

# Assessment of Socioeconomic Impact of Sericulture in Murshidabad: A Social Outreach Programme of Rammohan College

Chayanika Roy<sup>1</sup>, Sanjay Kumar Paul<sup>2</sup>, Brinta Basu<sup>3</sup>, Sriparna Bawali<sup>4</sup>, Mohana Mukherjee<sup>5</sup>,  
Siddhee Sthita Mishra<sup>6</sup>, Kaustav Dutta Chowdhury<sup>7</sup>, Santi Ranjan Dey<sup>8</sup>

<sup>1, 2, 7</sup>Assistant Professor, Department of Zoology, Rammohan College

<sup>3, 4, 5, 6, 8</sup>Graduate Student, Department of Zoology, Rammohan College

<sup>1</sup>Corresponding Author Email: [srdey5\[at\]gmail.com](mailto:srdey5[at]gmail.com)

**Abstract:** Sericulture was traditionally the main source of income for rural residents in Murshidabad, West Bengal. Sericulture greatly boosts the state's economy by generating jobs, especially for rural women. In 2015–16, the state produced 2568 metric tonnes of raw silk, generating jobs for 22, 19 lakh people. In West Bengal's various districts, there are many problems that affect sericulture workers, such as fluctuating cocoon prices, a lack of markets where raw cocoons can be sold, poor market connections, a lack of storage facilities, poor information about market prices, middlemen who take advantage of sericulture workers, a lack of funding, a lack of innovation, etc. The Researchers were motivated to do this particular investigation by these related issues. As a result, the current investigation will focus on issues at the highest level to lowest level. We found tremendous poverty and gender discrimination, INDIA is earning a lot from Sericulture. This study examines the socioeconomic disparities within the sericulture industry, focusing on the living conditions and prosperity of farmers, weavers, and industrial employees. Through comprehensive research and data analysis, we found that farmers, as landowners, enjoy greater prosperity compared to weavers and industrial employees. The key factor contributing to this disparity is the limited government involvement and support in the growth of the sericulture business, particularly in relation to weavers and industrial employees. Our findings reveal that weavers and industrial employees face extreme poverty, with minimal access to government assistance. Moreover, our investigation uncovered that multiple reelers share a single reeling machine, highlighting the collective efforts of individuals in overcoming resource constraints. The study underscores the urgent need for government intervention to uplift the conditions of weavers and industrial employees, as well as to promote equitable growth in the sericulture industry.

**Keywords:** Sericulture, Murshidabad, Gender, Socio - economy, Survey

## 1. Introduction

The Chinese word "Su" [Si], which implies silk, has been translated to the English word "Sericulture." Seri means "silk" in Sericulture, while culture refers to raising animals [1]. Raising silkworms for the production of raw silk and other byproducts is known as sericulture. In other terms, sericulture is the mass - scale raising of sericigenous insects for the purpose of producing raw silk. Being a unique fibre and known as the "Queen of Textile," silk. Sericulture is a rural, labor - intensive, agro - based cottage industry that offers plenty of jobs to the economically underprivileged groups in society [2]. Sericulture is attracting farmers' attention since it needs little capital outlay and yields great returns quickly. It is the ideal method for enhancing both the rural economy and farmers' level of living. One of India's key economic sectors, sericulture has a significant impact on reducing poverty. Sericulture is one of the cottage businesses that gives rural residents more employment options [3]. The only cash crop in the agricultural industry that provides immediate returns within 30 days is sericulture. The Indian silk industry is the largest in the world and accounts for over 15% of global production [4]. Sericulture is an industry that values the environment and is friendly to women. It illustrates how communities may utilise natural resources without endangering the ecosystem and how people and nature can coexist peacefully. Therefore, sericulture is the ideal profession for West

Bengal's rural population. Sericulture is hence frequently referred to as the "Poverty Industry." The second - highest number of individuals are employed in sericulture, a cottage industry in agriculture (1 acre supports 13 people). Despite the small investment, the profit margin is high. Silk has the ability to produce enough foreign cash. The Morus tree helps halt soil erosion and can be grown on shared land. [4]. Sericulture is a profession that welcomes women and Additionally, fishing, poultry, and the development of medicines can all benefit from using silk worm byproducts [5]. The plant is grown in agricultural fields, and West Bengal is where high yielding versions of the S1, S1635, and BC229 silkworms are raised.

The silk moth can go through one life cycle (univoltine), two life cycles (bivoltine), or four to five life cycles (multivoltine) in a calendar year. The Nistari eggs, which are a hybrid between two distinct cycles, are employed during raising. Typically, multivoltine into multivoltine, multivoltine into bivoltine, or bivoltine into bivoltine are crossed to create Nistari. Typically, multivoltine breeds like A23, B, G, etc. as well as KPGB, NB18, P5, etc. are employed. There are bivoltine breeds utilised. A thread called silk has a sericin - coated protein covering its fibroin core in the middle. The silk gland secretes silk. The fourth and fifth instar larva have a fully formed silk gland. Adults have a lifespan of 4 - 6 days. In women, it is larger than in men. It has a yellowish brown hue. Scales cover the body.

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Compared to women, men are more active. Within 6 to 8 weeks, the life cycle is finished. Larvae have a whitish colouring. Very fine hair all over the body. The head, thorax, and abdomen make up the body. There are 11 parts in the abdomen. Between the third and sixth segments, there are 4 pairs of legs. The attached figure depicts a short life cycle. Loamy soil is ideal for growing mulberries. It is also grown in the mountainous area. *Morus* was multiplied through cutting, grafting, etc. *Morus* once sown live for 25 years. *Morus* is susceptible to different pests like grasshopper, thrives leaf hopper, termite etc. It is also affected by fungal disease like Blight, Collar, Wrought, Stem blight etc [6].

