CHAPTER–III
SILK INDUSTRY AMONG THE TAI-AHOMS
OF DHAKUAKHANA

3.1 Introduction

Silk industry of Dhakuakhana has taken giant stride from time immemorial. The agro-climatic condition is highly suitable to develop sericulture in Dhakuakhana. They practice three types of silk cultivation i.e. muga, eri and mulberry. All of those families, studying for the work do not associated with those three types of silk cultivation. Some of them practice one or two or three of them. It depends upon the facilities available to them. Generally, the silk industry is a female oriented labour intensive cottage industry. In earlier days, large numbers of families were found to carry on these activities as leisure time occupation but due to high expensiveness and great perspective activities this industry become part and parcel of their life. Total number of families under the study are shown in the below diagram.

Figure 3.1 Total number of families under the study
However, in the study five villages it has found that a large number of families engaged in silk culture. The results are shown in the table below.

Table 3.1

Village wise distributions of rearing silkworm

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the villages</th>
<th>Total number of families</th>
<th>Number of family engage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Muga</td>
</tr>
<tr>
<td>1</td>
<td>Bantau</td>
<td>37</td>
<td>33</td>
</tr>
<tr>
<td>2</td>
<td>Dighalagaon</td>
<td>90</td>
<td>82</td>
</tr>
<tr>
<td>3</td>
<td>Hilodari</td>
<td>49</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>Katharbari</td>
<td>111</td>
<td>67</td>
</tr>
<tr>
<td>5</td>
<td>Malabari</td>
<td>86</td>
<td>80</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>373</td>
<td>302</td>
</tr>
</tbody>
</table>

Table 3.1 reveals the village wise distribution of rearing silkworm. Among the total 373 household 302 families i.e., 83.69% are engaged in muga silk industry, 329 families are engaged in eri cultivation, and the percentage is 88.19%. Among them 132 families have done mulberry cultivation, where the percentage is 35.35%. Altogether 106 families (28.39%) are engaged in all three types of silk cultivation. Although 17 families, (1.92%) do not rear the silkworm but they relates with the same either through reeling, weaving and marketing of silk.
Among these families rearing silkworm it is seen that they cannot maintain regularity due to some reasons like lack of manpower, lack of food plants, continuous effects of flood, non-availability of own food plantation, lack of skilled manpower and so on and so forth. In the following table, the continuity of silk rearing has shown.
Table: 3.2  
Type of engagement in sericultural activities

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Village</th>
<th>Total number of families</th>
<th>Continuously practicing every year</th>
<th>Seldom</th>
<th>Practiced Earlier</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Muga %</td>
<td>Eri %</td>
<td>Mulberry %</td>
<td>Muga %</td>
</tr>
<tr>
<td>1</td>
<td>Bantau</td>
<td>37</td>
<td>33</td>
<td>8.84</td>
<td>31</td>
<td>8.31</td>
</tr>
<tr>
<td>2</td>
<td>Dighalagaon</td>
<td>90</td>
<td>81</td>
<td>21.71</td>
<td>78</td>
<td>20.91</td>
</tr>
<tr>
<td>3</td>
<td>Hiloadari</td>
<td>49</td>
<td>40</td>
<td>10.72</td>
<td>44</td>
<td>11.79</td>
</tr>
<tr>
<td>4</td>
<td>Katharbari</td>
<td>111</td>
<td>63</td>
<td>16.89</td>
<td>97</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>Malabari</td>
<td>86</td>
<td>79</td>
<td>21.17</td>
<td>75</td>
<td>20.10</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>373</td>
<td>296</td>
<td>79.33</td>
<td>325</td>
<td>87.11</td>
</tr>
</tbody>
</table>
In the table 3.2, type of engagement in sericulture activities is discussed. Total 296 families out of 373 continuously practice muga cultivation. The percentage is 79.33%. Moreover, 325 families, 87.11%, and 123 families 32.97% are maintaining regularity in cultivation of eri and mulberry respectively. Numbers of families are 6 1.06%, 4, 1.07% and 9, 2.41% respectively who seldom practice muga, eri and mulberry culture. Again, each 12 families, 3.21% earlier practiced both muga and mulberry cultivation and 33 families i.e. earlier rear mulberry cultivation.

Figure:3.3 Type of engagement in sericultural activities

However, different types of methods and processes are applied for the rearing of each type of silkworm.

3.2 Muga Silk Industry of Dhakuakhana

Muga silk industry of Dhakuakhana comprises with rearing, stifling, deflossing, degumming, reeling, and spinning, weaving, designing, and marketing of silk. This culture is performing by all sections of the people irrespective of their social status and age. Division of labour has shown in practicing silk culture, such as, able men and women collected the seed, rear the worm in somani (som plantation where worms are rear outside), children help them to pursue the insects, bat, birds, and others. Old male and female engaged in reeling activities, female engaged in weaving etc. In some of the families due to non-availability of work force and host plant, they cannot perform all these three activities together. In such situation they shared or sale the plant or cocoon or yarn.
Muga silkworm rearing is an outdoor activity. Although it is polyphagus in nature, it has shown from the survey that the people of Dhakuakhana mainly use som and soalu tree as host plant because of its abundance there. The host plants are generally available in a natural state, but plantation and maintenance of host plant is important for better gaining. Different host plants produce silk of different colour. The size and volume of cocoon are also varying. There are different varieties of both of these trees and the taste of these are varies. Locally the leaf of the som tree named as azarpatia, Jampatia, Naharpatia etc. Naharpatia considered as the best variety for muga silkworm rearing because of its sweet taste. Similarly, soalu has also different variety of taste. The larvae reared on som tree yields more silk and the resulting female moths lay more eggs than larvae are rear on other trees. Plants of these varieties attain height of about 60 feet when fully grown. Plantation of som trees in 4 meters apart and soalu tree at 5 meters in square system is ideal, which will accommodate 625 and 400 plants per hectare respectively. One full-grown tree of 12 months to 2 years growth can support the rearing of 5 to 10 laying and yields 500 cocoons in one season. However, som trees become suitable for rearing after 5 years of plants. One tree may be easily utilizes for two rearing in a year alternately during spring and autumn. Thus, one tree can yield 1000 cocoons in a year and 5 trees are required to produce 5000 cocoons which yields one K.G. of muga silk (Thanagavallu et al,1988). In 1 K.G. of silk 8 numbers of mekhela (traditional lower garment of Assamese women) can be weaved which price in present day market is 12000.00. Sometimes, the maximum production of muga silk has been close to one lakh raw cocoon of one rearer. Manuring and pruning are necessary for a systematic plantation and these have to done in an appropriate time. Inorganic fertilizer may be applying every year. To gain smooth, big, and healthy leaf, the host plants should pruned and give a desirable shape of the plant.

The field of host plant for muga is call as somani in local language (photo plate-1) and the rearer called as somania or sungia. They considered the muga culture as the gift of supernatural being locally called as deo (male deity). They believe the spirit guard their rearing and his blessing affects the cultivation.
To satisfy the *deo* (the supernatural power) for silkworm rearing, people first clean the *somani* very well by *mechi da*, a cutting implement, which process is called as *habi jua*. They offer betel nut; incense stick, one-rupee coin to the spirit by wrapping in a banana leaf in front of the main *som* tree, that principal *som* tree is locally call as *lai gas*. The tree trunk is wrapping by a creeper called *tikani barua*. After that, the offering materials are well wrapped by banana leaf and kept it below the roof of *somani tangi* (a bamboo and thatch house build in the *somani* for convenience of rearer to live or keep vigil until the rearing process is completed). Women prohibited entering the *somani* during their menstruation period.

Although, some villagers have a plot of land for *som* cultivation, but sometimes they face some problems to rear the silkworm in the same plot of land like, scarcity of leaf in the plant, lack of work force to look after the worms etc. In this situation, rearer can hires the host plant garden from others in *aadhi* system. It may be either giving half of profit or jointly rear in owner’s firm or government sericulture firm with or without any payment or dealings. Some villagers have hired the garden because of non-availability of garden. Here, the owner demands half of produce cocoons in using the trees from first stage of the larvae. If it has used from second or third stage, the share would be 1/3 of total cocoons. Moreover, in using the host plant in the last stage the rearer have to give 200-300 numbers of cocoons to the owner of host plant. Table-3.3 given below show the pattern of rearing by the families.
Table 3.3 reveals the patterns of plantation and hiring of *som* trees by the families to rear muga silk worms. Among, 302 total household of muga rearing 238 families i.e.78.87 percentage has own *som* plantation. Total 10 families, 3.31% have own land of *som* tree but also hired from others. Another 2 families, 0.66% rented the plant with profit, while single family i.e., 0.33% rented to other with payment. Again, it is seen that 2 families rear muga in the sericulture farm whose percentage is 0.66%. Thus, it is seen that most of the villagers has a plot of land for *som* plantation and who do have not it, they can hire from others to rear. People show lots of interest to cultivate the silk. In the table below, we have seen how much area has occupied for plantation of *som* tree.

