60%	43 34.40%	1 100.00%	22 41.50%	92 36.80%
T.V & Others	1 1.40%	11 8.80%		4 7.50%	16 6.40%
None	38 53.50%	48 38.40%		18 34.00%	104 41.60%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table 21

Other assets across income (Sidlaghatta)

Assets	Less than 6000	6001-12000	12001-24000	24001-30000	30001 and above	Total
Bullock cart	1 50.0%				1 50.0%	2 100.0%
Cycle	2 5.88%	3 8.82%	4 11.76%	2 5.88%	23 67.64%	34 100.0%
Motorbike	1 50.0%				1 50.0%	2 100.0%
Radio	1 1.08%	8 8.69%	33 35.86%	12 13.04%	38 41.30%	92 100.0%
TV & others	2 12.5%	1 6.25%	7 43.75%	1 6.25%	5 31.25%	16 100.0%
None	8 7.69%	28 26.92%	41 39.42%	15 14.42%	12 11.53%	104 100.0%
Total	15 6.0%	40 16.0%	85 34.0%	30 12.0%	80 32.0%	250 100.0%

In very broad terms, we can state that as nearly half (42%) the respondents do not own any of the assets listed above, their lifestyle is also of a very modest standard, indicating extreme poverty. A higher proportion of Scheduled Castes (53.50%) fall within this category of extremely poor.

Table 22

Other assets across occupation

Assets	Reeling Owner	Reeling Owner labourer	Reeling Labourer	Grainage Labourer	Total
Bullock cart			2 1.10%		2 0.80%
Cycle	1 25.00%	15 32.60%	11 6.00%	7 41.18%	34 13.60%
Motorbike	1 25.00%	1 2.20%			2 0.80%
Radio	1 25.00%	18 39.10%	65 35.50%	8 47.06%	92 36.80%
T.V & Others	1 25.00%	6 13.00%	9 4.90%		16 6.40%
None		6 13.00%	96 52.50%	2 11.76%	104 41.60%
Total	4 100.00%	46 100.00%	183 100.00%	17 100.00%	250 100.00%

One of the most sought after attributes of working in reeling units is the availability of advance against wages. With all its (reeling) negative features, the possibility of interest-free loans/grants, is most attractive to the labourers. Thus, a very large number of the respondents (79 per cent) have taken advance from their respective owners (Table 23). Grainage workers do not get any advance. Reasons for taking advance included: to meet day to day obligations, to perform religious functions, and due to illness (Table 24). Taking advance is not an entirely beneficial transaction to the labourers. Once they have taken a substantial sum as advance, they are tied to the same unit, irrespective of the wages they get. For instance,

a respondent, Akthar Unnisa, aged about 38 years, has taken Rs.9,800 as advance to arrange the marriage for her daughter, and pay for medication during her illness She says, "my earnings are not sufficient to run the family itself, then how can I repay the advance/loan taken from my owner. Without repaying the advance, I will not be allowed to go out of the reeling unit and also from this job." In a few cases, respondents have been able to borrow money from one owner to repay the advance taken from another. But if the amount is very large, other owners would not advance money to that extent. In another instance a man indicated his wife as guarantor for the advance. And, together, they had taken Rs.20,000 as advance. The man took the money and left Sidlaghatta and his family. Now, his wife Shaheena (26 years of age) is working in the same unit as a bonded labourer. A portion of her earnings is taken for household expenses and the remaining is considered as loan repayment.

Table 23

Advance taken among reeling labourers of different castes and religion

N = 183*

Range of advance	SC & ST	Muslim	Other (Hindu)	Total
Nil	15 24.60%	21 26.90%	3 6.80%	39 21.30%
501 – 1000	3 4.90%	3 3.80%	2 4.50%	8 4.40%
1001 – 3000	26 42.60%	27 34.60%	11 25.00%	64 35.00%
3001 – 5000	14 23.00%	18 23.10%	16 36.40%	48 26.20%
5001 – 10000	3 4.90%	9 11.50%	10 22.70%	22 12.00%
10001 and above			2 4.50%	2 1.10%
Total	61 100.00%	78 100.00%	44 100.00%	183 100.00%

*Only reeling labourers

Table – 24

Reason for taking advance by reeling labourers

N = 183

	SC & ST	Muslim	Other	Total
To clear old debt		2 66.7%	1 33.3%	3 100.0%1.
To perform religious functions	5 23.8%	6 28.6%	10 47.6%	21 100.0%
To meet day to day family obligations	42 39.3%	36 33.6%	29 27.1%	107 100.0%
Illness	6 27.3%	15 68.2%	1 4.5%	22 100.0%
Construction of House	1 50.0%		1 50.00%	2 100.0%
Advance not taken	7 25.0%	19 67.9%	2 7.1%	28 100.0%
Total	61	78	44	183
	33.3%	42.6%	24.0%	100.0%

While her (Shaheena) wages are very low (as with other reeling labourers), she has two small children to support. She also has asthma and so too with one of her children. So there is hardly any money left for medical expenses, thus aggravating the health problem.

When in financial need, which was a regular feature with most labourers, their usual practice was to take an advance against their wages from the unit owner. Owners themselves would need to look for alternative sources of funds when they needed additional finances than they had readily at hand. The lack of collateral among labourers was one of the crucial reasons why they preferred advance against wages. Other reasons included the fact that advance money did not carry any interest, and was more easily available, and payment schedules were convenient. However, if larger sums were needed, than the owner was willing to pay, then there would be some difficulties in raising loans/funds (Table 25).

Table 25

Source from which loan is taken

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Unit Owner	1 100.0%				1 100.0%
Money Lender				1 100.0%	1 100.0%
Neighbours/Relatives		4 100.0%			4 100.0%
Commercial Banks	4 66.7%	2 33.3%			6 100.0%
Any other source	4 40.0%	3 30.0%		3 30.0%	10 100.0%
Not taken	62 27.2%	116 50.9%	1 4.0%	49 21.5%	228 100.0%
Total	71 28.4%	125 50.0%	1 4.0%	53 21.2%	250 100.00%

Quite a few respondents said if financial assistance is given for animal husbandry like dairy, poultry, rearing pigs etc., they are ready to take up such occupations rather than reeling activity, which according to them is also detrimental to their health. Those who had indicated health problems also suffered from asthma or tuberculosis, or both. They wanted to get out of the reeling occupation, but as of now, could not.

A very small proportion of respondents were able to save through various schemes (Table-26). The rest stated that their minimum expenditure were usually in excess of their income, and therefore, it is quite beyond their capacity to "save."

Table 26

Nature of savings across caste/religion (Sidlaghatta)

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Chitfunds	2 50.0%	1 25.0%		1 25.0%	4 100.0%
LIC	5 35.7%	4 28.6%		5 35.7%	14 100.0%
NSC	1 100.0%				1 100.0%
None	63 27.3%	120 51.9%	1 0.4%	47 20.3%	231 100.0%
Total	71 28.4%	125 50.0%	1 0.4%	53 21.2%	250 100.00%

Table 26a

Nature of savings across caste/religion (Hosahalli)

Particulars	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Commercial Banks	1 100.0%								1 100.0%
LIC	2 40.0%		2 40.0%		1 20.0%				5 100.0%
None	36 45.0%	2 2.5%	25 31.3%	2 2.5%	6 7.5%	1 1.3%	7 8.8%	1 1.3%	80 100.0%
Total	39 45.3%	2 2.3%	27 31.4%	2 2.3%	7 8.1%	1 1.2%	7 8.1%	1 1.2%	86 100.00%

When savings rate of males and females are compared, a marginally higher proportion of males in the Sidlaghatta sample i.e., 11.20 per cent are saving a portion of their income, but females constitutes only 4 per cent (Table-27). A probable reason is that a significant number of the males drink and spend on what may be considered as non-essentials, but have a

small amount left over. Women have to take care of the family expenses which could take their entire earnings. The phenomenon of a larger proportion of men being able to save appears to be at the initiative of women---where women insist that men save some of their income in chit-funds, and spend the rest on liquor etc., if they choose. Women need to support their families, and have no savings after their expenses. Therefore, males save more but not the females. An effort was made to see the savings rate across ownership (Table – 28). We did not find any significant difference across ownership of the unit as the sample is concentrated on reeling labourers, and the owners are also not large entrepreneurs. However, a significant number of grainage workers had taken up LIC policies.

Table-27
Nature of savings and gender (Sidlaghatta)

Particulars	Male	Female	Total
Chitfunds	4 100.00%		4 100.00%
LIC	9 64.30%	5 35.70%	14 100.00%
NSC	1 100.00%		1 100.00%
None	111 48.10%	120 51.90%	231 100.00%
Total	125 50.00%	125 50.00%	250 100.00%

Table-27a

Nature of savings and gender (Hosahalli)

Particulars	Male	Female	Total
Commercial Banks	1 1.50%		1 1.20%
LIC	5 7.50%		5 5.80%
None	61 91.00%	19 100.00%	80 93.00%
Total	67 100.00%	19 100.00%	86 100.00%

Table 28

Ownership and Savings

Particulars	Chitfunds	LIC	NSC	None	Total
Reeling Owner	1 25.0%			3 1.3%	4 1.6%
Reeling Owner Labourer	1 25.0%	2 14.3%		43 18.6%	46 18.4%
Reeling Labourer	2 50.0%	3 21.4%	1 100.0%	177 76.6%	183 73.2%
Grainage labourer		9 64.3%		8 3.50%	17 6.8%
Total	4 100.0%	14 100.0%	1 100.0%	231 100.0%	250 100.0%

Income & Expenditure of Reeling and Grainage Workers

Even with the recognizable health problems, workers showed a clear preference for reeling work. The reasons included a relatively regular income, accommodation from unit owners, interest free advance, much of which are not available in other occupations, and agriculture. In fact, even with health problems, they felt they were better off in reeling since they

could eat more regularly---something not always the case in seasonal agricultural work. This last point is the reason why several of our respondents had even migrated from other places, to Sidlaghatta. Being illiterate, most of the workers were also under no illusions about their job prospects.

While the rate of wages is more or less the same for all workers who hire out their labour to reeling units, the major differences in annual incomes of these workers depend only on the number of days they work in a year. Family income is an aggregate of the incomes of several persons who take up paid work. Except in the case of owners, who may earn substantial incomes even when there is only one family member in a sericulture occupation, in the remaining cases, family income is directly related to the number of workers in a family. The higher income in a sense is also related to higher expenditure on specific items such as food, since there are more members in the family. Grainage workers generally received higher salaries, since they were paid by the month, and were usually permanent employees. They were also better equipped with health support, so that their personal expenses on medicines etc., were also less than that of workers in private units.