After mating, a female lies within the funnel or piece of paper. On the paper, also referred to as an egg card, they typically lay 2000 eggs. The egg card is set in a tray that is often made of bamboo or plastic. Cubed morus leaf is used to feed the larva. The larva are placed in a circular tray, or Chandraki, after they reach the fifth instar. They create cocoons there. As it boils in water, the pupa inside the cocoon is destroyed by steam or hot air. The reeling device takes the silk. Rendita is the number of cocoons needed to produce one kilogramme of silk. Protozoan disease Pebrine, bacterial disease Flacherie, Sotto court, etc., or viral disease Grasserie all affect silkworms. Fungus that produces white or green muscardine also affects them. The Uzi fly is their parasite. The silkworm is also attacked by ants, mice, rats, and birds [7].

### 1.1 History of Sericulture

China is the birthplace of silk production and is known as "Serica's Land." Around 8000 B. C., in China, the Neolithic era is when silk production began. The art of silk reeling, the method of raising silkworms, and the production of mulberries all date back to the reign of Emperor Hwang - Ti in China, almost three thousand years ago. For over 2000 years, China held the monopoly on the silk trade thanks to the secrecy surrounding all the processes and techniques involved in reeling silkworms and weaving. Although there are myths about the origin of silk in Confucius' writings and Chinese tradition, they claim that, in the 27th century BC, Chinese empress Leizu was drinking tea in the garden when a silk worm's cocoon fell into the cup. In an effort to remove the cocoon from her beverage, the 14 - year - old girl started unrolling the cocoon's thread. Later, she decided to weave it. The emperors and monarchs of Japan, Thailand, and the Indian subcontinent have all long favoured silk. A very old route known as the "Silk Road" that started in China, travelled through Tashkent, Baghdad, Damascus, Istanbul, and reached European countries can be used to trace the growth of silk over the years. Around 300 CE, the practise of making silk reached Japan, and by 522 CE, the Byzantines had acquired silkworm eggs and had started cultivating them. The 9th century saw the start of Arab silk production as well. In addition, Western Europe, including France, Germany, and Italy, began practising sericulture in the 12th century. With the advent of the Industrial Revolution (1800 A. D.), the textile and silk industries flourished and created a significant demand for raw silk. The Buddhist era is when sericulture in India first began. The term "Silk and cocoon," which is used in India, is found in ancient Sanskrit literature, which suggests that India had a

type of silkworm in very early times. According to philosophical references to silk thread in the Mahabharata, the Ramayana, and the "laws of Manu," the silk industry in India predates the arrival of the Christian era.

### 1.2 Research in Sericulture

The thorough spatial analysis of sericulture in West Bengal was emphasised by Trivedi and Sarka in 2015 [8]. The author discussed the bio - ecological, geo - economic, and multifaceted issues in West Bengal in terms of various sericulture sectors, including mulberry farming, silkworm rearing, silk reeling, weaving, and ultimately sale of finished silk products. The study also showed that the ineffective market mechanisms are to blame for the high cost price of silk fabrics. According to Trivedi, S. and Sarka, K. (2015), the flow to the sericulture is enough and timely [8]. He claims that sericulture primarily needs credit in four areas of farm operation: for the preparation of irrigational facilities, for the construction of rearing houses and provisions for rearing, equipment, and farm operation, including the short term credit for mulberry cultivation and rearing. Mishra (2003) concentrated on the potential for implementing sericulture in the Andhra Pradesh district of Prakasam [9]. From field preparation to commercialization, rural adolescents are vital to sericulture activities. The young people work seasonally in sericulture on a part - time basis. In the Rayalaseema region of Andhra Pradesh, Trivedi, S. and Sarka, K. (2015) examined the employment prospects available to rural women in sericulture [8]. The silkworm raising process is mostly handled by women and older people, and it doesn't call for any complex machinery in the sericulture sector. The alleviation of rural poverty is a highly valuable source of income. According to Yasin, S. (2013), the Ananthapur district is one of the key districts in Andhra Pradesh for mulberry production and silkworm breeding [4]. The recent changes in raw silk pricing have had a significant impact on cocoon prices, demonstrating the importance of studying sericulture's economics. The analysis made it quite evident that sericulture generates somewhat more revenue. The year - round consistent income was the other significant benefit. Bangladesh is a developing, small nation, and Yasin (2013) said that the silk industry is crucial to the economy of the nation [4]. The survey unmistakably indicated that Bangladesh's silk industry deals with a number of issues, including outdated technology, bad advertising, a lack of showroom space, a paucity of raw materials, inadequate governmental infrastructure, a lack of funding, etc. In addition, the writers noted a few opportunities, such as expanding sales and market share, a low cost of labour, rising demand, a favourable geographic position, and job opportunities. According to Yassen S. (2013), the Indian silk industry dominates the globe despite producing only 15% of the world's total production [4]. However, the Indian Sericulture sector has a number of issues, including the fluctuating price of cocoons, the lack of a viable market, a lack of funding, the sheer volume of products available, and the lack of storage facilities. Bivoltine silkworm races, which can produce raw silk of international standards and hence increase production, have only lately been able to develop and become more well - known thanks to the Central Silk Board [10]. According to the study, India is capable of producing sufficient amounts of high - quality

silk to both meet domestic demand and earn important foreign cash.

