Chapter II

Techniques of spinning, weaving and dyeing

Meghalaya with its contrasting, climate and altitude, provide a wealth of raw materials for making textile such as cotton and silk, bamboo and wood for constructing loom, as well as plants, minerals needed for dyeing the yarns. The art of sericulture and weaving were known by these tribes from time immemorial. At one time it was prevalent only in Shillong, but now weaving is seen in many villages such as Nongkhrah, Paham, and Umwang, Mawhati, Korhadem, Umden, Umaing, and Umtyrkhang (Ri Bhoi district); Nongstoin; Lakadong, Nartiang, Mynso, Sumer, Shangpung, Saipung, and Ummulong (Jaintia district) where people weave cloth out of cotton and endi silk of different textures and variety.

Source of Raw Material: The natural raw materials are assessed, extracted, spun, twisted into continuous yarn and made into textiles suitable for their specific purposes. Local raw materials for textiles are obtained from insects 'Ailanthus Silk moth' (Fig.2.1) giving an eri or endi silk locally called Ryndia (Fig.2.2) and fibres extracted from plants are seed fibre from cotton, a pineapple plant, banana plant. The latter two were used for making bags by knotting the fibres, however they are not in use now and have been replaced by plastic bags. Silk is now obtained from insects reared at home not from the wild. Cotton is also planted in the fields and even in their gardens (Fig.2.3). They harvest materials from local plants and trees to make dyes, as well as mordant the yarns by use of plant extracts, ashes, etc. A woman does both weaving, planting and harvesting the rice crops. This tradition is still followed in rural areas, but some changes are seen in the Governmental weaving centre where women does only weaving throughout the year and good incentives were paid on the basis of the cloth length they wove. Imported yarns, particularly the cotton and acrylic wool have found their way into this region in the mid 18th century. This imported has
become a substitute to the local fibre which slowly became a supplement and its price is very less to the locally made fibre.

**Keypad (Cotton):** It is one of the world’s major textile fibre. It is also one of the most versatile fibres which can be used alone or blend for a seemingly infinite variety of apparel household and industrial products. It is the fibrous matter that surrounds the seeds of various shrubs or woody herbs belonging to the genus Gossypium and family, Malvaceae. The fibre is obtained from multi-stemmed bushy plants of 3 to 5 feet in height. It is composed of 87-90% cellulose, as that of wood and linen. Cotton fabrics are woven in India for thousands of years.

In Meghalaya, cotton is planted in Bhoi region (Khasi Hills) and in Kupli at Jaintia hills, though earlier, it was grown wild and also grown on the bank of the river. Seeds are sown in summer, but budding takes place in autumn. The cotton produced in Kupli was reported to be one of the finest products than that in Bhoi area\(^26\). Textiles woven from these cottons are widely used by the two tribes as because it is a good conductor of heat.

**Spinning Kymphad (Cotton)-**For Spinning cotton, these tribes used traditional method of separating the lint or Kymphad from the seed with a small wooden hand operated ginning tool called Dieng Tylliat (literally meaning grinding stick) is still practiced. The wooden gin consisted of two rollers set in an upright frame. This is made stable by a piece of wood projecting at the base, which is weighed down by the operator using the legs. The lower roller is connected to a handle; when this is turned the motion is transferred by the screw to the roller above, which rotates in a counter direction. The space left between the rollers can be adjusted by means of a wooden wedge forced between the horizontal frame bar and the rollers, and the fine fibres (lint) are carried through them to the other side while the seeds and impurities pass through and drop down (Fig.2.5). This cotton is carded on a bamboo mat where the weavers sit and used a Dieng Ryntieh (device shaped like a hunting-bow) to flick the cotton fiber\(^27\). The bow string is stuck rapidly over the cleaned cotton to vibrate
against the fibres and make them fluffy (Fig.2.6). Once the fibres are sufficiently fluffed up, the cottons are rolled to produce elongated tufts, which are then rotated and twisted on wooden spindle called Punshi (Fig.2.7) to produce a continuous thread which then gets spinned by hand so as the spun thread is rolled on the spindle. It is often weighted at either the bottom, middle, or top, commonly by a disc or spherical object called a Whorl, but many spindles exist that are not weighted by a whorl, but by thickening their shape towards the bottom. The spindle may also have a hook, groove, or notch at the top to guide the yarn. Spindles come in many different sizes and weights depending on the thickness of the yarn one desires to spin. It may be seen that the lengths of ordinary spindles vary from 27 to 38 cm, but the spindle whorls are remarkably uniform in diameter [ranging from 2 to 3 cm] and thickness [ranging from 1 to 1.5 cm]. The forms of the whorls are also all of one basic type, a section of a cylinder or cone. Neither spindles nor whorls are usually decorated, other than perhaps one or two lines incised around the whorl. No material other than wood is used for spindles or whorls. Cotton fibres of these regions are short stapled, therefore spun together to create a continuous yarn useful for plying and weaving. Mostly the elderly women are seen walking around the village with the cotton rolags and spinning them into yarns with Punshi.

