CHAPTER- III

AN APPRAISAL TO ENDI CULTURE IN ASSAM

Botanical Aspect of Endi

Assam holds the exclusive monopoly in the world with regard to the production of eri and muga silk. For topographical and meteorological factors the eri industry has widely spread over the north-east region. Plains and hill areas up to an altitude of 5000 ft. are proved to be suitable for sericulture, and hence extensively practiced. Philosamia cynthia and Philosamia ricini (known as Attacus ricini too) are the two types of eri worms mainly found in Assam. In the hilly region, Ricini is the domesticated variety with blue, green, and yellow, larvae producing white and brick-red open mouthed cocoons. Moreover, species like canningi, obscura, lumuloides are also found in Assam. Lumuloides is almost like ricini, and found in Assam only whereas the others are distributed in different parts of the world. Castor is an important source of income for the people of Assam. It is a primary food plant of eri silk worm and is also used for green fencing.

An earlier written account of the endi worm runs thus- "The Eri worm derives its name from the eri or castor plant (ricinus communis. L), on which it is usually fed.
Patches of the plant are to be seen in the gardens of most villagers, and the worm is proportionately common. From five to six broods are usually reared in the year, those which spin their cocoons in November, February, and May, yielding most silk. As with the *muga* moth the females when they emerge, are tied to pieces of reed, and are visited by the males who are left at liberty. The eggs are hatched in the house, and take from a week to 15 days to mature. As soon as the worms appear they are placed on a tray which is suspended in a place of safety, and fed on the leaves of the castor oil plant. When fully grown they are about \( \frac{3}{2} \) inches long, and of a dirty white, or green color. After the final molting, the worms are transferred from the tray to forked twigs suspended across a piece of reed and when they are ready to spin, are placed on a bundle of dried plantain leaves or withered branches which is hung from the roof of the hut. The matrix of the cocoon is very gummy, and the silk which is of a dirty white color, has to be spun not reeled off. Before this is done the cocoons are softened by boiling them in water, and a solution of alkali. Empty cocoons yield about three quarters of their weight in thread" (Allen, cited in Das Gupta, 1982:194).

(a) Classification

The moth of the genus *Philosamia*, also known as *Samia*, to which the *eri* worm belongs is somewhat brownish green in color, and possesses narrow crescents on the wings instead of the usual central eyespots like other species of *saturnids*. The *Philosamia* larva develops a powdery alcoholic substance at later stages. The body of *eri* worm contains six pointed fleshy thorns. The pupa is big with tapering abdomen. The wild cocoon is light brown, and its inside is smooth and
polished containing a long peduncle. The *eri* cocoon is white or red, but the peduncle is absent. The wild form is mostly uni, bi-or trivoltine. Moths are nocturnal in habit. The domesticated variety *Philosamia ricini* is multivoltine, and its culture is confined particularly to Eastern India.

*Philosamia ricini*, is a domesticated type, distinguished from *Philosamia cynthia* by wooly flecks on the abdomen in a transverse form. *Philosamia ricini* is said to have been derived from *Philosamia obscura*. *Philosamia ricini*, *Philosamia obscura*, *Philosamia canningi*, and *Philosamia lunuloides*, are possibly mixed up in this region. There is constant cross breeding of *Philosamia ricini*, and *Philosamia cynthia*, during the cultural operations. In this way, the red cocoon of *eri* is said to have been derived. Several cross breeding between different varieties and species of genus *Philosamia* are available and sub-specific names have been given to them. Most of the races or sub-species, such as, *Philosamia ricini*, *obscura*, *canningi*, *lunuloides*, *cynthia*, etc. are found in Northeastern India.

(b) The Host Plants

The host plants of *eri* worm are available in a natural state in the plains and hills of North-Eastern region of India. The hills are the main areas of distribution; the riverine banks of the plains also have the plants. Even though there is no organized cultivation of castor plants, the plants are available, though few in number, in every rearer’s homestead in the plains. *Eri* worm is polyphagus and feeds on leaves of varieties of plants. These plants belong mostly to the family *Euphorbiaceae*. Castor is the preferred variety of plants. *Kesseru* (*Heteropanax fragrans*) is utilized next.
Other important host plants are barkesseru (Ailanthus grandis, glandulosa or excelsa), payam (Evodia flaxinifolia), gulancha (Plumeria acutifolia), tapioca (Manihot utilissima), etc. Besides korha (Sapium eugenifolium), gamari (Gmelina arborea), bajramani (Xanthoxylum rhesta, alatum), etc. are used during periods of shortage of the main leaves; but they are not of much importance. Leaves of Ilex, syringa, prunus, pirus, juglans, laburnums, papaya are also used sparingly. The wild worm is found occasionally in some of these leaves.

(c) The Life-Cycle and Culture of Eri Worm

The life-cycle of the eri worm has four stages, such as, egg (kani), larva (polu), pupa or chrysalid (leta) encaged in a cocoon (khola), and adult or moth (chakari). The lifecycle lasts about 44 days in summer, and 85 days in winter. The days in stages can be taken as follows:

Table 3.1: Stages of eri worms

<table>
<thead>
<tr>
<th>Sl. no</th>
<th>Stages</th>
<th>Summer (Minimum days)</th>
<th>Winter (Maximum days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Egg stage</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Larval stage</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>3.</td>
<td>Spinning stage</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Chrysalid stage</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>5.</td>
<td>Adult stage</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total days</td>
<td></td>
<td>44</td>
<td>85</td>
</tr>
</tbody>
</table>

The eri worm is multivoltine. Six broods or generations can be reared in a year, if adequate supply of leaf can be made available. The wild variety is uni-, bi-, or trivoltine, and the chrysalid goes into hibernation. Like all other worms, the different life aspects of eri worm are highly sensitive to photo-periodism. Such important periods of activities are mentioned below:
Table 3.2: The Life cycle of *eri* worms

<table>
<thead>
<tr>
<th>Activity</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergence of moths</td>
<td>Morning to noon</td>
</tr>
<tr>
<td>Pairing of moths</td>
<td>Dusk</td>
</tr>
<tr>
<td>Egg deposition</td>
<td>Night</td>
</tr>
<tr>
<td>Hatching of worms</td>
<td>Morning</td>
</tr>
<tr>
<td>Molting of larvae</td>
<td>Any time</td>
</tr>
<tr>
<td>Maturing of larvae</td>
<td>Morning to noon</td>
</tr>
</tbody>
</table>

There are some delicate phases in the life-cycle of the worm, which are important from the operational point of view. There should be no jerk or vibration during the period of cocoon formation; if there is, the silk formation is seriously disturbed. In the male chrysalid, the formation of germ cells is completed at this stage, which commences several days prior to the late larval stage. The female completes it in the egg stage, i.e., after deposition and prior to actual fertilization. The period of actual changing over from the larva to the chrysalid stage occurs from 4 to 7 days after complete formation of cocoon. The larval structures disintegrate during this period and new structures for the adult moth start developing.