Table 29

Number of members working in a family(Sidlaghatta)

Family Size group	1 Member	2 Members	3 Members	4 Members	5 Members	6 Members	7 Members	Total
1- 4	33 76.70%	84 70.60%	24 63.20%	10 27.80%				151 60.40%
5-7	9 20.90%	34 28.60%	14 36.80%	23 63.90%	7 77.80%		2 50.00%	89 35.60%
8 & Above	1 2.30%	1 0.80%		3 8.30%	2 22.20%	1 100.00%	2 50.00%	10 4.00%
Total	43 100.00%	119 100.00%	38 100.00%	36 100.00%	9 100.00%	1 100.00%	4 100.00%	250 100.00%

Table 29a

Number of members working in a family (Hosahalli)

Particulars	0	1 Member	2 Members	3 Members	4 Members	5 Members	Total
1-4	1 50.00%	11 44.00%	19 52.80%	6 40.00%	2 28.60%		39 45.30%
5-7	1 50.00%	14 56.00%	17 47.20%	8 53.30%	5 71.40%		45 52.30%
8 & Above				1 6.70%		1 100.00%	2 2.30%
Total	2 100.00%	25 100.00%	36 100.00%	15 100.00%	7 100.00%	1 100.00%	86 100.00%

Table 30

Working members in a family across different castes (Sidlaghatta)

Communities	1 Member	2 Members	3 Members	4 Members	5 Members	6 Members	7 Members	Total
SC & ST	8 11.30%	39 54.90%	14 19.70%	6 8.50%	3 4.20%		1 1.40%	71 100.00%
Muslim	23 18.40%	58 46.40%	16 12.80%	21 16.80%	4 3.20%	1 0.80%	2 1.60%	125 100.00%
Christian		1 100.00%						1 100.00%
Other	12 22.60%	21 39.60%	8 15.10%	9 17.00%	2 3.80%		1 1.90%	53 100.00%
Total	43 17.20%	119 47.60%	38 15.20%	36 14.40%	9 3.60%	1 0.40%	4 1.60%	250 100.00%

Table 30a

Working members in a family across different caste (Hosahalli)

Caste	0	1 Member	2 Members	3 Members	4 Members	5 Members	Total
Madiga		8 32.00%	20 55.60%	8 53.30%	2 28.60%	1 100.00%	39 45.30%
ST			1 2.80%	1 6.70%			2 2.30%
Lingayats	1 50.00%	12 48.00%	8 22.20%	3 20.00%	3 42.90%		27 31.40%
Muslims		1 4.00%		1 6.70%			2 2.30%
Tigalaru	1 50.00%	2 8.00%	2 5.60%	1 6.70%	1 14.30%		7 8.10%
Brahmin		1 4.00%					1 1.20%
Madivala Shetti		1 4.00%	4 11.10%	1 6.70%	1 14.30%		7 8.10%
Other castes			1 2.80%				1 1.20%
Total	2 100.00%	25 100.00%	36 100.00%	15 100.00%	7 100.00%	1 100.00%	86 100.00%

Table 31

Income level across ownership and number of family members working.

Ownership	Income level	1 Member	2 Members	3 Members	4 Members	5 Members	6 Members	7 Members	Total
Reeling Owner	Less than 6000	1 100.00%							1 25.00%
	30001 and above		1 100.00%	1 100.00%	1 100.00%				3 75.00%
		1 100.00%	1 100.00%	1 100.00%	1 100.00%				4 100.00%
Reeling Owner labourer	Less than 6000	2 33.30%	1 5.00%	1 25.00%	1 8.30%				5 10.90%
	6001-12000		1 5.00%						1 2.20%
	12001-24000	1 16.70%	3 15.00%						4 8.70%
	24001-30000	1 16.70%	4 20.00%		1 8.30%				6 13.00%
	30001 & above	2 33.30%	11 55.00%	3 75.00%	10 83.30%	3 100.00%		1 100.00%	30 65.20%
		6 100.00%	20 100.00%	4 100.00%	12 100.00%	3 100.00%		1 100.00%	46 100.00%
Reeling Labourer	Less than 6000	8 26.70%	1 1.10%						9 4.90%
	6001-12000	19 63.30%	20 21.30%						39 21.30%
	12001-24000	3 10.00%	63 67.00%	11 37.90%	4 20.00%				81 44.30%
	24001-30000		7 7.40%	10 34.50%	4 20.00%	2 33.30%			23 12.60%

	30001 and above		3 3.20%	8 27.60%	12 60.00%	4 66.70%	1 100.00%	3 100.00%	31 16.90%
		30 100.00%	94 100.00%	29 100.00%	20 100.00%	6 100.00%	1 100.00%	3 100.00%	183 100.00%
Grainage Labourer	24001 – 30000	1 20.00%							1 6.30%
	30001 and above	4 80.00%	4 100.00%	4 100.00%	3 100.00%				15 93.80%
		5 100.00%	4 100.00%	4 100.00%	3 100.00%				16 100.00%
LSP Owner	30001 and above	1 100.00%							1 100.00%
		1 100.00%							1 100.00%

Table – 32

Reeling Technology and Income Group

Technology	less than 6000	6001 – 12000	12001 – 24000	24001 – 30000	30001 and above	Total
Dupion Silk Unit	5 19.20%	2 7.70%	10 38.50%	3 11.50%	6 23.10%	26 100.00%
Charaka Technology	2 5.70%	7 20.00%	11 31.40%	4 11.40%	11 31.40%	35 100.00%
Cottage Basin Technology	8 4.70%	31 18.00%	64 37.20%	22 12.80%	47 27.30%	172 100.00%
Grainages				1 5.90%	16 94.10%	17 100.00%
Total	15 6.00%	40 16.00%	85 34.00%	30 12.00%	80 32.00%	250 100.00%

Table – 33

Distribution of respondents across various income groups

(Sidlaghatta)

Income	SC/ST	Muslims	Christians	Others (Hindu)	Total
Less than 6000	1 1.4%	11 8.8%		3 5.7%	15 6.0%
6001-12000	11 15.5%	21 16.8%		8 15.1%	40 16.0%
12001-24000	35 49.3%	33 26.4%		17 32.1%	85 34.0%
24001-30000	11 15.5%	14 11.2%		5 9.4%	30 12.0%
30001 & above	13 18.3%	46 36.8%	1 100.0%	20 37.7%	80 32.0%
Total	71 100.0%	125 100.0%	1 100.0%	53 100.0%	250 100.0%

Table – 33 a

Distribution of respondents across various income groups (Hosahalli)

Income	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Less than 5000	3 7.70%		3 11.10%		1 14.30%				7 8.10%
5001-10000	6 15.40%		6 22.20%	1 50.00%			2 28.60%		15 17.40%
10001-15000	13 33.30%	1 50.00%	2 7.40%		1 14.30%		1 14.30%	1 100.00%	19 22.10%
15001-20000	7 17.90%		4 14.80%		3 42.90%		2 28.60%		16 18.60%
20001-30000	6 15.40%	1 50.00%	3 11.10%		2 28.60%		2 28.60%		14 16.30%
30001-40000	2 5.10%		3 11.10%			1 100.00%			6 7.00%
40001 and above	2 5.10%		6 22.20%	1 50.00%					9 10.50%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

Table 34

Gender and distribution of respondents' family incomes (Sidlaghatta)

Gender	Less than 6000	6001 - 12000	12001 – 24000	24001 - 30000	30001 and above	Total
Male	7 5.60%	16 12.80%	41 32.80%	11 8.80%	50 40.00%	125 100.00%
Female	8 6.40%	24 19.20%	44 35.20%	19 15.20%	30 24.00%	125 100.00%
Total	15 6.00%	40 16.00%	85 34.00%	30 12.00%	80 32.00%	250 100.00%

Table 34a

Gender-wise distribution of respondents' family incomes (Hosahalli)

Income	Less than 5000	5001-10000	10001-15000	15001-20000	20001-30000	30001 - 40000	40001 & above	Total
Male	6 8.9%	13 19.5%	11 16.4%	13 19.4%	10 14.9%	5 7.5%	9 13.4%	67 100.0%
Female	1 5.3%	2 10.5%	8 42.1%	3 15.8%	4 21.0%	1 5.3%		19 100.0%
Total	7 8.1%	15 17.4%	19 22.1%	16 18.6%	14 16.3%	6 7.0%	9 10.5%	86 100.0%

Table – 35

Income and Employment Status (Sidlaghatta)

Occupation	less than 6000	6001 – 12000	12001 – 24000	24001 – 30000	30001 and above	Total
Reeling Owner	1 25.00%				3 75.00%	4 100.00%
Reeling Owner labourer	5 10.90%	1 2.20%	4 8.70%	6 13.00%	30 65.20%	46 100.00%
Reeling Labourer	9 4.90%	39 21.30%	81 44.30%	23 12.60%	31 16.90%	183 100.00%
Grainage Labourer				1 5.88%	16 94.12%	17 100.00%
Total	15 6.00%	40 16.00%	85 34.00%	30 12.00%	80 32.00%	250 100.00%

Table 36

Weekly Household Expenditure (Sidlaghatta).

