



# A Critical Study On Setting Up Of Raw Silk Production Project In Murshidabad District Of West Bengal

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## ABSTRACT

Present study clearly indicates that one can earn three times more profit in designing silk production project by adopting multiend reeling machine. Monthly profit is almost 1.5 lakh which is almost three times of monthly profit of Charka based reeling but in case of charka reeling investment is quite lower than the multiend reeling setup. But in Murshidabad District, it is still charkha dominated silk industry is popular due to degeneration of silkworm breeds, inability to rear high productive bivoltine breeds and even crossbreeds due to climatic disadvantages and unskilled labour, falling prices of raw silk, withdrawal of European Cocoon buying and silk buying firms, low wages in sericulture, organizational set back, lack of skilled person in the field of Sericulture. Though earn is less but still fifty thousand rupees income per month from Charka reeling (adopting three country charkas) cannot be ignored. So, an organized effort may be done in Murshidabad District to make poor rural women self-sufficient to reel silk in country charka and earn significant profit without much initial investment. Rural women can start their own venture in their home. Availability of machineries and raw material, technical guidance and selling of products will be assured by the organization. Even small rearer can reel their own cocoons through charka in green condition which will increase more profit margin. In this way a model sericulture village will be developed which will justify the long heritage of sericulture of Murshidabad district. It is also important to develop multiend reeling based reeling industry in West Bengal which will create large

entrepreneur by assuring more profit. The present study also indicates that it is important to develop bivoltine seed zone in West Bengal to ensure supply of bivoltine seed cocoon throughout the year so that seed producers may develop crossbreed seed of multi-bi components which ensure flow of quality raw materials throughout the year for high consuming multiend reeling machine.

Key words: Silk, Reeling, Charka, Multiend reeling machine

## INTRODUCTION:

Sericulture has been fully recognized as an important rural industry in India and elsewhere and is practiced as a house hold industry. It is a labour intensive, export-oriented cottage industry, generating high employment and income per unit area of land. Matured silkworm extrudes a semi liquid mixture of protein, coated with a gummy substance called sericin from its spinneret. The liquid is thus ejected at a rate of about a foot per minute and transformed into fiber when exposed to air. This fibre is known as silk which is considered as queen of textile fibre (Chattopadhyay and Satkar,2008). India is the second largest silk producing country of the world and has the unique distinction of being the only country that cultures four commercial varieties of silk i.e. Mulberry, Tasar, Eri and Muga. West Bengal is the major traditional state of sericulture in India. There is a long tradition of Sericulture in West Bengal and as well as in Murshidabad District. Chronological sequence of various stages of growth of sericulture is difficult to ascertain due to lack of systematic record but Bengal silk came to prominence during Muslim regime in the 13th century. Organized development of sericulture & proper exploitation initiated by East India Company. East India Company started exporting Bengal Silk to Europe from Murshidabad. Even Sericulture was introduced in South India from Bengal. Tipu Sultan introduced Sericulture in Karnataka (Then named as 'Mahisur') from Bengal. Presently 90 % of silk production of our country comes from this Southern belt.

Bengal was the origin of some unique silk handicraft like 'Baluchari', 'Murshidabad Silk', 'Dhakai Maslin' etc. Unwinding of silk filament from the cocoon is known as reeling. Reeling may be done through Country Charka and Multiend reeling machine. It is better to reel multivoltine cocoons through Country Charka and Crossbreed and bivoltine cocoons through Multiend reeling machine (Krishnaswami *et al*, 1970). Though it is found that rearing of bivoltine, bivoltines hybrid and cross breed (M x Bi) ensure production of quality silk than the rearing of indigenous multivoltine race. But in West Bengal it is difficult to rear cross breed and Bivoltine hybrid through out the year due to prevailing of high temperature and high humidity. In West Bengal rearing season is divided mainly in two parts i.e. Favourable season and unfavourable season. November to April comes under favourable season and May to October comes under unfavourable season. During favourable season, generally dry summer is predominant and during unfavourable season wet summer is predominant. Mulberry crop span is 70 days. So five harvests as well as five rearings can be done in a year. November crop (winter / Agrahani), February crop (spring / Falguni) and April crop (summer / Baishaki) come under favourable season (dry summer) where June-July crop (Rainy / Shrabani) and August-September crop (autumn / Aswina) come under unfavourable season (wet