Planting cotton in these regions has decreased remarkably since Mill spun cotton yarns have reached their village market, therefore hand spun cotton is slowly becoming rare.

**Ryndia** (Silk): Silk is a lustrous tough, elastic hydroscopic fiber that is produced by silkworms secreting fluids in the form of two filaments consisting of fibrin cemented by sericin into a single strand which is solidified in the air and is capable of being reeled from the cocoons. These silk moths 'Philosamia ricini' locally called Nienglong were gathered from wild and bred seasonally. Today, many women in these regions cultivate castor plants in their home gardens and keep regular breeding stocks of silkworms. Castor plant takes two to three years to grow, and the young trees are pruned and fertilized before the monsoon season when growth is rapid. They use to sell these silk to the weavers of Assam.
and Bangladesh. Silk found in these areas are mostly the Eri silk locally called Ksyai Ryndia. ‘Ksyai’ means Thread; ‘Ryndia literally means ‘Castor plant’. The name Eri is derived from the Assamese word 'Era', which means ‘Castor’ as the moth feeds on castor leaves. It can be spun evenly or unevenly coarse form or very fine counts which amplifies the elegance of silk, and provide comfort as cotton and warmth as wool but softer and finer. This silk is white or yellowish but its filaments are so exceedingly delicate that it is impractical to wind off the silk and therefore it is spun like cotton. It is darker and heavier compared to other silk from this region and also blends well with wool and cotton. The spinning of endi silk thread and weaving it into cloth is, however, a fairly considerable industry amongst the Khyrwang and Nongtung village of the Jaintia hills.