(In rupees)

Particulars	SC & ST	Muslims	Christians	Others Hindus)
Rice	74	80	84	79
Ragi	63	24	16	40
Pulses	28	31	14	33
Vegetables	26	27	30	29
Fish/Meat	68	84	55	73
Edible Oil	17	18	19	22
Sugar/Jaggery	16	17	32	21
Transport	24	26	30	29
Medicines	32	66	10	17
Entertainment	15	11	50	14
Paan/Tobacco	12	6	5	5
Clothing	29	31	57	42
Liquor	40	10	40	8
Others	2	4	-	12
Weekly Expenditure	446	435	442	424
Monthly Expenditure	1911	1864	1894	1817
Annual Expenditure	22937	22371	22731	21805

Table 36a

Weekly Household Expenditure (Hosahalli)

(In Rupees)

Particulars	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other Castes
Rice	69	30	60	10	55	140	72	60
Ragi	67	23	87	50	5	1	34	1
Pulses	39	45	38	26	51	38	41	60
Vegetables	35	16	35	52	47	50	49	20
Fish/Meat	62	65	-	135	126	-	74	30
Edible Oil	20	25	57	23	30	30	21	40
Sugar/Jaggery	14	7	45	43	21	60	15	-
Transport	45	35	146	50	41	148	17	30
Medicines	13	-	32	25	10	50	21	-
Entertainment	6	15	11	-	26	-	9	-
Paan/Tobacco	6	1	3	-	3	-	1	3
Clothing	23	10	66	52	51	38	35	76
Weekly expenditure	399	272	580	564	466	517	389	320
Annual Expenditure	20805	14183	30243	29409	24299	26958	20284	16686

Table – 37

Frequency of food intake across caste/religion (Sidlaghatta)

Consumption of Food	SC & ST	Muslim	Christian	Other (Hindu)	Total
Twice in a day	44	47	1	24	116
	62.00%	37.60%	100.00%	45.30%	46.40%
Thrice in a day	27	78		29	134
	38.00%	62.40%		54.70%	53.60%
Total	71	125	1	53	250
	100.00%	100.00%	100.00%	100.00%	100.00%

Table – 37a

Frequency of food intake across caste/religion (Hosahalli)

Consumption of Food	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Twice in a day	9	1	4		1				15
	23.10%	50.00%	14.80%		14.30%				17.40%
Thrice in a day	30	1	23	2	6	1	7	1	71
	76.90%	50.00%	85.20%	100.00%	85.70%	100.00%	100.00%	100.00%	82.60%
Total	39	2	27	2	7	1	7	1	86
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00 %

Table – 38

Gender, and number of daily meals (Sidlaghatta and Hosahalli)

	Gender	Twice in a day	Thrice in a day	Total
Sidlaghatta	Male	48	77	125
		38.40%	61.60%	100.00%
Hosahalli		10	57	67
		14.90%	85.10%	100.00%
Sidlaghatta	Female	68	57	125
		54.40%	45.60%	100.00%
Hosahalli		5	14	19
		26.30%	73.70%	100.00%
Total		131	205	336
		38.99%	61.01%	100.00%

Of the 125 male labourers, 62 per cent have three meals a day and the remaining persons eat twice in a day. Of the women, 46 per cent have three meals a day, and 54 per cent have two meals a day (Table 38). Women appear to eat less in a day compared to the other members of the family. Hosahalli respondents eat more often, and presumably their levels of nutrition are better than in Sidlaghatta.

Chapter IV

Reeling and Grainage Activities, and Health

Part A

This section deals with the various health problems[6] that labourers in our sample have had in the past, or still have at present. Diseases such as asthma, tuberculosis, skin problems, stomach disorders, etc. have been mentioned by the respondents (see tables 39,42,43 across technology, caste and sex). Respiratory problems such as asthma have, in many cases, been causally related to reeling/grainages. This is being described in greater detail in the clinical sections of this report (i.e. as occupational asthma). The labourers involved in silk reeling, and especially the labourers involved in charka reeling, appear to have marginally more health problems than the rest (i.e. workers in cottage basin units, dupion units) This is not a conclusive statement. Inasmuch as we could not standardize or control for various variables, we cannot definitely state that one technology is more or less harmful than another. Overall, around 54 per cent of the labourers are suffering from one or the other health

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[6] Health problems' in our study refer to a list of diseases, and/or disabilities, and respondents were asked if they suffered from these diseases during the course of the preceding year. 'Healthy' are those who do not have these diseases/disabilities, and also includes those who may have had these at some time and have recovered from them.

problem. When we compared across gender, a greater proportion of women appear to have health problems than males, constituting 56.7 per cent (of women labourers) and 43.3 per cent (of male labourers) respectively. Several reasons could be attributed for a larger proportion of female labourers being afflicted with health problems. These include: a) If we take just the women between the ages of 16-40 as being within the child bearing ages, 99 (79.2%) of our sample of women fall within this group. Regular child bearing is a factor in their poorer health, b) their work schedule is usually very strenuous, including both household chores, as well as working in reeling units or grainages. Rest, during the day, is very difficult for them to get[7], c) several cases in our sample have indicated that when there is any food shortage in their homes (which is normal in low income households), it is their husbands and children who have the first choice of food. The women get less food, after the rest of the family has eaten (see Table 38). The clinical section would also indicate results of blood tests, which showed that a significant proportion of the sample of women had anemia. However, there were also women with asthma who stated that if they eat a larger quantity of food, they felt a general uneasiness, and therefore, preferred to eat less.

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[7] The women themselves have not explicitly stated that they are over-worked. But from a detailed description of their daily activities, we can state that they hardly have any time to relax, and leisure as such is not available for any reasonable length of time.

Comparing the general health of the reeling and grainage workers with the control group, a larger proportion of them have reported having health problems than those in the control group. We can hypothesize that among sericulture activities, and particularly reeling, there is a greater possibility that health problems are more frequent than in other occupations, such as agriculture.

Health status across ownership indicates that the owners of reeling units (in our sample) do not have any disease. A possible reason could be that they are not always directly involved in reeling, and do not remain within the reeling unit's premises for much time. They supervise the reeling activity from time to time, and their major activity is buying cocoons, and selling silk yarn, i.e. marketing. On the other hand, a few among our sample of owner-labourers have health problems, an indication, perhaps, that being involved in the actual reeling activity would make them more prone to health problems. In the control sample, it is difficult to state that one or the other occupational status is more likely to cause health problems.

Chart 1: Health Status of Sidlaghatta and Hosahalli responents

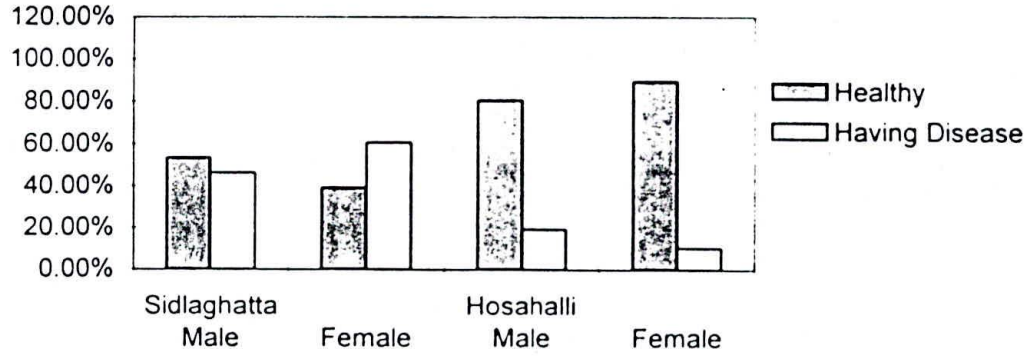


Table 39

Health status and technology

Particulars	Dupion Silk Unit	Charaka Technology	Cottage Basin Technology	Grainage	Total
Healthy	18	15	81	2	116
	14.80%	13.00%	70.40%	1.70%	100.00%
	69.23%	42.90%	47.10%	11.80%	46.00%
Having Disease	8	20	91	15	134
	6.00%	14.90%	67.90%	11.20%	100.00%
	30.77%	57.10%	52.90%	88.20%	53.60%
Total	26	35	172	17	250
	10.40%	14.00%	68.80%	6.80%	100.00%
	100.00%	100.00%	100.00%	100.00%	100.00%
Pearson Chi-square					13.859*

*Significant at 5% Level

Association between technology and health status.

Chart 2 : Health Status of Reeling and Grainage Respondents

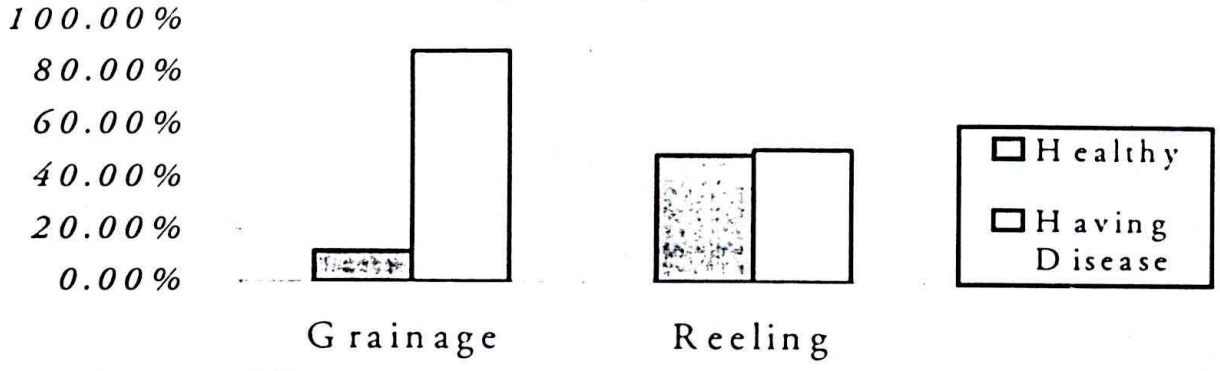


Table 40

Health status and reeling technology

N=233

Health Status	Dupion Silk Unit	Charaka Technology	Cottage Basin Technology	Total
Healthy	18 15.80%	15 13.20%	81 71.10%	114 100.00%
Having Disease	8 6.70%	20 16.80%	91 76.50%	119 100.00%
Total	26 11.20%	35 15.00%	172 73.80%	233 100.00%
Pearson Chi-square				5.037**

** Significant at 10% Level

There is an association between technology and health

Table 41

Family size and health status

Family Size	Sidlaghatta			Hosahalli		
	Having Disease	Healthy	Total	Having Disease	Healthy	Total
1- 4	89 58.90%	62 41.10%	151 100.00%	8 20.50%	31 79.50%	39 100.00%
5- 7	40 44.90%	49 55.10%	89 100.00%	6 13.30%	39 86.70%	45 100.00%
8 & above	5 50.00%	5 50.00%	10 100.00%	1 50.00%	1 50.00%	2 100.00%
Total	134 53.60%	116 46.40%	250 100.00%	15 17.40%	71 82.60%	86 100.00%
Pearson Chi-square			4.465	Pearson Chi-square		2.255

Sidlaghatta : There is no association between family size and health status
Hosahalli : There is no association between family size and health status

Although one may have expected that a larger family would have more problems in maintaining a reasonable level of health, since nutrition, and other necessities of life would have to be shared among a larger number of people, there is no statistical association between the size of families and health.