**Figure:3.4 Patterns of plantation and hiring of *som* trees by the families**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the villages</th>
<th>Total no. of muga rearing household</th>
<th>Having own <em>Som</em> plantation</th>
<th>% Own &amp; hired</th>
<th>% Hired from others</th>
<th>% Rented to other with profit</th>
<th>% Rented to other with profit</th>
<th>% In farm</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bantau</td>
<td>33</td>
<td>30</td>
<td>12.6</td>
<td>1</td>
<td>2.04</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dighalagaon</td>
<td>82</td>
<td>75</td>
<td>31.51</td>
<td>1</td>
<td>6</td>
<td>12.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hiloidari</td>
<td>40</td>
<td>30</td>
<td>12.6</td>
<td>5</td>
<td>3</td>
<td>16.2</td>
<td>1.33</td>
<td>1.33</td>
</tr>
<tr>
<td>4</td>
<td>Katharbari</td>
<td>67</td>
<td>41</td>
<td>17.2</td>
<td>2</td>
<td>23</td>
<td>46.93</td>
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<td>1.33</td>
</tr>
<tr>
<td>5</td>
<td>Malaubari</td>
<td>80</td>
<td>62</td>
<td>26.05</td>
<td>2</td>
<td>16</td>
<td>32.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>302</td>
<td>238</td>
<td>78.87</td>
<td>10</td>
<td>49</td>
<td>16.2</td>
<td>0.66</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Table 3.3 reflects the patterns of plantation and hiring of *som* trees by the families to rear muga silk worms.
Table 3.4

Area of *Som* plantation of the families

<table>
<thead>
<tr>
<th>Areas of land (in acre)</th>
<th>Bantou</th>
<th>%</th>
<th>Dighala Gaon</th>
<th>%</th>
<th>Hiloidari</th>
<th>%</th>
<th>Kathbari</th>
<th>%</th>
<th>Malubari</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>27</td>
<td>10.50</td>
<td>70</td>
<td>27.24</td>
<td>33</td>
<td>12.84</td>
<td>40</td>
<td>15.56</td>
<td>60</td>
<td>23.35</td>
<td>230</td>
<td>89.49</td>
</tr>
<tr>
<td>1.1-2</td>
<td>7</td>
<td>2.72</td>
<td>6</td>
<td>2.33</td>
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<td>.38</td>
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<td></td>
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<td>1</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>36</td>
<td>14.01</td>
<td>76</td>
<td>29.57</td>
<td>38</td>
<td>14.78</td>
<td>43</td>
<td>16.73</td>
<td>64</td>
<td>24.98</td>
<td>257</td>
<td>99.97</td>
</tr>
</tbody>
</table>

Table 3.4 depicts that maximum 3.1 acre of land is occupied for *som* plantation by 1 family of Bantau village. Highest 230 villagers have *som* plantation in 0-1 acre of land, where the percentage is 89.49% which is followed by 1.1-2 acre of 23 villagers and 2.1-3 acre of 3 rearers. The percentage is 8.94% and 1.16 respectively. Anybody wanting to involve in muga cultivation prefer to plant 2-3 *som* trees in their homestead land.

Figure:3.5 Patterns of plantation and hiring of *som* trees by the families

Some case studies related to host plant and hiring of it are given below.
Case 3.1

Date 7.3.08

Dimbeshwar Barua, aged 49 of Katharbari village reported that he practices the muga silkworm rearing and it continued traditionally from the time of his ancestors. He has total 1.5 acre of land for som plantation. The plot of land are scattered here and there and has about 140 numbers of som trees. It is sufficient for his cultivation. He never gives the som plant for other’s use. He said that according to Sericulture Manual guideline the som tree plantation have to 4 meters apart from each other. However, according to him, when the trees would be mature, they may touch each other. Then, silkworm may be transfer to other trees. He gives his own labour to care the som plant, pruned the plant, clean the plant etc. He has not gain any training from government in any matter of muga silkworm rearing. He generally rears kotia and jethua breed of muga.

Case 3.2

Date 1.3.08

According to the story narrated by Lachit Gogoi, aged 54 of Hiloidary village it is convenient to pruned the som tree regularly. He also said that according to Central Silk Board guideline the trees should be prune in 6 feet. However, Lachit Gogoi said that much pruning of the tree resulting dryness of the tree. The liquid extraction of the tree becomes decrease day by day. If no new branch has shoot, the tree may become completely devastated. However, instead of individual firm, in other firms a chemical has been used to fresh the tree. He has a somani of almost 1 acre. Now he is rearing jethua breed of muga combined with his aunt. His aunt uses his host plant. Seed has brought collectively. As he is a government service holder, he has not enough time to rear the worms. Therefore, his aunt stay in the somani and the profit as cocoon will be dividing into half.

Case 3.3

Date 7.2.08

Banshidhar Gogoi, aged 63, of Bantau village rear the jarua breed now with his five partners. The six rearers collectively rear the muga silkworm in the sericulture
firm of Muga Seed Development office in Dhakuakhana. The firm covers an area of 2 acre. They are used only less than one acre to rear the worm in exchange of 20% profit. Firm does not demand the poor cocoons. The firm does not provide any rearing equipments, lamp, or electricity etc. They are now rearing jethua breed of muga, where the seed collected from Chepan, Sibsagar. They build a somani tangi in the somani. In the daytime, all are engaged in rearing or making any implement such as bow, pellet, khang, kuki etc. in the somani, but during night they alternately staying there. They cook and eat in the somani tangi.

3.2.II Seed Collection and Process of Muga Silkworm Rearing

The muga silkworm passes through four stages of development, i.e. pupa or chrysalides (leta) covered by cocoon(khola), moth or male moth(chakara) and female moth (chakari), egg (koni) and larva or caterpillar (polu). The pupa covered by cocoons are the seed which are collected from various places. The rearer believed that the seed from far distance is good for rearing. Almost 4/5 decades ago, the villagers collected the seed from Garopahar, Goalpara of lower Assam. They also bring the seed from undivided Sibsagarh district of then days. However, in present day, due to expensiveness in transportation or disturbance of other passenger, they are not interested to carry the seed from such a long distance. Today people of Dhakuakhana have collected the seed from nearby villages and from other parts of Lakhimpur such as, Narayanpur, Laluk, Baginadhi and from Dhemaji district specially from western Dhemaji, Lakhtokia, Ghuguha, Machkhowa etc. and south bank of river Brahmaputra. They have to carry the seeds in the bag and bring it as 8-9 cocoons against ten rupees. They identify the female moth which cocoon is big, tubular, and coarse. Small and tight cocoons are identifying as being male moth. After bringing the cocoons, they gathered it in xanja or pera (a bamboo cage). These activities are doing inside the house. After two or four weeks of formation of cocoon, the moth forms slowly depending upon the environment. The process of emergence of moth is also a very delicate phase, as the moth has to pierce both the tough pupa spin and the flossy cocoon shell. Rearer gets happiness if the female moths are more than male moth. The female moth is tied with a bundle of straw, locally called as khorika, with a string of thread. It is 30-35 cm in length with a hook at one end. Then the process of pairing has done. Unequal female moth left in bank of river or near the well, tiding with small twigs of bamboo for whole night. The male moth on the other hand has allowed moving freely. They belief that
male moth comes to drink water and has meet the female moth there. The process locally called as ba ja dia, a song has been sung during that time on behalf of female moth. Female moth –

*Rupali kanya na darar karane*
*Apeksha kari rai aso*
*Nā dara aahi atia xunkale*
*Tumi mok lag dhara*
*Duyure purnanga jiban garha*

Beautiful bride
Waiting for new groom
Let come the bridegroom
As soon as
Meet me and let us form
Complete life for both of us

Another song, *Chakara a aice aice aice*

*Chakari aase xunar xajat*

Let come the male moth
Female moth is in golden cage.

The *Khorika* is making by old thatch of roof so that it has functioning a gum and the eggs tightly tied with it. Otherwise, the newly used thatch is slippery. Moreover, the rearer sprinkles *tulsi* (ocinum sanctum) water on the *khorika* to prevent crawling of the newly hatched worms. The larvae suck little droplets of the *tulsi* water and the sucking of such juice has some polyphyletic action against the attack of pebrine. The process of tying is laborious, as the rearer has to deal with hundreds of *khorika*’s within a period of two or three days. After paring, they are prepared for mating and lay eggs. The mating process in locally called as *garh bandha*. Male moths are reddish in colour and female moth is big and brown coloured. The seed, which are keep in *sanja*, and from which moth come up from the cocoon within 5 days, there maximum male moths are appeared. Until 6-7 days, both male and female moth comes almost equal in number. The people therefore required the seed of 6-7 days so that male and female moth has to be equal. Gradually, after 6-7 days, the number of female moth has increased. The couple is left undisturbed until next day after mating. The pairing
room should be well ventilated and have sufficient space but not the direct effect of wind. The compiling moths are separate after a day. The usual practice followed is to move a torch of fire made of straw, jumuthi near the rows of kharika with the moths, so that moths separated by themselves. It is locally call jak dia. The Khorika are placed either in a row locally called dol or in a circle made of bamboo, which is locally called chak (photo plate- 2).

Photo Plate 2 : Korikas are placed in the chak

The diameter of the circle generally is of 2 feet. Some string tied from one end of diameter to other end. The khorika has hung in the cane string. A moth lay about 250 eggs on an average. The diseased moth and eggs are discarded and burnt. Only healthy eggs out of disease free moths has retained for rearing. After 2/3 days, the moth laid eggs and moth has separated from the khorika by cutting the threads that is called pakhila kata. The rearer kept the moth in the basket especially in a small type of basket called khong. The moth in khong may hatch new larvae. The khong are also tied with the host plant so that tiny, hatched new larvae can automatically go to eat the leaf (photo plate-3).
The larvae grow from the eggs in phased manner within 9 or 10 days. The larvae undergo four moults, which is call *chalkata* and pass five instars.

After feeding 3 to 4 days in summer or 6 to 8 days in winter, the larvae enters, the first moults i.e. locally called *chai ulua* and it transforms itself into the second instars larvae. The stage lasts for 3 to 5 days in summer and 7 to 10 days in winter. Locally it is call *dui ulua*. After that, larvae enter the next moults. The third instars larvae stage lasts for more days then previous two; it lasts for 5 to 7 days in summer and 10 to 13 days in winter. It is locally call *maiki ulua*. After that next phase is, locally known *paka ulua* that means forth instars larvae completed after finishing 7 to 10 days in summer and 12 to 15 days in winter. The entire life cycle lasts for about 50 days in summer and 120 days in winter. The ultimate stage lasts for 10 to 12 days in summer and 16 to 19 days in winter. A fully mature larva attains 10 to 15 grams in weight and 12 to 13 cm in long. Generally, the female larvae are larger and heavier than the male larvae.

The tiny, newly hatched larvae have a tendency to disperse in search of food soon after. Before they disperse, the *khorikas* are place on the trunk or in the branches of a dwarf host plant (photo plate-4).
Photo Plate 4: Khorikas with newly hatched larvae are hanged in small tree.

The *khorikas* are place on the eastern or southern side of the tree so that the warmth of morning sunlight can be gain. The new larvae have high up to the top of a tree and commence chewing the tender leaves (photo plate-5).