summer). It is comparatively easier to rear crossbreed (M×Bi) during favourable season because crossbreeds with bivoltine components cannot withstand high temperature and high humidity (Das *et al.*, 1994, 2006). On the other hand during wet summer (unfavourable season) due to prevailing of high temperature, high humidity and heavy fluctuation of climatic condition it is better to rear multivoltine and their hybrids (Das *et al.*, 1994, 2006). Because multivoltine and their hybrids are more resistant to high temperature and high humidity as compare to crossbreeds (M×Bi) (Krishnaswami, 1978, Benchamin and Jolly, 1986). So at present in West Bengal multivoltine hybrid (N×M12(W)) is generally reared during unfavourable season and crossbreed (N×NB4D2) is generally reared during favourable season at farmers level (Das *et al.*, 1994,2006, Chattopadhyay *et al.*, 2004, Chattopadhyay and Sarkar,2006, Sarkar, 2006, Sarkar, 2008). So it is essential to reel silkworm cocoons through both country charka and multiend reeling machines according to nature and types of raw materials are available. The present study has undertaken to know the cost and return in case of both the occasions i.e. reeling with country charka and reeling with multiend reeling machine which ultimately establish viable of raw silk production project in Murshidabad district of West Bengal.

## Project with Cost and Return in Country Charka

### COST OF PRODUCTION OF RAW SILK

#### A. Establishment Cost :-

Sl. No.	Particular	Quantity	Rate (Rs./unit)	Cost (Rs.)
1.	Reeling charkha (5 Tahabil with each set)	3	15,000/set	45,000.00
2.	Cocoon storage rack(approx 15 trays (5ft×4ft) capacity)	10	2000/piece	2,0000.00
3.	Cocoon storage tray (bamboo made 5ft×4 ft)	150	200/piece	30,000.00
4.	Country balance	1	3000/piece	3000.00
5.	Cocoon dryer (with 100 kg. capacity)	1	1,00000/piece	10,0000.00
6.	Electronic Weighing balance	1	20000/piece	20000.00
7.	Silk container(Almira)	1	10000/ Piece	10000.00
<b>Total</b>				<b>228000.00</b>

**B. Training Cost :-**

Period of training -----15 days

Total no. of trainees to be trained ----- 10

Total amount of green cocoon required

For training period @ 300 gm./ day head----- 45 kg.

Total cost of green cocoon @ Rs. 400 / kg. ----- Rs. 18000.00

Fuel for training period ----- Rs. 15,000.00

Training fees -----Rs. 15,000.00

**Total training cost ----- Rs. 48,000.00**

**C. Variable Cost (for one month):-**

S.L. No.	Particular	Rate (Rs./unite)	Total Cost (Rs.)
1.	<u>Quantity of cocoon required:</u> (estimated raw silk production/ day is 6 kg. & expected renditta = 8kg.) Cocoon required @ 48kg. /day x 25 days=1200 kg.	400/kg	480000.00
2.	<u>Coal:</u> (@ 12kg./day/charkha) Coal required – 900kg/month	20/kg.	18000.00
3.	Electricity (exp.)	-----	1500.00
4.	Rental for cocoon storing room	-----	6,000.00
5.	Wages of training stuff (reeler)		10000.00
6.	Wages of women engaged in reeling		9000.00
<b>Total</b>			<b>524500.00</b>

**Estimation or cost of production of raw silk of one month :**

Sl. No.	Item	Cost (Rs.)
1.	Depreciation cost of establishment cost (A)-based on 15 years life	15200.00
2.	Interest on establishment cost (A) @ 11% per year	34200.00
3.	Depreciation cost of training cost (B) for 15 years	3200.00
4.	Variable cost (C)	5,24,500.00