Table 42

Health Status across different caste/religion groups (Sidlaghatta)

Health Status	Healthy	Having Disease	Total
SC & ST	24 33.80%	47 66.20%	71 100.00%
Muslim	62 49.60%	63 50.40%	125 100.00%
Christian	1 100.00%		1 100.00%
Other (Hindu)	29 54.71%	24 45.29%	53 100.00%
Total	116 46.40%	134 53.60%	250 100.00%

Table 42a

Health Status across different caste/religion groups (Hosahalli)

Health Status	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Healthy	33 84.60%	2 100.00%	18 66.70%	2 100.00%	7 100.00%		7 100.00%	1 100.00%	70 81.40%
Having Disease	6 12.80%		9 33.30%			1 100.00%			16 17.40%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

Table 43

Gender and Health Status (Sidlaghatta and Hosahalli)

	Gender	Healthy	Having Disease	Total
Sidlaghatta	Male	67 53.6%	58 46.40%	125 100.00%
Hosahalli		54 80.60%	13 19.40%	67 100.00%
Sidlaghatta	Female	49 39.20%	76 60.80%	125 100.00%
Hosahalli		17 89.50%	2 10.50%	19 100.00%
Total		187 55.65%	149 44.35%	336 100.00%
Sidlaghatta	Pearson Chi-Square value			5.211*
Hosahalli	Pearson chi-square value			0.810

*Significant at 5% level

Sidlaghatta – Association between gender and health status

Hosahalli - No Association between gender and health status

Table 44

Education and Health Status (Sidlaghatta and Hosahalli)

Sample	Health Status	Illiterate	Less than 4 years	Primary	Middle	High School	PUC	Diploma	Any Degree	Total
Sidlaghatta	Healthy	65 56.00%	2 1.70%	11 9.50%	15 12.90%	21 18.10%	1 0.90%		1 0.90%	116 100.00%
Hosahalli	Healthy	34 47.90%	2 2.80%	6 8.50%	7 9.90%	15 21.10%	4 5.60%	1 1.40%	2 2.80%	71 100.00%
Sidlaghatta	Having Disease	93 69.40%	2 1.50%	9 6.70%	16 11.90%	12 9.00%	2 1.50%			134 100.00%
Hosahalli	Having Disease	6 40.00%		1 6.70%	4 26.70%	1 6.70%	1 6.70%		2 13.30%	15 100.00%
Total		198	6	27	42	49	8	1	5	336
		58.93%	1.79%	8.03%	12.50%	14.58%	2.38%	0.30	1.49%	100.00%
Sidlaghatta	Pearson Chi-square value									7.726
Hosahalli	Pearson Chi-square value									7.942

Sidlaghatta: There is no association between education and health status

Hosahalli : There is no association between education and health status

Table 45

Occupation and health status (Sidlaghatta)

Occupation	Healthy	Having Disease	Total
Reeling owner	4 100.0%		4 100.0%
Reeling Owner labourer	33 71.73%	13 28.27%	46 100.0%
Reeling labourers	77 42.07%	106 57.93%	183 100.0%
Grainage Labourer	2 12.5%	14 87.5%	16 100.0%
LSP Owner		1 100.0%	1 100.0%
Total	116 46.4.0%	134 53.6.0%	250 100.0%
Pearson Chi-square value			26.131*

* Significant at 5% Level

There is an association between occupation and health status.

Table 45a

Occupation and health status (Hosahalli)

Occupation	Healthy	Having Disease	Total
Agriculturist	6 50.00%	6 50.00%	12 100.00%
Owner Cultivator	45 86.50%	7 13.50%	52 100.00%
Agricultural Labourer	20 90.90%	2 9.10%	22 100.00%
Total	71 82.56%	15 17.44%	86 100.00%

Of the 134 persons with health problems (table 47) about 89 per cent of them are above 16 years of age. This could indicate that serious health problems afflict workers only after several years of working in reeling/grainages. One may also observe that our sample of grainage workers are not likely to have got their job at a very young age. Reeling workers on the other hand joined as child labourers in many cases. Further, several women in our sample observed that their health problems started after their marriage. This involved, a) in a few cases, they had migrated from their native place to Sidlaghatta, and started work in reeling, b) frequent child bearing exacerbated health problems, c) little help from their husbands or other males in their families, made it necessary for women to continue working even when they had health problems. Only when the intensity of health problems increased to a very high extent that they could not work, did they stay at home and away from reeling, d) Health problems, in more cases, do not begin soon after a person takes up work in a reeling unit, but usually after a few years.

Table 46

Health Status across different age groups of Reeling and Grainage respondents

Technology	Health Status	11-15	16 – 20	21 – 25	26 - 30	31 -35	36 –40	41 & above	Total
Grainage	Healthy							2 100.00%	2 100.00%
	Having Disease				1 6.70%	2 13.30%	2 13.30%	10 66.70%	15 100.00%
Total					1 5.90%	2 11.80%	2 11.80%	12 70.60%	17 100.00%
Reeling	Healthy	4 3.50%	20 17.70%	36 31.90%	16 14.20%	16 13.30%	9 8.00%	13 11.50%	113 100.00%
	Having Disease	11 9.20%	10 8.40%	19 16.00%	26 21.80%	20 16.80%	14 11.80%	19 16.00%	119 100.00%
Total		15 6.40%	30 12.90%	55 23.60%	42 18.00%	36 15.50%	23 9.90%	32 13.70%	233 100.00%
Grainage	Pearson Chi-square								0.944
Reeling	Pearson Chi-square								16.79

Grainage :: No association between health status and age group

Reeling :: Association between health status and age group

Table 47

Health status across Age Groups (Sidlaghatta and Hosahalli)

Sample	Health Status	11-15	16-20	21-25	26-30	31-35	36-40	41 & above	Total
Sidlaghatta	Healthy	4 3.40%	20 17.20%	36 31.00%	16 13.80%	16 13.80%	9 7.80%	15 12.90%	116 100.00%
Hosahalli	Healthy			13 18.30%	12 16.90%	7 9.90%	13 18.30%	26 36.60%	71 100.00%
Sidlaghatta	Having Disease	11 8.20%	10 7.50%	19 14.20%	27 20.10%	22 16.40%	16 11.90%	29 21.60%	134 100.00%
Hosahalli	Having Disease		1 6.70%		2 13.30%	1 6.70%	3 20.00%	8 53.30%	15 100.00%
Total		15 4.46	31 9.23	68 20.24	57 16.97	46 13.69	41 12.20	78 23.21	336 100.00%
Sidlaghatta	Pearson chi-square								20.842
Hosahalli	Pearson Chi-square								8.606

Sidlaghatta: There is an association between Age Group and Health status

Hosahalli : There is no association between Age Group and Health Status

Table 48

Duration of job and health status of Sidlaghatta and Hosahalli Respondents

Duration of Job	Sidlaghatta			Hosahalli		
	Healthy	Having Disease	Total	Healthy	Having Disease	Total
Less than 1 year	8 57.10%	6 42.90%	14 100.00%	2 66.70%	1 33.30%	3 100.00%
1-5 year	22 45.80%	26 54.20%	48 100.00%	9 100.00%		9 100.00%
6-10 yea	31 47.70%	34 52.30%	65 100.00%	7 87.50%	1 12.50%	8 100.00%
10-20 years	48 53.90%	41 46.10%	89 100.00%	32 86.50%	5 13.50%	37 100.00%
20 & above	7 20.60%	27 79.40%	34 100.00%	21 72.40%	8 27.60%	29 100.00%
Total	116 46.40%	134 53.60%	250 100.00%	71 82.60%	15 17.40%	86 100.00%
Pearson Chi-square			11.838*	Pearson chi-square		5.032

Sidlaghatta: Association between duration of job and health status
Hosahalli : No Association between duration of job and health status

As may be expected, we have also observed that an association exists between the number of years in reeling/grainages, and the existence of health problems. Health problems, particularly asthma, often take years to manifest themselves, and this may account for the fact that, generally, the people who had worked for a greater number of years in reeling/grainages, suffer more health problems.

Table 49

Number of days worked in a year and health status

No.of days	Sidlaghatta			G. Hosahalli		
	Having Disease	Healthy	Total	Having Disease	Healthy	Total
0	4 100.00%		4 100.00%		1 100.00%	1 100.00%
150-200 days	24 49.00%	25 51.00%	49 100.00%	8 16.70%	40 83.30%	48 100.00%
201-250 days	50 48.10%	54 51.90%	104 100.00%		4 100.00%	4 100.00%
251-300 days	30 69.80%	13 30.20%	43 100.00%		3 100.00%	3 100.00%
300 & above	24 54.50%	20 45.50%	44 100.00%	5 19.20%	21 80.80%	26 100.00%
None	2 40.00%	3 60.00%	5 100.00%	2 50.00%	2 50.00%	4 100.00%
90 days		1 100.00%	1 100.00%			
Total	134 53.60%	116 46.40%	250 100.00%	15 17.40%	71 82.60%	86 100.00%
Pearson chi-square			11.221**	Pearson chi-square		4.713

** Significant at 10% level

Sidlaghatta : Association between number of days worked in a year and health status

Hosahalli : No association between Number of days worked in a year and Health status

While we have already indicated that the number of days in a year that a respondent has worked in reeling is not absolutely certain, even with its

limitations, there is a clear association between the number of days worked in reeling and health problems.

Table 50

Joining age and health status of respondents

Gender	Joining Age	Healthy	Having Disease	Total
Male	6-10 years	13 19.70%	12 20.70%	25 20.00%
	11- 15 years	23 34.80%	21 36.20%	44 35.20%
	16 & above	31 45.50%	25 43.10%	56 44.80%
	Total	67 100.00%	58 100.00%	125 100.00%
Female	6-10 years	13 26.50%	13 17.10%	26 20.80%
	11- 15 years	13 26.50%	19 25.00%	32 25.60%
	16 & above	23 46.90%	44 57.90%	67 53.60%
Total		49 100.00%	76 100.00%	125 100.00%
Pearson Chi square value Male Female				0.126 1.967

Male: No association between joining age and health status
Female: No association between joining age and health status.

While it is known that smoking (beedis, cigarettes) and alcohol consumption are harmful to health, we were also concerned about their effect on reeling and grainage workers. Smoking is also known to aggravate respiratory problems such as asthma. Just about 16 per cent including

men and women, of the workers have admitted to being regular consumers of alcohol. No health problem has, in this study, been observed as being directly related to alcohol consumption, but there is sufficient evidence elsewhere to suggest that regular consumption of alcohol has adverse effect on a person's health. Only a longer term study using several clinical parameters would be able to confirm the adverse effect of alcohol in conjunction with reeling or working in grainages (Table 52).

Table 51

House type (economic condition) and health status

	Particulars	Healthy	Having Disease	Total
Sidlaghatta	Kaccha	61 52.2%	83 61.9%	144 57.6%
Hosahalli		56 78.90%	11 73.30%	67 77.90%
Sidlaghatta	Semi-Pucca	47 40.9%	44 32.8%	91 36.4%
Hosahalli		12 16.90%	2 13.30%	14 16.30%
Sidlaghatta	Pucca	8 7.0%	7 5.2%	15 6.0%
Hosahalli		3 4.20%	2 13.30%	5 5.80%
	Total	187 100.0%	149 100.0%	336 100.0%
Sidlaghatta	Pearson Chi- square			2.242
Hosahalli	Pearson Chi-square			1.913

Sidlaghatta –No association between type of house and health status.
Hosahalli –No association between type of house and health status.

