CHAPTER - V

PROBLEMS

OF

MUGA CULTURE
5.1 Diseases of muga silkworm:

Golden yellow silk producer *muga* silkworm, *Antheraea assama* Ww. is a semi-domesticated endemic sericigenous insect species of North Eastern India. It is multi voltine in nature having 5-6 broods throughout the year. Due to its outdoor nature of rearing, *muga* silkworm are exposed to various rigors of changing environment of this region and thus prone to number of diseases, pests and predators. *Muga* silkworm is susceptible to different protozoan, bacterial, viral and fungal diseases. Unless prophylactic measures are adopted, the disease outbreak can not be contained. The major and serious diseases of *muga* silkworm are Pebrin, Grasserie, Flacherie and Muscardine.

A. Pebrine:

Pebrine is the most serious disease of *muga* silkworm caused by a protozoa of *Nosema* sp. It is unique in being transmitted to offspring by transovarial/transovum means from mother moth.

1) Occurrence

The disease may occur in all seasons of the year.

2) Symptoms

a) At early stage of infection: The infected muga silkworm larvae appear normal. Only microscopic examination of the silkworm larvae may indicate the presence of spore stage of the pathogen.

b) Later stage of infection: The silkworm larvae loose appetite, varies in size, retard in growth, moult irregularly and the colour of the larvae become light yellowish green instead of deep green colour of normal
healthy larvae. Infected late stage larvae of *muga* silkworm show black dots or specks on the surface of the body and hence, the disease is known as *Phutuka* i.e. spotted disease in Assamese.

3) Infection

The disease is transmitted from the infected mother to the offspring by transovarial/transovum means and this is called primary infection. If infection is primary, more than 50 percent larvae die before third moult and rarely larvae go for spinning. When healthy larvae get infected through contamination during rearing, it is called secondary infection. Secondary infection during early fourth larval stages leads to formation of flimsy cocoons, whereas larvae infected during fifth larval stage form well formed cocoons.

4) Source of infection

**a) Egg stage**

i) Transovarilly

ii) Surface contamination of eggs (transovum)

iii) Contaminated grainage appliances

**b) Larval stage**

i) Contaminated egg laying kharika

ii) Transovarially infected larvae

iii) Faecal matters of infected larvae

iv) Exuviae of infected larvae

v) Contaminated foliage
vi) Contaminated rearing site

vii) Contaminated rearing appliances

c) Moth stage

i) Purchase of infected seed cocoons

ii) Infected moth

iii) Infected grainage appliances

iv) Meconium and moth scales

v) Grainage dust

5) Spread of disease

Pebrinized larvae extrude faecal matter, gut juice and vomit containing pathogens, which contaminate the rearing environment, appliances and host plant foliage. Mostly, consumption of contaminated foliage/egg shell results in infection and spread of the disease.

6) Prevention/Control of the disease

☐ Follow the scientific inspection method of individual mother moth testing for detection of pebrine in egg production.

☐ Practice disinfection of grainage appliances before and after every grainage operation with 2 percent formalin.

☐ Ensure use of microscopically tested disease free disinfected eggs only.

☐ Practice surface sterilization of the eggs with 2 percent formalin for 5 minutes.

☐ Maintain hygienic conditions in egg production room and rearing sites.
□ For basic stock maintenance, follow cellular method of rearing.
□ Practice disinfection of rearing appliances before use.
□ During rearing, test the faecal matters, unequal/lethargic/unsettled/
irregular molters periodically. If pebrine spores are detected, reject
the entire infected crop.
□ Ensure the measures for destruction of diseased silkworm larvae/
cocoons/moths/eggs.

B. Grasserie

Nuclear polyhedrosis, commonly known as Grasserie is a major viral disease
of muga silkworm caused by a baculovirus.

1) Occurrence

The disease prevails although the year but is predominant during rainy
summer months of the year.

2) Symptoms

The silkworm larvae fail to moult. The integument becomes fragile and
inter-segmental region becomes swollen and that is why, the disease is
known as Phularog or swelling disease in Assamese. The body tissues and
haemolymph of the infected larvae get disintegrated into turbid white fluid
and the larvae hang upside down with the anal cluspers after dying. The
turbid fluid contains large number of hexagonal polyhedral bodies.

3) Infection

The silkworm larvae get infected on feeding of contaminated foliage of the
host plants.
4) **Source of infection**

Disintegrating disease silkworm, its body fluid and contaminated rearing site and appliances.

5) **Pre-disposing factor**

High temperature clubbed with high humidity, poor quality host plant leaves.

6) **Spread of disease**

The diseases silkworm larvae extrudes the pathogen along with oozing of body fluid due to injury and breakage of dead diseased larvae. The body fluid and broken body parts of the larvae contaminate the foliage, rearing site and appliances. The disease spreads to healthy worms on feeding of the contaminated leaves as well as the use of contaminated appliances during rearing.

7) **Preventive measures of the disease**

- Practice disinfection of rearing site before rearing with 2 percent formalin solution spray. Dusting of 0.3 percent slaked lime in addition to usual disinfection procedure is recommended for rearing site and appliances disinfection in case of high incidence of disease in previous rearing.
- Pick out growth retarded/lethargic/irregular moulters and destroy.
- Ensure measures of destruction of diseased/doubtful worms by burning or burying with 5 percent formalin solution.
- Ensure hygienic conditions during rearing.
☐ Use certified disinfected disease free laying only.