The period of emergence of moth is also very delicate. A deformed adult with crumpled wings may emerge, if conditions remain unsuitable during this stage. During pairing of moths, deposition, and fertilization of eggs, extreme care is necessary if the operation has to be successful. There should be no fluctuation of environmental conditions. Appropriate maintenance of temperature and humidity is essential during the period of blastokinesis, i.e., during the fourth day of embryo development, when the embryo takes a turn inside the egg. During the molting
period, jerk, vibration, or disturbance of any kind should be avoided, otherwise there is high mortality of larva at this stage.

(i) Egg

*Eri* egg is of medium size as compared to mulberry or *muga* egg, and has oval shape. The egg has a hard shell and is candid white with a colourless glue. The glue helps to adhere the eggs on a surface. The shell color may be creamy as in the wild form. The yolk inside is green or yellow and constitutes the nutrition for the developing embryo. A female moth deposits from 300 to 500 eggs in cluster. The deposition is sometimes protracted for 3 or 4 days. The eggs of first two days are kept for rearing and the worms derived out of these eggs have uniform and simultaneous hatching. The worms hatch after about ten days at normal temperature, in seven days at 30°C, and after two weeks at 15°C. Fluctuation of temperature and humidity during incubation period may lead to high percentage of dead eggs, irregular hatching of larvae or non-uniform growth of larvae. Besides, the larva becomes susceptible to disease in the last stage.

The unfertilized eggs dry up slowly. The fecund eggs show a progressive change of color and the yolk mass remains clear light green. The formation of cells inside the egg occurs gradually and the egg content gets concentrated slowly. The formation of blastoderm occurs approximately twenty hours after oviposition at normal room temperature. The germ band is divided into segments by transverse furrows from 24 to 36 hours. The embryo occupies two-thirds of the area of
periphery of the egg. The ventral side of the embryo is covered by the amnion. The cephalic lobes become clearly visible.

The embryo is elongated, cephalic, and thoracic appendages start developing immediately. The ten segments of the body become clear. The mouth parts start forming slowly. After sixty hours, the girth of the embryo increases, and the process of elongation is retarded. The mouth parts become clearer. The thoracic appendages and spiracles start appearing. The blastokinesis stage appears on the third day, and completes on the fourth day. The foregut and hind gut become clearer. Invagination of the silk glands extends up to the third abdominal segment, the thoracic legs become pronounced on the fifth day, the cephalic appendages are clear. The silk glands continue extending in length. The mid gut is formed completely by now and is full of yolk material. The alimentary canal is formed on the sixth day, the eyes on the seventh day, and the spiracles on the eight day. The egg shell shows a bluish tinge because of the pigmented developing embryo inside. The embryo hatches as a fully formed individual on the ninth day after consuming the extra yolk material of the egg.

(ii) Larva

The cluster of eggs in the stick (kharika) is collected, and is wrapped in a piece of cloth. The eggs are kept in a safe corner till hatching. It is however, desirable to wash the eggs in 2 per cent formaline to disinfect them from pebrine. The tiny larvae tend to remain together, and do not easily move about. Tender leaves of castor are given over the tiny larvae, where they stick to the undersurface. The leaves are then slowly transferred to trays. Larvae of the first two days are kept
for rearing. The larvae feed ceaselessly, and continue growing only stopping to shed their skins four times during the larval period. During the period of molting, they do not feed. Fresh leaves are supplied three or four times daily till the last stage. More number of feeds is required sometimes, as the larvae become gluttonous at the last stage. The quantity of leaf to be given depends on the age of the larvae. Dry, worn out, wet or yellow leaves are not given or else the larvae may suffer from flacherie. It is necessary to protect the larvae from the infestation of flies or enemies during the period of rearing. During the last stage, the larvae are reared on hanging bundles of leaf tied in the stalk. A fresh bundle of leaf is provided to attract the larvae from the eaten up stalks. Tender leaves are not given to the larvae at the last stage and mature leaves to the young larvae. Copious feeding is essential at the last stage. The leaves should be washed and dried before being given as feed. A temperature of 24°C with high relative humidity is essential during the last stage.

Overcrowding and over spacing of larvae at the tray or stalk should be avoided. A larva requires three times the space occupied by its body, otherwise the growth becomes irregular. Use of polythene sheet over the rearing bed at the early stages reduces evaporation from the leaf, and consequent reduction of feeding period. The hatched larva is one centimeter in length and grows to a size of eight centimeters, when mature. There are twelve segments of the body with spots in each of it, which disappear with the growth of the larva. In the hatched larva, the head is initially black, body yellow with black tubercles, bearing three to five setae. Anal segment is black and the body contains black spots in each segment. The body becomes greenish yellow, blue or deep cream with the passing of instars. During the
last stage, the body becomes covered with a type of white crystalline powder produced by the malpighian tubercles. The powder is an alcoholic substance, the functional significance of which is unknown.

The first moult occurs after three days, and there is some change on the body surface. The position of microchetes on the head, and sclerites on tubercles remains unchanged throughout the entire larval life. The microchetes appear after the first moult. The uric acid content in the blood plasma goes on decreasing after each moult though it remains constant in the integument. The larva matures in 17 to 45 days depending on environmental conditions. In large scale rearing, more than 75 per cent cocoon can be harvested with suitable care. The effective rate of rearing in *Eri* worm is high compared to other silkworm. *Eri* worm are found in varieties of color such as, yellow, green and blue. The intensity of color may vary. There may be also dots and lines in the body. The larvae should be segregated based on color and making with the progress of rearing. Sex in larval stage can be distinguished by genital markings of male and female at the last stage. Male and female cocoonages can thus be kept separately. This procedure becomes convenient at the time of pairing of moths.

(iii) Casting off the Skin

*Eri* larva moults four times during the period of its growth. The moults are known as *halodiya*, *duir kata*, *tinir kata*, and *charikata*, corresponding to 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> moults, respectively. The approach to molting needs to be observed carefully, and no feed is given when the molting starts. The larva at this stage goes
to a state of repose without movement. Cleaning and delitage are essential prior to molting, so that the larva can rest themselves upon a thin layer of clean leaves. Prelude to moult can be detected easily if carefully observed. The larva looses appetite, the head remains fixed with a sign of uneasiness by moving the head to and fro. The body and head look shinning at first, dull and compressed gradually. Then it goes to motionlessness. A part of larvae may require extra feed to go into molting. The *eri* larva is seen to be bent while in moult.