<b>Total</b>	<b>577100.00</b>
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**Return :**

Sl. No.	Item	Unit cost (Rs.)	Cost (Rs.)
1.	Raw silk production per month – 150kg. (@ 2kg. /day/charka (considering 25 working days/month)( 6 kg in three	4100/kg.	6,15,000.00
2.	Charka/day) Byproducts (@ 3% of raw silk )	-----	18450.00
<b>Total</b>			<b>6,33,450.00</b>

Therefore, net profit per month from raw silk production with charkha is

Rs. (633450.00 -577100.00) = 56350.00

## Project with Cost and Return in Multiend Reeling Machine

### A. Initial Cost:

Sl. No.	Particular	Unit cost (Rs)	Cost (Rs.)
1.	Land @ 1,100 sq.ft/reeling set	50000/720 sq.ft	77000.0
2.	Reeling Shed@700 sqft /reeling set	1000/sqft	700000.00
<b>Total</b>			<b>777000.00</b>

### B. Establishment Cost :-

Sl. No.	Particular	Quantity	Rate (Rs./unit)	Cost (Rs.)
1.	Multiend reeling machine (10 ends/basin)	1	4,50000/set	4,50000.00
2.	3 pan cooking arrangement with cooking cage,brush,economic oven &mini boiler	1	126000/set	126000.00
3.	Cocoon storage rack(approx 15 trays (5ft×4ft) capacity)	10	2000/piece	2,0000.00
3.	Cocoon storage tray (bamboo made 5ft×4 ft)	150	200/piece	30000.00
4.	Country balance	1	3000/piece	3000.00
5.	Cocoon dryer (with 100 kg. capacity)	1	100000/ Piece	100000.00
6.	Electronic Weighing balance	1	20000/piece	20000.00
7.	Pump set	1	30000/set	30000.00
8.	Booking machine	1	6000/set	6000.00
9.	Wrap reel	1	20000/piece	20000.00
10.	Silk container	2	10000/piece	20000.00
<b>Total</b>				<b>8,25,000.00</b>

**C. Training Cost/ Batch:-**

Period of training ----- 3 months/Batch

Total no. of trainees to be trained ----- 10

Total amount of green cocoon required

For training period @ 300 gm. / day/ head----- 225 kg.

(25 days working period)

Total cost of green cocoon @ Rs. 500 / kg. ----- Rs. 112500.00

Power and fuel for training period ----- Rs. 15,000.00

Traveling, transportation etc----- Rs. 15000.00

Trainer (Rs.10000/month) ----- Rs. 30,000.00

**Total training cost ----- Rs. 172500.00**

**Total 4 batches will be trained/year so total cost -172500×4=690000.00**

**C. Variable Cost (for one year):-**

S.L. No.	Particular	Rate (Rs./unite)	Total Cost (Rs.)
1.	Quantity of cocoon required: (estimated raw silk production/ day is 9 kg. & expected renditta = 7 kg.) Cocoon required @ 63 kg. /day x 25 days=1575 kg. /month i.e. 18900 Kg /year	500/kg	9450000.00
2.	Power and fuel	50000/month	600000.00
3.	Wages of women engaged in reeling (10 women /set to maintain 10 end)	10000/month/women/end	1200000.00
4.	Wages of training stuff (reeler)	10000/month	120,000.00
5.	Silk marketing and experts visit	10000/month	120000.00
6.	Miscellaneous		6000.00
<b>Total</b>			<b>11496000.00</b>

**Estimation or cost of production of raw silk of one year :**

Sl. No.	Item	Cost (Rs.)
1.	Depreciation cost of initial cost (A)-based on 15 years life	51333.00
2.	Interest on initial cost (A) @ 11% per year	85470.00
3.	Depreciation cost of establishment cost (B)-based on 15 years life	55000.00
4.	Interest on established cost (B) @ 11% per year	90750.00
5.	Depreciation cost of training cost (C) for 15 years	46000.00
6.	Variable cost (C)	11496000.00
<b>Total</b>		<b>11824553.00</b>