☐ Ensure rearing on good quality leaves, because in case of silkworm, food is the major source of the diseases.

C. Flacherie

Flacherie is a syndrome of bacterial diseases in muga silkworm. Some flacherie diseases are caused by an ultra virus, which is, in fact, an exciting agent, followed by secondary infection of bacteria.

1) Occurrence

The disease prevails in all seasons of the year but is intensive during rainy summer months (June to August) of the year.

2) Symptoms

The infected silkworm larvae become lethargic and motionless. The colour of the haemolymph turns black. Chain type excreta, sealing of anal lips, rectal protrusion are some of the easily detectable symptoms of the disease. Infected larvae die within a short time.

3) Infection

The muga silkworm larvae get infected on feeding of contaminated/poor quality foliage of the host plants.

4) Source of infection

Diseased larvae, its gut juice, faecal matters, body fluid and contaminated rearing site and appliances.
5) **Pre-disposing factor**

Sudden fluctuation in temperature and humidity, bad weather, poor quality leaves with high water content.

6) **Spread of disease**

The disease is transmitted by secondary infection of larvae feeding of the contaminated/poor quality leaves. Infected worms are oozing out body fluid containing pathogen throughout incubation period of infection and contaminate the leaves of the host plant and rearing environment. The disease spreads to healthy worms on feeding of the contaminated leaves. Feeding of late stage worms with very tender succulent leaves and sudden fluctuation of temperature and humidity during rearing period also may lead out break of the disease.

7) **Preventive measures of the disease**

- Use disinfected quality seeds of disease free zone.
- Practice orientation of brushing to protect the young larvae from direct sunlight.
- Disinfection of rearing site before rearing with 2% formalin solution is mandatory. Ensure dusting of 0.3% slaked lime in addition to usual disinfection procedure recommended for rearing site and appliances in case of high incidence of the disease in previous rearing.
- Inspect rearing field regularly and pick out stunted/sluggish/irregular moulters and destroy.
- Ensure measures of destruction of diseased/doubtful worms by burying with 5 percent formalin solution.
Practice washing of hands with formalin solution at the time of transfer of worms.

Maintain hygienic conditions during rearing.

Ensure rearing on good quality leaves, because in case of silkworm, food is the major factor of the diseases.

Do not allow late stage worms to feed on tender succulent leaves.

D. Muscardine

Muscardine is one of the major diseases found in silkworm. But in muga silkworm, white muscardine is less prevalent occurring under certain specific environmental influence only. Observations over the last decade revealed that the disease appeared alternately after 2-3 years intervals. The casual organism of the disease is a fungus, which is not yet identified in case of muga silkworm.

1) Occurrence

The disease occurs during winter months of the year, when night temperature falls down and the day temperature remains comparatively high associated with high humidity i.e. foggy weather.

2) Symptoms

The infection may occur in any stage of the silkworm larvae. Infected larvae loose their appetite and become inactive. The colour of the larvae turns pale, gradually ceases movement within 12-18 hours of infection. The larvae hangs on tree twig or trunk and hardens. Within another 6-8 hours, larvae dies. In next 16-18 hours, a white encrustation appears on the
larval body. Within another 24 hours, the whole body of the larvae gets covered by the white encrustation and becomes dry, brittle and mummifies.

3) Predisposing factors

Low temperature with high humidity.

4) Source of infection

Mummified/diseased larvae contaminates the rearing environment and foliage of the host plants.

5) Spread of disease

The conidia or spores of the pathogenic fungus are dispersed by wind and through contact. The conidia on contact with host integument, germinate, penetrate into the host body and cause the infection.

6) Preventive measures of the disease

☐ Practice orientation of brushing towards sunlight during winter.

☐ Practice disinfection of rearing site before rearing with 2 percent formalin solution.

☐ Practice dusting of slaked lime in the field to control humidity at the time of rearing.

☐ Practice dusting of Tasar Kit Oushad developed CTR & TI, Ranchi on the body of the larvae at the time transfer

☐ As prophylactic measure, spray 0.5 percent Sodium Hydroxide solution on the worms after 24 hours of each moult.

☐ Maintain hygienic conditions during rearing.

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Collection and destruction procedure of dead/diseased larvae:

- Pick out sick or dead worms by forcep or chopstick and keep in a container with 2 percent formalin solution.
- Bury the carcasses in a pit and cover with soil.
- Wash hands with formalin or dettol solution after dead or infected larvae.
- Don’t allow the birds, ants and poultry to eat the carcasses.

Diseases of muga silkworm can be controlled completely due to its outdoor nature of rearing, but can be contained considerably adopting prophylactic means.
5.2 Natural enemies of muga silkworm:

*Muga* culture is a risky operation and the rearing process is done in the open air. Both in the outdoor and indoor phases of *muga* silkworm rearing, various natural enemies attack the egg, larva, pupa and adult and this often reduces the effective rate of rearing. The major parasites of *muga* silkworm are uzifly (*Exorista sorbillans*), locally known as *Kunji makhi* and brachonid fly (*Apanteles glomeratus*). The brachonid fly attacks early instars (first to third instars) and uzifly causes damage to the full grown worms (fourth and fifth instars). These flies are diurnal visitors. "The femals of the brachonid flies lay eggs inside the body of *muga* larvae and uzifly deposits eggs on its surface. The incidence of uzifly occurs throughout the season but it is more intense during winter and late summer"¹. "The commercial autumn crop is relatively free from uzifly menace"².