The old integumen is shed off after a day or two. Before shedding off the skin, the larva strains itself towards the interior part of the body, slipping off the old integument backwards. A liquid secreted by Verson’s glands situated in each joint on both sides of the body helps in slipping the old integument. The old integumen breaks at the head and on the sides and the larva comes out with a new one. Feed is given when all individuals have passed out of their moult. The larva does not eat the cast-off skin like *muga* or *tassar* larva. The larva should not be disturbed during the molting period. Handling the larva increases its mortality. The larvae should not also be exposed to high wind. The temperature should not fluctuate in the rearing room. The change of skin results in change of color of the larva. The larva becomes a glutton after the last moult.

(iv) Silk Gland

Larva is reared for production of silk. Silk is a secretion of a pair of large glands, which correspond to salivary glands of insects. The single gland is a long, tubular structure, folded in a characteristic manner. It is the largest organ of the
body. The gland occupies almost the whole of the body of mature larva. After food intake is stopped, and last litters are dropped, the body of the larva becomes full of silk protein. The larva excretes its silk substance after settling in a crevice with a semi-circular movement of the head. The whole content of silk gland is extruded to form the cocoon, within which the larva transforms slowly into a chrysalid. The larva discontinues spinning cocoon with slightest disturbance.

(v) Cocoon

Eri cocoon is open at one end and the silk does not form into a continuous filament. The cocoon is spun and not reeled. Domesticated eri cocoon has no peduncle, is loose and candid white or blood red, flossy, and large. The shape, size, and color vary according to host plant used. Cocoon obtained from leaves of castor is small and compact. White cocoon fetches better price than red cocoon. The red color becomes white after boiling in alkaline solution. The yarn from red cocoon is said to be durable. The size of cocoon depends on the type of cocoonage used. Certain types of dry leaf are very suitable for good cocoonage like plaintain, mango, jackfruit, etc. In government grainages, bamboo cocoonage is used, which gives cocoons a uniform size and shape. Late spring and late autumn cocoons are best and are used for commercial spinning. About 2000 cocoons weigh about one kilogram. Larval and shed pupal skin inside the cocoon weighs about 20 per cent of the cocoon weight. Eri cocoon is hydroscopic. Spinners prefer clean empty cocoons which give fine yarn. The size of the single filament, tenacity and elongation is estimated at 2.5, 3.5 and 22.5 per cent, respectively. Cut cocoon, out of which moth has emerged can also be spun. The merged moth soils the cocoon. These cocoons
are later cleaned of larval and pupal moulted skins. Cut cocoon is valued less than empty cocoons, from which the chrysalid is taken out immediately after completion of the cocoon.

(vi) Pupa

The larva when attains maturity ceases feeding. The last litters along with the drop of liquid frass are excreted. The male matures earlier than the female. The larva prepares to transform into a chrysalid. If rolled between the two fingers, and held to the ear, the larva makes a hollow sound. It starts reaching for a crevice to spin cocoon. It has a natural tendency to go up in search of a place for cocooning. The spinning starts with to and fro movements of the head. The larva gets deeply embedded in the thick layers of silk. It takes 3 to 4 days to spin the cocoon completely. With slightest disturbance, the extrusion of silk is discontinued. Unless some dry leaves are provided, the mature larvae disperse in different direction in search of places to spin cocoons. The larva transforms itself into a chrysalid after passing through a pre-pupal stage which is the intermediary stage between larva and chrysalid. The chrysalid is brown in color. The chrysalis is a prelude to moth stage with all the appendages of future moth; such as compound eyes, wings, antennae, legs, genetalia, etc. which can be seen in bold relief.

The chrysalid has a tough impermeable integument. By means of opening of trachea, situated on both sides of the body, the respiratory activity continues. The chrysalid is full of fatty deposits, and therefore, the energy is conserved fully. The waste matter of the body is accumulated in the hind gut and is discharged
immediately after the moth emerges from the cocoon. High temperature accelerates metabolic activity of the chrysalid, thus leading to early emergence of moth. In low temperature, the activities are retarded leading to delayed emergence. The genital marking of the chrysalid is very prominent. The female chrysalid is heavier than the male. The relief of male or female wings can be distinguished in the chrysalid stage. Before emergence, there is a sharp movement of the posterior portion of the abdomen. The color of the chrysalid turns black before emergence as moth.

(vii) Moth

_Eri_ cocoons are spread over a bamboo tray in a single layer. The moths cannot emerge easily, if the cocoons are left in a heap. For easy emergence of the moth, there should be enough space for the moth to crawl out conveniently. The emergence occurs after about two weeks of chrysalid stage. The moth bores its way out through the open end of the cocoon in the morning hours. When the wings are fully stretched, the male finds out the female and the pairing commences. The pairing of all the moths is completed towards noon. The mating lasts for about twenty four hours, but a period of about six hours is enough for good pairing. The male unpairs next evening. Egg deposition commences after un pairing and eggs are usually laid during night. A female moth lays about 300 to 500 eggs in cluster. Some eggs are laid during day time also.

The female moths are tied on a straw stick, for convenient deposition. Sometimes ten moths are tied in a long stick to save space. A vertical position is preferred for oviposition. If not tied on a stick, the female moths should be kept
confined in a cage or otherwise they move and deposit eggs here and there. For convenient handling, the entire lot of moths are allowed to emerge out of the cocoons of the tray. The moth discharges an opaque liquid after emergence. Unless proper care is taken, they may spoil the cocoon. The healthy and robust moths are segregated for breeding. Weak moths that lay small quantities of eggs are discarded. 

_Eri_ moth has a wing expanse varying from 10 cm. to 15 cm. The body is relatively small, i.e. 2.5 cm. in male and 3. cm. in female. Both sexes have pectinate antennae with white tufted bodies. The male has slightly outcurved apex in the forewing. The ground color of the wing varies from green to orange brown or even to sepia colour. There is a bright median line, incurved twice near the transparencies of the lunule. The lunules are in the shape of a crescent; in some races, it is narrow and in some, it is like a semi-circle. A part of the lunule is always crescentiform.