Silkworms breeding takes place during monsoon as new leaves add to the castor trees and this season correlates with the time where rice cultivation has been completed and thus could involve many women folk in the job. Initial stock is obtained by barter from those who have bred silk worms out of season; this can provide an important source of income for poor families. In the first cycle the moths are allowed to hatch, and males and female insects are placed together on rattan trays and left covered with a cotton cloth. Around seven days after breeding each female lays 250-350 eggs which hatch in about nine days into tiny caterpillars, referred to as silkworms. The worms are laid on circular bamboo trays called Prah, lined with paper, and feeding begins three days after hatching. The worms are fed three times a day on finely chopped castor leaves which women gather fresh from their gardens or from plots on the outskirts of the village. When castor leaves are gathered from a distant plot, they are wrapped in banana leaves to protect them from shriveling in the hot sun. Silkworms need shelter from the sun so a hut beside the main house is constructed for protection and rearing of worms; and skilled labour is also needed to maintain the necessary standards of hygiene and care. They fed chopped castor leaves in the early morning, at noon and in the early evening. Every day the paper lining on ‘Prah’ is cleaned and changed, and the worms graded and resorted by size on two new trays to allow room.
for growth. Silkworms are vulnerable to insect pests, especially parasitic wasps, flies and ants. To protect the worms from attack by ants and other crawling insects the rattan trays are stacked on wooden racks which are kept standing in water. To keep parasitic wasps and flies away the trays are covered with cotton cloths. Inside the huts where they are kept there is enough room to clean, grade and feed the worms. When the worms are ready to spin cocoons they stop eating and develop a transparent look, which is described as ‘ripe’. At this stage they are moved to large, circular, compartmentalized trays Prah which are about 5 ft. (1.5m) in diameter. The ripe worms attach themselves to the wall of a compartment by secreting a small droplet of gum. First the preliminary web, called floss, is spun, and this forms the foundation for the main filament. The whole process takes two to three days. When spinning stops, the cocoons are removed from the jaw and stored in a basket covered with a cloth to prevent from insect. Cocoons must be reeled within ten days before hatching into adult as the latter damaged the silk filaments. Any cocoons which are damaged or infested are rejected before reeling begins and some healthy cocoons are held back and allowed to hatch into moths to continue the breeding cycle. When a good supply of cocoons obtained for reeling, a small charcoal or wood fire is prepared. Some women prefer a long fire as they believe that it is easier to control the heat. A clay/metal pot known as Kshoo Sla Khor of water containing silk cocoons is placed over the fire and the water temperature kept just below boiling-point (Fig.2.8). The chrysalids (pupae) inside the cocoons provide a tasty snack for village children who stand and keep an eye open for the juiciest ones as it emerge from the cauldron. In some of these tribe villages silkworms provide an important source of protein for children and adults. To make a delicious dish the worms are ground to form a past and mixed with chili, garlic, salt and shallots, or they are roasted in banana leaves with herbs and spices. Any surplus worms are bartered in the village or sold in a local market.

**Spinning of Ryndia (Silk):** The shells of the cocoons are boiled in Kshoo Sla Khor. The cocoons are boiled with ashes from indigenous plants like yam leaves called Shriew or soda. The boiled cocoons are opened by hand, chrysalids removed, flattened and washed,
kneaded with hand (Fig.2.9), dried in the sun and then the threads are stacked in a stick before it is drawn and spun with help of a handmade tool called Punshi the Spindle Whorl\textsuperscript{38}.

A filament is drawn from the end of the roll and wound around the spindle, inside the groove. The spindle is strongly twirled with the fingers of the right hand, and the whorl acting to balance the spindle and prolong the spin. The base of the spindle often rests on the floor or upon some solid object but this is not essential. The eri silk filament is twisted into yarn, and, as it becomes yarn, is wound onto the spindle just above the whorl; the next section is wound into the groove, and this goes on. The fingers of the left hand may be used to guide the silk. An experienced spinner working with clean silk rapidly produces an unbroken length of yarn whose diameter is quite consistent(Fig.2.10) if the yarn breaks, the ends may be easily spliced by fluffing them out a bit, then spinning them together.

‘Pdem Rong U Ksyai’ (Dyeing)-Natural and Vegetable dyes are dyes or colorants derived from plants, insects or minerals. Majority of natural dyes are vegetable dyes from plant sources:- roots, berries, bark, leaves, and wood—and other organic sources such as fungi and lichens. Archaeologists have found evidence of textile dyeing dating back to the Neolithic period. In China, dyeing with plants, barks and insects has been traced back more than 5,000 years.\textsuperscript{39} typically, the dye material is put in a pot of water and then the textiles to be dyed are added to the pot, which is heated and stirred until the colour is transferred. Textile fiber may be dyed before spinning but most textiles are "yarn-dyed" or "piece-dyed" after weaving. Many natural dyes require the use of chemicals called mordants to bind the dye to the textile fibers; tannin from oak galls, salt, natural alum, vinegar, and ammonia from stale urine were used initially. Many mordants, and some dyes themselves, produce strong odors, and large-scale dye works were often isolated in their own districts\textsuperscript{40}.

Throughout history, people dye their textiles using locally available materials, however dyes were also obtained from insects and these products were brilliant and permanent
colours such as the natural Tyrian purple and crimson kermes, and became highly prized luxury items in the ancient and medieval world and also hard to find. Plant-based dyes such as woad (Isatis tinctoria), indigo, saffron, and madder were raised commercially and were important trade goods in the economies of Asia and Europe. Across Asia and Africa, patterned fabrics were produced using resist dyeing techniques to control the absorption of colour in piece-dyed cloth.