The predators of *muga* silkworm consist of several invertebrate and vertebrate species. The most important invertebrate predators which cause considerable damage to *muga* silkworm are—ants and wasps of different species, hornets, spiders etc. The vertebrate predators of muga silkworm are generally active during spring and summer, who reduce the effective rate of rearing through their attacks. Among the vertebrate predators—Lizard (both Garden and wall), House sparrow, rat, mouse, snakes, fox, bat, monkey, cow (House and Jungle), owls, kite are the

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¹. Dr. Choudhury, S. N.- *Muga Silk Industry*. P.-60
². Thangavelu, K. *Handbook of Muga culture*. P. 78, PP. 79-81.

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main. Therefore, *muga* culture requires constant and careful watch against the predators of larvae for both day and night.

"Hail-storm, highwind, incessant heavy rain, hot weather are very injurious to muga silkworm or plants. Showers however, cause no great damage, as the worms take shelter under the leaves with perfect safety"¹.

5.3 **Problems of muga culture**: 

Under the case study, it has already been discussed the socio-economic features of the sample household, relevant aspects as regards production of *muga* cocoons, cost and expenditure and returns to the rearers and employment scenario in the industry. In this chapter an attempt is made to highlight only the specific problems faced by the muga silk industry. The problems of *muga* culture are viewed from two different aspects—

(a) Non-Economic and (b) Economic problems.

Non-Economic problems are—

(i) Education of Rearers

(ii) Attitude of the Society

It is estimated from the survey information, 33 percent of the respondents have read up to higher secondary level and 35 percent are found illiterate, while 16 percent of the muga growers have educational qualification up to P. U. This is due to their prevailing economic condition and compel them to take up *muga* farming. On the other hand *muga* farming is their age-old traditional

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source of livelihood. only 16 percent of the total respondents of rearers families are graduates and usually they donot come forward to take-up this profession, rather they rush to town and cities for getting employment either in government or private concern. This reveals migration of educated rural youths to towns or cities instead of seeking self employment. Thus the muga culture has been run mostly by the illiterate and a few literates, who have no idea about scientific as well as commercial rearing of silkworm. Due to illiteracy, the muga farmers can not avail the privileges given by the government due to communication gap. Of course, in this regard, the Seri-demonstrators of the State government can play active role by rendering necessary help and disseminating relevant informations to the muga farmers. During field investigation, a large number of muga rearers reported that the demonstrators in their regions occassionally visit either to provide technical guidance or to inform them of the governments schemes of assistance. Due to inferiority complex of the illiterate rearers, they donot dare to meet the superior officers with any complaint and are scared of seeking information from them. A few rearers reported that the employees of the sericulture department demand bribes against the payment of sanctioned grants. Besides illiteracy is the main factor which has been giving chances of exploitation by the middlemen. The muga rearers of Assam still believe that the causes of disease of silkworms are due to influence of nature and hence, the rearers try to avert them offering puja (worship) and following some customs (e.g., women are not allowed to handle muga silkworms and food leaves upto fifth day of
menses, collected food leaves are given only after purification by sprinkling water), instead of taking necessary scientific measures to eliminate the disease. The rearers also treat the silkworms as *deologa bastu* (sacred beings) and handle them with care and reverence.

**ii) Attitude of the society:**

There are still some sections of the people, who give lower status in the society to the persons connected with rearing of silkworms. Of course, it was also found during field investigation that caste-Hindu families also rear silkworms in some areas. Our practical experience shows that at present, most of the educated members of the traditional rearer families hesitate to rear *muga* silkworms, as they dislike the emission of odour from the worms and cocoons and prefer white collar jobs or petty trades to sericulture. Therefore, it appears that besides other problems, for fear of losing social status, the rich traditional rearers have been reducing their sericultural activities or left the same for the said reason.

**(B) Economic problems:**

**i) Healthy seeds:**

The most serious and basic problem that Assam is facing now in sericulture is the want of quality and healthy seeds of standard breed for commercial rearing under natural atmosphere. Department of Sericulture have failed to supply required layings to the muga rearers at proper time. The Sericulture Department connected with *muga* seed development have by and large failed to supply required disease free *muga* seed cocoons to the rearers. The activities of
Muga Seed Development Project, Dhakuakhana (Dhemaji District) and the most of the Government Muga Seed Farms are not satisfactory. Their records show usual failure in raising healthy muga seed cocoons during 1987-88 and 1990-91, all the Government Muga farms, Muga sub-station and multiplication centres supplied 3,24,416\(^1\) and 2,09,146\(^2\) seed cocoons to the rearers. The seed cocoons produced in Government establishments are able to meet about 15 to 20 percent of the total demand for seed cocoons. The muga industry is still thriving only because of the rearers own efforts and initiative, who take much stress and pain in searching for quality seed cocoon from place to place. It was also reported by the rearers that usually, the seed supplied by government farms were not of good quality and disease free, and hence, the rearers have to lose the full harvest now and then. Therefore, most of the rearers, basically depend and rely on the private source for getting quality seed.

ii) Feeds of silkworms:

The quantity of silkworms food plants have been decreasing in a speedy way throughout Assam. It is well known fact that for rearing of various types of silkworms, varieties of food leaves are required, but shortage of the same has been giving a set back to the muga culture. The root cause of shortage of feeds are-pressure of population on the waste land for cultivation recurring floods, river erosion, lack of protective measures from the government to preserve natural grown food plants, clearance of somonise etc. "William Robinson had

1. Statistical Handbok on Sericulture institution, Directorate of sericulture, Assam, 1988, P.-2

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observed in the mid nineteenth century that almost every raiyot had a plot of eri plants in the homestead land”¹. But now such plants have become a rarity, cultivators even donot like the wild growth of such plants.