**Tools and Implements used for Manufacture of Endi Clothes**

(a) Cottage Spinning

The open mouthed _eri_ cocoon has to be spun like cotton. The cocoon cannot be reeled like mulberry, or _muga_ cocoons, which are compact with continuous filaments. The _eri_ moth emerges without disturbing the cocoon, and the fibre. Hence, all cocoons can be utilized for spinning after proper cleaning. Most rearers stifle the cocoons, unless they are to be preserved for breeding purpose. Cocoons are stifled by exposure to sun for few days. This method helps to preserve the cocoons longer and also avoids the discolouration of cocoons usually associated with stifling by fire. The staple of _eri_ cocoon obtained from first drafts operation is glossy, long and fine.
It is finer than tasar silk, but less fine than mulberry silk. Nothing is wasted in eri cocoon by spinning. The yarn spun out of fibres is regular and fine, if the spinning is done with a little care.

Cocoon for spinning are cleaned of the pupal and moulted skins, which remain inside. Otherwise black specks would appear because of the entangled skin and the yarn quality suffers. The tribal people remove the pre-pupae after complete formation of cocoon and eat it. Stifled cocoons are cleaned, but certain quantities of dirt and speck always remain inside the cocoon. Dirt and remains of pupal skin in unclean cocoons spoil the quality of the yarn. Clean and empty cocoons fetch a higher price.

(b) Degumming

Prior to spinning, eri cocoons are required to be degummed in an alkaline solution. For preparation of the solution, an indigenous process is extensively used. Ashes of certain leaves or straw are used for preparation of the solution. The quantity of alkaline ash required is half the weight of the cocoon used. Boiling for two or three hours in an alkaline solution is sufficient for degumming, and the fibres comes off easily when pulled. Over boiling leads to weakening of the filaments. Soda and potash solutions are generally used in preparation of the alkaline solution. Soft water is preferable to hard water. The boiled eri cocoons are wrapped in a green arum or plantain leaf for 3 to 4 days. The process loosens the inner content of the cocoon. Boiling for a second time sometimes becomes necessary. The well treated cocoons are thoroughly washed in water and the inner dirt, if any, is removed. The
flattened cocoons in the form of cakes are then dried and preserved for spinning at a suitable time.

(c) Spinning Appliances

The appliances commonly used for spinning eri cocoons are the drop spindle or takli/takuri or charkha/ Jatar (spinning wheel). The drop spindle is a simple device, and the twisting of the thread is done by hand. In the spinning wheel, the twisting is done by a wheel. In both the cases, the process is same as in the case of spinning of cotton. When spun on drop spindle, the cocoon cakes are moistened for better gloss and twist. A spinner can spin about 50 grams or about 420 meters of eri yarn in 8 hours in drop spindle using about 100 to 150 cocoons. A kilogram of empty cocoon yields about 750 grams of fine yarn. An expert spinner can spin very fine yarn in drop spindle. The count of the yarn depends on the weight of the spindle. For finer yarn, slightly heavier spindle is used. The traditional weaver, prefers drop spindle yarn for production of fine fabric, because of the appropriate twist.

An individual from Assam named as Nidhiram Das has invented an endi spinning machine which is named as Nidhiram Charkha after his name. The rate of production on this spinning wheel is much higher than that of the drop spindle. The Das-type eri-spinning charhka is built on a wooden frame and is operated by pedal. It is fitted with automatic traverse motion. Feeding of fibres can be controlled with ease. Motion is transmitted to a bobbin, which is loosely fitted on the spindle frame. The spindle is stationary, but the twists are imparted with the rotation of the bobbin itself. Two auxiliary wheels are added for augmenting the speed of the spinning
bobbin with less strain on the feet. The thread passes over a brass cap from the hand of the spinner and is wound on to the bobbin, the machine occupies little space. Another improved type of spinning wheel named Jaipur Charkha is also gaining popularity amongst the rearers for the purpose of endi spinning. Chowdhury -type eri- spinning charkha is an improved one. The machine is pedal -driven, durable, and can be operated easily. The machine moves on ball- bearings or still bushings, and can be mended easily. The count of the yarn is uniform because of a ring and a traveler. Besides the above machines, there are other simple pedal-driven charkhas, which are presently not much in use.

(d) Various Stages of Manufacturing Process

Before raw endi is taken up for weaving it has to undergo certain preparatory processes like wetting, wrapping, etc. The different processes which are involved in the manufacture of endi cloths are described below:

Silk thread produced from the cocoons is wound on a swift or spool to make a wrap. The first stage in the art of weaving consists of preparation of the yarn for weaving. The preparation of wrap requires great care and caution. At first the hanks of the yarn are to be unfastened and thoroughly examined, then the knots are loosened, and the loose yarns are placed in a reservoir of water for washing. The water of the reservoir has to be changed frequently. Washing with water is done according to necessity. Sometimes the yarns or wraps are boiled with rice or paddy, or with flour or sago and water to make the thread stronger. This process is locally termed as mardia. After that the yarn or wraps are taken out of water and dried in the
sun. The unnecessary particles stuck on the wraps are then removed after which the wrap is ready for the next stage.

When wetting of yarn is finished it is to be wound on *ugh* (bobbins). A wrapping spinning wheel is used for the purpose. The hanks of wraps are deposited over a bamboo shift, kept at the left hand side of the worker. By rotating the wheel of the spinning wheel with the help of the handle, the yarn is spun into an attached bobbin. The required number of bobbin is thus prepared. During this process utmost care is taken so that no individual strands of thread get mixed with each other. The ends of broken threads have to be tied together with a small knot and sometime broken thread are brought together and twisted with hand to make a continuous thread.

The most important stage is warping. The warping is performed in different ways in different places. It is performed according to convenience. There are four main types of warping; these are: Stick warping, zig zag warping, peg warping and drum warping. Stick warping is generally done at an open space. In this method, the weaver has to move one stick to another and back repeatedly with filled up bobbins arranged in a cage. Zig zag warping is done when there is no sufficient space for warping. By this method warping can be done even inside a house by putting the sticks in a zig zag way. Peg warping is applied when there is no sufficient space for warping. By this method warping can be done even inside a house by putting the sticks in a zig zag way. Drum warping is more commonly found. It can be done
indoor and in small space. A book creel is used for the purpose. By this device a weaver can save time.

The next process of drawing the warp ends through the reed is known as denting. In this process, the warp threads are passed through the reed. For this two persons are required, one to pick up the threads in succession and pass them through the reed, and the other to pull towards the weavers' beam with the help of a hook.

The act of spreading the warp yarns and winding evenly and lightly upon a weaver's beam is called beaming. The ends of all the warp threads passed through the reed are then rolled over the beam to give a taut surface before weaving is started. It is necessary that all the threads should have uniform tension, and lease rods are, therefore, inserted in the warps at intervals to avoid inter-mingling of threads.