Photo Plate 5: Korikas with larvae are hanged in big tree
Later, as the larvae grow in size, and became green, they gradually descend in the tree canopy. During their third instars, the larvae frequently cut off the base of a leaf. That is a peculiarity of the muga larvae and regarded as a sign of healthy brood. Unsuitable leaf has discarded. This is known as *pakhila pelua*. Fine weather helps the larvae to flow up easily. Fluctuation of weather or heavy rain, thunder and other disaster leads to heavy mortality. The rate of mortality may also be high if the rearing is conduct near brickfield or dusty road, railway station because of smoke, dust or carbon particles. Moreover, during the heavy rain or thunderstorm, when the larvae fall down from the tree, the small larval cannot took in the hand, rearer then attach a small branch of host plant with the nearby tree so that the larvae can crawl to the tree, that is locally called *xako*. Eating habit in day and night are same. During the moulting period, the larvae do not feed for a day or two. During the last stage, a rustling sound has heard in the plantation due to continuous feeding by the grown up larvae. The larvae crawling in the tree trunk and comes down to the tree trunk. Rearer wrapped the tree trunk with dry leaves of banana, bark, or with *tara* (a genus of tropical plant) tree, creeper, thatch or other coarse material, so that larvae cannot descending to below. The wrapper is locally call *gari bandh* (photo plate-6).

Photo Plate 6: *Gari bandh* in the *som* tree to prevent downward movement of larvae
When the leaves are defoliated from a tree completely the larvae start descending to the base. They are then picked up gently and sorted out according to size and placed on a triangular bamboo sieves, known as *chillingi* (photo plate-7).

Photo Plate 7: Silk cultivator transfer the larvae from one tree to another

These sieves have then hanged up again a new tree with nail. The sieve is triangle in shape and may be differ in size. The base of a big sieve is about 2 to 2 ½ feet. Gradually, it has point in the top (photo plate-8).

Photo Plate 8: *Chilingi* hanged in the *som* tree
When the larvae attain complete maturity, it takes rest. The last semi liquid faecal matter *jolom* is discharge and the larvae prepare to spin a cocoon. Silk gland is formed in the fifth larval stage. That is call *paka ulua*. The larvae make a sound when it rolled between the hands. After observation, rearer can notice whether the larvae or muga is either fine or not. There are various types of larvae or muga according to the rearer. These are,

*Kamini or Pavamukhia muga:* This type of larvae has broad chest. It is regarded as the best.

*Kachupatia muga:* It is of the colour of tuber, it shows sign of illness.

*Phutuka muga:* This type of larvae has black spot in the body, but it do not gain maturity. Larvae destroy before maturation.

*Bali Phutuka muga:* This type of muga has slight stripe in the body.

*Garva Phutuka muga:* It has big black spot. It is slightly black inside.

*Kajala muga:* It is somehow blackish in colour.

*Kukurbahi muga:* It is good in breed but small.

Among all of these, *pavamukhia* or *Kamini muga* is the best variety of larvae. The larvae those are not affected by severe climatic condition are called *juibandh muga* i.e. tight muga. The larvae as like as the colour of *som* tree is consider as good. Water removed from the mouth of larvae is called *lelawati* in local language. It makes stain in the cloth.

The larvae are on the constant vigil at the *somani* to protect them from birds, insects, and animals. Uzifly (Exorista sorbillans) locally known *Kunji Makhi* is a common enemy of sericigenous insects. The rearer uses pellet bow and slingshot to expel the birds and animals. The bow is made of bamboo and pellet is from the clayey soil of the bank of river (photo plate-9).
A lady scared bird with bow from *som* filed

Some reaper used net to cover the whole *somani* area. The mature larvae are collect in a type of basket known as *kuki* (photo-plate-10) and then transferred to a leafy dry cocoonage known as *jali* (photo-plate-11).

*Kuki* used for collecting fully matured larvae
There are two types of *jali*, *topa jali* and *dang jali*. In *topa jali* two numbers of cane stick of 6 feet folded and tied with each other to form four corners by applying a technique. The dry twigs of above mentioned plant of almost 1 feet hung in the frame. Almost 1000 larvae can attach with it. Again, in the *dang jali* four cane stick of 6 feet are required. Two frames of cane are connected with a bar where, the difference between the frames 2 feet. The approaches of *dang jali* tied with thread in indoor and the larvae kept in the *chillingi* below the *jali*. The larvae then gradually come up and touch the *jali*. According to therearer, 3000-4000 larvae can make cocoons in a *dang jali*. A mature muga may be of weight of 20-25 gm. Some *jali* are covered with net. Hence, larvae cannot go outside from there. It is call *bandha khowa*. Without net the *jali*, constant watching and guarding by day and night are essential. Because some larvae escape to the ground, which is call *palaria muga*, later spin cocoons in between dry leaves or in hole and get themselves lost. After 11/12 days the *jali* are broken.

After completion of rearing process, which is locally known as *somani utha*, the rearer perform a ritual where, the rearer offer betel nut, rupee, rice beer and special type of chicken curry to the *somani deo*. A special prayer is also made by the priest.

However, rearing of muga silkworm has conducted in five times in year. Five names of muga-harvested crops are *jarua, jethua, aherua, bhodia* and *kotia*. Table 3 given below shows these varieties produced in this area.
### Table : 3.5

**Muga cocoon crops and their features**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Crop name</th>
<th>Regular/overlapping</th>
<th>Month</th>
<th>Nature of crop</th>
<th>Silk recovery per 1000 cocoons (gm)</th>
<th>Muga silk yarn received in 1 bigha land (Kg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jarua</td>
<td></td>
<td>Feb-March</td>
<td>Seed crop</td>
<td>150</td>
<td>0.75-1</td>
</tr>
<tr>
<td>2</td>
<td>Jethua</td>
<td></td>
<td>April-May</td>
<td>Second commercial crop</td>
<td>250</td>
<td>2-2.5</td>
</tr>
<tr>
<td>3</td>
<td>Aherua</td>
<td></td>
<td>June-July</td>
<td>Seed/commercial crop</td>
<td>200</td>
<td>1-1.5</td>
</tr>
<tr>
<td>4</td>
<td>Bhodia</td>
<td></td>
<td>Aug-Sep</td>
<td>Seed crop</td>
<td>175</td>
<td>1-1.5</td>
</tr>
<tr>
<td>5</td>
<td>Kotia</td>
<td></td>
<td>Oct-Nov</td>
<td>First commercial crop</td>
<td>275</td>
<td>2.5-3</td>
</tr>
</tbody>
</table>

In the table 3.5, it has seen, as *kotia* breed of muga is the best one, which produces 2.5 Kg. – 3Kg. yarn in a land of 1 *bigha* in one breed. *Jethua*, which is another commercial crop produce 2 to 2.5 Kg yarn in the same plot of land.

Therefore, rearing of *kotia* and *jethua* are the most popular breed for the villagers due to profitable return of yarn. Favourable environment takes place during the rearing time of *jethua* and *kotia*. Birds, insects, maggots etc. are less during that time. *Jarua* breed is reared for seed during the winter season and rearing time become very long. Moreover, disturbance of bat is a cause for less cultivation of *aherua* breed. It is rear only for seed because the cocoon of *aherua* is very light in weight and the colour of yarn are also very light. It cannot produce much yarn from the cocoon. *Bhodia* breed is also a seed crop. During the time of *Bhodia*, wasp and fly mostly affect the larvae. They scented the larvae from a long distance. Birds, bats, monkey etc. also harm to the larvae. In each of these villages the distribution of different breeds are discussed in the below table.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the villages</th>
<th>Malaubari</th>
<th>Katharbari</th>
<th>Hilodiary</th>
<th>Dighalagaon</th>
<th>Bantow</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>107</td>
<td>Kotia</td>
<td>27</td>
<td>30</td>
<td>6</td>
<td>37</td>
<td>7</td>
<td>35.43</td>
</tr>
<tr>
<td>96</td>
<td>Jethua</td>
<td>34</td>
<td>22</td>
<td>23</td>
<td>17</td>
<td></td>
<td>31.76</td>
</tr>
<tr>
<td>75</td>
<td>Kotia &amp; Jethua</td>
<td>15</td>
<td>8</td>
<td>7</td>
<td>22</td>
<td>22 %</td>
<td></td>
</tr>
<tr>
<td>24.47</td>
<td>%</td>
<td>4.96</td>
<td>2.64</td>
<td>2.31</td>
<td>7.28</td>
<td>728</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Kotia &amp; Jarua</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.33</td>
<td>%</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Jethia &amp; Karua</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.99</td>
<td>%</td>
<td>.33</td>
<td>.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Kotia, Jethia &amp; Jarua</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4 %</td>
<td></td>
</tr>
<tr>
<td>4.58</td>
<td>%</td>
<td>.66</td>
<td>1.3</td>
<td>.66</td>
<td>.66</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Jethia, Kotia &amp; Bhodia</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.33</td>
<td>%</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Kotia, Jethia &amp; JaruaAherua</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.33</td>
<td>%</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Jethia, Kotia &amp; JaruaAherua Bhodia</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.66</td>
<td>%</td>
<td>.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Jethia, Jarua &amp; KotiaBhodia</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.99</td>
<td>%</td>
<td>.33</td>
<td>.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>302</td>
<td>Total</td>
<td>81</td>
<td>64</td>
<td>40</td>
<td>80</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>99.63</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.6 reveals that among 302 muga rearing families 107 families, 35.43% are practicing kotia brood only, 96 families cultivate the jethua crop, where the percentage is 31.76% and 75 families rear both kotia and jethua brood and the percentage is 24.47. Among all of these only single-family i.e., 0.33% practice kotia and jarua, 3 families, 0.99% practice jethua and jarua, while 14 families rear kotia, jethua and jarua breed and the percentage is 4.58%. Only one family i.e., 0.33% practices jethua, kotia and bhodia. Another one family rear kotia, jethua, jarua and aberua. Again, 2 and 3 families rear jethua, kotia, jarua, aberua, bhodia and jethua, jarua, kotia, bhodia respectively. The percentage is 0.66% and 0.99%.

![Figure:3.6 Village wise distribution of different type of muga crops](image)

There are some case studies generating regarding the rearing of muga.

**Case 3.4**

**Date 4.3.07**

Mainu Konwar aged 31, of Katharbari village narrated that she collected the seed from Mohemari village to rear the jethua breed of muga, jointly with her neighbour Padma Duwarah. They have bought 350 numbers of seed by each on rupee one. They carried the seeds in the bag and kept it in xanja. She has own somani of 1 bigha and now they rear in her somani with her partner. After maturation, the larvae were taken to her home to form the cocoon. They took the seed before forty days from
today. After 12 days, appearance of moth has started. They hang the moth inside their house and she got 137 female moths. Some seeds have damaged by uzifly. Now the larvae got third stage of maturation. It is not necessary now to stay in the somani at night but when the larvae will mature, they have to spent night in the somani to protect them from bat, owl etc. They tied gari bandh in the tree trunk. She made jali with som or ajar plant. After formation of cocoon, these are fermented in the dhowa chang (bamboo shed above fire) or in sunshine. Then it is prepared for reeling.