### 1.3 Sericulture at Global Level

Sericulture is essential to the world economy, and notably to the rural economies of all countries. After China, which produces the most raw silk worldwide, India is the second - largest producer [11]. The key silk - producing countries include China, India, Uzbekistan, Brazil, Japan, Republic of Korea, Thailand, Vietnam, Iran. Other countries that produce cocoons and raw silk, though in considerably smaller quantities, include Kenya, Botswana, Nigeria, Zambia, Zimbabwe, Bangladesh, Columbia, Egypt, Japan, Nepal, Bulgaria, Turkey, Uganda, Malaysia, Romania, Bolivia, etc. The top silk consumers worldwide are the United States, Italy, Japan, India, France, China, United Kingdom, Switzerland, Germany, UAE, Republic of Korea, and Vietnam.

### 1.4 Sericulture in India

Mulberry, Tropical Tasar, Oak Tasar, Eri, and Muga are the five various varieties of raw silk, and they are all only made in India. Mulberry is the primary sericulture product in India. The production of mulberry silk accounts for over 75% of the nation's total silk output. Karnataka, Andhra Pradesh, West Bengal, Tamil Nadu, and Jammu and Kashmir are the five states that produce the most mulberry raw silk, accounting for 96% of the country's total production [12].

Additionally, non - traditional states like Uttar Pradesh and Madhya Pradesh produce a significant amount of mulberry silk. The major producers of tropical Tasar silk are the states of Jharkhand, Chhattisgarh, Odisha, Madhya Pradesh, Maharashtra, West Bengal, Uttar Pradesh, and Andhra Pradesh. Oak tasar is grown in the Indian sub - Himalayan region, which encompasses the states of Manipur, Nagaland, and Uttarakhand. Assam has the highest production levels

among the North - Eastern states, where ericulture is largely practised. Assam's Muga culture is distinctive to that state and plays a key role in its history and culture. Arunachal Pradesh, West Bengal, Meghalaya, and Nagaland are a few states that are starting to adopt Muga culture.

### Distinction of Silk, Silkworm names and Feeding plants

Distinction of Silk	Silkworm name	Common name of food plant rearing
Mulberry	<i>Bombyx mori</i>	Mulberry
Tropical Tasar	<i>Antheraea perni</i> <i>Antheraea mylitta</i>	Sal, Asan, Arjun
Oak Tasar	<i>Antheraea proylei</i>	Oak
Eri	<i>Philosomia ricini</i>	Castor, Tapioca, Kesseru
Muga	<i>Antheraea assama</i>	Som, Soalu

**Source:** Sericulture in India: Cultivation and Economics, Kurukshetra Journal, Vol.65, No.3, January 2017

### 1.5 Sericulture in West Bengal

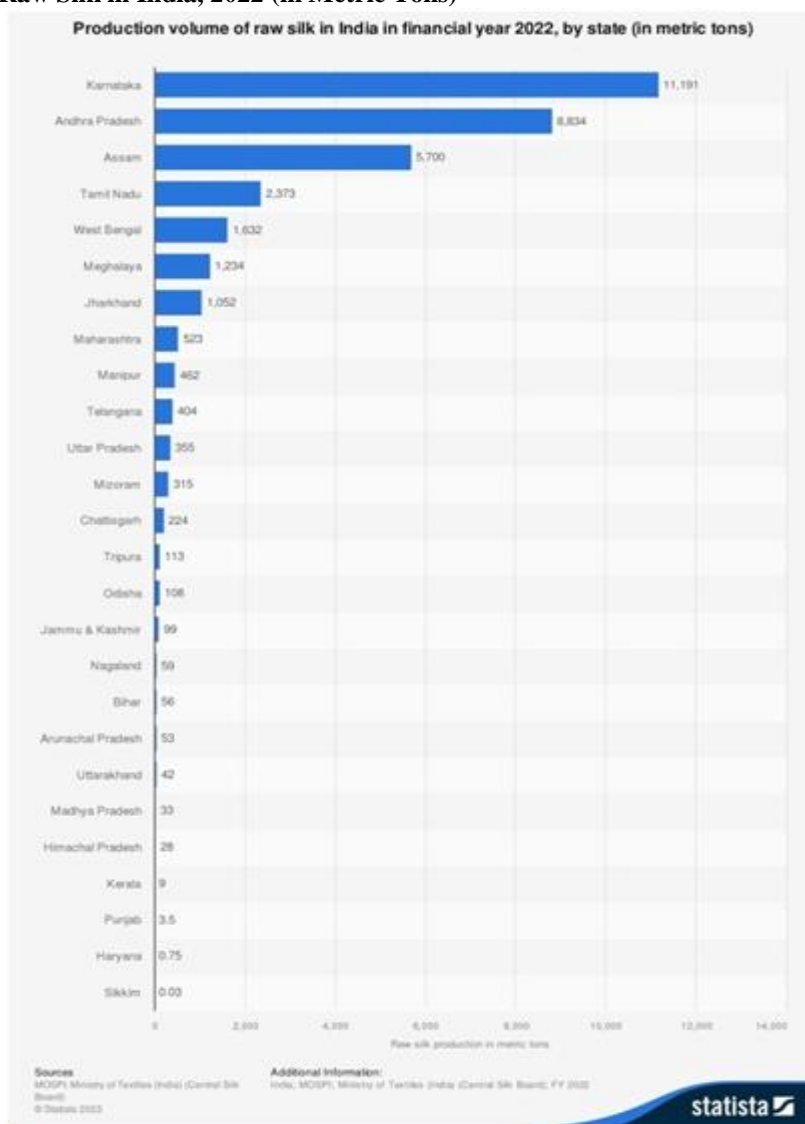
West Bengal is known as a traditional state in sericulture. West Bengali peasants have been involved in sericulture since the beginning of time. It is an additional crop for the agricultural industry in West Bengal. Sericulture is a significant source of revenue for small landowners. Because of its suitable climate and ecology, West Bengal is a natural centre for the production of many varieties of raw silk. West Bengal's sericulture agricultural districts include Malda, Murshidabad, Birbhum, Cooch Bihar, Jalpaiguri, Darjelling, Nadia, and East Mednipur. There are roughly 2865 villages where sericulture is practised, and over 22.19 lakh people work in this field. Sericulture is crucial to the state's economy since it provides work for rural populations, particularly women. West Bengal is a significant producer of Mulberry raw silk and a little producer of Tropical Tasar, Eri, and Muga kinds. In the state, races known as bivoltine (a white race) and multivoltine (a hybrid of two races) have both developed. Although the state doesn't generate a lot of raw silk, the silk it does produce is of very good quality [13].