Table-52

Health Status and alcohol consumption/smoking (Sidlaghatta)

Particulars	Healthy	Having Disease	Total
Consuming Alcohol	17 43.60%	22 56.40%	39 100.00%
Smoker	37 56.92%	28 43.07%	65 100.00%

Table-52 a

Health Status and alcohol consumption/smoking (Hosahalli)

Particulars	Healthy	Having Disease	Total
Consuming Alcohol	13 86.70%	2 13.30%	15 100.0%
Smoker	27 77.10%	8 22.90%	35 100.0%

While the clinical section would indicate, from objective indices, the probable causes of health problems, in this section we have indicated the subjective perceptions of the reeling and grainage workers themselves, about the causes of their health problems. The largest number of persons said that smoke from boiling cocoons is the main reason for getting respiratory problems (Table – 54 & 55). Their `solution' to this problem is that new reeling technology should be introduced which reduced the smoke which is emitted within the units. Earlier, there was only charka technology available, where reeling labourers were directly cooking the cocoons, and which made them inhale the smoke. Workers stated that in

the present charka reeling they face the same problems as those working with this technology in the past. Also, since they have to regularly dip their hands in boiling water while reeling the silk yarn, skin diseases also were high among these workers. With cottage basins now being available, cocoons are cooked in one place and reeling is done at a distance from the cooking process. This has helped in reducing problems. Those who were working in dupion and charka technology and have shifted over to cottage basin reeling have particularly remarked on this aspect. Labourers are aware that health problems of various kinds have been associated with working in reeling units. They are also under the belief that cottage basin units are less harmful to them. However, one has to consider the environs of these two types of technology. In our sample, the owner-labourers have small scale charka units, and where they are themselves engaged in reeling. In this set up they are also the victims of the technology involved in reeling. Being relatively poor, the conditions of work include poor ventilation, filthy surroundings, poor lighting, and poor drainage. Thus, the conditions conducive to encourage health problems are already clearly visible in these units. Cottage basin technology usually involves substantially higher investments than charkas, and as such are set up by relatively more affluent owners. These owners are also able to provide relatively better working conditions than that found in charka units. Thus, while respiratory problems are clearly evident in both types of units,

workers are convinced that they suffer from less health problems, or lower intensity respiratory problems in cottage basin units, than when they were working in charka units.

Table 53
Prevalence of diseases and gender (Sidlaghatta)*

Name of the Disease	Male	Female
Asthma	30.4%	46.4%
Backache	12.8%	25.6%
Blood Pressure	6.4%	0.8%
Cough	36.0%	57.6%
Diabetes	1.6%	Nil
Eye Problems	8.8%	17.6%
Headache	16.0%	29.6%
Increase in body heat	28.0%	27.2%
Skin Problem	7.2%	18.4%
Stomach Disorders	12.8%	19.2%
Tuberculosis	2.4%	4.0%
Total Respondents	125	125

*As respondents, reported several health problems being present at the same time, the total percentage does not end as 250 tallying with 100%.

Table 53a

Prevalence of diseases and gender (Hosahalli)

Name of the Disease	Male	Female
Asthma	11.9%	21.1%
Backache	4.5%	21.1%
Blood Pressure	1.5%	5.3%
Cough	16.4%	36.8%
Diabetes	3.0%	Nil
Eye Problems	3.0%	5.3%
Headache	1.5%	5.3%
Increase in body heat	1.5%	Nil
Skin Problem	Nil	Nil
Stomach Disorders	9.0%	Nil
Tuberculosis	Nil	5.3%
Total Respondents	67	19

The health problems indicated by reeling and grainage workers is generally higher than in the control group. However, it is not immediately known which can be causally related to their occupation----other than the details provided in the clinical section of this chapter.

Table – 54

Workers' reasons for diseases across caste/religion (Sidlaghatta)

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Work Atmosphere	3 4.20%	5 4.00%			8 3.20%
Smoke of boiling cocoon	52 73.20%	104 83.20%	1 100.00%	30 56.60%	187 74.80%
Dipping fingers frequently into hot water while reeling	1 1.40%	3 2.40%		6 11.30%	10 4.00%
Over burdened with work	1 1.40%			1 1.90%	2 0.80%
Lack of rest	1 1.40%	1 0.80%			2 0.80%
Lack of drainage system				1 1.90%	1 0.40%
Oven heat	5 7.00%	2 1.60%		3 5.70%	10 4.00%
Others	6 8.50%	10 8.00%		5 9.40%	21 8.40%
Formalin Smell	2 2.80%			3 5.70%	5 2.00%
NA				4 7.50%	4 1.60%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table – 54a

Workers' reasons for diseases across caste/religion (Hosahalli)

Particulars	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Work Atmosphere	1 2.60%		3 11.10%						4 4.70%
Overburdened with work	25 64.10%	2 100.00%	14 51.90%		5 71.40%	1 100.00%	3 42.90%	1 100.00%	51 59.30%
Lack of rest	6 15.40%		6 22.20%	2 100.00%	2 28.60%				16 18.60%
Lack of Drainage System	1 2.60%								1 1.20%
Others	4 10.30%		1 3.70%				3 42.90%		8 9.30%
NA	2 5.10%		3 11.10%				1 14.30%		6 7.00%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

Table -55

Respondents' Reasons for Disease (Sidlaghatta)

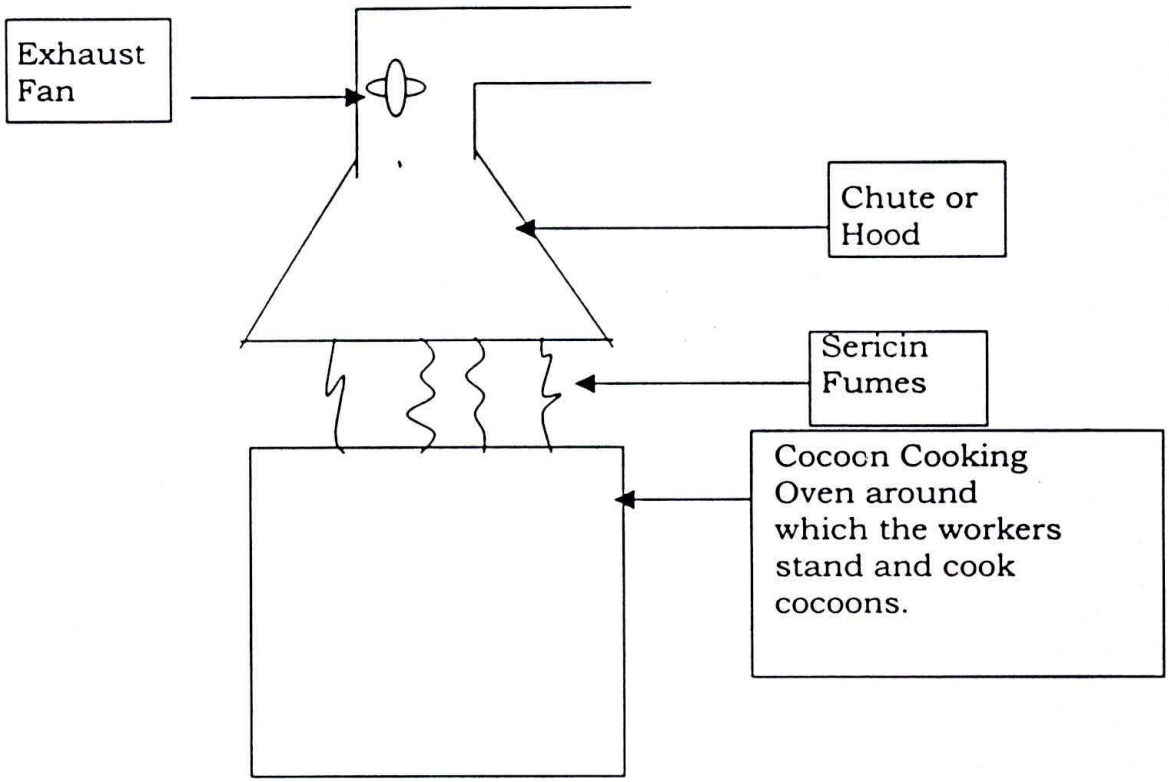
Particulars	Male	Female	Total
Work Atmosphere	1 0.80%	7 5.60%	8 3.20%
Smoke from boiling cocoons	94 75.20%	93 74.40%	187 74.80%
Dipping fingers frequently into hot water while reeling	6 4.80%	4 3.20%	10 4.00%
Over burdened with work		2 1.60%	2 0.80%
Lack of rest	1 0.80%	1 0.80%	2 0.80%
Lack of drainage system	1 0.80%		1 0.40%
Oven heat	2 1.60%	8 6.40%	10 4.00%
Others	14 11.20%	7 5.60%	21 8.40%
Formalin Smell	3 2.40%	2 1.60%	5 2.00%
NA	3 2.40%	1 0.80%	4 1.60%
Total	125 100.00%	125 100.00%	250 100.00%

Table –55a

Respondents' Reasons for Disease (Hosahalli)

Particulars	Male	Female	Total
Work Atmosphere	4 6.00%		4 4.70%
Over burdened With work	38 56.70%	13 68.40%	51 59.30%
Lack of rest	13 19.40%	3 15.80%	16 18.60%
Lack of drainage Facilities	1 1.50%		1 1.20%
Others	6 9.00%	2 10.50%	8 9.30%
NA	5 7.50%	1 5.30%	6 7.00%
Total	67 100.00%	19 100.00%	86 100.00%

A simple design for improving the unit's environment, reduce steam/smoke from the unit, was provided by T.S. Nagaraj (Technical Adviser, Seri-2000). A reeler who has used the design and equipment for about three months is convinced about its usefulness in reducing the smoke in the unit, and labourers too seem to agree with this view. However, labourers found it somewhat inconvenient as well, since the equipment hit their foreheads. Mr. Nagaraj considered this a small problem, and easily rectified. Another problem was that during rain, water entered the cooking pot. The original cost of the instrument was about Rs.8,000/- and Nagaraj says it can be reduced to Rs.2,000. But as of now, it can be used only in cottage basin reeling technology and not in charka reeling units.



