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## Comparative study on income generation through agriculture crop and sericulture at farmer's level in Murshidabad district

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### Abstract

Sericulture is recognized as an important rural as well as cottage industry in India. In this study, we have made a comparative analysis on the income generation from sericulture as compared to traditional agriculture crops. Our study clearly indicates that sericulture is capable of generating more income than other cash crops like paddy, wheat etc. Most of the crops can be grown once or twice in a year but sericulture can be practiced 4-5 times in a year. The combined net income from that multiple farming system in a year is Rs. 42,550 (Paddy in summer season, paddy in rainy season and mustard each amounting Rs. 13,330 + 18,580 + 10,640 = Rs. 42,550) which is still less than sericulture which generate Rs. 52,900 in one acre of land for irrigated condition. Sericulture provides regular employment to the farmers which ultimately check the migration of population from rural areas to urban areas, thereby minimizing the population and pollution in urban areas by arresting the growth of slums in urban areas. Sericulture has a major role in the employment generation for the rural people. Hence, sericulture can be considered as an essential tool for the rural development for improving the standard of living of human population of village level.

**Keywords:** Sericulture, Agriculture, Income, Murshidabad.

### 1. Introduction

Sericulture is the rearing of silkworms for the production of silk. Sericulture as a cottage industry has flourished in Brazil, China, France, India, Italy, Japan, Korea, and Russia. China and India contributes more than 60% of world's annual production of silk. In India sericulture has made a good stride in the recent past, especially during eighties and nineties. The R&D (Research and Development) contributions of various institutions of Central Silk Board, Universities, and continuous efforts in transferring these R&D (Research and Development) achievements to the fields helped in spreading sericulture to varied agro climatic regions of the country. With a steady and sustained growth for the past two decades, sericulture has now become a lucrative and remunerative enterprise. It is an ideal project which reduces the poverty of poor peasants by providing high productive employment. Sericulture industry brings about many sections of the population, especially in rural and semi urban areas (wage earners, farmers, weavers, reelers, twistors, market intermediaries) and also different enterprises of the rural farm households.

Sericulture is a supplementary crop to the agriculture in West Bengal. Mostly sericulture is practiced by small land holder for their livelihood. West Bengal occupies about 53911 acres land under mulberry cultivation out of which, 26533 acres of land has been planted with High Yielding Verities (HYV) of mulberry. Sericulture is practiced in about 1625 villages and approximately 401000 people are employed in this industry <sup>[1]</sup>.

One hectare of sericulture land can create remunerative employment for 13 persons per year <sup>[1]</sup>. Hence, this crop can be very effective in rural scenario where unemployment level is high. Jolly (1988) <sup>[2]</sup> indicated that sericulture is successfully practiced as viable rural industry because of two reasons. Firstly, it gives remunerative employment to family labour throughout the year and secondly, it ensures periodic income even to the small and medium holdings. From the individual rearer point of view, sericulture is the most remunerative cash crop as compared to any other crop.

Balasubramanian (1986) <sup>[3]</sup> reported that even the small farmer with his meager capital base, makes Rs. 14,000 gross income from an acre of irrigated land. He also reported that a person with two acres of dry land can get a net income of Rs. 3,000 on an average per year.

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Reddy (1985) <sup>[4]</sup> reported that a farmer can earn Rs. 19,997 from one acre of irrigated land. Reddy *et al* (1986) <sup>[5]</sup> reported that sericulture as an integrated enterprise with moriculture generates two times more employment than alternate enterprises.

West Bengal is a traditional agriculture belt. Due to agro climatic advantages almost all the agricultural crops are grown in huge quantities. So it is not easy to shift from agriculture to sericulture. But due to huge employment potentially in sericulture industry, farmers of Malda, Murshidabad, and Birbhum districts take sericulture largely as a supplementary crop with agricultural crop.

Several studies on sericulture have been reported from this region <sup>[6-14]</sup>.

Besides this, it is an ideal side line actively for the rural people engaged in sericulture. Return from sericulture is assured within a month. So, sericulture and agriculture farmers both are equally interested to take this profession simultaneously with other agricultural crop.

But before going to multiple farming systems, it is essential to study the comparative income generation in agriculture and sericulture.

At present sericulture farmers are reluctant to do sericulture even in various traditional districts of sericulture. It is also reported that some framers uproot their mulberry cultivation and switch over to other crops. This present study was conducted to know actual status of sericulture as compared to other crops in terms of income generation.

## 2. Materials and Methods

Samples of 200 respondents from Nabagram Block of Murshidabad District were interviewed on the structure questionnaire and collected data. The study was conducted during October, 2013 to May, 2014.

The data collection by interviewing respondents is generally the simplest and cheapest method implied to this study. However, the accuracy depends on the ability of respondents to remunerate the information requested and on their willingness to reply truthful <sup>[15]</sup>. The pre-prepared questionnaires contained information on the land holding, capacity of the farmers, cropping pattern, intensity of cropping, comparative income generated in agricultural and subsidiary crops and the return of the different crops.

Mostly the interviews were administered to one respondent at a time, usually the farmer of the head of the house hold. The data collected were analyzed to find out their income structures. Climate is an important physical element which indicates the atmospheric conditions of heat, moisture and air circulation. It plays a dominant role in shaping vegetation and determines the mode of human life ultimately affecting all forms of life.