**Return :**

Sl. No.	Item	Unit cost (Rs.)	Cost (Rs.)
1.	Raw silk production per year- 225kg/month, 225×12=2700 Kg/year (@ 9kg. /day/set (10 end considering 900 gm silk/end) (25 working days/month)	4900/kg.	13230000.00
2.	Byproducts (@3% of raw silk)	-----	396900.00
<b>Total</b>			<b>13626900.00</b>

Therefore, net profit per year from raw silk production with multiend reeling machine is Rs. (13626900.00-11824553) = 1802347.00

Therefore, net profit per month from raw silk production with multiend reeling machine is Rs. =1802347/12=150195.58/

**Key Points regarding establishment of raw silk production unit based on Charka**

Involvement of cost is less. Small rearers can reel their own green cocoons by establishing Charka unit in his farm. In this case establishment cost can be minimized upto large extent. Cost related to stifling and storing facilities of cocoons may be minimized upto large extent. Stifling is essential to kill the pupa inside the cocoon to prevent metamorphosis of pupa into moth and comes out from cocoon and makes the cocoons unfit for reeling. But if one once just after the harvesting of cocoon makes the arrangement of reel the cocoons, there is no need of stifling because storing of cocoons can be avoided. Besides that, if family labour himself reels the cocoons, the cost of hired labour may be minimized, it will help also help to increase the margin of profit (Sarkar, 2019). Sixty percent work of Silk Industry is done by women only (Sarkar *et al*, 2017).

So, employment generation and empowerment of rural women can more effectively done by setting up of small charka unit at farmers' own house.

### **Key Points regarding establishment of raw silk production unit based on Multiend reeling Machine**

Net profit from establishing reeling unit on multiend reeling machine is approximately rupees 1.5 lakh/month. It can be possible from one ten ended multiend reeling machine. So big entrepreneurs can approach in this direction. But to ensure fulfilling this direction, it is important to procure huge quantity of raw materials (cocoons). But it is very difficult to arrange quality raw materials through out the year. But proper strategy should be implemented to ensure rearing of productive breeds throughout the year so that flow of the availability of raw materials can be possible. Rearing of cross breed multi × bi cocoons are minimum requirement for running multiend reeling machine. But due to climatic disadvantages it is not possible to rear bivoltine seed crop in most part of West Bengal, it is the major disadvantages of sericulture in West Bengal (Chattopadhyay and Sarkar, 2006 and 2008). So, it is important to develop bivoltine seed zone in West Bengal to ensure supply of bivoltine seed cocoon throughout the year so that seed producers may develop crossbreed seed of multi-bi components which ensure flow of quality raw materials throughout the year (Sarkar, 2020).

### **Advantages of Raw Silk Production Project:**

- 1. Great Tradition:** Murshidabad district is considered as pioneer of Sericulture in India. It is the major traditional district of sericulture in West Bengal. Sericulture was practiced as trade in Murshidabad since centuries. Even East India Company exported Bengal Silk to Europe from Murshidabad.
- 2. Increasing Demand of Silk in the market:** At present 2100 MT of Mulberry silk is produced in West Bengal. It is almost half than the actual requirement. Because demand of silk and silk goods are increasing day by day not only in our state as well as in our country and even in World market. Murshidabad was the origin of some unique silk handicraft like 'Baluchari', 'Murshidabad Silk' etc. So the demand of raw silk for production of that product is huge in Murshidabad District.
- 3. Easy availability of raw material:** For the production of quality silk easy availability of raw material is important. It can be easily available from Panchgram cocoon market which is just 30 Km away from selected blocks for that project. Cocoons can also be purchased from adjoining districts like Bhadrapur of Birbhum.
- 4. Proper marketing facilities:** Marketing of silk can be done easily. Islampur, Panchgram, Nabagram, Bishnupur (under Berhempore Subdivision), Mirzapur are the major markets of silk present in Murshidabad District. Besides that silk can be sold in adjoining districts like Bhadrapur and Akalipur of Birbhum District, Kaliachawk of Malda Districts etc. Local Resham Khadi organizations are also the major consumers of silk. There is even provision of transportation of quality silk to Bhagalpur of Bihar, Bangalore

of Karnataka etc. Silk wastes can be sold in Narayanpur of Malda District where the biggest spun silk mill of our country is working under “Pataka Group of Industries”