SERICULTURAL STATISTICS IN INDIA - A GLANCE							
Particulars	Unit	2016 - 17	2017 - 18	2018 - 19	2019 - 20	2020 - 21	2021 - 22
Mulberry Plantation	ha.	216810	223926	235001	239967	237578	242277
<b>Mulberry Cocoon Production</b>							
Bivoltine	MT	34202	38945	46458	46295	43885	52328
Cross Breed	MT	121487	122739	139102	138848	125460	134913
<b>Total</b>	<b>MT</b>	<b>155688</b>	<b>161684</b>	<b>185560</b>	<b>185143</b>	<b>169345</b>	<b>187241</b>
<b>Mulberry Silk Production</b>							
Bivoltine	MT	5266	5874	6987	7009	6783	7941
Multivoltine	MT	16007	16192	18357	18230	17113	17877
<b>Total</b>	<b>MT</b>	<b>21273</b>	<b>22066</b>	<b>25344</b>	<b>25239</b>	<b>23896</b>	<b>25818</b>
<b>Vanya Silk</b>							
Tasar Reeling Cocoon	Lakh No.	23674	22435	23336	24181	20775	12217
Tasar Silk Yarn	MT	3268	2988	2981	3136	2689	1466
Eri Cut Cocoon	MT	7060	9968	9120	9219	8951	9528
Eri Spun Yarn	MT	5637	6661	6910	7204	6946	7364
Muga Reeling Cocoon	Lakh No.	8450	9645	11682	12814	12056	12886
Muga Raw Silk	MT	170	192	233	241	239	255
<b>Total Vanya Silk Production</b>	<b>MT</b>	<b>9075</b>	<b>9840</b>	<b>10124</b>	<b>10581</b>	<b>9874</b>	<b>9085</b>
<b>Total Raw Silk Production</b>	<b>MT</b>	<b>30348</b>	<b>31906</b>	<b>35468</b>	<b>35820</b>	<b>33770</b>	<b>34903</b>
<b>Exports</b>	Creore Rs.	2093.42	1649.48	2031.88	1745.65	1466.6	1848.96
	Mn. US\$	312.13	255.93	291.36	246.67	198.3	248.56
<b>Import of Raw Silk</b>							

Quantity	MT	3795	3712	2785	3315	1804	1978
Value	Crore Rs.	1092.26	1218.14	1041.40	1149.32	570.56	819.68
	Mn. US\$	162.85	189.01	148.38	162.38	77.24	109.75
Employment	Lakh Person	85.10	86.04	91.78	94.30	87.3	87.8
<b>Prices</b>							
<b>Mulberry</b>							
Reeling Cocoon (CB) *	Rs. /kg	353	398	282	330	254	420
Reeling Cocoon (BV) *	Rs. /kg	421	492	342	409	330	541
Raw Silk (#) **	Rs. /kg	2864	3500	3191	3026	2562	3421
Silk Waste (Filature) ***	Rs. /kg	500 - 625	540 - 650	540 - 700	520 - 680	400 - 550	410 - 740
<b>Vanya</b>							
<b>Tasar</b>							
Reeling Cocoon (Daba - Grade I)	Rs. /1000 No.	3000 - 3300	3000 - 3700	3000 - 3450	3200 - 3400	2700 - 3200	3200 - 3680
Reeling Cocoon (Raily)	Rs. /1000 No.	3500 - 6300	4000 - 5000	4000 - 5000	4500 - 5000	2700 - 3200	3200 - 3680
Raw Silk (Reeled Yarn)	Rs. /kg	3200 - 4800	3200 - 3500	3200 - 3500	4000 - 4500	3200 - 4000	3200 - 4000
Raw Silk (Ghicha Yarn)	Rs. /kg	1600 - 2200	1800 - 2100	1800 - 2100	2000 - 2200	1800 - 2100	1800 - 2100
<b>Eri</b>							
Cut Cocoon (Superior Quality)	Rs. /kg	550 - 850	700 - 890	700 - 900	750 - 950	770 - 930	770 - 1100
Raw Silk (Spun Yarn)	Rs. /kg	1800 - 2600	2100 - 2700	2250 - 2800	2500 - 2900	2460 - 2800	2500 - 2900
<b>Muga</b>							
Reeling Cocoon	Rs. /1000 No.	1600 - 3500	1800 - 4000	1800 - 6000	3000 - 6000	2200 - 4000	2000 - 4000
Raw Silk (Warp)	Rs. /kg	14200 - 18000	13000 - 22000	18000 - 25000	19400 - 25500	19800 - 26000	19800 - 30000
Raw Silk (Weft)	Rs. /kg	12500 - 15500	12000 - 20000	16500 - 20000	17000 - 19000	17800 - 20000	18000 - 27000