The next process is called as heald knitting. After the beam is prepared, it is put on a frame or fixed on a loom. The local loom consists of four bamboo or wooden posts fixed in the ground so as to make a rectangle of about 5'-1" x 2'-6" or 177.8cm.x76.2cm. and are joined together at the top by cross bamboo beams. An arrangement is also made in the loom with the help of two solid wooden bars fixed horizontally on both sides of the loom to keep the warp. It is also essential that warps are stretched tightly so that the threads of the warp are in uniform tension. Lease rod is then pushed in the warp causing a slight opening in it. Then one end of the thread...
with which healds are to be knitted on the warp is passed through this opening from the right to the left. The heald knitting is done with the help of a hollow piece of bamboo which is locally known as *Ba-chunga* and the process of knitting heald is called as *Ba tola*. During this process care is to be taken so that the threads in the warp all passes through the same sequence in which they pass through the loops of the reed.

There are two healds in the loom, one heald is passed under every alternate warp and the remaining warps are tied to the second heald. Each thread of the warp is passed through the loops in the heald. Generally the first thread of the warp is passed through the first heald and the second through the second heald. The process is continued in sequence till all the threads are exhausted. After the heald knitting is completed, both the healds are connected with treadles or pedals, made of two small pieces of bamboo, by ropes which can be operated by the weavers' feet, and also connected by rope with two *nachani* or pulley made of iron, bamboo or wood which are hung from a post placed vertically over the top of the loom. The healds can be moved up or down by the movement of the pedals or treadles at the feet of the weaver. As the healds move up or down, a passage or shed is created in the warp through which the shuttle can be plied.

The next process is called as shedding. The process of shedding (opening of the warp) is done by the healds which are operated with the help of the feet. The mechanism of the operation is that, when one of the treadles or pedals is depressed by the foot the healds connected with it go down while those connected with the
other treadle go up thus forming a shed or passage in the warp. Then the shuttle (mako) is thrown across the shed by one hand from one side, and caught by the other at the opposite side of the warp. The weft thus passed through the gap or shed must be beaten up with a reed known as rash, which is made of bamboo fitted on to stay and is given to and fro motion by hand during weaving. Weavers usually throw the shuttle from the right hand side to the left. The weaving thus comprises interlacing the weft yarn with the warp yarns at right angle. There are three principal stages which actually govern the art of weaving namely (1) Shedding, (2) Picking, and (3) Beating. Shedding is the process by which a passage or sheds formed by the heddle when the treadles or pedals is depressed by foot. The picking motion consists in propelling the shuttle by the shed or passage lastly beating the filled in weft yarn into position with reed. The process thus continues and how fast these three motions can be affected depends upon the dexterity in weaving.

(e) Weaving

Eri yarn is full of loose fibres sticking out of the thread. The yarn which is to form the warp has to be sized in order to bind all floating and loose fibres into the body of the thread and also to strengthen the thread. Badly spun thread requires more sizing. Sizing required for weft is much less than warp yarn. Starch made into gruel or some mucilaginous substance is used for sizing of eri yarn. Sometimes, the sizing is applied to the warp to counteract the fraying of the ends on account of constant shaking caused by the movement of the healds. The application is done by a brush to the warp of the loom. Very often an additional sizing is applied to the cloth after it is taken out of the loom. This is very necessary in case of inferior variety of
cloth. Thus the inner spaces between the threads are filled up to give the cloth a smooth and fine appearance. The cloth is washed and stretched fully.

(f) Looms

The traditional tools and implements used over the ages are still in use for weaving eri cloths. The looms which are mainly used for weaving endi cloths are briefly described below.

(i) The Throw- Shuttle Loom

It is used for eri fabric weaving. The loom is hung free from upright bamboo. Sometimes, a wooden frame is used, the shuttle is thrown with hand from side to side, and beating is done by pulling the sley with hands. The operations preliminary to weaving on the loom consist of twisting, winding, and warp preparation. These processes are done by hand. The spinning machine twists the yarn and the yarn for warp is prepared directly. Weavers prefer yarn prepared from drop spindle with appropriate twists and uniformity and sometimes weft yarn prepared from spinning wheel is used. The warp threads that run parallel lengthwise should be strong. The appropriate yarn is selected, and wound on the bobbins and then wound on warp bobbins. The double winding secures even tension, and also cleans the yarn. Warp is prepared section by section either in horizontal drums or in hand reel to get sufficient numbers to make the fabric with required width. While warping on the beam, it is necessary that the ends lie paralleled, evenly distributed and have uniform tension. The weft thread is also wound from the bobbins of the spinning wheel or from the drop spindle to a small bobbin, which is fitted into a boat- shaped
shuttle. The yarn from the shuttle flies backward and forward; the weft yarn is put in position by this process. The fabric is made finally, and is wound on the cloth beam continuously.

(ii) The Fly- Shuttle Loom

The fly -shuttle loom can be used in case of blends of eri yarn with those of polyester and fibres like ramie, when the tension of the yarn is high. The productivity rate is two and a half time higher than that of throw- shuttle loom. With blending , the price of ultimate fabrics can be made cheaper in a fly shuttle loom. The products will have new dimension with the added characteristics of creasing property, high tensile strength, dyeing quality, etc. The products can be used for coating, shirting, upholstery, etc., and will have a wider market. The fly- shuttle loom has a wooden frame with four posts. The sley and pulley bar overhang from the cross- bars at the top fitted to the frame. Two mid- stands are fixed to the frame for fixing the cross-bars. The front posts have a height of 1.80 meter and the rear posts 1 meter. The front rest is fitted to the front pair of posts at a height pair of posts from the ground. The cloth beam is held by two wooden brackets fitted to the middle cross- bars fixed to the frame. A teethed round plate is fixed to the beam on one side, and an iron catch is provided to hold the beam properly. The beam occupies a position near to the front pair of posts, and just over the legs of the sitting weaver, so that the weaver can move her legs conveniently while operating the treadles. The warp beam is kept in position by means of centre pins fitted on both sides of the beam. A wooden teethed wheel is fitted to the beam, and a wooded catch is provided to the frame to control the warp beam, so as to retain the warp at the appropriate position for
weaving. The treadles are operated with their fulcrum at the distal ends held by a rod fixed to the cross-bar below the warp beam.