**5. Easy availability of technical assistance:** Central Sericultural Research and Training Institute under Central Silk Board is situated in Murshidabad District. This Institute is the oldest research Institute of Sericulture in our country. At present this institute is one of the three major research Institutes of Sericulture in our country. So there is no problem in terms of technical assistance. This Institute has already organized training programme in reeling and spinning of raw silk for the women and girls selected by this organization

**6. Suitable for Women:** It is estimated that 60 % work of this industry is done by women only. Raw silk production needs high delicacy so women can be effectively used in this sector.

### **Disadvantages of Raw Silk Production Project:**

#### **A. Unpopularity of Multiend reeling machine**

Present study clearly indicates that one can earn three times more profit in designing silk production project by adopting multiend reeling machine. Monthly profit is almost 1.5 lakh which is almost three times of monthly profit of Charka based reeling but in case of charka reeling investment is quite lower than the multiend reeling setup. It is no doubt that reeling of cross breed (M x Bi) cocoons through multiend reeling machine ensure production of quality silk than the reeling of multivoltine cocoons (Sarkar *et al*, 2008). But in Murshidabad District, it is still charkha dominated silk industry is popular due to Degeneration of silkworm breeds, inability to rear high productive bivoltine breeds and even crossbreeds due to climatic disadvantages and unskilled labour, falling prices of raw silk, withdrawal of European Cocoon buying and silk buying firms, low wages in sericulture, organizational set back, lack of skilled person in the field of Sericulture.

#### **B. Involvement of risk in the said project:**

This is a season specific industry. Raw material will not be available through out the year. Generally raw material (Cocoons) will be available five times in a year i.e. in November, February, April, June and August. It is better to procure whole annual requirement during November, February and April because these three crops are the best ones. But there may be a chance of wastage of raw materials during transportation and preservation due to bulk procurement. It is important to dry the green cocoons immediately after purchasing otherwise live pupa inside the cocoon will become moth and comes out from the cocoon by piercing the cocoon shell during the course of metamorphosis. Pierced cocoons are unfit for reeling. So any negligence or procrastination in drying may result in huge loss. Sometimes frequent power cut may delay the process of drying in case of drier. Sun drying may also not helpful if intensity of sun light is low. During the reeling of silk yarn it is important to maintain requisite denier (thickness of yarn) of silk yarn. Unevenness in

thickness may reduce the cost of silk drastically. During initial stage it is difficult to maintain uniform thickness in silk yarn which will reduce the silk price.

### **Future Strategy:**

An organized effort may be done in Murshidabad District to make poor rural women self sufficient to reel silk in country charka and earn significant profit without much initial investment. Rural women can start their own venture in their home. Availability of machineries and raw material, technical guidance and selling of products will be assured by the organization. Employment generation and empowerment of rural women can more effectively done by setting up of small charka unit at farmers' own house. In this way a model sericulture village will be developed which will justify the long heritage of sericulture of Murshidabad district. It is important to develop multiend reeling based reeling industry. Due to huge profit margin, big entrepreneurs can approach in this direction. But it is important to develop bivoltine seed zone in West Bengal to ensure supply of bivoltine seed cocoon throughout the year so that seed producers may develop crossbreed seed of multi-bi components which ensure flow of quality raw materials throughout the year which fulfill the needs of multiend reeling machine. So, both approach is important, on one hand charka-based reeling may fulfil the needs marginal reelers and may utilize the comparatively inferior low yielders in economic manner, other hand multiend based reeling may fulfill the sophisticated demand of the industry.