Medication:

Through this study, reeling and grainage workers were asked about the type of medication they use whenever they had any health problems, and also the `medical' practitioner that they consulted. In this connection, we asked about the use of allopathic medicine, ayurvedic medicine, and "folk medicine." Folk medicine was broadly considered as any advise given by non-trained local persons about the use of local concoctions of some kind, which are presumed to have a beneficial effect on people with health problems. Reeling and grainage workers, by and large (about 80 per cent of them), used mainly allopathic medicine, and they were less satisfied with

the efficacy of other types of medicine, though they took these "remedies" from time to time, too. The general preference for steroid based drugs among the more severe cases of asthma is due to several reasons: a) doctors prescribe these medicines for a fixed period, but patients take them for long, and indefinite periods without medical supervision, on the assumption that as long as they provide relief they can carry on with these drugs, b) steroid based drugs are said to have an immediate and salutary effect on the patient, and they believe they can take the tablet whenever they feel particularly indisposed. Because of the medication they took in these conditions (i.e. when they had acute symptoms of respiratory problems), some semblance of normalcy was restored in a short while, and they were able to go for work. Missing work (particularly with the women) was not considered a viable option since they needed the wages to support their family.

Persons using medicine which they considered as "ayurvedic" constitute about 6 per cent (Table-60) of the total respondents. Haseena (16 years) was using `green tablets' for the past six months to control asthma. She had felt some relief, but that was only a temporary phenomenon. Muniyamma who is 52 years old has been using `herbal powder' prepared from some leaves and roots brought from Chintamani of Kolar district of Karnataka state. She stated that with this medicine, she could carry out

her daily business. Subbaramaiah (40 years of age) who was using allopathic medicines was not satisfied with that medication, and started taking 'fish medicine'[8] (including live fish). He claimed that with this "medicine" his cough has come down drastically. He had been using it for six months and plans to continue to use it for another six months. He hopes for a permanent cure with this medicine. Some others had had poor experience with "ayurvedic medicine" such as one, a woman of 32 years, who used some powder and liquid "medicine" for about six months. She had some allergic reactions on her skin, and even her respiratory problem became worse. Finding that the sought for "cure" was not forthcoming with "ayurvedic" medicine, many of the respondents reverted to allopathic medicine, which they felt gave them "instant relief."

Table 56

Using of folk remedies and health status

Folk Remedies	Sidlaghatta			Hosahalli		
	Having Disease	Healthy	Total	Having Disease	Healthy	Total
No	39 47.60%	43 52.40%	82 100.00%	7 16.30%	36 83.70%	43 100.00%
Yes	95 56.50%	73 43.50%	168 100.00%	8 18.60%	35 81.40%	43 100.00%
Total	134 53.60%	116 46.40%	250 100.00%	15 17.40%	71 82.60%	86 100.00%
Pearson chi-square			1.789	Pearson chi-square		0.081

Sidlaghatta : No association between using folk remedies and health.
Hosahalli : No association between using folk remedies and health

[8] 'Fish medicine' is an ayurvedic medicine which is put inside the mouth of a small, live fish. The patient has to swallow the fish, and the medicine.

Table 57
Types of medicines used

Medicines useful in the long run	Sidlaghatta			Hosahalli		
	Having Disease	Healthy	Total	Having Disease	Healthy	Total
Allopathic	117 58.20%	84 41.80%	201 100.00%	11 22.40%	38 77.60%	49 100.00%
Folk medicine	9 31.00%	20 69.00%	29 100.00%	1 5.60%	17 94.40%	18 100.00%
None	8 40.00%	12 60.00%	20 100.00%	3 15.80%	16 84.20%	19 100.00%
Total	134 53.60%	116 46.40%	250 100.00%	15 17.40%	71 82.60%	86 100.00%
Pearson Chi-square value			9.142*	Pearson chi-square		2.655

* Significant at 5% Level.
Sidlaghatta : Association between Medicines useful in the long run and health status.
Hosahalli : No Association between Medicines useful in the long run and health status.

Table 58

Number of visits to doctor in the past year

Number of visits to Doctor	Sidlaghatta			Hosahalli		
	Having Disease	Healthy	Total	Having Disease	Healthy	Total
Once in a Week	18 85.70%	3 14.30%	21 100.00%		1 100.00%	1 100.00%
Once in Fortnight	20 80.00%	5 20.00%	25 100.00%	2 66.70%	1 33.30%	3 100.00%
Once in a Month	40 64.50%	22 35.50%	62 100.00%	3 42.90%	4 57.10%	7 100.00%
Once in a Year	2 25.00%	6 75.00%	8 100.00%		9 100.00%	9 100.00%
Once in a Quarter	47 46.10%	55 53.90%	102 100.00%	9 23.70%	29 76.30%	38 100.00%
Not Visited	7 21.90%	25 78.10%	32 100.00%	1 3.60%	27 96.40%	28 100.00%
Total	134 53.60%	116 46.40%	250 100.00%	15 17.40%	71 82.60%	86 100.00%

Table 59

Frequency of meals

Frequency of meals	Sidlaghatta			Hosahalli		
	Having Disease	Healthy	Total	Having Disease	Healthy	Total
Thrice in a day	67 50.00%	67 50.00%	134 100.00%	10 14.10%	61 85.90%	71 100.00%
Twice in a day	67 57.80%	49 42.20%	116 100.00%	5 33.30%	10 66.70%	15 100.00%
Total	134 53.60%	116 46.40%	250 100.00%	15 17.40%	71 82.60%	86 100.00%
Pearson Chi-square			1.505	Pearson Chi-square		3.186**

** Significant at 10% level

Sidlaghatta : There is no association between frequency of food intake and health status

Hosahalli : There is an association between frequency of food intake and health status.

Table 60

Types of medicines used by respondents (Sidlaghatta)

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Ayurvedic	4 5.60%	6 4.80%		6 11.30%	16 6.40%
None	67 94.40%	119 95.20%	1 100.00%	47 88.70%	234 93.60%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table-60a

Types of medicines used by respondents (Hosahalli)

Particulars	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Ayurvedic			1 3.70%						1 1.20%
None	39 100.00%	2 100.00%	26 96.30%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	85 98.80%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

Many respondents (see tables 61 and 62) constituting about 67 per cent of the sample use local remedies on the belief that they can be benefited from using them (some were consumed; while others need external application). Those items being used include tender coconuts, butter milk, neem leaves, alcohol for asthma, ragi flour, caster leaf, green gram, pork, buttermilk, banana, ragimalt, cowdung to reduce body temperature. Sidlaghatta labourers used *sapat mulam* (for blisters and other skin problems), eye ointment, and tamarind pulp whenever they felt the need . These measures were said to provide temporary relief and therefore they used them. Alcohol consumption was frequently stated to provide relief from respiratory problems, and enabled sound sleep at night. Men and women consumed alcohol for this purpose[9].

[9] In the presence of a local physician, a reeling labourer stated that he had stopped drinking alcohol on this doctor's advise, and now his health problems had greatly increased.

Table – 61

Respondents' use of folk remedies (Sidlaghatta)

Particulars	SC & ST	Muslim	Christian	Other	Total
Yes	56 78.90%	83 66.40%		29 54.70%	168 67.20%
No	15 21.10%	42 33.60%	1 100.00%	24 45.30%	82 32.80%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table 62

Respondents' use of folk remedies (Sidlaghatta)

Use Folk Remedies	Male	Female	Total
Yes	77 61.60%	91 72.80%	168 67.20%
No	48 38.40%	34 27.20%	82 32.80%
Total	125 100.00%	125 100.00%	250 100.00%

A woman respondent (52 years, grainage worker) uses ragi flour with castor leaf to reduce body temperature. She applies ragi flour to her legs, hands and stomach and at the same time uses castor oil and covered with caster leaf. Another woman (60 years) prepares ragimalt at night, and mixes it with onion in the morning, and then drinks it. Jayamma (25 years) applies cowdung to her hands and feet (for skin problems) leaves it

on for about two hours, and then washes it off later[10]. Various measures are tried on one after the other, and whenever they think one of these measures works, they stick with it, and drop the others.. However, over a period of time, allopathic medicine is preferred, as more labourers find them relatively effective. (Tables 63 & 64).

Table 63

Types of medicines used by respondents (Sidlaghatta)

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Allopathic	52 73.20%	108 86.40%	1 100.00%	40 75.50%	201 80.40%
Folk medicine	12 16.90%	8 6.40%		9 17.00%	29 11.60%
None	7 9.90%	9 7.20%		4 7.50%	20 8.00%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table 63 a

Types of medicines used by respondents (Hosahalli)

Particulars	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Allopathic	24 61.50%	1 50.00%	16 59.30%	2 100.00%	3 42.90%		3 42.90%		49 57.00%
Folk medicine	8 20.50%	1 50.00%	2 7.40%		4 57.10%		3 42.90%		18 20.90%
None	7 17.90%		9 33.30%			1 100.00%	1 14.30%	1 100.00%	19 22.10%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

[10] There is a general lack of awareness regarding cowdung---and the possibility that open cuts on their hands and feet could easily lead to infections when cow dung is rubbed on.

Table 64

Use of medicines by men and women (Sidlaghatta)

Particulars	Male	Female	Total
Allopathic	95 76.00%	106 84.80%	201 80.40%
Folk medicine	17 13.60%	12 9.60%	29 11.60%
None	13 10.40%	7 5.60%	20 8.00%
Total	125 100.00%	125 100.00%	250 100.00%

Table 64 a
Use of medicines by men and women (Hosahalli)

Particulars	Male	Female	Total
Allopathic	39 58.20%	10 52.60%	49 57.00%
Folk medicine	14 20.90%	4 21.10%	18 20.90%
None	14 20.90%	5 26.30%	19 22.10%
Total	67 100.00%	19 100.00%	86 100.00%

Around 32 per cent (Tables 65 & 66) of the labourers, and irrespective of the disease (as all the labourers suffer from one or the other disease in a year) medicate themselves from time to time. There are instances of negative side effects when they have gone in for self medication. According to our data, men are more prone to this practice than women. However, after encountering these side effects, most of these respondents have stopped medicating themselves.

Table 65

Prevalence of Self Medication across Caste/Religion (Sidlaghatta)

Self Medication	SC & ST	Muslim	Christian	Other (Hindu)	Total
Yes	24 33.80%	32 25.60%	1 100.00%	23 43.40%	80 32.00%
No	47 66.20%	93 74.40%		30 56.60%	170 68.00%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table 65a

Prevalence of self medication across caste/religion (Hosahalli)

Self Medication	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Yes	4 10.30%		3 11.10%		3 42.90%		3 42.90%		13 15.10%
No	35 89.70%	2 100.00%	24 88.90%	2 100.00%	4 57.10%	1 100.00%	4 57.10%	1 100.00%	73 84.90%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00%	86 100.00%

Table 66

Self medication and gender (Sidlaghatta)

Self Medication	Male	Female	Total
Yes	48 38.40%	32 25.60%	80 32.00%
No	77 61.60%	93 74.40%	170 68.00%
Total	125 100.00%	125 100.00%	250 100.00%

Table 66 a

Self Medication and gender (Hosahalli)

Particulars	Male	Female	Total
Yes	11 16.40%	2 10.50%	13 15.10%
No	56 83.60%	17 89.50%	73 84.90%
Total	67 100.00%	19 100.00%	86 100.00%

Labourers were asked about their visits to local doctors. Their frequency of visits to physicians is indicated in Tables 67 and 68. The reluctance to pay any fee to the doctors is an important reason for avoiding doctors, and another reason is that they cannot take time off too often to meet doctors, unless the problem is really acute. It is usually respondents of higher incomes who visit the doctor more often, as they have a sufficiently high income to pay the fee and also buy medicines. If at all they visit a doctor, most of the respondents remarked that they meet a government doctor as it is cheaper. Though the government doctor takes Rs.5/- per patient (not legal) it is still cheaper than a private doctor, and they get a prescription as well as occasional free medicines.