Moreover, apathetic attitude of the rearers towards scientific and systematic plantation is also one of the causes of shortage of muga food plants. The government institutions have also failed in optimum use of area under plantation (The best example is Muga Seed Development Project, Dhakuakhana). The institutions may bring under plantation, the unutilised land under their disposal.

At present, the State government provides food leaves to pat silk rearers through collective mulberry gardens, muga rearers by giving facility of rearing at village Grazing Reserves, and eri rearers through Eri concentration Centres. “The collected data from the Superintendent of sericulture Biswanath Chariali reveals that the office distributed leaves of eri silkworms 80,000 kg., 100,000 kg., 1,10,000 kg., during 1987-88, 1988-89 and 1989-90 and realised Rs. 660.00, Rs. 1000.00 and Rs. 1500.00 respectively from the rearers”². In order to tide over present crisis the different varieties of food leaves government efforts alone could not be sufficient, if the rearers donot extend their helping hands to the government in the development of muga culture. A concerted effort is to be undertaken for increasing food plant by the rearers, Govt. department through research and development activities.

¹. Robinson, W. - A Descriptive Account of Assam, 1975 P.-70.
². Annual Reports, DOS, Govt. of Assam, 1990.
iii) Financial problems:

The problem of finance in sericulture can not be underestimated. Because, it is clear from the field investigation that the muga rearers have to depend basically on their own finance. Of course, negligible amount of government grant is available only to selected rearers. But such grant is not sufficient to cover large part of the total rearing expenditure. The rearers are basically poor and hence, they can not undertake large scale rearing. From the field investigation, it is understood that the sericulture sector suffers from paucity of organised and institutional finance for its development. The commercial banks in Assam are not interested in financing sericulturists due to the insufficiency of mortgage value of land or possession of land without having title deed, associated risk of unpredictable production, fear of repayment of loans. For the overall development of muga silk industry in Assam, provision of institutional finance is essential.

a) Capital requirement:

The structure of capital relating to sericulture sector consists of two types—(i) fixed and (ii) Working or circulating capital. Fixed Capital consists of cost of plantation ground, cost of rearing house, plantation equipment (like hoe, dao etc.), rearing and grainage equipments (like microscope, ant locks, wooden rearing stands, chopping knife, chopping board, bamboo trays, coconage trays, leaf chambers etc.). The fixed capital represents the assets bought for permanent use. The working capital is required to continue the process of rearing activities. Usually, it consists of cost of seeds, labour charges in maintenance of plantation
For rearing of mulberry and eri silkworms, a minimum amount of Rs. 3,000 is required for the construction of thatched house, measuring about 4.5 x 3.5 meters, which can be used for a long period, but in muga and oak-tasar worm rearing, no extra rearing house is required as they are reared outdoor, but at the maturity stage of muga worms a separate room is required to provide facility to the worms to form cocoons. The value of rearing house or the rearing equipments required can not be assessed accurately due to variation in the nature of construction and make respectively. In case of fixed assets the cost of each item varies from Rs. 60 to Rs. 500. But in case of modern scientific rearing house the investment in rearing as well as grainage equipments may exceed Rs. 50,000. It is worth mentioning, that the implements used in rearing have much price variation in the state. Generally, the life span of the rearing equipments can not be estimated. Of course, the longevity of each equipment usually remains in between 2 to 5 years, although, some rearing equipments like saja stand etc. can be used for comparatively longer period than others.

The requirement of working capital is essential to meet the expenses on seed, labour (if employed), leaves, cleaning and disinfection materials etc. But, due to lack of working capital the muga rearers can not undertake rearing of silkworms in proper time and sometimes avoid the same. From the above, it is clear that majority of the rearers have been continuing sericulture as a tradition only without having any commercial prospect.
b) Source of capital:

In Muga culture, source of finance are strictly limited. Basically, the rearers have to depend on their own limited resources. Sometimes, they take temporary loans from their friends and relatives. Of course, such loans are insufficient to meet the expenses of rearing. The poor muga rearers of Assam get some amount as advance for meeting expenses during rearing period from the master-weavers, mahajans or dealers of muga cocoons, who indirectly reserve the right of obtaining muga cocoons from the loanee rearers at a cheaper rate.

Besides, the rearers also obtain grants from the state Sericulture department. But, it is seen that the grants given to the rearers are not sufficient. It was also found during field investigation that some of the recipients tried to conceal the facts about the receipt of grants-in-aid and some recipients of grants disclosed that they utilised the grants for muga culture in some other avenues.