(g) Dyeing

_Eri_ cocoon are either of white or red color. White cocoons are preferred by weavers as they fetch a higher price than the red cocoons. The red cocoons become somewhat creamy in appearance after being boiled in an alkaline solution. The common belief is that yarn out of red cocoons is more durable than the white ones. The Bhutanese people prefer fabrics prepared out of red cocoons to those from white cocoons. _Eri_ fabric made out of white cocoons is cream-coloured at the initial stage, but with more wash and wear, the fabric become bright and glossy. The natural color of the _eri_ fabric is liked by local people. Attempts have been made to bleach and dye the fabric, but because of the twist in the yarn, which unwinds slightly, there is some difficulty in uniform colouration, and the shade fades after every wash. Improvement in the technique of dyeing can improve the colouration.

_Eri_ silk has a poor affinity for dyestuff, and requires twice as much dye than mulberry silk. Hence dyeing is costlier for _eri_ fabric, and the fabric price goes up considerably. The yarns have to be bleached before dyeing. The yarn is bleached well in bioxide of barium, and it assumes a pale tint; however for dyeing deep color, the bleaching can be avoided. Aniline dyes with tannin are used as fixing factor for the yarn. Lac and vegetables dyes are also used with excellent results. Degumming of _eri_ yarn is done by boiling the yarn in a solution of textile soap mixed with pyrophosphate. The degummed yarn is bleached in a hot solution of hydrogen
peroxide and sodium silicate, and again boiled in sodium hydrosulphite. It is then scoured with dilute sulphuric acid and washed properly for any trace of acid and dried.

**Historical Background of Silk with Special Reference to *Endi* in Assam**

Spinning of cotton and cocoons of different kinds of silk worms have been in existence in this part of the country from time immemorial. There is a legend as to the origin of sericulture. It is said that a Brahmin girl gave birth to three children without having a husband. She was made an outcast by the society for the loss of her chastity. She had to live in the jungles for a long time in distress with her three children, and went to a holy hermit who being sympathetic to her, applied some spiritual power and transformed her three children into three beautiful worms namely *eri* worm, *muga* worm and *pat* worm. Another legend attached with the silkworm is that a long time ago, a Chinese lady was married to some Tibetan prince who brought three species of silk worms of different varieties amidst her other dowries from her parents' house, and used to rear them in Tibet. From Tibet, it probably came to Assam. The Chinese record states that the ancient route for trade in silk and other goods with Bhutan and Tibet was through Udalguri in Darrang district of Assam so from Tibet it easily came to Assam. The cultivation of different varieties of silk worms was first taken up by the Bodo community, and then it gradually spread amongst other communities. The origin and growth of *eri* and *muga* culture in the Assam valley is not part of recorded history. *Eri* and *muga* culture are considered to be of local origin, since these worms are not known to be cultivated outside the region.
The art of rearing silk worms and manufacturing clothes from these were known to the people of Assam since the days of the *Ramayana* and the *Arthasastra*. The *Ramayana* mentions the name of Magadha, Anga, Pundra and the "country of the cocoon rearers" which is believed by historians of the early period to be no other than Kamarupa lying to the east of Pundra. In the *Arthasastra*, Suvama Kunda is mentioned as one of the places which produced various silk garments, such as *ksauma*, *dukūla*, and *patroma*. Historians are of the opinion that this Suvarna Kunda is no other than modern Sonkudihā in the district of Kamrup. From the writings in the *Arthasastra*, *Harsacharita*, and other classical literature, it is inferred that in the art of rearing silk worm, and the weaving of the best kind of silk cloths, the weavers of ancient Assam had earned reputation equal to that of the Chinese (Choudhury, 1959:364-368). References have been made to dyed *eri*, *muga*, and *pat* silk.

The Greek travelers in their accounts referred to silk of Assam. Pliny in book XXXVI, Ch.II refers to the import of silk products from China to Greece through the Brahmaputra valley, Assam, and Eastern Bengal in the 1st century A.D. He also describes the land of Seres (Assam) as the country noted for silk production from its forests. Similarly, the anonymous author of *Periplus* mentions Assam's export of gold, silk, and malabathrum (*tezpat*) to Greece in the 1st century A.D. (both cited in Acharya, 1985:1-2). Dionysius refers to the tassar silk of Assam (Choudhury, 1959:358-364). In the *Harsacharita* of Banabhatta written in the 7th century A.D., there is reference of the textiles of Assam. It gives reference to the gifts sent to King Harsa of Kanauja by King Bhaskarvarmana of Assam. The gifts included a variety of fine textiles. The most important being a white parasol made of silk known as the
Another important item of presents typical of ancient Kamarupa textile industry were the linen cloths (*kshauma*) that were bright like the rays of the autumn moon, and were capable of undergoing washing treatment (*saushakshama*). The *ksauma vastra* sent by Bhaskarvarmana to Harsa is believed to be no other then the present *eri* silk of Assam. The Harsacharita mentions the color of the *ksauma* as white with a yellowish tinge. The *eri* cloth is usually white with a yellow tinge (Choudhury, 1959: 367). It is therefore inferred that in the early period, the *eri* silk was indicated by the term *ksauma*. There are reference of a special kind of scarfs that were rolled up (*kundalikrita*), not folded in the ordinary way, and hence required to be specially packed in round or cylindrical baskets of wicker work (*vetrakaranda*). Bana referred to them as *bhingura uttariya* in a list of textiles specially being made on the occasion of marriage of princess Rajyashri, which were so called because of the series of gadrooned folds along their length, this precluded folding necessitated a different kind of packing. (cited in Dasgupta, 1982:189).