Table 67

Number of visits to doctor, across caste/religion (Sidlaghatta)

Particulars	SC & ST	Muslim	Christian	Other (Hindu)	Total
Once in a week	10 14.10%	9 7.20%		2 3.80%	21 8.40%
Once in fortnight	6 8.50%	18 14.40%		1 1.90%	25 10.00%
Once in a month	19 26.80%	28 22.40%		15 28.30%	62 24.80%
Once in a year		4 3.20%		4 7.50%	8 3.20%
Once in a quarter	28 39.40%	53 42.40%	1 100.00%	20 37.70%	102 40.80%
Not visited	8 11.30%	13 10.40%		11 20.80%	32 12.80%
Total	71 100.00%	125 100.00%	1 100.00%	53 100.00%	250 100.00%

Table 67 a

Number of visits to doctor, across caste/Religion (Hosahalli)

Particulars	Madiga	ST	Lingayats	Muslims	Tigalaru	Brahmin	Madivala Shetti	Other castes	Total
Once in a week			1 3.70%						1 1.20%
Once in Fortnight	2 5.10%		1 3.70%						3 3.50%
Once in a month	3 7.70%		3 11.10%			1 100.00%			7 8.10%
Once in a year	6 15.40%		2 7.40%		1 14.30%				9 10.50%
Once in a Quarter	16 41.00%	2 100.00%	13 48.10%	2 100.00%	2 28.60%		2 28.60%	1 100.00 %	38 44.20%
Not visited	12 30.80%		7 25.90%		4 57.10%		5 71.40%		28 32.60%
Total	39 100.00%	2 100.00%	27 100.00%	2 100.00%	7 100.00%	1 100.00%	7 100.00%	1 100.00 %	86 100.00%

Table 68

Respondents' visits to doctors (Sidlaghatta)

Particulars	Male	Female	Total
Once in a week	8 6.40%	13 10.40%	21 8.40%
Once in fortnight	13 10.40%	12 9.60%	25 10.00%
Once in a month	33 26.40%	29 23.20%	62 24.80%
Once in a year	4 3.20%	4 3.20%	8 3.20%
Once in a quarter	52 41.60%	50 40.00%	102 40.80%
Not visited	15 12.00%	17 13.60%	32 12.80%
Total	125 100.00%	125 100.00%	250 100.00%

Table 68 a

Respondents' visits to doctors (Hosahalli)

Particulars	Male	Female	Total
Once in a week	1 1.50%		1 1.20%
Once in Fortnight	2 3.00%	1 5.30%	3 3.50%
Once in a Month	6 9.00%	1 5.30%	7 8.10%
Once in a year S	5 7.50%	4 21.10%	9 10.50%
Once in a Quarter	29 43.30%	9 47.40%	38 44.20%
Not visited	24 35.80%	4 21.10%	28 32.60%
Total	67 100.00%	19 100.00%	86 100.00%

Considering their frequent health problems, labourers thought that a regular visit from a doctor would be greatly in their interest. Of the 250 respondents, around 91 per cent of them said they needed a doctors visit to the place where they stayed.

Almost 87 per cent of the labourers are also ready to pay a nominal fee for the doctor's service, rather than availing of free medical advise.

Part B

Clinical

Medical report of the silk workers study done with Dr. Anand Inbanathan of ISEC, Bangalore by Dr.Om Prakash, consultant chest physician and Head, department of Medicine, St. Martha's Hospital, Bangalore.

- Introduction: Previous studies have shown that people involved in sericulture are at increased risk to develop asthma, due to occupational exposure to silk antigens. The prevalence has been estimated at about 14 per cent. In this study, the aim was to focus attention on a group of sericulture workers with occupational asthma and see their disease in perspective of severity, functional deficit, drug requirement, drug side effects if any and the reasons for nonoptimal management of the disease in the community. Further, an attempt has been made to suggest remedial measures based on the observations. A group of control subjects has also been studied to allow comparisons between the groups.
- Methodology:

  During the Sociological component of the study a questionnaire was provided to elicit presence of asthma using the International Union against Tuberculosis and Lung diseases questionnaire, slightly modified to suit the purpose of this study. The reliability of this questionnaire

has been adequately proven in previous studies internationally. Additional information with relevance to the exact nature of the occupation in sericulture was obtained in the field. Those subjects who were identified as having asthma (or chronic obstructive lung disease) were interviewed by the medical consultant (with considerable past experience in the field of investigation of occupational asthma in sericulture). The medical history focussed on the duration of silk work, its nature and the duration of asthma. Particular attention was given to elicit past history or family history of allergy which may have contributed to the illness. History of remission from asthma when away from silk work was looked into carefully as this is an important aspect in the diagnosis of occupational asthma, in most if not all subjects.

- Spirometry (Lung Function Tests):

Spirometry was conducted on all the study and control subjects, with the aid of a portable electronic spirometer, with pneumotachograph and computer base (SPIROSCREEN Model of Gould Electronics, U S A). The following parameters were recorded and analyzed.

1. Forced vital capacity (Liters)
2. Forced Expiratory volume in 1 second
3. Forced Expiratory volume in 1 sec/Forced vital capacity ratio.
4. Maximal midexpiratory flow rate (lit/sec)

5. Peak Expiratory flow rate (with a miniWright's peak flow meter.
6. Forced expiratory flow at 25% of vital capacity
7. Forced expiratory flow at 50% of vital capacity.
8. Forced expiratory flow at 75% of vital capacity.

The latter three parameters allow the appreciation of small airways flow and the degree of limitation of small airways flow. Mild (subclinical) airways dysfunction can be diagnosed with these parameters while the other values still remain normal.

The time volume curve and the integrated flow volume curves were observed for appreciation of presence of flow defects during the lung function tests.

The observed parameters were compared with already published norms for lung functions for five hundred and sixty South Indian Male and Female subjects[11]. In this manner, normal, obstructive and restrictive defects were analyzed as well as the degree of deficit noted.

Allergen Challenge Test: In one subject, who gave a strongly suggestive history of grainage dust causing immediate wheezing, the challenge test

was done with baseline spirometry and spirometry repeated after a few minutes of exposure to the grainage dust in the ambient atmosphere. The results of the test are elaborated in the results section below.

- Allergy prick Tests:

  The presence of atopy (allergy) to silk worm derived antigens was established by using prick tests performed with silk antigens derived from the pupae. In previous studies we have noted that a comparison of the antigens from the pupae was somewhat superior to the antigen from the cocoon, and hence we have been using the pupal antigen in all subsequent studies. The antigenic material was prepared at the Biochemistry laboratory of Professor P. V. Subba Rao of the Indian Institute of Science, Bangalore. The prick test were performed by placing a small droplet of the silk antigen, a droplet of Histamine solution and a droplet of buffered saline on the volar surface of the forearm of the subjects, and gently pricking the superficial layer of the skin through the droplet with a 26 gauge fine needle. The region was inspected after 15 minutes for the presence of a wheal and the area of the wheal if any was recorded. The skin test was regarded as positive or negative according to standard criteria employed in prick tests and the reaction was interpreted as positive or negative. The positive skin prick

[11] Om Prakash, Lung India, Vol 8, P23, 1990

tests to a given antigen indicates the presence of abundant antigen specific IgE antibodies in that given subject's serum. The tests were conducted on the study subjects as well as the control subjects. (All the prick tests were performed by the medical consultant and interpreted so that inter observer bias would be eliminated). Normally, histamine elicits a 4 to 8 mm wheal reaction (called positive control) and the saline solution elicits no reaction (called the negative control). A positive allergic reaction to any antigen should be above the diameter of the positive control wheal in order to be immunologically significant.

- Haematology:

  In selected asthma subjects and control subjects with chest symptoms, the following blood parameters were performed.

  1. Hemoglobin (gm%)
  2. Total white cell count.
  3. Differential white cell count.
  4. Erythrocyte sedimentation rate

  Attention was given to presence of any anemia (denoting poor nutritional status) and presence of high Eosinophil count which would favour the presence of allergic state.

- Radiology:

  Standard posteroanterior view chest X-rays were done in selected

subjects of the study as well as control subjects, in order to detect any radiological abnormality. Particular attention was paid to note evidence of chronic bronchitis and any past evidence or active pulmonary tuberculosis.

RESULTS

The study Group:

There were fifty seven subjects in the study group. With 42 females and 15 males. Among these, a few non respiratory illness subjects presented for medical examination and these were included as they would also serve as control subjects apart from the separate control group from the non sericulture area.

Age Range: Males : 16 – 55 years

Females : 20 – 60 years

Duration of Silk work:

Males : 2 to 27 years

Females : 2 to 35 years

Total number of asthmatics: 42 subjects

Occupational asthma: 32 subjects

(21 Females: 11 Males)

Non-occupational asthma: 10 subjects

Duration of silk work:

Females: 2 years to 15 years

Males : 2 years to 35 years

The duration of occupational asthma varied from as short as 6 months to as long as 15 years.

Three subjects were categorized as chronic bronchitis based on smoking history as well as clinical features and obstructive airway defect.

The following cases studied were noteworthy from the medical point of view as they raise certain questions which may add insights to the overall understanding of occupational asthma.

A. One 20 year old woman stated that she had no asthma symptoms during her childhood which was spent in the silk environment; she left Siddlaghatta and was away for a few years and later when she returned to Siddlaghatta, she developed asthma symptoms and evidence of allergy to silk antigens. This might imply that during the initial years of exposure, she had no allergic state but was being slowly sensitized (developing allergic antibodies to silk allergens); upon rechallenge later, she developed obvious asthma symptoms needing treatment. This phenomenon is well known with other common allergens like pollens and dust, but inadequately described in the

context of occupational asthma. It is not clear whether milder forms of this phenomenon are occurring in the community at large is an unanswered question.

B. One young woman was not a silk worker as such, but was living in the same house in which reeling was being done. She developed asthma and was allergic to silk antigen. This would be the passive exposure effect and again, the magnitude of this problem in the community at large is yet to be determined.