It is worth mentioning that one cannot expect any sort of development of the sericultural sector from the traditional rearers due to their meagre economic condition. But for commercialisation of this sector heavy investment is required. It may be noted that the grants-in-aid given by the State government either to individual rearers or voluntary organisations (like Mahila Samiti) or co-operative societies are not enough. The rules which have been framed by the Directorate of sericulture and approved on 17.2.89 by the Government of Assam, for the distribution of grants-in-aid to individual, non-government
organisations and registered co-operative societies engaged in the development and expansion of Sericulture industry in Assam reveal that grants-in-aid (non-recurring) are available for the plantation of the same, construction of rearing house including Jali house (house for cocoonage), grainage house, purchase of seed cocoons, rearing and grainage appliance and other essential equipments and chemicals. Besides, grants are also available for the purchase of recognised and approved reeling and spinning machines/charkhas and establishments of community reeling centres.

As per government rules, grants-in-aid to sericulture sector in any financial year shall not exceed the amounts indicated below. The State governments may relax the limit when necessary.

(i) Grants-in-aid towards working capital should not exceed Rs. 15,000 to each silk co-operative societies engaged in marketing of different sericultural products such as cocoons, silk yarn and silk fabric.

(ii) Grants-in-aid towards management cost of the silk-co-operative or voluntary organisations should not exceed Rs. 2000 in each case.

(iii) Grants-in aid to individual sericulturists who are engaged in the trade of all or any kind of silkworms rearing, food plant cultivation, reeling and spinning of cocoons will be Rs. 5,000 in each case.

(iv) Registered voluntary organisations engaged in sericultural industry comprising all or any kind of related activity, like production of cocoons or raw silk are entitled to grants-in aid for Rs. 5,000 in each case.

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v) Grants-in-aid in kinds to the community reeling centres should not exceed Rs. 5,000 in individually and not more than Rs. 1,00,000 collectively\(^1\).

On the analysis of the above, it becomes apparent that in the current cost structure, the said grants are insufficient. It is not possible to construct a rearing house on scientific basis including appliances at a cost of Rs. 5,000. From the field investigation, it is clear that construction of rearing house and plantation of food plants on scientific and systematic basis require heavy investment. Therefore, the government should take initiative to finance only those rearers who want to take sericulture on commercial line with the help of financial institutions. In this context, special reference may be made to Malda District of West Bengal. (Leading sericulture district) accounting for more than 65 percent (4.55 Lakhs tonnes) of mulberry silk production in the state, where commercial, rural and co-operative banks have been playing vital role in financing the development of sericulture. The overall performance of the financial institutions in extending loans to sericulture sector operating in the said district is highly satisfactory. The most impressive achievement has been made by the commercial and other co-operative banks during 1987-88, in sericulture finance, notably Indian Bank which reached 422 percent of its planned disbursement. The SBI comes next with 387 percent followed by UBI with 384 percent, Gour Gramin Bank 305 percent and UCO 189 percent. The district central credit Co-operative Bank has occupied the top position by financing 524 percent of its planned

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disbursement and the Allahabad Bank has 220 percent.\footnote{Moitra (Sengupta), M-Rural Banking and periority sector : A case study of selected Backward areas of Malda district (unpublished Ph. D. thesis) North Bengal University, 1992, p.-171-180.}

During the seventh five year plan period from 1986-87 to 1990-91, the State government granted financial aid to 2725 Nos. Scheduled tribes, 1229 Nos. Scheduled caste and 562 Nos. General caste persons in eri culture; 1220, 769 and 553 persons belonging to S/T, S/C, and General caste persons respectively in muga culture.\footnote{Hand Book of Assam, Sericulture at Glance, 1992. p.-11.}

**iv) Marketing of cocoons and yarn:**

Marketing of products is an important factor closely connected with the growth and prosperity of an industry. The process of marketing includes primary resources such as human resources, finance and management as well as staying power of the rearers or artisans for holding stocks of cocoons, yarns fabrics in order to direct the flow of goods from producer to consumers in the process of exchange and distribution.

The marketing activities of Muga cocoon markets are strictly limited due to non-existence of organised market. During field investigation also, we have not found any organised muga cocoon market like weekly haat market exchange etc., solely dealing in any kind of silk cocoon or yarn. The principal items in the entire silk industry are eggs (loosely termed as seeds), reeling/spinning cocoons, silk waste, yarn and fabric. But under this heading, discussion would be confined mainly to marketing of muga cocoons and yarns.

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"Since time immemorial, muga raw silk and eri silk cocoons were exported from Assam. As per available records, Assam exported muga yarn of Rs. 11,350 during the last part (year 1809) of the rule of swargadeo Kamaleswar Singha"¹. "During 18th and 19th centuries Assam's silk, especially muga was the staple trade of the East India Company as the same was very much in demand in Europe"². Besides, muga silk was also in great demand in the traditional handloom weaving centres of India, Between 1886 to 1912, Assam exported on an average, of 542 maunds (20,230 kg.) of muga reeled yarn. During 1890 alone, 1347 (50,275 kg. approx.) mounds of muga raw silk were exported from Assam and these were mostly consumed at the weaving centres of kolkata, Dacca, Madras, Hyderabad, Bhagalpur, Varanasi, Murshidabad etc., where it was used for embroidery and ornamental works due to its natural sheen and colour. In muga industry, there is no organised market. Naturally, the rearers have to depend upon the traditional marketing channels where the middlemen play an important role. As a whole, the rearers are at the mercy of these middlemen or traders. It is noticed during filed investigation that the middleman or traders from Sualkuchi, even from outside Assam purchase muga cocoons visiting rearers’ house in different villages of the state. Generally, the commercial reelers cum weavers or Mahajans of Sualkuchi collect muga reeling cocoons mainly from upper Assam deploying number of agents in the scattered and remote villages. It is said that the middlemen or Mahajans ususally advance