Plants and shrubs used for extracting dyes were obtained from the forest and now harvested locally in the gardens. In rural areas natural dyes are the only process followed to colour the cotton and silk yarns. The art of natural dyes has been practiced in mostly all weavers’ houses but have slowly started dying as the process of using the natural dyes and mordants was never taught to their generations. The elders can identify the trees and shrubs in the forest which were the source of dyes as they involved directly in preserving nature.

In villages where natural dyes are still in used an area compound of the house is set aside for preparing dye baths, and the raw ingredients and utensils are kept. Stone are placed to form triangle in a small area forming a fire place, wood are burned to heat a dye bath. Dyes ingredients are mixed in earthen pots which are now replaced by metal vessels. The recipes are difficult to record accurately because the dyers do not use a weighing scale but estimate the size of the yarns in relation to the volume of unprocessed dye ingredients. The dye ingredients are either soaked or boiled until the colour is extracted. Then the acid or alkali plant ingredients are added, interestingly at times even boiled with the dye ingredients. The yarns are dipped into this solution and kept till the dyers feel the colour is properly been absorbed into to fiber. If the colour is seem to be light than required the yarns are dyed again. Experienced dyers know when the dye is correctly balanced. Dyeing is like cooking for them as each one of them has their own recipe of preparing the dye bath. Mostly the same dyes are used for silk and cotton. Mordants are substances used to fix dyes. Today chemical dyes threads are easily available in the markets. The weavers say that
weaving with these threads can make their woven product cheaper, as the one dyed and woven by them are time taking therefore; they have to sell it at a higher price.

In the past a vast range of trees, plants, shrubs and raw iron ore locally found were used for dyes and mordants, but today only the elderly women can identify them\textsuperscript{44}. Younger generation is now keener on going for higher education and getting a better job. The art of spinning, dyeing, weaving are taking a back seat as cheap mill made cloth are available in remote village markets. With growing population the pressure on land for cash-crops, many woodland and shrub areas have been cleared and the habitat for dye plants has been lost. It is likely that the elderly women in the villages of the Khasi and Jaintia hills be the last generation to know the art of natural dyes. However, with the coming of awareness of globalization and the harm chemical dyes have caused be it the human health or the environment, there is an increase appreciation in hand-spun, vegetable-dyed fabrics in the world market, there is increase optimisms that this art will be preserved and not be completely lost. Dyes generally practiced by these tribes are red, yellow, black and very little green. The dye process is a tedious job because each process is repeated many times so that the colour dyed does not fade easily. The dye bath is boiled when it comes to dye the endi silk, but when it comes to the cotton yarns the dye solution is not boiled. Even if the dye solution is boiled then it is left to cool before the cotton yarn is dipped.

**Rong Saw** (Red Dye): Red colour comes from Lac locally called Laha, it is a deep red colorant extracted from the crude shellac resin excreted by the lac insect, Lakshadina chinensis, Laccifer (Tachardia) lacca (formerly Coccus lacca), indigenous to Southeast Asia. The female insect deposits the resin along the rain-tree branches (Albizia Saman). The lac insect is most often found on banyan trees (Fig.2.11) (Ficus benghalensis, or F. indica) and on juniper trees (Rhamnus jujuba). The dye develops in a resinous cocoon, known as "sticklac" (Fig.2.12) on the twigs of over 160 host trees in an arc from northern India through to Southeast Asia. The dyestuff is obtained by aqueous extraction of sticklac; a byproduct of shellac production. The operation involves crushing the sticklac and
extraction several times with water; insects and other debris are removed also at this stage. The dyestuff is obtained as a precipitate on acidification of the aqueous extract (Fig.2.13). The resinous residue is further processed to "seedlac" and then to the fully-refined "shellac." This then sold in the market. To harvest the resin the women use long stick to dislodge the deposits\textsuperscript{45}.