Case 3.5
Date 12.2.08

Tileswar Phukan, an inhabitant of Bantau village, aged 46, said that he generally rears kotia and jethua breed of muga silkworm. Last year, he reared the jarua breed where he brought 500 seed from Khajua Village of Dhakuakhana and gain 8000 cocoons from it. From there he has sold 200 cocoons for seed in 1200 rupees. He has own somani of $1/2$ bigha rearing is conducted in his own somani. According to him, Kotia breed was not reared by him earlier, but since 5-6 years he started to cultivate this breed also. During the time of his father, they were rearing the Aherua breed but because of disturbance of crow, wasp, and others, they give up to rear it. When wasp pinches the larvae of Aherua, it got rotten. Bhodia has also disturbed by the same. Phukan also stated that he seldom rear the jarua breed of muga only for seed.

During the days of his father they got 60,000-70,000 cocoons of jethua breed rearing in Sericulture firm of Muga seed development office of Dhakuakhana. They had to give 10% of cocoon to the firm.

Case 3.6
Date 12.2.08

According to the story of Nandeswar Gogoi, aged 63, of Bantau village has a somani of $2/3$ bigha. The plantation area is situating in three other parts. Earlier they rear three breed, jarua, jethua and kotia. However, now a days due to lack of work force he has given up to rear the jarua and kotia breed. Last year he collects 300 breed of jethua, from his own village but he lost his capital also due to diseased larvae. The larvae have suffered from pebrine in fifth larval stage. In the year 2006, he earned 15000 cocoons from jethua breed. He gave 600.00 rupees for 1000 breeds. During the
time of rearing kotia breed, his som plant hire by another. He got 1/3 cocoon if newly hatched larvae are attached in the tree and if the larvae are matured he gain ½ cocoon from the rearer.

**Case 3.7**

**Date 13.2.08**

Lakhi Chamuah, aged 45 in a permanent resident of Bantau village. He has a somani of 4 bigha of land. He collected the seed from Sibsagarh district, Narayanpur, Dhalpur of Lakhimpur district etc. Last year, he reared the jarua breed where 1000 seeds were collected from own village. He gets 300 khorika and earns 20,000 cocoons. From here, 8000 cocoons have kept for seed. Rearers, from his own villages and from Dholpeta, Ghilamara etc. collected seed from him. He used 800 of these seeds to cultivate the jethua breed and gain 6000 cocoons from it. To rear the kotia breed, he went two times to Lakhimpur for collecting seed, but not gained it. This year he started to rear the jarua breed with 500 seeds. Therefore, he gains khorikas. He has given it to other for rearing in his own plantation and demanded 1/3 of cocoons. He does not rear ahernua and bhodia for non-suitableness.

According to him rearing of muga is dependent luck of the rears. He believes in the supernatural power, which controls the same. Therefore, they worshipped the power in somani before rearing. Then the newly hatched larvae attached to the tree. They make the khorika. Other equipments like, topa jali, dang jali, chilingi, pellet, bow etc. are preparing by themselves, and these are lasting for several years. He generally used the topa jali. Rearing process is generally conducting by him but his old mother, who is of 90 years, sometimes looks after the larvae. His wife also stays in som garden alternately. His children help him to drive away the crow, bat, birds etc. from the garden. After maturation of larvae, they offer worship to the supernatural power.

**Case 3.8**

**Date 24.2.08**

Bhadreshwar Gogoi, aged 61 has 11 bigha of somani in 3 plot of land. He now rear the jarua breed in the sericulture firm of Muga Seed Development office of Dhakuakhana with other five partners. Generally, he rears the jethua in his own som plant, bhodia in sericulture firm and kotia in own firm. He stated that one time when a
successful cultivation has occurred, he carried the larvae in pera to som plant for creeping. He placed the pera in the root of tree and a small twig is place in the pera to the tree. When sufficient larvae go to the plant, the pera placed at another root of tree.

According to him, the leaf of the tree has different taste; Sweet taste is favourite for the larvae. It can be determined according to the colour of leaf. The khorika are hang in the tree with the eggs but after hatching the larvae they believe it as taboo to bring it to the home,. After performing a ritual of somani utha they brought it home. Then the shell of egg is degummed by the knife.

Gogoi also stated that today is the second day of hanging of kharika in the tree. They begin to cook from today in somani tongi. There is no any taboo to eat at somani. They do not allow entering the cow or goat to the somani. Moreover, red ant is harmful for the larvae too. He takes every care to protect the larvae for the whole period so that they can raise a good harvest.

3.2.III Stifling of Muga Raw Cocoon

After harvested the cocoon, the good one are separated and keep ready for reeling or rearing in next generation. The would be reeled cocoons are fermented for preservation, to kill the chrysalides. People burn a fire in a pit and burning charcoal is bringing out from the pit. Then the cocoons are casting down there. Sometimes a net is placed there and cocoons are fermented there by covering banana leaf. Moreover, these are stifled in hot air also. Rearer also stifle the cocoons in smoke by suspending the cocoons in a hanging position in a bamboo platform over the kitchen fire at a reasonable height. The hanging surface is call as Dhowa Chang (a hanging platform 3’ to 4’ high above hearth). It is a suitable place for preservation. The cocoons are also protected from attack of rates, lizards etc. there. If the cocoons have found to be infecting by maggots, they are stifled at once and the cocoons remain intact without being affect by the maggots. For stifling the cocoons, they apply sun-drying method also. Sun dried cocoons are very light and produce a rattling sound on shaking. The dried cocoons can be stored for any length of time. However, they must be stored in rooms with good ventilation. Moreover reeling can be done immediately also. After well stifling the cocoons are get ready for reeling. A case study on the stifling of cocoon is mention here.
Case 3.9
Date 8.4.07

According to Taruni Gohain, aged 67, of Dighalagaon, the harvested cocoons are preserving through fermentation. She stifled the cocoons so that the pupas kill inside. She is not interested to store the cocoons for a long time. According to her, growing demand of muga, inspire her to reel the cocoon as soon as possible so that they weave the fabrics. She prefers steam stifling where the cocoons covers with banana leaf are keeps in a net above the kitchen fire. Sometimes they apply pit-steaming method also, where burning charcoal removed from it and cocoons takes place. Moreover, on the fire a net is place where the cocoons are keeping in between of layers of banana leaf. However, most favorite technique of steaming is stifled in dhowa chang. There, smoke touches the cocoon and they are preserving from the attack of insects. This method may be adopting for moderate amounts of cocoons. But they are very careful during the time of steam stifling as the cocoons may get blackish in colour due to over or direct steaming. Hence, it may lose its beauty.

After stifling, the cocoons have sorted. The defective cocoons are generally rejected for reeling. She said that to prepare for reeling the cocoons are at first boiled or cooked. These have to be boiling for about 15 to 30 minutes with alkaline solution, which is locally called khar or kharoni. The pan where cocoons are boiling is calling Xirsaru. In the boiling solution she used some substances for smoothening of the filaments, such as Outenga (Dilenia indica), bark of Simalu (Sida), Lafa sag (Malva arvensis), Kukurhuta, damdeuka; bankapah etc. For straightness, she used the seed of Sendur during cooking. To find out the true reeling end of the cocoons and proceed with continuous reeling, the floss layer has to be removing by her that is called deflossing.

3.2.IV Reeling

Reeling of muga silk is carried out on a traditional machine called bhangari mari or bhir (photo plate-12). It is the simplest and the most common type of reeling appliance.
Two persons are required in the process i.e. one to take out the end of the silk out of the cocoons and the other to reel and twist it. During the time of reeling muga, cocoons have kept in the basin with lukewarm water. Muga silk reeling is a labourious process. The *bhanga mari* requires two persons, one person deflosses the cocoons and passes it on to the other person, the second person on receiving the yarn twist it on the forearm or a stick which is locally called as *xirmari* (handmade wheel). Before winding the yarn on the spindle, the spindle is locally call *akaxali*. There is an etymology of the name *akaxali*, that the Adi tribe (previously known as Aka) of Arunachal Pradesh has a tradition to thrust a wire in their braided hair. There is a similarity between the wires with the spindle, for which, it is calling *Akaxali*. The wire is generally made of Bamboo. However, wooden or iron wire is also used. The entire process of reeling is very slow and hence, productivity in silk has remained very slow and cost of muga silk reeling is quite heavy, two person reel 100 gm/ a day on an average, which means 20 men days are required to produce one kg of muga silk yarn. Moreover, the yarn produced by this technique may vary widely. Now a days, someone use reeling machine of Choudhuri, Trivedi, Bharali, CMERS, RMRS-I, RMRS-II, RMRS-III, Golden muga model, where productivity is high. However, the cost of machine is very high, hence villagers can cont adopt it for individual purpose. In Dhakuakhana, a few Self Help Group brought it and use for commercial purpose. These types of reeling machine require only one person for operation and are pedal operated.
During the process of reeling, the cocoon must keep in a basin over a low fire. Each cocoon has to be reeled one by one. The quality and the quantity of silk obtained vary from breed to breed. Good reeling or uniform quality in silk depends on the cocoons from healthy larvae.

Photo Plate 13: Reeling Muga silk yarn

3.2.V Spinning

The inferior, flimsy, or pierced cocoons along with the silk waste have spun separately. No part of muga cocoon has discarded. The floss, which is the outcome of cocoon or locally call Jutha, the residue silken shell after reeling, koli, the perforated cocoons, all are keep to be process and spun. The spun muga silk has known as juthori. About 25 to 50 percent of silk in a cocoon becomes waste silk. Such waste, mixed with spun eri, has woven into fabric and has known as ereea. The spinning of muga waste has usually done by expert spinners on takuri or drop spindle. To utilize a considerable quantity of muga waste a Spun Silk Mill had established in 1962 at Jagiroad. The different process involved in the manufacture of finished spun silk are degumming, dressing, noil spinning, preparatory, spinning and grassing. However, due to the lack of proper maintenance the mill is now not well functioning.