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Table - 5.1

Comparative statement between the rates of MRMB and market from 1980-81 to 1990-91

<table>
<thead>
<tr>
<th>Year</th>
<th>Variety of cocoons</th>
<th>MRMBs rate per 1000 cocoons (Rs.)</th>
<th>Rulling market price per 1000 cocoons (Rs.)</th>
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</thead>
<tbody>
<tr>
<td>1980-81</td>
<td>Jethua (spring)</td>
<td>65 to 85</td>
<td>30 to 50</td>
</tr>
<tr>
<td></td>
<td>Katiya (Autumn)</td>
<td></td>
<td>145 to 150</td>
</tr>
<tr>
<td>1981-82</td>
<td>Jethua</td>
<td>40 to 130</td>
<td>50 to 70</td>
</tr>
<tr>
<td></td>
<td>Katiya</td>
<td>60 to 135</td>
<td>80</td>
</tr>
<tr>
<td>1982-83</td>
<td>Jethua</td>
<td>60 to 130</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Katiya</td>
<td>50 to 150</td>
<td></td>
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<td>1983-84</td>
<td>Jethua</td>
<td>60 to 90</td>
<td>125</td>
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<tr>
<td></td>
<td>Katiya</td>
<td>100 to 145</td>
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<td>Jethua</td>
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<td>160 to 200</td>
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<td>190</td>
<td>130 to 210</td>
</tr>
<tr>
<td></td>
<td>Katiya</td>
<td>157 to 192</td>
<td>250 to 300</td>
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<tr>
<td>1987-88</td>
<td>Jethua</td>
<td>140 to 200</td>
<td>140 to 220</td>
</tr>
<tr>
<td></td>
<td>Katiya</td>
<td>170 to 210</td>
<td>220 to 300</td>
</tr>
<tr>
<td>1988-89</td>
<td>Jethua</td>
<td>140 to 200</td>
<td>200 to 250</td>
</tr>
<tr>
<td></td>
<td>Katiya</td>
<td>180 to 220</td>
<td>300 to 360</td>
</tr>
<tr>
<td>1989-90</td>
<td>Jethua</td>
<td>220 to 260</td>
<td>240 to 300</td>
</tr>
<tr>
<td></td>
<td>Katiya</td>
<td>232 to 255</td>
<td>260 to 320</td>
</tr>
<tr>
<td>1990-91</td>
<td>Jethua</td>
<td>280 to 300</td>
<td>280 to 360</td>
</tr>
<tr>
<td></td>
<td>Katiya</td>
<td>326 to 346</td>
<td>450 to 550</td>
</tr>
</tbody>
</table>

Source: Detailed Notes or Progress Achieved by MRMB, CSB, Sivasagar 1991, p.-5
money to the poor rearers for the purchase of seed cocoons and to meet the expenses during rearing periods and in return register or reserve the right on muga crop and keep them as ‘captive rearers’. These rearers are compelled to sell their harvests to such traders or Mahajans. Thus, the traders or middlemen control the cocoon market and thereby deprive the poor rearers from getting fair return on their investment. The traders who come from outside the state resale the same either at Sualkuchi or despatch the same outside the State.

It is roughly estimated that the traders or Mahajans of Sualkuchi purchase about 80 percent of the reeling cocoons from the Upper Assam districts, viz Lakhimpur, Sivasagar, Dibrugarh, Jorhat etc., and the cocoons are carried to Sualkuchi on bus top, trucks and river transport system, while the rest 20 percent is procured from Garo Hills and parts of Kamrup district of lower Assam. During field investigation the reelers cum weavers of Sualkuchi revealed that the reeling cocoons of Garo Hills have good demand in Sualkuchi’s market and cocoons of that place get better price in comparison to cocoons of upper Assam. It is also found in field survey, that well to do Mahajans, Master weavers or their agents of Sualkuchi pay visits to the residences of the selected rearers of different localities occasionnally and thus maintain a good relation and through their influence collect the quality cocoons from such localities. In this manner the aforesaid Mahajans, artisans or weavers are able to produce quality fabrics using quality cocoons and thus reap high rates of profits on the fabrics sold. As a whole, the muga rearers are directly or indirectly under the influence of the
traders or *Mahajans*, who exercise some form of monopoly power.

It is also observed that in recent years some petty traders of upper Assam collect *muga* cocoons from their localities and bring the same to Sualkuchi and sell them at other commercial places. Apart from Mahajans, traders or middlemen from Sualkuchi and outside the state, the weavers co-operative societies, government agencies like Assam Government Marketing Corporation Ltd., Assam Khadi and Village Industries Board, Muga Raw Material Bank (MRMB) etc. also procure muga cocoons. P.C. Dutta stated in his studies that the “entire muga cocoons were purchased either by the traders from Sualkuchi or by the Government agents of the Spun Mill”¹.