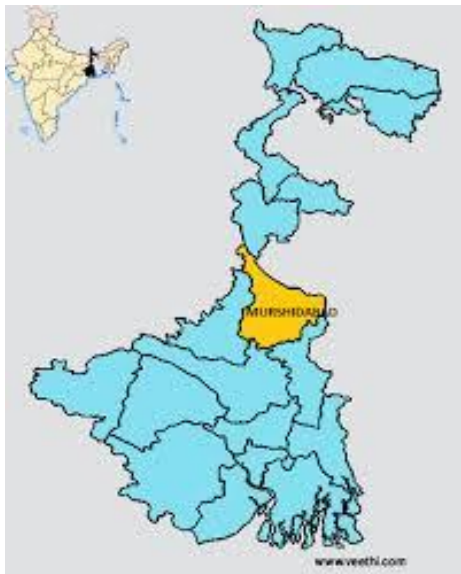
Source: Central Silk Board, Bengaluru

Production Volume of Raw Silk in India, 2022 (in Metric Tons)



### 1.6 Statement of the Problem

The traditional source of income for rural families in Murshidabad, West Bengal, was sericulture. Sericulture contributes significantly to the state's economy by creating jobs, particularly for women in rural areas [3]. The state produced 2568 metric tonnes of raw silk in 2015–16, providing employment for 22, 19 lakh people. There are many issues affecting sericulture workers in different districts of West Bengal, including price fluctuations for cocoons, a lack of suitable markets to sell raw cocoons, poor market links, a lack of storage facilities, poor information about market prices, middlemen taking advantage of sericulture workers, a lack of funding, a lack of innovation, etc. **These combined problems provoked the Researchers to take up this particular study.** So, the present study will examine the gross level problems of sericulture worker.



### 1.7 Area of Study

East Indian state of West Bengal includes the district of Murshidabad. The area is extremely fertile and is located on the left bank of the Ganges River. spanning a 5, 341 km<sup>2</sup> (2, 062 sq mi) area. The Bhagirathi River divides the district's two distinctive geographic areas. The Chota Nagpur plateau continues westward as the Rarh, a high, undulating plateau. The Ganges Delta's fertile, low - lying alluvial region known as the Bagri is located in the eastern section. The Bhagirathi and Jalangi rivers, as well as their tributaries, drain the district. A offshoot of the Ganges, the Bhagirathi runs south from the Farakka barrage, where the Ganges originates. It divides the region into almost equal parts as it flows south across it.



Study site I: Central Sericultural Research and Training Institute, Berhampore, Murshidabad.

Study site II: Textile Factory, Vill: Mukundapur, Near Nabagram Toll Plaza, NH 34, Murshidabad

Study Site III: Village Jafarpur, Block Panchgram, SubDivision Nabagram, Murshidabad

Study Site IV: Chowk Islampur, Block Raninagar II, Subdivision Domkol, Murshidabad

### 1.8 Objective of study

The primary objectives of the study are -

- 1) To assess the status of sericulture practice and its' economy in Murshidabad.
- 2) To find out the weighty problems of sericulture in Murshidabad
- 3) To investigate the areas of strengths and prospects of sericulture in Murshidabad.

### Database and Methodology

- 1) The present study is based on secondary sources of data. The data has been collected from Office of the Directorate of "Central Sericultural Research & Training Institute" Berhampur, Murshidabad, Ministry of Textile, Government of India (2015 - 2016 to 2021 - 2022).
- 2) Primary data has been collected from specific interview of farmers, workers, weavers, labour and factory manager/owner (2018, 2019 and 2022).

### Question of Primary Data Collection

#### 1) Scientists

- Q1. How the eggs are collected?
- Q2. How many times per day they are fed?
- Q3. What are the leaf size they are fed?
- Q4. What varieties of mulberry are used?
- Q5. How infections are detected?
- Q6. what is the room temperature/ humidity/ light?
- Q7. What is the source of egg?
- Q8. What id the process of hatching?
- Q9. What are the strains?
- Q10. What are the seasons of rearing?
- Q11. Why paraffin papers are used?
- Q12. In which instar and how many times the beds are cleaned?
- Q13. Self rearing/ shoot rearing, which one is preferred?
- Q14. How much time is required for the full formation of a cocoon?
- Q15. Why twig leaf is not used?

- Q16. When are they placed in chandraki?  
 Q17. How many silk worms are placed in a chandraki?  
 Q18. How the room is disinfected?  
 Q19. What are the cares taken during hatching?  
 Q20. What are the cares taken during moulting?  
 Q21. What is the spacing of silk worm?  
 Q22. What are the disease of silk worm prevalent in this region and their control?  
 Q23. What are the disease of mulberry prevalent in this region?  
 Q24. Whether they are making any hybrid?  
 Q25. How the silk threads are extracted (how many cocoons are taken in a machine) ?  
 Q26. What are the byproducts of dead silk worm?