3.2.VI Weaving

In Dhakuakhana, the villagers generally use the throw shuttle looms to produce muga fabric. The looms are locally called matixal. Important part of the loom are siri,
nachani, tultha, rans, nachani jori, putal, dalmari, xali, garakamari etc. Almost all are made of bamboo or wood. Other related instruments are jatar, chereki, letai, boa, mako, mahura and others. Initiation of a new loom in Thursday is considered as a taboo. However, starting on Saturday has regarded as the faster finishing of weaving cloth. Muga yarn being smooth and strong requires little sizing, but some days stuff is added for better luster and gloss. The sizing material is use in made out of gruel of rice cooked in water. The yarn has dipped and kneaded in the gruel and then washed and dried. They use the starch for the purpose. They locally called it tahan dia. For the purpose, they use a type of brass locally called kuchi, (photo plate-14) i.e. 10-12 inch in length and flat of 1 inch.

Photo Plate 14: Kuchi used for grueling in the thread

It can be hanging with thread. Important dress materials of muga yarn are women garments such as mekhelat (lower garment), chadar (breast cloth), blouse, salwar piece, shirting for male, head gear, curtain plain cloth for bag, tie, cushion cover and so on and so forth (photo plate-15).
Muga items have a great demand in present day market. Many villagers now engaged in the reeling and weaving except rearing due to lack of host plant or work force etc. They have bought the cocoons from the rearer and reeled and weave the muga fabric. A few case studies has stated below.

**Case 3.10**

**Dated 03.03.08**

The informant Baba Gogoi, aged 28, is the only male of Dighalagaon, who himself is not a rearer, but an excellent weaver along with his mother. According to him, they do not have land for som plantation. Therefore, they have bought the muga cocoons from other villagers, and those are reel by his mother and she has incorporated by her daughter in law. Sometimes they engaged wage labour with a change of fourty rupees per day. Last year, they reeled 30 thousand of jethua muga cocoons . They reeled 2000 cocoons per day and completed it in 15 days. They have used Bhangari mari for reeling. They reeled more than 250 grams of muga yarn in a day .Moreover, sometimes they bought the reeling muga yarn from the villagers. They offer 3200.00 for 1 kg of reeled yarn. Because of their business in weaving, they cannot gain enough time for reeling the yarn. They get so many orders for weaving from different places like Guwahati, Lakhimpur, Tezpur etc. and even from Punjab. He gets order for bridal dress also. In their home, his mother and sister- in- law engaged in weaving along with him. He had started weaving from last 4 years. They generally
weave the set of mekhela chadar of muga, muga single mekhela, churider piece, blouse piece, shirt piece etc. with various designs. According to him, in 1 kg of yarn, almost 18 meters of plain weaving cloth have obtained with 2.50 meter breadth. They have two fly shuttle looms in their house.

Photo Plate 16: A male weave muga cloth

Photo Plate 17: Women started activity of weaving

3.3 Ericulture in Dhakuakhana

Ericulture is the most predominant in the state of Assam. The eri silkworm samia ricini is fully domesticated and the easiest of the three silk varieties to produce, as the worms has grown indoor and not very sensitive to temperature or humidity, unlike the muga silkworms. It is popularly known as non-violent silk. This silk is soft and warm, strong and durable and resistant to sunlight, acid, and alkalis, is popular as shawl, and quilts. The colour of the silk is creamy white and fabrics become bright and glossy after every wash. The earlier reference to eri silk culture in India is documented
in 1779 and eri silk was for long called ‘Assam silk’ (Zethner, et al, 2012). An important thing in ericulture is that it is a female oriented culture.

3.3.1 Host Plant of Eri Silk Moth

The larvae of eri, feed mainly on leaves of castor (Ricinus communis) (photoplate-18), but have a number of alternative host plants such as keseru (Heteropanax fragrans), Cassava or Tapioka (Manihot grandis), Borkeseru (Ailanthus grandis), Bhotera (Jatropha curcas) and a few other plant species. In Dhakuakhana, most common host of eri silk are castor and keseru. Castor plants are grown naturally in general but maintenance is necessary. Keseru tree has found growing wild. It attains a height of about eight meters. Leaves of Keseru are better for feed from summer to winter. Tapioka is a small perennial shrub with thin and straight stems, having numerous leaf scars. Feeding of Tapioka is suitable from autumn and spring. The cocoons obtain from feeding Tapioka leaves are smaller than castor feed ones and number of eggs laid are less. Another host plant Bhotera or Jatropha curcas is a shrub 3 to 4 meter in height and found in tropical areas and hills. Very rarely, leaves are used for eri silkworm rearing. It has generally found in Lower Assam (Chowdhuri, 1982). The rearers of Dhakuakhana generally feed the castor leaf in summer and keseru in winter season. To gain 2.5 gm of eri yarn, 2-3 numbers of fully-grown keseru trees are required. Due to the lack of sufficient leaf, the rearer bought the tree from others. For a small tree they paid Rs. 10/- or in case of big tree they have to pay Rs.25/-to Rs. 30/- per tree. Moreover, a few other plant species are used as a host plant for eri silkworm. A village wise distribution and host plants for eri silkworm are shown in the below table.

Photo Plate 18: Castor plant used as host plant for eri silkworm.
Table 3.7
Village wise distribution of eri silkworm

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Name of the villages</th>
<th>Total household</th>
<th>Total no. of rearer</th>
<th>Using food plants</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Era</td>
<td>Keseru</td>
</tr>
<tr>
<td>1</td>
<td>Bantau</td>
<td>37</td>
<td>31</td>
<td>9.42</td>
<td>1.15</td>
</tr>
<tr>
<td>2</td>
<td>Dighala</td>
<td>90</td>
<td>78</td>
<td>23.70</td>
<td>2.73</td>
</tr>
<tr>
<td>3</td>
<td>Hiloidari</td>
<td>49</td>
<td>46</td>
<td>13.98</td>
<td>3.64</td>
</tr>
<tr>
<td>4</td>
<td>Katharbariri</td>
<td>111</td>
<td>98</td>
<td>29.78</td>
<td>3.03</td>
</tr>
<tr>
<td>5</td>
<td>Malaubari</td>
<td>86</td>
<td>76</td>
<td>23.10</td>
<td>2.43</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>373</td>
<td>329</td>
<td>88.20</td>
<td>11.79</td>
</tr>
</tbody>
</table>

Table 3.7 reveals that out of total 373 families 88.20% rear the eri silkworm. In the village Katharbari, highest 98 families, 29.78% practiced the ericulture. Among the rearers 44 families, 11.79%, 157 families, 42.09% and 128 families, 34.31% have used castor, keseru and both of these respectively as food plant of eri silkworm.

3.3.II Life cycle of Eri Silkworm

The lifecycle of eri silkworm has four stages, such as egg, larvae, pupa, and moth. The lifecycle lasts about 44 days in summer and about 85 days in winter.
The requirement of days in stages may take as follows:

<table>
<thead>
<tr>
<th>Stages</th>
<th>Summer (Minimum days)</th>
<th>Winter (Maximum days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg stage</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Larval Stage</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>Spinning Stage</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Crysalid Stage</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Adult Stage</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total Days</td>
<td>44</td>
<td>85</td>
</tr>
</tbody>
</table>

The eri silk moth may rear as 5-6 overlapping crops in a year. The best season for rearing is June-October. As the worms are rear indoors, there is necessity of 50 square meter large rearing houses. The house must build with adequate numbers of windows and should be well ventilate and maintenance of good environment is necessary. The eggs are incubated at 24°-26° Celsius and at 85-90% relative humidity. The cocoon crops of ericulture is shown in the below table.

**Table 3.8**

**List of eri cocoon crop practiced by people**

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Assamese name of crop</th>
<th>Season</th>
<th>Month</th>
<th>Nature of crops</th>
<th>Silk recovery per 1000 cocoons (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jethua</td>
<td>Spring</td>
<td>May-June</td>
<td>Second commercial crop</td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td>Kotia</td>
<td>Autumn</td>
<td>Sept-Oct</td>
<td>Main commercial crop</td>
<td>250</td>
</tr>
</tbody>
</table>

In the above table 3.8 the type of eri crops are reveal. In both of the crops, equal outputs have received. However, according to the rearer the yarn from keseru leaf is softer and worm than the cloth produced from castor leaf.
3.3.III Rearing of Eri Silkworm

The eri silk is the outcome of eri silkworm. The rearer collect the seed from far or nearby villages, or from own cultivation. Indoor rearing is prevailed there. They have to give Rs. 0.25 per cocoon. These generally brought by wrapping with cloth. The cocoons are then stitch with one another and hanged it (photo plate-19).

Photo Plate 19 : The seed of eri silkmoth hanged in the wall for appearance of moth

The shape, size, and colour of eri cocoons are vary according to the host plant used. Cocoons obtains from leaves of keseru is small and compact. The fiber is stronger than the thread obtained from castor fed ones. Rearer select the bests for further seed and other has used for spin. In the hanging position of seed cocoon the moth has appeared. Emergence of moth generally occurred in 15 days in winter and 8 days in summer. It is generally saying that, female moth are bigger than male moth .The period of emergence of moth is very delicate. After appearance of moth, the rearer hanged a big cloth in the wall and the moth attached to the cloth. The moth paired with each other automatically. The mating lasts for about twenty-four hours but a period of about six hours is enough for good pairing. There should be no fluctuation of environmental condition. Appropriate maintenance of temperature and humidity is essential during the period of embryo development (Chowdhury, 1982). The male impairs on next evening. Egg deposition commences after impairing and egg are usually lay during night. A female
moth lays about 300 to 500 eggs in cluster. The eggs have wrapped with a piece of cloth and hanged in the wall. The rearer should be alert to protect the egg from mouse, lizard, and others. They have kept in complete darkness and only exposed to light on the expected day of hatching in order to get a uniform hatching. The larvae of eri silk moths may reared by two methods. In bunch rearing, 10-12 castor or keseru leaves bunches are tie together as a bunch and hang vertically on bamboo or wires. The larvae are allowed to feed on the tied leaves, which are changed by keeping a fresh bunch ready to which the larvae can crawl, when the old foliage is exhausted. The larvae may fall down on a bamboo mat from where they easily can pick up without being soiled.

Bunch rearing is simple and easy with minimum labour for bed cleaning due to good hygienic conditions. Strict hygiene maintenance is required such as timely replacement of old bunches. However, there is a limit to how many larvae can accommodate on a bunch and hence greater space is required for large scale rearing.