The Ahoms from the very outset of their rule in Assam took an interest in spinning and weaving. During The Ahom ruler, King Sutupha or Suteopha (1268-1364) engaged one thousand *paiks* (a common rayat) from the Chutia and Kachari community to rear worms for silk like *pat*, *muga* and *mejankari*. The Ahoms have been credited to have introduced silks like *muga* and *pat*. Medieval Assamese society laid stress on the use of indigenous products. The existing material refers to the use of cotton and varieties of silk. Assam has been famous for silk since ancient times. This tradition of producing varieties of silk continued till today. Medieval Assam produced three kinds of silk, viz, *eri*, *muga* and *pat*. Gomeceng and
Mejankari were the finest varieties of silk which were mainly used by the aristocrats. Usually cotton clothes were worn, but on ceremonial and official occasions apparels of muga and pat were used. In the medieval biographies of Vaisnavites preachers certain areas of Assam like Tantikuchi (Barpeta), Hajo (including present Sualkuchi), etc., were mentioned as silk producing centers. Spinning and weaving were an indispensable occupation in every Assamese households. During the reign of the Ahom ruler Pratap Singha or Susengpha (1603-1641 A.D.) the minister Momai Tamuli Barbarua made it an obligatory duty of every household to spin and weave. All women had to spin two or three bundles of yarn for weaving. Each morning the gaonburha or the village headman was to inspect the working of the previous night. Every household had to send the king about 250 grammes of silk yarn every year. Women who failed to produce specified quantity of yarn were severely punished, even physically. Pratap Singha also settled many weavers at Sualkuchi from many places on the south bank of the Brahmaputra. The Assamese women were expert weavers. There was a belief among the Ahoms during that period that unless a wife could clean cotton spin yarn and weave martial attire for her husband within a night he might not return victorious from the fight. Such clothes made in a night is called kavach kapor (a cloth having the protective power like an amulet) in the Ahom chronicles. In his book An Account of Assam the writer Wade observed that it was customary on the parts of the warriors to wear in the morning that piece of cloth which was manufactured by the female weaver of the family on the preceding night after ginning the cotton at midnight. The spinning of the thread and weaving of the cloth were to be completed before the daybreak. (cited in the Gazetteer of India, 1976:220). The art of weaving was considered as a noble profession by the
Assamese people in the medieval period. As a result of it, the cotton, silk, and endi clothes were produced in sufficient quantity to meet the needs of the people, and as such no import of cloth of any variety was made except woolen clothes from the northern tribes. Dhekial Phukan in the book *Asomiya Buranji*, gives a list of dresses used in Assam during the pre-British days. It covers Assamese costumes belonging to the medieval Assamese society. Among the dresses mentioned are the *eriya bar-kapor* (double fold endi), *bar kapor, dangori kapor* (wrappers of coarser and thicker variety), etc (cited in Rajkhowa, 1991:57-61).

Referring to the rich silk industry in Assam during the rule of the Ahom kings, people preferred silk to cotton as the durability of *eri, muga* and *pat*, is much longer than cotton. These three types of silk were reared locally. While *eri* and *muga* were produced by almost all the communities, the rearing of *pat* was exclusively a trade of the jogi-katania or katania caste. Rearing of silk was not considered socially lower as in the case of other parts of India. Women of all social status, belonging to all the castes and communities, liked to weave and it was treated as an extraordinary qualification for spinsters in the marriage market. *Eri* was generally reared inside the houses and the clothes produced was specially suitable for the winter season. This industry was directly patronized by the state, so much so that queens established weaving schools in the palace to teach the art to the daughters of the nobles and the grandees. Widows and other female members of the executed prisoners were also employed by the state for spinning and weaving as a means of subsistence. The women of all castes, from the queens downwards, wove the four kinds of silk that were produced in the country. A good quantity of the two coarser kinds of silk was
exported. There was one loom for every two women and in rich families there were eight or ten, which were used by slave girls. The raw material was seldom purchased, each family spinned and wove the silk which it reared, and petty dealers would purchase these from the rearers. There were many looms in the royal harem which were used by the female attendants. From the biographical records it is learnt that the mother of Bhavanipuria Gopal Ata, a disciple of Vaishnava saint Srimanta Sankaradeva, who was very expert in weaving, was entrusted with the charge of superintending the twelve score of looms that were in the royal harem during the reign of the Dihingiya Raja, Suhungmung. Some of the Ahom queens also took a personal interest in training the girls and looking after the activities of the looms which were in the palace. Queen Sarveswari, the third wife of King Siva Singha, established a school in the palace for girls to be taught the arts of weaving and music. It was one of the most important acts of state patronage to the art of weaving. There were some persons appointed by the Ahom administration who supplied the raw materials for the looms of the prominent queens of the Ahom kings. There were also some higher officials appointed by the state to supervise the activities of these people. The Raidangia Phukan and the Raidangia Barua, two higher officers of the Ahom king were under the Raidangia queen to manage her estate as well as to see the activities of the common rayat who were in charge of supplying yarns and other raw materials for the looms of the queen. Similarly, the Parbatia Phukan and the Parbatiya Barua under the Parbatiya queen also did the same task.

According to Travernier, the silk of Assam was produced on trees, and the silks which were made of these trees were very brilliant (cited in Rajguru, 1988:294).
The textiles produced during the Ahom rule were in great demand both within and outside Assam. These were exported to countries in Tibet and Burma. It was also sent for sale in Bengal and Sikkim. The Mughals also prized Assamese silk textiles which were either sent as gifts to the Mughal court or were sent for sell.

The Koch kings also patronized the growth of the silk industry in the Koch kingdom and Baranagar was a great centre. The people of all sections used to cover their body in an *endi* scarf during the winter season. Silk and textile were the most noted industry in the kingdom. There were professional silk weavers called *katanis* in the Koch kingdom. The *muga* silk from Assam and Kooch Behar formed an important article of trade with Bengal, Bhutan, Tibet, Mughal India and in the Coramandal and Malawar Coast. During the rule of the Mughals in India, once a year in normal times, large quantities of aloe wood, pepper spikenard, musk, gold, and varieties of silk were offered in exchange of salt, saltpeter, sulphur and several other products at the Ahom-Mughal checkposts. It is possible that many of these commodities, mainly silk, came from Kooch Behar as well. As weaving was considered an art, there were also families even among the high-castes who gained their livelihood by weaving. Professional weavers had to pay an annual tax of rupees two to the administration. As sericulture was a common occupation in the Koch kingdom, plants like *era* (*Riccinus communis*), *chom* (*Antheroea assama*), *nuni* (*Mulberry tree*), *sowalu* (*Tetran thera nacropaylla*), *kecheru* (*Heteroponax fragrans*), *champa* (*Michelia pulnycnisis*), *dighalati* (*Tetrnthera diglotti*), *hidal* (*Barringtonia accutangula*), etc, were cultivated to feed the worms.
Enedi was produced in different places of Assam. It was mostly produced in Lower Assam and was not so popular in Upper Assam. In Darrang district the chief centres were to the north of Mangaldai inhabited by the Kacharis. Kalaigaon was a silk market. Chief products of the area were endi wrapper, lower wrappers, and cloth for making coats and shirts. In Kamrup eri silk worm was not reared by caste Hindus like the Brahmins, Ganaks, and Kalitas. It was the monopoly of the Garos, Kacharis and Karbis. Eri and muga were the chief silks produced in this area. Chief centres of production were Barduar, Chaygaon (Champaknagar), Pantan, Tamulpur, Barama and Palasbari. No other silk except eri was developed in Goalpara where wrappers were produced out of it. Rangjuli, Salmara and the Eastern Duar areas were the chief centres.