5.4 Role of Muga Raw Material Bank in marketing of muga cocoons:

As per direction and sanction of Ministry of Textiles, Government of India, vide letter No. 2517/22/80-silk, dated 23rd August 1980, CSB had established MRMB at Sivasagar, Assam. In 1980, with the object to arrange procurement of muga cocoons from the actual rearers by ensuring a fair and reasonable price to the real producers, and thus prevent distress sale made by the rearers and to ensure supply of procured cocoons to the genuine reelers and weavers, registered Co-operative societies and other government organisations at a reasonable price. This process has helped elimination of exploitation of both the producers and the consumers by the middlemen who used to procure cocoons at a throw away price by exercising their strength over the marketing of *muga* cocoons. It

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is expected that MRMB would help the rearers to free themselves from the clutches of the middlemen and to get better price from the produce.

Table 5.1 shows that the rearers used to get a price of Rs. 145 to Rs. 150 per 1000 of Katiya cocoons, during 1980-81, Whereas the same type of muga cocoons at present (1990-91) fetches Rs. 450 to Rs. 550 to the rearers. The appearance of MRMB* has a salutary effect on muga rearers, as they know that MRMB would purchase their cocoons in case there is no buyer in the market and this sort of thinking comples the trades or middlemen to boost their price of cocoons. After all, the MRMB is able to limit the wide fluctuation in the market rates of cocoons and help the rearers to get better price as it announces support prices fixed by Local Advisory Committee (LAC), comprising representatives of rearers, reelers, weavers, consumers of government organisations and officers of CSB under the chairmanship of Directorate of sericulture, Government of Assam at seasonal intervals and MRMB Strictly follows by price fixed by LAC during procurement of muga cocoons.

It is worth mentioning here that MRMB has some practical difficulties like shortage of field staff, transportation and preservation difficulties. Therefore, it can not help the rearers of remote villages, where transportation facilities are yet to be developed. The officials of MRMB can not carry huge amount of cash during purchase operation due to associated risk and therefore, spot payment is not possible in the case of purchase of large quantity. Form the above, it appears

* P. C. Dutta, in his thesis stated that a Central Raw Material Bank was established in Sivasagar during 1980-81 fulfil the need of the rearers. (p.-138)
that the operation continued by the RMRS can not be claimed as fully successful, as the muga rearers have deep-rooted intimacy/relation with the traders and middleman who extend financial help to them at the time of necessity or rearing. Hence, the MRMB can not eliminate the middlemen from their trade of muga cocoons immediately with its present structure. It was reported by the reelers as well as spokesmen of co-operative establishments that the reeling cocoons supplied by MRMB are not of good quality. Therefore, it is necessary to revitalise the activities of the said bank with a view to give full benefit to the rearers realising its basic objectives.

5.5 Role of middlemen in muga cocoon marketing:

It is generally said that the activities of the middleman associated with cocoon marketing should be controlled somehow, as they exploit the innocent rearers depriving them in getting a reasonable return on their investment. As already stated, the traders or middleman made advances to the known rearers before commencing actual rearing and maintain a very close relation with them and thus influence the rearer families and easily take the chance of exploitation. But, at this juncture, we like to advocate that unless concrete alternative measure are taken by organising rearers, co-operative societies and augmenting departmental activities for smooth marketing of cocoons and yarn, the role played by the middlemen/traders is indispensable due to the following reasons—

1) Firstly, the middlemen collect the cocoons from the rearers of remote areas, which cannot be collected by the reelers/spinners cum weavers or government officials.
2) The government departments extend their activities to such areas where transport and communication facilities are available, whereas the middlemen collect meagre production of cocoons from door to door visiting a large number of rearers.

3) The rearers get immediate cash from the traders/middlemen after selling the cocoons on the other hand, if the rearers sell the cocoons to government agencies, they have to wait for a long period or run after the concerned officials to get their dues.

4) The middlemen keep the flow of cocoons regular or continuous, otherwise, the reellers/spinners cum weavers have to block their capital, which is not possible for most of the reellers/spinners cum weavers due to their deplorable condition.

5) The middlemen collect and store the cocoons at the time of harvesting and release the same gradually. In this process they have to bear the associated risk of damage and thus relieve the rearers from the burden of storing.

6) The traders/middlemen also advance required capital to the rearers for rearing (especially applicable in muga rearing) and this help the muga rearers to continue production successfully. But loans or assistance are not easily available from the government institutions.

From the above observations, it becomes apparent that the middlemen have been playing constructive role in keeping both Sericulture and weaving industry survive and, therefore, they should not be criticised on the ground that they exploit the rearers.
5.6 Training on muga culture:

In spite of having congenial climatic conditions for rearing of all the different types of silkworms, (especially muga culture) Assam is not making much headway. The low productivity may be attributed to dearth of qualified persons in the majority of the households. During field investigation in the muga rearing in 7 blocks of Kamrup district of Assam, it is observed that the traditional rearer families donot take up muga culture on scientific basis. Any loss of crop is considered by them as a work supernatural power or evil charm. With such superstitious beliefs the traditional rearers have been continuing their muga culture activities and as a result fail to harvest optimum crop. Ultimately, the loss of energy and money in rearing activities has indirectly restrained and discouraged the rearers to undertake rearing any further. Even, the traditional rearers do not think of disinfection of rearing site (if available) or rearing implements before commencing rearing.