In tray rearing, the larvae are feed with leaves on trays. The trays are generally round and made of bamboo (photo plate-20). Here, clean leaves of host plant are given for feeding.

Photo Plate 20 : The eri silk worm in tray raring feeding keseru leaf

The eri larvae moult four times during the period of its growth. The moults are locally known as sai ulua, dui ulua, tini ulua and maiki ulua corresponding to 1st, 2nd, 3rd, and 4th moults respectively. The fifth instars larvae locally known as Paka ulua are
ready for spinning their cocoons. The matured larvae produce a hollow sound when rubbed between the fingers. This is the time to put the larvae on the mountages, normally consisting of baskets or gummy bags filled with semi dry leaves. The larvae preferred the dry leaves of plantain to form cocoon. Moreover, certain types of dry leaves are very suitable for good cocoonage. Mango, jackfruit etc are suitable. After having reached the optimum number per mountage, they are covered with light cloth to make the semi dark conditions suitable for cocooning. The eri cocoon is spun but can be reeled.

Late spring and late autumn cocoons are best and are used for commercial spinning. Cut cocoons out of which moth has emerged can spin. However, it is valued less then empty cocoons from which the chrysalid is taken out immediately after completion of the cocoon.

**Case 3.11**

**Date 4.8.07**

Runamani Gogol, aged 32 is an inhabitant of Katharbari village, said that they traditionally practice the ericulture since a long period. She along with her mother rears the eri silkworm. They have six numbers of keseru food plants in their homestead land and therefore they preferred the keseru host plant to feed the worm. According to her, last year they reared both the jethua and kotia breed of eri silkworm. Both times, they have brought the seeds from their village by carrying in a bag of cloth. The seed cocoons are stitch together and hanged in the wall. Moth gradually appeared there and laid eggs in a plain cloth hanged in the wall. The moths laid eggs, which has wrapped by a piece of cloth. Hatching has done there. Newly hatched larvae were replaced to a large bamboo tray and clean tiny leafs were provided to the worm in the tray. Quantity of feeding leaf has increased day by day with the maturation of larvae. The larvae continuously fed the leaves even in night also.

Tray was cleaned everyday by them. They use the nylon or cotton net to protect the larvae from the insects. They gave the dry leaf of plantain for cocoonage. In the essence of plantain leaf, they offer the dry leaf of jackfruit or mango to form the cocoons.
Case 3.12
Date 2.4.08

According to Shuwala Gogoi, an informant of Hiloidari village, aged 43, said that her family practiced ericulture extensively from the time of their ancestors. Last year she collected the seed of eri from Maloubari village to rear the kotia breed and gain ½ kg of eri yarn. According to her, the cocoon of chakari (female moth) is bigger than the chakara and chakari by identifying on these characteristics. Then as usual stitched the cocoon and hanged in the wall. Almost 15 days later the moths have appeared. Those were tie with a chereki, a contrivance for winding up thread made of bamboo with cotton thread. In one bamboo stick of chereki, Maximum 2 moth can tie. After one day, the moth laid eggs, which have removed from the chereki and wrapped in cloths. Then the eggs have hanged in the wall so that ant could not eat the eggs. Those have hatched after 12 days. Gradually they overcome four larval stages and after fifth larval stage, they get maturation to form cocoon. The informant said that she applied the bunch rearing process, which is locally call joka lagua in case of eri silkworm. She has seven numbers of keseru trees in her homestead land. She tied 10-12 small twigs of keseru tree and hanged vertically on a bamboo stick. The larvae have placed in a bamboo mat and fed the leaf after crawling. After the completion of feeding leaves that branch, they replaced another branches of leaves continuously in day and night. During the casting of skin, the larvae stopped to eat for one day or night. In the same day of getting fifth larval stage, she attached the larvae in the bundle of half-dry plantain leaf, which is locally called jali. Those are covered with a net and hanged in a bamboo stick. In one week, when the cocoon has fully formed, these have separated from the jali and kept in a bamboo basket.
3.3.IV Stifling of Eri Cocoon

The eri cocoon cannot be reeled like muga cocoons. The eri moth emerges without disturbing the cocoon and its fiber. Hence, all cocoons can utilize for spinning after proper cleaning. As like as the muga cocoons, the eri cocoons are stifle by exposure to sun for few days, so that the cocoons may preserve for long time. Stifling
in fire has adopted by a few people, but discolouration of cocoons usually associated with stifling by fire. The staple of eri cocoon obtain from first draft operation is glossy, long and fine. The cocoons, which are ready for spinning, have boiled to make it softer for easy spinning. Prior to spinning, the cocoons have required being degummed. For the process, an alkaline solution is prepared. Soda and potash solutions have generally used in preparation of the alkaline solution. Sometimes they used ashes of paddy straw or plantain tree or leaf as soda. Boiling for one hour is sufficient for degumming and fiber comes off easily when pulled. Over boiling should avoid as it weakens the filaments. Once the cocoons has boil, these have taken out and remove the pupa. After that, cocoons have thoroughly washed with clean water. The flattered cocoons are than dried and preserve for spinning at a suitable time. These types of cocoons may preserve for several years. The waste cocoons are also spin roughly. Some petty businesspersons collect the waste cocoons and yarn from the villagers.

3.3.V Spinning Appliances

Spinning has done by the traditional method. There are two different methods in spinning cocoons. The most common and popular method of spinning is by drop spindle, which is locally known as takli or takuri. The second important method is, spinning on a spinning wheel locally known as jotor (made on one wheel with a rope connected to reel spool). Takuri is a simple device and the twisting of the thread is doing by hand. For spinning on the takuri the cocoons are to be place in a vessel filled with water and are taken out one at a time for spinning. At first, the mouth of the cocoon is broadening with hand and then placed the one end of a bamboo stick about 8 inches long. Some fibers of the cocoons are so arrange that has connected with the top of the takuri, which will be cause to move with one hand for twisting the fiber and finishing the same into thread. The uniformity of the thread is preserve by rubbing it between two fingers while twisting is in progress. The twisted thread has wound on the lower part of the handle of the takuri and made like a bamboo. A spinner can spin about 50 grams or about 420 meters of eri yarn in 8 hours in takuri using about 100 to 150 cocoons. One kilogram of empty cocoons yields about 750 grams of fine yarn. An expert spinner can spin very fine yarn in takuri. The yarn after spinning has generally kept on a bamboo basket locally known as khilang. The count of the yarn depends on the weight of the takuri. For fiber yarn, slightly heavier takuri is used. The traditional weaver prefers takuri yarn for production of fine fabrics, because of appropriate twist.
The second method is quite different and is a much improve labour saving device. Here, a spinning wheel or *jotor* is used. In the spinning method, only dried cocoons are used. At first, the spinner takes some cocoons in hand and some fiber of a cocoon has attached on the spindle head of the *jotor* while it is operate by peddling. The spindle of the *jotor* with a rope wheel attachment when in operation rotates at high speed and as a result, the thread is twisted and wound on the spindle itself in the shape of a bobbin. During the process, rubbing of the twisted thread with fingers of the other hand is required to preserve the uniformity of the thread. The fibers of the cocoons in hand is connected one after another with the end of the thread already twisted and wound on the spindle and the production of thread thus continuous.

![Photo Plate 23: Eri silk yarn](image)

![Photo Plate 24: Eri silkyarn twisting in bobbin](image)
However, the methods of spinning are old and traditional. It involves quite a lot of wastage and is time consuming. Even the people of Dhakuakahana preferred the drop spindle to spin the eri cocoons.

3.3.VI Weaving

After spinning, the process of weaving has started. However, there is some traditional process of preparing the yarn for the convenient of weaving. The weavers soaked the yarn with an indigenous process, which is locally call *posa dia*. They have boil shaddock (citrus documans) to remove the juice of it and thereafter mixed it with the congee. Then the yarn wrapped with the mixture. There are some weavers, who used flour and *sagodana* and wrapped the yarn. The process has locally called as *bhatai lua*. The yarn is then brushed with *kuchi* (one type of brush made locally), where the fiber is attach with the *kuchi* and it is convenient for weaving. After that, the yarn has dried in the sun. In the next step, the yarn has winding in bobbin or *ugha*, a kind of reeling appliance. A wrapping implement locally known as *jotor* is use for the purpose. The hanks of wrap has deposited over a bamboo shift, kept at the left hand side of the worker. By rotating the wheel of the *jotor* with the help of the handle, the yarn has spun into an attached bobbin.

Photo Plate 25 : Gents Jacket of eri silk
The throw shuttle loom is use for eri fabric weaving. The local loom consists of four bamboo or wooden post fixed in the ground. The shuttle is throwing with hand from side to side and beating has done by pulling the sled with hands. The manufacturing product of eri silk are gents wrappers, women scarves, and traditional dress- *mekhela chadar* for female of late cloth for shirt, curtain etc.

**Case 3.13**

**Date 05.05.08**

Labanya Chamua of the village Bantau, aged 51, reported that she rear the eri worm in one time yearly. She has 13 numbers of keseru plants in her homestead land. She has spun the eri cocoon with drop spindle. She prepared it in her own house from bamboo. For spinning on the takuri, the cocoons are to be placed in a vessel filled with water and are take out one at a time for spinning. Before it, the cocoons are boiling with soda or soap. Sometimes ashes of paddy straw are boiling in water and the cocoons are cooked with it. After the completion of cooking, the pupa removed from the cocoon and wrapped as it is with plantain leaf or with plastic. When the cocoons become rot, the fluid has removed from it and again thoroughly washed. Then these are stifled in the sunrays. These can be spin simultaneously or may be keeping for years also. She has prepared the gruel in her house with shaddock congee. Before weaving, they mixed it with the yarn and then brushed with kuchi. Then the yarn is again dried and prepared bobbin for weaving.

She weaves varieties of fabric in her matixal (throw shuttle loom) such as eri cheleng, xakhania borkapor, women scarf, mekhela chadar etc. The waste cocoons are also spin by her stoutly. Some petty businesspersons come to her village and bring those.