### **REFERENCES**

Benchamin, K.V. and Jolly, M.S. 1986. Principles of silkworm rearing; in Proceeding of Seminar on Problems and Prospects of Sericulture. *Mahalingam. S. (ed.)*. pp. 63-108. Vellore, India.

Chattopadhyay, S. K. and Sarkar, K. 2006. *A Manual of Practical Sericulture (Vol-1)* - Published and Printed by Aakaash Publications. Berhampore, West Bengal

Chattopadhyay, S, K., Sarkar, K. and Bhattacharya, D. 2004. Key Points behind the Success of Cocoon Crops at Farmers Level in West Bengal. Dissertation submitted to the University of Kalyani for the partial fulfillment of Master of Science in Sericulture.

Chattopadhyay, S.K and Sarkar, K (2008) A Profile of Sericulture.  
*Social Environmental and Biological Association.*\_Vol. 5, No.1,  
2008, pp.1-6

Das, S.K., Pattnaik, S., Ghosh,B., Singh, T., Nair.B.P., Sen, S.K. and Subba Rao, G. 1994. Heterosis analysis in some three-way crosses of *Bombyx mori* L., *Sericologia*, 34 (1): 51-61.

Das, S. K., Chattopadhyay, G.K., Moorthy, S.M., Verma, A.K., Ghosh, B., Rao, P. R. T., Sengupta, A. K. and Sarkar, A. 2006. Silkworm Breeds and Hybrids for Eastern Region. In *Appropriate Technology in Mulberry Sericulture for Eastern and North Eastern India* (17<sup>th</sup> and 18<sup>th</sup> January, 2006) workshop organized by CSR&TI, Berhampore: 91-96.

Krishnaswami, S., Ahsan, M.M. and Sriharan, T.P. 1970 Studies on quality of mulberry leaves and silkworm cocoon production, Part-2. Quality difference due to maturity. *Indian j. Seric.* 9: 11-17.

Krishnaswami, S. 1978. *New technology of Silkworm rearing*. CSR&TI, Mysore. 1-10.

Ray, G. L. and Mondal, S. 1997. *Research Method in Social Science*

& *Extension Education*, Naya Prakash, Calcutta.

Sarkar, A. 2006. Mulberry Sericulture in West Bengal. Power point representation.

Sarkar, K., Bhattacharya, D.K. and Chattopadhyay, S, K. 2008. Studies on the effect of differential feeding on the commercial characteristics of Mulberry Silkworm (*Bombyx mori* L.). Thesis submitted to the University of Kalyani for the Doctor of Philosophy in Zoology.

Sarkar, K, Chattopadhyay, S.K and Trivedi, S 2008. Management Of Silkworm Rearing In West Bengal. *Social Environmental and Biological Association*. Vol. 5, No.1, 2008, pp.65-76

Sarkar, K, Bhattacharya, D.K and Chattopadhyay, S.K. 2008. An Over View On Major Silkworm Races (*Bombyx Mori* L) Of India And Their Characteristics. *Social Environmental and Biological Association*. Vol. 5, No.1, 2008, pp.43-47.

Sarkar, K, Majumdar, M and Ghosh, A .2017. Critical Analysis on role of Women in Sericulture Industry. *International journal of Social Science*. 6(3):211-222.Print ISSN: 2249-6637, Online ISSN: 2321-5771.NAAS rating.3.02.

Sarkar, K .2019. Impact of Family Labour Participation and Hired Labour for different activities of sericulture Industry: A critical analysis. *Social Science and Humanities International*: 1 (4): Nov-Dec-2019.11-20. ISSN 2581-7965.

Sarkar, K .2020. Studies on the Effect of different types of feeding on the commercial characters of Mulberry Silkworm (*Bombyx mori* L) in West Bengal: A Review. *International Journal of Agriculture, Environment and Biotechnology*. 13(3): 305-321.ISSN-0974-1712.Naas rating 4.69.