## 2) Manager/Owner

- Q1. What is the wage of the workers?  
 Q2. What is the amount of profit?  
 Q3. How much export/ import take place?  
 Q4. What is the male - female ratio among workers?  
 Q5. Do they provide PF/ESI for the workers?  
 Q6. What are their future plans?  
 Q7. Do they have any Government assistance?  
 Q8. Is the light within the industry adequate or not?  
 Q9. Is the heat cooling system within the industry adequate or not?  
 Q10. Do they arrange transport for workers?  
 Q11. Are the workers local or not?  
 Q12. Are there quarters for the workers?  
 Q13. How many days a worker works in 365 days?  
 Q14. If there is any illness working here?  
 Q15. What are the pollution control measures?

## 3) Farmers

- Q1. Do they have any practice of rearing in farms?  
 Q2. What is there source of egg?  
 Q3. Whether they are rearing any wild type variety?  
 Q4. What are they doing in winter?  
 Q5. What is their subsidiary profession?  
 Q6. What are the problems they face in this industry?  
 Q7. What is the disease frequency?  
 Q8. Socio - Economy
- House structure
  - Tv/ fridge/ motor cycle/ gas
  - Job card/ NAREGA
  - Family member
  - Disease frequency among family members
  - Food habit
  - Government subsidy or assistance or bank loan
- Q9. What they want?

## 4) Weavers

- Q1. Whether it is their primary or secondary profession?  
 Q2. What is their amount of income?  
 Q3. What are the problems they face?  
 Q4. Socio - economy
- House structure
  - Tv/ fridge/ motor cycle/ gas
  - Job card/ NAREGA

- Family member
  - Disease frequency among family members
  - Food habit
  - Government subsidy or assistance or bank loan
- Q9. What do they want?

## Total Sample

Scientist: 23; Factory Manager: 05, Farmer: 23 and Weaver: 169

## 2. Result

### Economy of Sericulture in Murshidabad

From the secondary data from Department of Agriculture, Government of West Bengal, Trivedi and Sarkar (2015) and from the 'answers of the questions' of Sericulture Farmers [8]

### Profit from Paddy in Rainy season

For one acre land Cost (Rs) 1. Quantity of seed (24 kg)[at]30/Kg 720.00 2. Land preparation 2000.00 3. Insecticide 900.00 4. F Y M 1000.00 5. Fertilizer 1300.00 6. Total labour (73 MDS)[at]150 10950.00 Total cost 16870.00

### Return

Production of paddy 21 Quintals[at]Rs.1200.00/Q Rs.25200.00 2. Paddy straw Rs.5000.00 Gross income Rs.30200.00 \*Net income (Gross income – Total cost) Rs.13330.00

### Profit from Paddy (in summer season)

For one acre plantation Paddy Rs.22, 020.00 is required as the cost of production. Cost of production includes – (i) Quantity of seed (24 kg) - Rs.720.00 (ii) Preparation of land – Rs.2000.00 (iii) Insecticides Rs.1200.00 (iv) F Y M Rs.1000.00 (v) Chemical fertilizer – Rs.1800.00 (vi) Irrigation Rs.3600.00 and (vii) Labour – Rs.11700.00.

Total return from cultivation one acre land from Summer Paddy is Rs.40, 600.00 and net profit is around Rs.18580.00.

### Profit from Mustard

Present study shows that, for one acre land cultivation of Mustard, we invest Rs.8, 560.00 as the total cost of production including (i) Seeds –Rs.210.00 (ii) Preparation of land – Rs.900.00 (iii) F Y M – Rs.300.00 (iv) Fertilizer – Rs.1000.00 (v) Irrigation Rs.600.00 (vi) Insecticides Rs.300.00 (vii) Labour – Rs.5250.00

Total return from cultivation one acre land of Mustard is Rs.19, 200.00 and net income is Rs.10, 640.00.

### Profit from Grams

By cultivating Grams in one acre land, we get net profit of Rs.8480.00 where Gross income is Rs.16, 500.00 and the total cost of production is Rs.8, 860.00. The cost of production includes for one acre land Cost (Rs) 1. Seed (12 kg)[at]50/Kg 600.00 2. Preparation of land 720.00 3. F Y M 300.00 4. Fertilizer 900.00 5. Rhizobium 100.00 6. Irrigation 600.00 7. Labour (30 MDS) 4500.00 8. Insecticides 300.00 Total cost 8020.00

**Return**

Production 5.50 Quintal [at] Rs.3, 000.00 / Quintal Rs.16500.00 Gross income Rs.16500.00 Net income (Gross – Total Cost) Rs.8480.00

**Profit from Wheat**

In case of wheat we find that for cultivation of Wheat in one acre land we invest Rs.10, 250.00. The total cost includes (i) Seeds – Rs.1800.00 (ii) Preparation of land Rs.900.00, F Y M – Rs.300.00 (iv) Insecticides Rs.300.00 (v) Fertilizer – Rs.1, 300.00 (vi) Irrigation Rs.2200.00 (vii) Labour – Rs.3, 450.00. Here Gross income is Rs.15500 and net income is Rs.5250.00.

**Profit Sericultural crop (cocoon)**

The present study shows that we get 5 crops in a year in irrigated condition. We get net profit Rs.52900.00 in irrigated condition per acre land where input is Rs.1, 32, 500.00. In irrigated condition we can harvest 900 kg of cocoons/acre/year by taking 5 crops /year and 400 dfls/crop (100 dfls means approximately 40000 silkworm larvae).