**Case 3.14**

**Date 07.02.08**

According to Malabika Chamua of Bantau village aged 37, informed that she has extensively practice the ericulture. Last year, she gains 1Kg of yarn. In her homestead land 21 numbers of keseru trees are there. She applied bunch-rearing process. For cocoonage, she gave the dry leaves of banana. As a preparation of
spinning, she has cooked 250 grams of cocoon in 5 liters of water with a teaspoon soda. 25 to 30 minutes are required for the purpose. After completion of boiling, she removed the pupa from it and stifled these in sunrays. It may be spin whenever required. She use drop spindle or takuri to reel the eri cocoon. For this purpose, a bamboo stick of 7-8 inch is use with a round piece of slate fitted at the bottom. At first, the mouth of cocoon is broadening with and put it one end of the bamboo stick, which is locally call kali or kalimari. After attaching 10-12 cocoon, some fiber of cocoons are so arranged that has connected with the top of the takuri. Sometimes it is compress with the fingers of leg or sometimes it is keep on hand and sometimes hanged to downwards. The kalimari has kept in the left hand and the thread is twist in takuri. To make the takuri, a bamboo stick of almost 30 cm is prepared as round and smooth. In one end of the stick, there is a slight notch, in which the fiber can be touched. The lower end of the stick is comparatively more broad and round. In almost 1 cm above from the below ending point a heavy weight is attached, so that, it stain the takuri towards down. She used lead as a weight, but somebody use any screw etc. for the purpose according to their convenience. She also said that in earlier days, her mother and other contemporary people placed the lead in a pit in the ground and the end of the takuri has thrust there. When the lead is congealing, the end of takuri has tightly fixed with it.

3.4 Mulberry Culture in Dhakuakhana

A popular saying has been continuing regarding the mulberry yarn of Assam as ‘dried in shadow and hidden in grip that is mulberry yarn’. Assam as well as Dhakuakhana is an area where mulberry culture is prevailed as a common practice but less than muga and eri. The mulberry silk is soft and bright, lustrous, and durable. The mulberry silkworm Bombyx mori is a monophogous insect and feed only fresh mulberry leaves. This female oriented culture takes a prominent place to support their silk culture and to enhance their economic gaining.

3.1 Mulberry Host Plant

There are different verities of mulberry leaves, even Morus indica is present in the Himalayan ranges including Assam and popularly known as nuni tree (Ganga, et al,
It has generally grown in gardens located preferably on flat land or on sloping bench terrace lands. The soil should be well drained and loamy. Temperature ranging from $24^\circ$ to $29^\circ$ Celsius is ideal for the growth of mulberry. In Assam, it is grown under both rain fed and irrigated conditions. A rainfall range from 600 to 2500 mm per year has considered ideal. It is comparatively resistant to environmental fluctuations and is relatively free from pests and diseases. Mulberry plants can use for other purpose in addition to being used in sericulture. Another requirement for mulberry plantation is that it should be away from the influence of chemical factories, industrial establishment, and tobacco field as these polluting the atmosphere with their smoke and dust. The mulberry worms are more sensitive than other silkworm hence; it cannot tolerate the heavy dust on the leaves. The leaf feed by the larvae should thoroughly clean and washed. The rearer planted the mulberry tree in their homestead land. Otherwise, they hired tree from others with payment. They have to give Rs. 20/- to 30/- for a well mature mulberry tree.

3.4.II Mulberry Silk Rearing in Dhakuakhana

As like muga or eri seed, the seed of mulberry cannot be collect locally. The rearer collects the eggs from the Sericulture Department of Dhakuakhana. The department bought the eggs from outside Assam. They inform the rearer directly through different channels, as soon as possible because; the eggs could not be preserves there for a long time. The eggs are wrapping by a piece of cloth. Rearer paid Rs. 20/- to 30/- for 1 packet of eggs. The villagers stated that one packet consists of eggs almost of 20 moths. After buying the eggs, they keep the eggs in a large bamboo tray maintaining standards of hygiene. The rearing house is well ventilated and disinfected. Other necessary equipments have also washed and clean. The eggs are also to be protecting
from ants and cockroach. When the eggs are hatching, some new leaves are provided to the larvae. The leaves must be well cleaned and dried. The larval period is continuing for almost one month. The larvae overcome four larval stages and gain five instars. The quality of cocoons harvested depends mainly on the quality of leaves feed during rearing. Therefore, the rearer provides healthy leaves and much more leaves to the larvae. The larvae got maturity as soon as and as much as they fed the leaves. The waste leaves and stool has to remove from the rearing place for easy growth of the larvae. The newly hatched larvae are blackish in color but gradually it become lighter in color after the completion of fifth instars larvae, the larvae make a sound when it is roll by hand. The larvae after obtaining full growth are ready to spin a cocoon around itself and transforms into a pupa inside it. The rearer has transforms the larvae to xaja (a bamboo cage) and placed them above a clean paper. Some dry leaves of banana, or mango or jackfruit have given to form the cocoon. The larvae then spin the cocoons, which may last a couple of days. These are covered with a cloth so that people could not see them or the larvae feel comfort in darkness to spin the cocoon. Rearer made a bamboo implement round in shape. There is a special type of net provided by government for cocoon age (photo plate-26). Matured cocoon then removed from the
dry leaf and kept mainly in bamboo basket in a safer place. The mulberry cocoons must be reeled rapidly, otherwise they may be lost.

Photo Plate 26: Plastic net used for mulberry cocoonage

Photo Plate 27: Preparing a circle used for mulberry cocoonage
3.4.III Stifling of Mulberry Cocoon

Stifling in the first process taken up as soon as the cocoons are harvested, so that the pupa kills inside and cocoon avoiding reeling problems. The rearer adopted the method of sun drying and steam stifling. In sun drying method, the cocoons are exposed to the scorching action of direct sunlight until the pupa inside is killed and dried. They used large bamboo tray and bamboo mate to stifle in the sun. It requires a prolonged exposure of freshly harvested cocoons to bright sunlight. Sun dried cocoons are very light and produce a rattling sound on shaking. The method of sun drying is easy and cheap. Nevertheless, the cocoons cannot store for prolonged period. On the other hand, steam stifling is also a common method of drying the cocoons. In this process, the cocoons are stifled more uniformly and quickly. Stifling by this method has done by putting the cocoons well spread over a fire, and a bamboo tray, which is locally call *dhowa chang*. By applying sufficient heat, the chrysalides are killing. The cocoons are then ready for reeling. In this method, the cocoons are fragile because of the moisture and cannot be stored for a long time.

3.4.IV Degumming and Reeling

As like as eri and muga cocoon the mulberry cocoons are also boil having a water temperature of $40^\circ$ – $45^\circ$ Celsius with an alkaline solution. Soda or ashes of certain leaves of straw i.e. locally call *khar* has use for preparation of the solution. The time of boiling is depending upon the strength of solution and quality of cocoons in order to remove the natural gum that is contained in the silk. Over boiling means weakening of filament. The cocoons have stirred with staff so that, every cocoon gets uniform boiling. After cooking, the reeler removes the floss with the help of a stick and gluing with the staff. Then it is connected with the reeling machine. The yarn of mulberry is very fine but the yarn of waste mulberry cocoon becomes very stent. The waste yarn has thrust inside the tire of bicycle. Some vendors of Sualkuchi of Kamrup district took that waste cocoon by weight.

3.4.V Reeling Appliances

There are three types of reeling appliances generally shown to reel the mulberry silk i.e. *charkha*, cottage basin and filature basin. The rearers of Dhakuakhana used the *charkha* to reel the mulberry silk. This is manually operated simple and cheap reeling machine which is traditionally homemade, using material available like bamboo and
wood in the village setting by the reeler himself or herself with the help of village carpenter and blacksmith. Only two persons are need for the reeling operation.

3.4.VI Weaving of Mulberry Fabric

As the yarn of mulberry can keep for few years after reeling, the rarer therefore weave the cloth from it according to their convenience. The weavers of Dhakuakhana generally used the throw shuttle looms or matixal to weave. The parts of the loom have made by locally available wood & bamboo by themselves. They spent a lot of time of their daily routine to maintain the silk culture as well as in weaving. Every rural woman is an expert weaver, who woven their costumes for their own and their family. They weave mekhela and chadar, blouse piece, saree etc. The weaving is an extra income for them. They prepare varieties of designs in their cloth, which has discussed in the later part.

Case 3.15

Date 12.5.09

Jyotika Gogoi aged 45, is a permanent resident of the village Katharbari. Her family rears muga, eri and mulberry types of silk. She continuously rear the mulberry silk from almost two years. Her husband collects the seeds from nearby sericultural farms like the firm of Dhakuakhana, Bhomajarani etc. She has four numbers of mulberry trees in her homestead land. In earlier days, before 10-15 years, they paid a minimal price for the eggs but now a day, she paid 60.00 to 70.00 rupees in 50 gm of mulberry eggs. Those have carefully preserved in a clean bamboo tray. Newly hatched larvae have feed the juice of mulberry leaf. The breed of April-May month takes generally one month for completing but if those are reared in June-July or August-September they takes twenty-eight days for completing the breed. She has applied both tray rearing and mat rearing for rearing purposes.

According to the informant, she reel the yarn after boiling the cocoon with the charkhas. She said that in 50gm of egg ½ Kg of yarn could remove. In the year like 1975-76, the price of 1 Kg. mulberry yarn was only Rs. 150.00 but new a days, the price become increased to Rs 1500.00 per Kg. In 1 Kg. of yarn 12 numbers of chadar
(upper garment of women) can weave. The waste cocoons have brought by the vendors of Sualkuchi from their house, where they give Rs. 150.00 for per Kg.

She weaves traditional dresses like mekhela, chadar, saree etc. of women in her throw shuttle loom for her own and for business purpose also. She makes various divergent designs in her garments.

Case 3.16
Date 02.01.08

Niru Gogoi, an informant of Bantau village aged 42, said that she has related to the mulberry culture from a prolonged period, from that time she collect the seed from the Sericultural farm of Dhakuakhana. According to her, the farm provides both female moth and eggs as seed. The farm provides female moth by Rs. 5.00 to 10.00 per head, which are ready for laying eggs. The moths have sustained in a smooth cloth so that, during the time of hatching, those newly hatched larvae have not to effect because, the mulberry larvae are more sensitive than muga and eri silkworm. She has grown four numbers of mulberry trees in her homestead land with the aim of rearing the mulberry worms. They also collect the mulberry eggs from the farm in gram. Tray rearing is prevailing by her. Last season, she has bought 50 grams of mulberry eggs from the farm in gram, where she gain ½ (half) Kg. of thread. According to the informant, the rearing room has been keep very clear and well ventilated, otherwise the worms can suffer, and she may lose then. She also provides very clean and dry leaves to the larvae. In the summer season, moss may be produce in the leaf, therefore the rearer must be careful so that such leafs are not given to the larvae. Those has also well protected from flies in summer season. After maturation, the larvae kept in a xaja made of bamboo, for cocoonage. She has reeled the mulberry thread in bhangari with her daughter. Before reeling, she has stifled the mulberry by adapting sun-drying method. She professed this method than steam stifling because, through this method the outgoing yarn is not get blackish in colour. She weaves the mulberry only for domestic purpose.