The process of dyeing this red colour is also simple. They crush the sticklac and extract it by boiled it in water, in which locally found as well as planted leaves Ka lapyndong (symlocus racemosa) or Ka larnong (morinda tinctoria)(Fig.2.14) which is acetic are added, the Endi silk thread is added to this boiled solution. The silk yarns are left in this solution for few hours before they are dried and used for weaving. If the colour seems light they repeat the process and dip the threads in the solution again three to four times so that the fiber absorbs the colour and does not fade fast (Fig.2.15).

For the cotton yarns leaves of Latyrngei or Sesame leaves (Sesamum indicum), bark of Rnong tree is mixed in water with ashes of wood (alkali) from the fire place\textsuperscript{46}. The dye bath is cold and is not boiled. The cotton threads is dipped in this solution and rinsed before they are dried in the sun. This red dye is very common and extensively used in all the Khasi and Jaintia villages where weaving is done. This colour plays a vital role in their traditional costumes especially worn by the women both these tribes.

‘Rong Stem’ (Yellow Dye): Yellow dye is made from raw Turmeric (Curcuma longa) locally known as ‘Synrai’ (Fig.2.16). The root of the turmeric plant is crushed to. All information’s were photo documented during field work by research scholar.( 2006-2011).powder and mixed with water to form a paste and with it they mix bark of a tree locally known Dieng Rnong and Dieng Stong Shynrang, leaves of Sla Pyngdong. This solution boiled with the silk threads and stirred frequently to ensure the fiber absorbs the dye evenly (Fig.2.17). This process is repeated three to four times\textsuperscript{47}. This way the fiber is seen to never fade very fast.
Whereas, the cotton, the turmeric and bark of Dieng Rnong as well as ashes from the fire placed are mixed in water, in which the thread is soaked. The solution is not boiled. So the threads are soaked till the desired yellow colour is achieved. Turmeric is grown extensively in these regions and is one of the export products from this region\textsuperscript{48}; therefore, yellow played a vital role in their traditional costumes.

‘\textit{Rong Long}’ (Black Dye): The black colour derives from Eit nar or iron-ore which is found in abundance in these regions again. With it, they mix leaves of plant Sohtung and Nuli. Bark of Khlieh pyrthat is also used. All these leaves and bark are mixed with the powdered iron-ore in a hot water\textsuperscript{49}. The silk yarn is boiled with this solution. This process is repeated three to four times so that it gets properly absorbed into the fibre and does not fade easily.

The cotton yarn for black dye is leaves of Nuli plant with ashes from the fire wood is mixed together and the yarn is dipped in this solution. This solution does not need to be boiled but it’s a cold dye bath. The threads are soaked as long as the desired colour is obtained\textsuperscript{50}.

‘\textit{Rong Jyrngam}’ (Green Dye): For green colour betel leaf vines\textsuperscript{51} were used. The silk yarn is boiled with the vines till the need green colour is achieved. The yarn is dried and then used for weaving. The dye bath is cold in case of cotton that is the vines are boiled and left to cool before immersing the yarn. Jngum’ or ‘Rong Bneng’ (Indigo Dye): Indigo is a natural dye extracted from the stems and leaves of the Indigofera Tinctoria and Indigofera Anil plants locally called Deingsoh\textsuperscript{52}. This stem and leaves are pounded together. Water and ashes of wood are added into the mixture. The solution is ready to dye the yarns, as mentioned earlier for silk it is immersed hot solution, whereas, cold dye bath in case of cotton. The yarns are later besmeared in an amla fruit or Indian goose berry called Soh Mylleng \textsuperscript{53} which has been soaked in water for a week. The yarns are later dried in the sun. This colour is not preferred in cloth worn but seen only on the belts used by the women of Bhoi region people for tying the lungi at the waist.
After dyeing all yarns are generally dipped into Um Ja or rice boiled water. The process stiffens the yarn and strengthens it after it goes through the rigorous dye solution. The yarn is also strong to go through the warping process.