No doubt, Muga culture is a cottage or household industry, but upgraded technical knowledge and skill are required to cope with present day needs for plantation of food plants and in every stage of rearing process of silkworms. As stated earlier, all such activities are performed by the rearers in a traditional manner. The Seri-Demonstrators of State sericulture department, who ought to advice the rearers in the matters of rearing have failed to provide the same as reported by a large number of rearers while it is urgently necessary to provide intensive training facilities to the traditional rearers so that they are enabled to

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reap the benefits of scientific silk rearing and thus strengthen their economic condition. It may not be out of place to mention that the Sericultural Training Institute at Titabar is playing a vital role in training up departmental personnel as well as farmers.

It provides for a —

i) Certificate course of 1 year duration covering both mulberry and non-mulberry silk culture offered to post matric candidates.

ii) Refresher course of training, covering a period of 3 months duration, and training provided to the field level officials about the up-to-date techniques and silk rearing.

Besides the above, CSB imparts a two months practical training in advanced technology of sericulture practices to the farmers by the Boards Research Institutes at Boko, (Kamrup) and Jorhat through their network of research extension centres. Farmers Training is also organised under National Sericulture Project (NSP) Programme and Training is provided on mulberry culture. During 1989-90, 1990-91 and 1991-92 training was imparted to 29,298 and 1020 persons (both male and female respectively in six Technical Service Centres (TSC)1.

The State government should organise a ‘Technical cell’ and the persons of the said cell should be entrusted with the work to train up uneducated or partly educated rearers by organising demonstration camps in different sericulture

village. The cell, besides, giving advanced training, should also communicate other relevant matters in respect of finance, government assistance etc., to the rearers. The State government should take necessary steps to motivate the rearers for acquiring scientific techniques of silk rearing so that the rearers can undertake sericulture as a primary source of income like the rearers of Karnataka, West Bengal etc. The State government should make it compulsory for the rearers to have training, and after completion of course, they should be given certificates. Loan facility should be given only to such certificate holders provided they would undertake sericulture on commercial basis. "Assam holds monopoly and a unique position as regards production of muga cocoons on commercial line. But the muga weavers of Sualkuchi have been facing crisis of muga cocoons due to decline in the production of cocoons since 1974-75. Of course, considerable variation in production is noticed since then till 1989-90. Due to the shortage of muga cocoons, the muga looms of Sualkuchi also declined simultaneously, from 806 in 1970-71 to 318 in 1980-81, and that of reelers, decreased by 23.29 percent from 468 to 359 in the years under reference."¹ The price of the muga cocoons also increased year after year due to high demand. In the year 1982-83, the price of the quality muga cocoons was Rs. 150 per thousands and the same rose to Rs. 350 and Rs. 550 at the end of June, 1990, and in 1991, showing as increasing rate of 226.67 percent over that of 1982-83. Of course, in recent years the production of muga cocoons as well

¹. Baishya, P. -Problems of the Silk industry of Assam. p.-26  
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as number of looms show an increase due to handsome return both from cocoons and fabrics production. It is estimated that Sualkuchi possessed about 1000 muga looms, which is about 16.67 percent of the total looms (about 6000 fly shuttle looms) operated in Sualkuchi during 1991.

From the above observation, it appears that the production of muga cocoon should be increased by taking appropriate measures, otherwise, the glory of the muga silk industry will be obliterated. The governmental measures so far taken for the production of different kinds of silk in Assam as well as North-Eastern States under the auspices of the North-Eastern Council (NEC) as well as by the State sericulture department have remained confined to the establishment of seed farms as first and foremost strategy for development of sericulture.

5.7 Conclusion:

The problems analysed in this chapter show that the traditional muga silk industry has been losing attraction for the new generation due to uncertainty of income and associated problems of seeds, feeds, Raw materials and technology. The common problems faced by the sector are marketing, finance and training. Unless appropriate measures are taken to improve the muga silk industry, its prospects are bleak. Hence, necessary step should be taken to uplift muga silk culture as a whole creating conducive atmosphere and infra-structural facilities to the rearers as well as weavers. To eliminate the prevailing role of the middlemen in the cocoon and silk fabrics marketing co-operatives should be re-


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organised as well as revitalised. The government should also re-activise the
departmental marketing procedures. The government should take keen interest
in financing sericulture and silk weaving under different plans and programmes.
The government of Assam should also adopt a policy of persuading the banks
through guarantee for liberal financing. The attitude of the officers of the banks
also seems to be apathetic towards the rearers and weavers in sanctioning loan
because of difficulties encountered in recovery of loans. Therefore, it should be
duty of the government to help the banks in recovering overdue loans.
Encouragement may be given by the banks through rebate system, i.e. if the loan
is redeemed within the specified period some concessions in interest may be
given to the loanee. Moreover, the traditional rearers should be induced to
scientific and commercial rearing. The old technique of silk fabric production
should be substituted by modern technology wherever possible.

In the next chapter, a conclusion of all the chapters has been carried out
along with the suggestions offered by the researcher for the overall development
of muga sector in the State of Assam