Case 3.17
Date 21.2.08

Karabi Gogoi, aged 38, has extensively practiced the mulberry cultivation. She is an inhabitant of Hiloidari village. She is a beneficiary of RSVY (Rastriya Sram Bikas
Yojana) scheme of mulberry cultivation. According to her, the Government sericulture farm select 100 beneficiaries who extensively practice the same and luckily they get this opportunity. As a beneficiary, she obtained a mulberry-rearing house with a signboard of the cost of 12000.00 in the year 2004-05. The house is mud walled and floor is made of concrete. She also gets training from Department of Sericulture Lakhimpur District, where she gets the theoretical knowledge along with her practical experience. In this year, she also gets eight numbers of xaja or Jali for cocoonage, from the Government according to RSVY scheme. Those are made of plastic instead of bamboo. Moreover, she also obtained 100 numbers of female moths as the same. According to her, to rear such number of mulberry worm, there has been required 12-14 bigha and of matured mulberry tree. She also collects the eggs of mulberry worm from the firm. She has informed by the department of sericulture when the eggs are bringing by the same. She reeled the yarn of mulberry yarn with the help of her family or neighbours in the reeling machine. She weaves the cloths for business as well as domestic purpose.

3.5 The Process of Weaving Silk

Weaving is one of the main activity connected with the craft performed generally by the womenfolk, who acquire the knowledge of techniques of spinning and weaving automatically from their elders. Some of the male folk also engaged in weaving activities. One can easily find a loom in almost every home of the village and neatness the process of preparing the silk garment carried out as its various stages in each of these household. The silk thread that has woven in the loom is classifying into two. The vertically woven silk thread that forms the base of garments has called the digh. In addition, the silk used to weave the horizontal patterns or flowers is calling the bani. At first, the silk thread, which is the digh, is spin around a bamboo instrument called the sereki. The sereki has five small bamboo sticks attached to a longer, common bamboo stick at the center forming a cylindrical shape. This has done to remove the knots or uneven fibers of the thread. The thread is again spin into a smaller bamboo frame calling letai in the local language. Later, the spinning of the thread into smaller spools called bobbin in preformed with the help of spinning wheel jotor. The jotor has run single handed by a person who spins the thread into the wheel with one hand while wrapping the thread into the spools with the other hand. After the thread has woven into a number of such bobbins, these bobbins are than placed on a huge frame called ughai consecutively. The thread from each of these bobbin placed on the ughai is spin around a
huge wooden wheel called the warping drum. The spinning enables the weaver to get the exact size and length of the silk garment that has to woven on the loom. The thread has then taken out from the wheel very systematically and place on the long wooden bar of the loom called *tulutha*. The *digh* thread from the wrapping drum has slowly taken out systematically and slowly encircled around the *tulutha*. This has done with the aid of a sharp iron tool inserted at the end of the *tulutha*. Once the thread are placed around the *tulutha* systematically, the lose threads will be inserted one by one into a threaded frame called *bao*. This step has done with a lot of precision. These threads are than inserted into a comb like frame called *ranch*. These threads have then taken by the weaver to weave the garments.

As the *digh*, thread is place on the *tulutha*, the *bani* thread is than placed on small spools inside a small wooden frame called the *mohura*. The *mohura* has again placed on a bigger frame called *mako* attached at the side of the loom. The colourful thread from the *mohura* has then woven into the flowers, patterns, and motifs on the *digh* thread, which now forms the entire base of the garment.

### 3.6 Designs and Motifs Used in Silk

The weavers of Dhakuakhana manufacture both women and gents garments using divergent designs and motifs. The attires of gents are generally plain and simple with no designs embroidered on it. Designs have mostly woven in the women garments. The attractive designs made of beautiful colour combination in female attires greatly enhanced the beauty of the apparels and put them in great demand in and outside the state. The symbols and motifs, which have woven on the silk garments traditionally, have undergone a massive change. Some of the designs have angular geometric shape and some motifs are realistic and mostly imitation of flowers, trees, butterflies, animals, birds, insects, fruits, seeds, herbs, leaves, mountain, and even Assamese traditional ornaments. The designs may be dividing in various types-

1. Floral design
2. Animal diagram
3. Natural objects (mostly in geometric form)
4. Others

The richness of these patterns, their names, and meanings of motifs represent their cordial relationship with nature. An insight into some of the motifs has described
here. All of these designs are use in the traditional dresses of males and females and in *gamocha* (long handkerchief) too.

**Bird Motif:** Different motifs of bird are commonly used pattern by the Assamese people. The symbol of peacock is a favourite design to weave silk garments. The dresses with this motif is more valuable than others are.

**Biscuit Design:** Some square and rectangular design like a biscuit in a modern motif where one or two colour is used. The weavers of Dhakuakhana have made this design very commonly because of less rigidity.

**Butterfly Motifs:** As most, patterns woven on the Assamese *mekhela chadar* has inspired by nature. The pattern of butterfly is after woven in different shapes depending on the expertise of the weaver. Traditional *mekhela chadar* along with such design become highly expensive.

**Crab Like Motifs:** This motif is as the crab made on both ends of the cloth.

**Creeper Like Motifs:** Most of the attires are decorated with creeper like floral motif. Those have generally designed in both ends of the garments. Such type of motif is commonly use in male scarves along with female garments.

**Dhol Biri Style:** This motif is also an imitation of traditional ornament of neck. This is a pendent, which is like a *dhol* (drum) and chain, which is call *biri*. This motif is a unique and popular design among those people.

**Diamond Like Motif:** Diamond like the one floral motif is also common to weave the silk. Flowers are designed as like as the shape of diamond.

**Elephant Style:** This is a traditional design, which tries to weave the shape of the elephant in a geometrical shape.

**Flower Motif:** Most patterns and motifs used in the traditional garments are representation of the nature. Hence, flower or a bunch of flowers is one of the most common motifs found in the traditional garments manufactured by the weavers of Dhakuakhana. The floral based diagram consists of different forms of leaves and flowers ranging from ‘eight point star’ to lotus. Among the floral designs, rows of floral diagram, floral diagram on border, *anchal* (upper end of cloth) and body, dense floral
diagram in both side and ends, step by step floral diagram in both the sides, single floral design in the border and floral design scattered in the body are very popular among the inhabitants and outsiders too. The floral design may be round, oval, triangular, or rectangular etc. Generally the design is best situated in mekabella, mekhela chadar set, saree, shirt, eri wrapper etc. In a diagram, several colours are set according to the nature. Red, green, yellow and black are the most popular colours.

**Gaamkharu Style:** This style is inspired from the Assamese wristband called Gaamkharu, which forms a major part of the traditional Assamese attire. There are more traditional ornaments which motifs are used to design the silk cloth, such as thuria, lokaparo, dug dugi etc.

**Japi:** It is the traditional headgear once used by females of noble and rich families but now serves as a headgear for farmers to protect them from rain and sun. It is a valuable as well as prestigious item for Assamese people. The motif of Japi has often found woven on traditional garments by the weavers of Dhakuakhana. Japi is another cultural identity of the people of Assam. Earlier, in the agricultural societies it was used to protect them from rain and sunburn. Now days, it is regarded as one of the cultural trait. Thus, it takes its place in the silk loom of Assamese women.

**Joon Biri Style:** This pattern woven on the silk garment is inspired from the Assamese necklace called joon biri. The shape of the joon biri is like a crescent moon and is engrave with many patterns.

**Kalka:** Kalka or Kalki patterns are contemporary patterns with non-traditionalism attached to it. These patterns are often woven on the traditional Assamese garments have become very popular in the recent times.

**Kaziranga Style:** It is one of the most commonly used motifs. According to the local craftsmen and experts, this style derives its inspiration from the wildlife of Kaziranga. Here, often a rhino and a deer have woven in the silk garment.

**Kech:** This motif is very frequently used in the textiles and often used at the borders of the horizontal lines. It is a linear diagram with colour combination. The design has a background colour and several other colours has joined with that. It signifies, the hairline or women’s braid. This motif is especially use to decorate the riha (breast cloth of female). According to some scholar, riha is the contribution of Tai-Ahom society to
Assamese society. The *riha* with *kesh* usually designed of red colour. However, floral design has rarely seen. Generally, red colour is most preferred one in the muga silk cloth. Red colour symbolizes the strength and beauty and as, the muga is the pride of Assamese people, therefore it is preferential. But, of course, other colours are also accepted and used in all types of silk.

**King Khap Design**: This style is inspired from the Tai Ahom dynasty and signifies the royalty and magnanimity of the erstwhile kingdom. As the Tai Ahoms originally hailed from Thailand, the design is largely inspired from the region. The design consists of two lions facing each other. It was believed that the traditional design consisted of rhinos and later was replaced with lions by the Ahoms in order to signify the royalty and power of the kingdom.

**Mountain style**: Some mountain as if floral motifs are used to design the female attire. The borderlines of women scarf have generally decorated with this design.

**Plain Stripe**: In some garments, plain stripes are giving to decorate the cloth. colour combination play a vital role in such designs. The weavers generally weave such garment to use for domestic purposes.

**Sarai**: This motif signifies the traditional Assamese *sarai* (a brass platter) on which the sacred book is mounted at the prayer rooms. It is also a part of cultural heritage of Assamese as well as Tai-Ahom society.

**Tree Motif**: The motif of a tree is one of the most common patterns found in the traditional garments. The shape is after represented in a geometrical manner and design varies according to the expertise of the weaver. Dresses are expensive with this design.

It is found that the weavers have their own distinctive designs of artistic expression of their appreciation of nature; designs may be change according to the weavers as well as customers. They have now adopted some new design following various books on motifs getting in the market. Some of the weavers still adhere to the traditional design in their product, which has adopted by their ancestor. Still, commercial weavers make the designs keeping the aim of customer’s interest.