In respect of one acre mulberry land Irrigated (Rs) 1. Depreciation cost rearing building site 500.00 2. Depreciation cost rearing building 3000.00 3. Depreciation cost on rearing equipments (based on 5 years life) 3000.00 4. Rearing cost (Irri - 5 crops / years 400 DFls / crop 40000.00 5. Interest on above[at]14% 6000.00 6. Leaf cost 5 crops – Irrigated 80000.00 Total cost 132500.00

**Return**

Cocoon yield (kg/acre)[at]45 kg/100 DFls (Irrigated) (Irri - 5 crops / years 400 DFls / crop 900 kg Cost of Cocoon 200/ - /kg 180000.00 Bye - product[at]3% of cocoon product 5400.00 Gross income 185400.00 Net income (Gross – Total Cost) 52900.00

**3. Discussion**

According to a comparison study of the income generated by various crops, the mustard crop generates an average income of Rs.10, 640.00. In contrast, sericulture has the largest net income because it can be practised four to five times per year. Sericulture may produce an annual harvest with an average net income of Rs.52, 900 on an acre of irrigated land. Sericulture is compared to many crops, such as paddy, which is grown twice a year, mustard, which is grown once a year, or grammes, which is grown once a year, with a 90 - 120 day growth cycle for each crop. We receive annual net income from that multiple agricultural setup. Paddy generates roughly Rs.13, 330, 18, 580, and 10, 640 when combined with mustard in the summer and the rainy season, for a total of 42, 550, which is still less than sericulture, which brings in Rs.52, 900 from an acre of irrigated land. According to Enayet et al sericulture is a home industry in West Bengal that creates jobs. The current analysis demonstrates that even three different crops, such as paddy grown twice as briefly in both the summer and the rainy season and mustard planted at the beginning of the winter, cannot produce as much profit as sericulture. This comparative study on income generation through agriculture crop and sericulture at farmer's level suggests that

sericulture is capable of more income generation than other traditional agricultural crops [15].

The study shows that sericulture is essential to the transformation of the state's economy. According to Ishtiaque [15], the state produced 1531 metric tons of raw silk in 2005–2006 and created 36.87 lakh jobs. The sericulture method involves wide farming with little agricultural inputs and modern technology, the use of just two or three seasons for silkworm rearing, the absence of mulberry plant irrigation, and the absence of effective plant protection measures. In addition to these issues, the mulberry cultivators are underprivileged and lack the resources to keep up the mulberry gardens. So in that time the state has produced small quantities of raw silk. And the silk products are consumed within the country. The finished products are consumed within the country. The study also highlighted that among all the varieties of sericulture in West Bengal, **mulberry cultivation** has been mostly practiced because of suitable soil and climatic conditions.

However, the state produced 2568 metric tons of raw silk in the 2015–16 fiscal year, and this activity supports 22.19 lakh jobs [16]. The production of raw silk has steadily increased because sericulture is currently practiced as intensive farming, with the adoption of four to six seasons for silkworm rearing, the availability of guaranteed irrigation facilities for mulberry cultivation, guaranteed plant protection measures, the availability of cheap and skilled labour, etc. The silk market is utilized for economic gain. West Bengal exports finished raw silk products to other nearby nations like Nepal, China, Myanmar, and Japan, among others.

Malda district took first place in silk output in the 2005–2006 fiscal year (631 metric tonnes), contributing 36% of the state, followed by Murshidabad district (352 metric tonnes), which contributed 17% of the state [17].

However, in 2015–16, Murshidabad district produced 513 metric tonnes of silk, accounting for 20% of the state's total production, while Malda district's proportion of the state's total production fell to 41%.

**Socio economy of sericulture in Murshidabad****General:**

- 1) Employed: Male: Female= 34.5: 65.5
- 2) Male Workers = Manager, Scientists, Moriculture farmers, Businessman
- 3) Female Workers = Silkworm rearing, Reeling workers, Re - reeling workers
- 4) Income: Factory Male= 250/ - day, Female= 170/ - day
- 5) Family Income:
  - Farming: 30, 000/ - month
  - Factory: 4500/ - month
  - Weaving/Re - reeling: 1500 - 3000/ - month

**Farmer Data (Family members 4 - 5, Secondary school Education 100%)**

House	
Mud	15%
Brick	85%
Appliances	
TV	100%
Gas	90%
Fridge	01%
JOB Card	100%
Motorcycle	60%
Disease	
Communicable	100%
Non Communicable	22%
Malnutrition (Animal Protein intake 440gm/month)	100%

**Weaver/Re - reeling/Self - help group Data (Family members 4 - 6, Secondary school Education 100%)**

House	
Mud	95%
Brick	5%
Appliances	
TV	Nil
Gas	5%
Fridge	0%
JOB Card	90%
Motorcycle	0%
Disease	
Communicable	100%
Non Communicable	20%
Malnutrition (Animal Protein intake 150gm/month)	100%

**4. Conclusion**

Farmers (land owners) are discovered to be more prosperous than industrial employees and weavers. Government involvement and support in the growth of the sericulture business is the key issue. Weavers and industry employees both live in extreme poverty. Government help is not provided to them. Even though there are 4 - 5 reelers, it is discovered that they shared a single reeling machine that they bought collectively.