## 3. Results and Discussion

The agro climatic condition of those regions is as follows-

**Soil:** Alluvial, moisture % is good in soil. Basically it is clay in nature, water holding capacity is more.

**Rainfall:** According to District weather office of Murshidabad, rainfall ranges between 600 to 1400 mm/year. The distribution of rain is not proper, resulting water scarcity during hot summer.

**Temperature:** Temperature of Nabagram Block ranges between 8 °C to 42 °C throughout the year. This has been reported by the District weather office.

**Time Scale:** The study was started in the month of October, 2013 and ended in month of May, 2014.

**Target Group:** The study was carried out among the farmers

of the Nabagram Block of Murshidabad district, West Bengal. The present study was undertaken to know the rate of income generation in different multiple forming system. The study was carried out in identified villages of Murshidabad district in West Bengal. The results obtained in different crops are given in tables (I - VI).

### 3.1 Paddy (in Rainy season)

For one acre plantation of paddy Rs. 16,870.00 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. 900.00 (iv) F Y M Rs. 1000.00 (v) Fertilizer – Rs. 1300.00 (vi) Labour (Total labours 73 MDS) Rs. 10,950.00.

Total return from one acre land is around Rs.30, 200.00 and the net profit is Rs. 13330.00. (Table-I)

**Table 1:** Paddy in Rainy season

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

### Return

1. Production of paddy 21 Quintals @ 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

### 3.2 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. (Table-II)

**Table 2:** Paddy in summer season

For one acre land	Cost (Rs)
1. Quantity of seed (24 kg) @30/Kg	720.00
2.Land preparation	2000.00
3. Insecticide	1200.00
4. F YM	1000.00
5. Fertilizer	1800.00
6. Irrigation	3600.00
6. Total labour (78 MDS) @150	11700.00
Total cost	22020.00

### Return

1. Production of paddy 28 Quintals @ Rs.1200/Q	Rs.33600.00
2. By- Products	Rs. 7000.00
Gross income	Rs.40600.00
*Net income (Gross income – Total cost)	Rs.18580.00

### 3.3 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. (Table-III)

**Table 3:** Mustard: (In Winter season)

For one acre land	Cost (Rs)
1. Seed (3 kg) @70/Kg	210.00
2. Preparation of land	900.00
3. F Y M	300.00
4. Fertilizer	1000.00
5. Insecticides	300.00
6. Irrigation	600.00
7.Labour (35 MDS) @ Rs.150/MD	5250.00
Total cost	8560.00

#### Return

Production 6 Quintal @ Rs.3200.00 / Quintal	Rs.19200.00
Gross income	Rs.19200.00
Net income (Gross – Total Cost)	Rs.10640.00

### 3.4 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 (i) Seeds (12 kg) – Rs.600.00 (ii) Preparation of land – Rs.720.00 (iii) F Y M Rs.300.00 (iv) Fertilizer – Rs.900.00 (v) Rhizobium – Rs.100.00 (vi) Irrigation Rs. 600.00 (vii) Insecticides Rs. 300.00 (viii) Labour – Rs.4,500.00. (Table-IV)

**Table 4:** Grams

For one acre land	Cost (Rs)
1. Seed (12 kg) @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 @ Rs.3,000.00 / Quintal	Rs.16500.00
Gross income	Rs.16500.00
Net income (Gross – Total Cost)	Rs.8480.00

### 3.5 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. (Table-V)

**Table 5:** Wheat: (In Winter Season)

For one acre land	Cost (Rs)
1. Seed (60 Kg) @30/Kg	1800.00
2. Preparation of land	900.00
3. F Y M	300.00
4. Insecticides	300.00
5. Fertilizer	1300.00
6. Irrigation	2200.00
7. Labour (23 MD)	3450.00
Total Cost	10250.00

#### Return

Production 10 Quintal @ Rs.1,550.00 / Quintal	Rs.15500.00
Gross income	Rs. 15500.00
Net income (Gross – Total Cost)	Rs.5250.00

### 3.6 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). (Table-VI)

**Table 6:** Cocoon production

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 @ 14%	6000.00
6. Leaf cost 5 crops – Irrigated	80000.00
Total cost	<b>132500.00</b>

#### Return

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

From the comparison study in terms of income generation through different crops, the average income generation from mustard crop is Rs. 10,640.00.

On the contrary, if we consider Sericulture, net income in Sericulture is highest because it can be practiced in 4-5 times in a year. As an annual crop Sericulture can generate an average net income, Rs.52,900 for irrigated condition for one acre of land.

We compare Sericulture with multiple crops like Paddy grown twice in a year and Mustard grown once in a year or grams grown once in a year taking each crops span is around 90-120 days. We get net income from that multiple farming system in a year Paddy both in Summer and Rainy season and Mustard together is about Rs. 13,330+18,580+10,640=42,550 which is still less than Sericulture which generates Rs. 52,900 in one acre of land for irrigated condition. Roy *et al.* [16] also revealed that sericulture is employment generating household industry in West Bengal.

The present study shows that even 3 different crops in a year i.e. paddy twice short duration cultivation both in summer and rainy season, mustard in onset of winter can't earn 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.

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