Enedi among the different Tribes of Assam and North East India

Different types of products woven with endi silk are in use throughout North-East India. The eri shawl is woven out of eri silk. Size of an eri shawl for women is usually 200cm in length and 90cm in breadth; and for men it is 250m in length 90 cm in breadth. The eri shawl used by women is woven with different motifs and designs. In addition to white, a number of other colours like red, orange, and yellow etc., are used for the purpose. The lower garment of a woman is also sometimes woven with endi silk. In Lower Assam, a mixed product of eri and muga yarn is available. Its price is slightly higher than eri lower wrapper. Riha is yet another garment worn by married women in the upper part of the body. Like the lower wrapper, riha is also made of eri, muga, pat or mixed yarns. The eri wrapper is made of either cotton or eri yarn and sometimes with both. The usual size of an eri wrapper is 21 feet long.
and 5 feet wide. Another cloth used as a warm clothing is the *pashra*. It is woven either with cotton or *endi* or both.

Dalton (1978), in the book *Tribal history of Eastern India*, describing the costume of the women of the Miri (now known as Mising) tribe writes that while traveling and working they wore an elaborate and peculiar form of dress, 'at other times they wrap themselves in a large cloth of *eri* silk of Assamese manufacture, doubled over the shoulders, and pinned in front like a shawl'. Animal husbandry and rearing of *eri* cocoons are two other economic pursuits of the Karbis. *Eri* yarn are spun from the *eri* cocoons, and are used to prepare warm *eri* cloth (*pe-inki*). They also sell *eri* cocoons and *eri* threads. They rear the *eri* cocoon by feeding castor leaves, which they produce in the *jhum* fields. (Medhi, 1994: 130). The author also mentions about Karbi Anglong being the highest producer of *eri* cocoons in comparison to other districts of Assam. Hamren sub-division of that district is the biggest market of *eri* cocoons in North east India. The Karbi woman rear *eri* worms and produce *endi chaddar* in their looms. By selling the *endi* cocoons and scarfs the womenfolk in the Karbi society earns some money and they treat these as their own income and keep for themselves. (Bora, 1993:13). Among the Karbi tribe, the *endi* yarn is used for weaving a number of their traditional dresses. The *Poho* is a turban made of *endi* yarn and is traditionally worn by the Karbi males. The Karbi ladies also use a coloured and striped *endi* scarf called *khongjari* during winter season. During the performance of *Chomangkon* (death ceremony) young girls use a special *endi* scarf called as *dokherso*. Similarly, the Dimasa woman also earns an income by selling *endi* cloth, costumes, dress, etc. (Nunisa, 1993:82). Leaves of castor, on
which the *endi* silk worms thrive, are found abundantly in the vicinity of the Dimasa villages. The sericulture department of Assam has also establishes a number of *Endi* Concentration Centres from where the people can easily get castor and other leaves required for the rearing of silk worm. The Kachari are also expert in rearing indigenous variety of cocoons which is used for manufacturing Assam silk. The cloth popularly known as *eri clothe* is used during the cold season. These clothes prepared by the Kachari are soft and warm as well as of remarkable strength and durability. (Vidyarthi, 1986:97). In the book, *The Kacharis*, the author Endle(1995: 19-22) devotes considerable pages on the Kachári peoples involvement with *eri*. The rearing of *eri* worm and the manufacture of *eri* cloth was, one of the chief and profitable industries among the Kachári. A Kachári woman can on an average reel off some 150-200 cocoons in a day. The loom employed for weaving the *eri* silk was very simple, and the villagers used local resources for its construction. The market value was about five rupees. It was set up on a shady side of the dwelling house, or where this was impracticable, a rough structure of thatch and bamboo work was provided to shield the weaver from the sun. He further gives a vivid description of the Kachari woman in the loom weaving *eri* clothes. He writes ‘the actual work is always carried out either by the lady of the house, or by one of her grown up daughter; and it is in every way suitable to women workers, as it requires very little exertion of physical strength, but only a certain quickness and readiness of eye and hand’. It was a pleasant sight to see a ‘Kachári woman working placidly and contentedly at the *eri* loom, singing quietly to herself in sheer happiness of heart....soon after the master of the house , with one or more grown - up sons , has betaken himself to the rice - fields,....his goodwife seats herself at the loom , and
works away steadily until about 8 or 9 a.m.....she resumes her position at the loom for the greater part of what may remain of daylight.....it is said that a Kachári woman, if not greatly or frequently interrupted in her work, can weave about half a yard each day; and, as this eri cloth, woven in long strips about two yards wide, can always command a ready sale at about Rs. 2/- per yard, it will be at once evident that a good worker can in this way, without neglecting other urgent domestic duties, easily make a substantial addition to the family income'. The writer was presented with a piece of eri cloth which was made into two bed sheets. He writes 'The fabric itself (eri cloth), so produced, is one of great value, especially for use in the cold season, being at once soft and warm as well as remarkably strong and durable'.

The rithap is a fine quality eri wrapper used by the Karbis. The women of the Rongnampa Monpas of Kalaktang Circle of West Kameng district of Arunachal Pradesh cover their body with the dress called as Sinka and a petticoat of ordinary endi type cloth.(Bagchi,1983:12-22 ).The Sherdukpen living in the Kameng District of Arunachal Pradesh also make use of the endi fabric. The men folk of the tribe put on a sleeveless sape, a cotton or endi silk cloth of 2 ½ yards in length and 1 ½ yards in width, the two ends of which are pinned on the shoulders. (Nair, 1985:83)

Decline in the Art of Spinning and Weaving

A large number of traditional silk growers of Assam have shifted from muga and endi food plantation to other commercial cash crops including tea and rubber. There are many weaknesses inherent in the silk industry. These are inconsistent supply of raw materials due to low productivity, vagaries of nature, poor absorption of
technology, unorganized market, absence of storage facility, absence of formal and informal credit flow to the silk sector as well as absence of market orientation and trade awareness among them. De and Das (2007) writes that despite the significant rise in total number of families engaged in ericulture during 1991-2005, its share to total workforce declined due to relatively faster growth of other (tertiary) sector of the economy. Similarly, in the villages of Tripura, women who do not or cannot participate in agriculture and wage labour work, have taken liquor brewing for sale as their principal occupations. It was observed that among women liquor distillation is one of the avenues of earnings as it has become more remunerative than spinning and weaving. In many cases the traditional household industry like weaving by Tripuri women is replaced by liquor brewing. According to Somendra Chandra Deb Barman (cited in Chakraborty, 1999:30-37), almost all the jhumia households in Tripura owned spinning wheel and loin loom, and women used to produce beautiful clothes. Tripura was once very famous for her Ria (Ganguly, 1968:40). But at present most of the tribal households cannot afford to purchase cotton yarns for weaving.