**Problems of Sericulture in Murshidabad**

After going through the production of silk in West Bengal during the periods of 2005 - 06 and 2021 - 22 the researcher have observed ample problems associated with silk industry. The study reveals that sericulture industry in West Bengal faces weighty problems. They are as follows -

- 1) The primary source of nutrition for silk worms is mulberry leaves. Silkworms need enough mulberry leaves throughout the raising phase. The growth of silkworms and the calibre of cocoons are mostly influenced by proper and sufficient nutrition. As a result, the growers either prefer their own mulberry bushes or manage these plants for free at the chawkie rearing centres. In order to establish mulberry trees, poor farmers who lack access to their own property must rely on rich landowners, who then take advantage of them by demanding exorbitant fees for the leaves. Sericulture of Murshidabad is mostly carried out by the illiterate persons as these are mainly practiced in rural areas. Usually, educated youth do not come forward to take up this occupation. So, the rearing people have no

idea about its scientific as well as commercial process of rearing of silkworms.

- 2) Mulberry silkworms must be raised indoors because they are domesticated insects. The rearers must take great care and put in a lot of effort to preserve these worms. The rearing of silkworms requires a good, ventilated room. The majority of farmers lack adequate raising homes and other facilities for necessary equipment.
- 3) From one season to the next, Cocoons' prices change. The West Bengali government or the West Bengali Ministry of Textile should set a uniform price for cocoons to assist farmers in overcoming the issues caused by the volatile cocoon market. Till now market for sericulture has been buyer's market. The middlemen or the traders purchase the cocoons from the rearers at their door. There is no any organized market facility for the silk producers.
- 4) West Bengal's sericulture has long competed fiercely with other cash crops like paddy, jute, pine apples, mangoes, and litchi. People consequently have less care for sericulture.
- 5) The primary requirement for any profitable organisation is finance. The successful operation of this industry depends on the proper supply of financing. Every step in the sericulture process requires fixed capital, including the planting of mulberry leaves, the building of rearing homes, the purchase of equipment for grain storage, etc. Only a few carefully chosen rearers receive a small amount of funding, and the majority of those rearers who raise silk on a huge scale are impoverished. Lack of marketing information is another bottlenecks faced by this industry due to which rearers not getting remunerative price for their finished products.
- 6) The state has not setup any technical and guidance institute for the development of sericulture.
- 7) Erratic or extreme flood, seasonal conditions and cyclone (kal Boisakhi) make hurdles in silk worm rearing.

The future of sericulture activities in Murshidabad, West Bengal, seems quite promising. It significantly reduces poverty in Murshidabad, West Bengal, by creating a lot of jobs and income in rural areas [18, 19]. Women make up more than 65% of the sericulture workforce. The state will become 75 percent bi - voltine silkworms rearing in the mulberry industry if the current trend is continued in the future. The sericulture farmers in Murshidabad, West Bengal, are pleased with this activity since they receive good returns. However, the primary issue is that this industry is biased against women.

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## References

- [1] J. H. He. 'Silk is china and china is silk', Arhaemetry University of Oxford.2010. pp.1475 - 4765.
- [2] A. Aziz and H. G. Hanumappa. 'Silk Industry: problems and prospects' Ashish Publication Housing, New Delhi.1985.
- [3] S. K Dewangan. 'Sericulture - A tool of eco - system checking through tribal'. Journal of Environmental Research and Development, 2011. Vol.6 No.1, July - Sept.
- [4] S. Yasin,. 'Indian Sericulture Industry: It's Importance, Problems and Prospects' International Journal of Research in Management.2013. Vol.2 No.2 pp.1 - 15.
- [5] Hisau, Aruga. Principles of sericulture, New Delhi: Oxford.1994.
- [6] Aggarwal Hari Om & M. K., Seth. 'Sericulture in India'. Volume - I 'Dehradun, Uttarakhand.2000.
- [7] Sericulture in India: Cultivation and Economics, Kurukshetra Journal, Vol.65, No.3, January.2017.
- [8] S. Trivedi, and K. Sarka. Comparative study on income generation through agriculture crop and sericulture at farmer's level in Murshidabad district. Journal of Entomology and Zoology Studies; 2015.3 (1): 242 - 245
- [9] S. Mishra. Rural Youth empowerment through sericulture - A case study of Prakasam district of Andhra Pradesh, The international Journal of Humanities and Social Studies.2003. Vol.4. Issue 9. pp.65 - 73.
- [10] D. Gangopadhyay. 'Sericulture industry in India - A Review'. A document in Indian Science and technology studies, New Delhi.2008.
- [11] I., Farhan. . Promote of Sericulture for Sustainable Development.2008.
- [12] N. Sukla. 'Economics of rained sericulture - A study in Udaipur district of Rajasthan India', Indian Journal of innovations Development.2012. Vol.3, Issue 8. pp.67 - 75.
- [13] S. K. Thade. 'Status of sericulture in West Bengal'. Souvenir, National Seminar on mulberry sericulture Research in India. KSSR & DI, Bangalore.2011.
- [14] A. Enayat, S. Snehasish, and P. Sultana. 'Present scenario of mulberry cultivation in Malda. Indian silk'.2008.47 (6), 4 - 7.
- [15] A. Ishtiaque. 'Silk industries of Bangladesh: Problems and possibilities: Directory of business case studies publications', 2011. Vol.4. Issue 6, pp.1 - 10.
- [16] J. Nagaraju. Silk of India, Grace and luster. Biotechnology News.2008. Vol.3, Issue 5, pp.14 - 18.
- [17] Y. Neelm. Social status of women engaged in sericulture enterprise in Uttarakhand.2013.
- [18] D. V. Ramana. 'Economics of Sericulture and silk industry in India' Deep and Deep publications, New Delhi.1981.
- [19] R. Sandhya. "Women in sericulture, Discovery publishing House, New Delhi.2006.



Basic Training



Factory Survey



Reeling Worker Survey



Farmer Survey