C. One 43 year old man, a driver by profession (who spends most of the time outdoors and is exposed to grainage dust only periodically when he comes indoors), complained of cough and wheeze upon entering the grainage area. He was subjected to the allergen challenge test. Baseline spirometry was done and the data recorded. He was asked to walk about in the grainage for five minutes. He was asked to walk about in the grainage for five minutes. He was noted to have chest tightness, cough and mild shortness of breath, at which point of time, spirometry was repeated. The data obtained are shown below.

Parameter	Baseline	Post exposure
F V C	3.79	2.88 (- 24%)
F E V 1.0 sec	3.16	2.38 (- 24%)
Peak Flow rate	450 L/min	300 L/min
M M E F R	2.61 L/Sec	1.65 L/sec
Flow at 50% VC	3.18 L/sec	1.67 L/sec

This subject had a strongly positive skin test for silk antigen and this

conclusively proves that he was a subject of occupational asthma. To our knowledge, this is the FIRST time that a challenge test has been performed in the contest of silk studies, and this may be important as this type of "natural setting" challenge tests are easy to perform and can pick up subjects suspected to be having allergy to airborne allergens.

D. Two subjects showed remission after suffering from asthma for a few years; in one case, it appeared to be natural remission while the subject continued to be exposed to silk allergens. In the other, the remission was due to the subject leaving silk work due to illness which was becoming increasingly severe. The immunological mechanism underlying the first subject's clinical behaviour is not clear at this time.

- ANALYSIS OF LUNG FUNCTION TESTS:

  A. All the 57 study subjects underwent spirometry. Among these, ten subjects had normal lung functions. These included six intra-group controls (those with no lung symptoms) and one with mild asthma but normal lung functions at time of testing.

  B. 32 subjects with asthma had abnormal lung functions, with varying severity of functional impairment.

  C. Two subjects had chronic bronchitis with severe impairment of lung functions.

D. There were SEVEN cases of pulmonary tuberculosis, of whom six were treated cases and one was an active case. The lung functions I the six cases showed mild to moderate restriction of vital capacity, due to lung fibrosis (scarring) and in the active case testing was not done.

Based on careful analysis of the lung function tests, the following observations can be made:

1. The longer the duration of asthma, the more the functional impairment.
2. Generally, subjects with short duration of asthma tend to have better preserved lung functions, though there may be exceptions to this.
3. It is to be noted that even subjects with mild asthma showed impairment of small airway parameters, indicating that there was disease in a mild form. This finding is of considerable importance from the point of view of detecting asthma in the occupational setting and from the epidemiological point of view in further studies.
4. It must be stated, however, that occupational and non-occupational asthma will both show similar defects and one cannot use lung function parameters to differentiate the two.

- Haematology:

The results of the blood tests revealed among the 20 study subjects who had blood tests, as many as 15 had mild anemia (less than 11.0 Gm hemoglobin. Five subjects showed mild eosinophilia. Eosinophils increase in blood in many states of allergy, and presumably the cause of eosinophilia in these subjects was asthma. However, worm infestation is also a common cause and this has to be kept in mind in interpreting the data.

- Radiology:

Routine Chest X-rays were performed in thirty three subjects and interpreted by the medical consultant. 26 were radiologically normal. Seven subjects had evidence of pulmonary tuberculosis, with resultant scarring of the lung. One subject had chronic bronchitis as well as tuberculosis. One subject had left basal bronchiectasis.

- CONTROL SUBJECTS

The control subjects were from among those surveyed in a village in which silk work is not present. A total of sixteen subjects were included. There were 14 males and 2 females. The age ranged from 35 to 75 years. Among these seasonal asthma was noted in three subjects and chronic bronchitis in eight subjects. Perennial asthma was noted in one subject. Only this subject was dependent on oral steroid medication for relief. There were five non respiratory subjects,

(diabetes, hypertension and alcoholism).

Skin tests:

All the subjects were negative to prick testing with silk pupal antigen. This of course, was an expected finding.

Radiology:

Chest X rays were done in six selected cases. All these X-rays were interpreted as normal. It must be noted that mild to moderate bronchitis may not be evident on chest X-ray and is essentially diagnosed by lung function tests and history. Notably, there was no case of tuberculosis.

Haematology:

Haematology was done in the same subjects who had radiology. Anemia was noted in one subject. Mild eosinophilia was noted in one asthmatic who was the one with perennial asthma.

DISCUSSION

The present study reveals that a substantial morbidity due to occupational asthma exists in the silk workers. The exposure to allergens derived from silk can occur at different stages. Firstly, the process of boiling of cocoons before reeling can expose the worker to aerosolised particles and sensitize

him/her. Secondly, the reelers are at risk for the same reason. Thirdly, in the grainages, exposure to epithelial dust from the moths pervades the atmosphere indoors and can act as the allergic trigger over a period of time. In the past studies we have shown that the epithelial dust is indeed antigenic by showing that the dust is rich in the same proteins which emanate from the pupae. Further, studies from Japan indicate that even the inhalation of dried urine of the silkworm moths can be antigenic, so that rearers can also be at increased risk to develop asthma.

What are the therapeutic options open to alleviate the morbidity due to occupational asthma? The ideal option would be to identify young subjects who are already sensitized to silk allergens and counsel them to be away from this environment. (In fact we have noted in the past two boys, one aged five and the other seven years old who were showing strongly positive skin tests to silk allergen). But this seems unfeasible. The other option is for the worker to leave the occupation at an early stage in the development of the disease so that he can escape to relative health. But this again seems a formidable step given the economic conditions that prevail. Past studies have shown in other models of occupational asthma that the longer the duration of asthma, the more severe the asthma and gradually persistent (as opposed to reversible) airways obstruction results. In fact many examples we saw in the course of our study were indeed such cases

with permanent respiratory symptoms despite treatment.

The other option would be to try to reduce the degree of exposure to the allergens by some means of environmental engineering. In the silk grainages at least, where the particles are airborne matter, the following suggestions have been proposed.

a. Well designed buildings with cross ventilation as well as exhaust facilities.
b. Reduce the particulate matter by wet curtains and wet floor.
c. Filter pad masks for the grainage workers.

These measures may be possible in the organized sector to some extent. While not entirely curative, these measured may tend to lessen the degree of morbidity. Yet, one must remember than unlike mineral and other dust particles, where one can talk in terms of particle density in the atmosphere (in mg per meter), in the context of allergy the amount of allergens matter that needs to be inhaled can be extremely small, and the measures mentioned above may not work to the extent anticipated. Only systematic studies can throw more light on the question.

In the reeling units, exhaust fans and airflow designed to carry the aerosol emanating away from the worker can be looked into; this step also needs to

be studied in a very controlled manner before large scale recommendations can be made.

This leaves us with options directed towards treatment of the affected worker; after all, allergy and resultant asthma affects only a proportion of the workers, and perhaps financial and other forms of thrust may have to be directed towards treatment of the individual and monitoring his/her progress.

The present study emphasizes on the degree of morbidity as assessed by clinical criteria in the form of symptoms and disability as well as by impaired lung functions. It was noted that the efficiency of the workers suffers due to the disease, as well as the cost of the treatment strains the already poor economic resources. A more serious dimension is the fact that many of these patients are placed on corticosteroids orally to control asthma symptoms. Steroids, undoubtedly, do cause significant reduction in asthma by a variety of biochemical mechanisms; but long term use of steroids can lead to systemic side effects; the more important of these are hypertension, diabetes, impaired immunity leading to frequent infections and loss of calcium from bones (osteoporosis). One of the most significant advances in the management of asthma in general has been the availability of inhaled steroids (namely, Beclomethasone, Budesonide and more

recently, Fluticasone). These are extensively used in the treatment of asthma in our communities, wherever the patients can afford them. Inhaled steroids can cause reduction in asthma with minimal side effects. But the cost of these appear prohibitive in the context of the silk workers. Further, the inhalation devices and the proper use of them are difficult to teach even in the urban context; it would appear formidable in the field at large. One has to them resort to large volume spacer devices which can deliver aerosol medications more effectively and can be taught easily. But the cost may again be an inhibiting factor, though the spacer device is an onetime investment. Unfortunately, there is very paucity of studies addressing towards the trials of inhaled steroids in the setting of common occupational asthma models. Further, it is not known whether asthma in general responds more readily than the occupational variety.

In view of these observations, we decided to administer long acting theophyllin and nonsedating antihistamine to a group of 20 asthmatic subjects. These were given as Theophyllin (Theolong) 100 mg once at bedtime or twice daily, depending on the severity of asthma; cetirizine hydrochloride 10 mg given at bedtime. After a period of four weeks, most patients reported some degree of reduction of symptoms, particularly nocturnal symptoms during the study period. Perhaps a controlled trial of inhaled steroids, in a study group can be very useful to answer the

question of an alternative to oral steroids.

Tuberculosis: It was noted during the study that as many as seven subjects had developed pulmonary tuberculosis and needed treatment. None of the control subjects had pulmonary tuberculosis. Though definitive conclusions can perhaps not be drawn about this, one is intrigued by the rather high prevalence of tuberculosis in the silk setting. It is well known that oral corticosteroids impair cell mediated immunity and hence it is tempting to implicate steroids as the cause for reactivation of tuberculosis among some of the workers. But it has to be noted that the subjects with tuberculosis were not steroid dependent; it is however possible that occasional steroid use may have been resorted to by these asthmatics when asthma was severe. Also, it is noteworthy that there were non-asthmatic subjects who had contracted tuberculosis among the study group. It is hence more likely that the congested living conditions might have been conducive to the lateral spread of tubercular infection.

In this context, it I worth noting that some occupational pneumoconiosis such as silicosis can predispose to tuberculosis of the lungs. It is not clear whether asthma, in some complex way reduces the local immune mechanisms and predispose to break-down of tuberculosis. Overall, it is felt that the higher prevalence of tuberculosis needs to be looked into in

greater detail with epidemiologically controlled data documentation.

Pediatric Population: During the course of the study, we noted that a large number of young children, including infants in arms, were exposed to silk environment. As noted earlier, sensitization is occurring at a young age. It is imperative that studies by pediatricians be conducted to see the extent of the problem and the possible long term implications of the exposure.

In conclusion, the data obtained from this study, denote that there is substantial morbidity due to asthma in silk workers. The prevailing socio-economic conditions do not seem to favour environmental manipulation as the major alleviating factor. It would appear that provision of long term bronchodilators and perhaps anti inflammatory drugs such as inhaled steroids to the asthma subjects may be the viable option to mitigate the suffering as well as minimize side effects due to steroids.