There are only few dyers who know the art of dyeing as lack of proper documentation, it’s getting difficult to know the natural dyes processes. As well as the knowledge of which plants, shrubs, etc. were used are known by elder of these tribes and the younger generations are keen in getting the chemical dyed threads of different shades. The chemical dyed yarns are available in cheap price in the village market. This is one reason why these vegetables and natural dyes lost its importance. The cloth woven using these chemical dyed threads is cheap compared to the naturally dyed cloth.

**Loom and weaving techniques**

According to the dictionary, a loom is a machine or device from which a textile is produce by interweaving thread or yarn at right angles. Weaving is the method of making cloth from threads by means of interlacing. Since time immemorial, people have learnt the art of weaving to make clothes for wearing to cover nakedness. As the technique improved, styles and designs took shape. With the development of science and technology, dyes were used to give varied colour and texture to the cloth woven by hand. For about 30,000 years ago, cave people were quite innovative and used different materials to weave baskets and containers for their daily use. They used straw, stalks of reed, cane, etc, which were available in their neighborhood. They improved the technique in the course of years and went on to make cloth for clothing in a similar manner. With modification from time to time, they developed a device called loom.

Weaving like spinning and dyeing is exclusive monopoly of women in this region. When the agricultural job is all done women in the Khasi and Jaintia hills are seen setting their
looms. There is no special place for setting up the looms instead it is laid on the bare earth which extends on throughout the compound. They set it outside in the compound depending on the weather if it is very cold or raining the loom is seen on the veranda or shaded space in front of their house. Women work at their looms intermittently between household chores and farm labors. Even when agricultural works are less yet them have the kitchen gardens work to take care of as well as chicken and pigs to feed, the household to run and possibly the rearing of silk worms. The loom can easily be set up in and corner of the house as well as easily rolled up if heavy rain falls. Therefore, they still used the ground loom and back strap loom, not any other modernized loom as seen adopted by other tribes. Only in some Khasi and Jaintia districts Weaver’s Service Centers have set up a weaving unit where the throw shuttle loom has been placed. The interested weavers can come to learn how to weave in these looms. To encourage the weavers to come and learn, incentives are paid to them. After learning whenever they are free from daily chores be it house-hold or agricultural works, they are encouraged to come and weave in these looms without spending on the threads but get paid for just woven cloth depending on the length.

**Kor Thain Jain** (Ground Loom)-The origin of the ground loom is unclear, but it is the ancestor of the modern counterbalance loom. It has an advantage over the back strap loom as in the ground loom the body of the weaver is not strapped to the loom. This loom also has treadles so heddles can be made for the warp threads as needed to get a design. The heddles are suspended from two shafts, which could be raised or lowered alternately to change the shed. Snat Seith or Bamboo reeds keep the horizontal spacing of the warp threads proper and not get entangled. The ground loom has fixed support on both ends of the warp, thus freeing the weaver physically from the loom (Fig.2.18). The weaver sits in front of the loom and weaves. The heddles for basic plain weave is divided into two groups and suspended from two shafts that could be raised or lowered alternately to change the shed. The harness is made by placing two bamboos on the side of the warp threads, just at hand reach of the weaver (Fig.2.19).
The wooden warp beam at the end of the loom holds the warp threads and the wooden beam set in front of the weaver not only keeps the warp thread in position but is the cloth beam where the woven cloth is wrapped into (Fig. 2. 20). The weft thread is wrapped into a bamboo stick and inserted in a bamboo spool which passes between the gaps of the two warp threads. A smooth flat stick called a batten or sword is placed between the warp threads to widen the gap so that the weft threads can be passed through. The bamboo reed is dragged forward besides keeping the warp threads in proper position it also acts as a beater stick to pack the weft threads into position.

These tribes in the Khasi hills have a local term for all the parts of the ground loom. They structure of the loom is generally made of bamboo and wood from palm or betel nut tree which gets glossy and stronger as time passes with frequent use. They are described below:-

Myrlon or wooden beams on which warp thread are placed. Myrlon Trai is the wood that holds the warp threads to the cloth beam which is a thick wood piece of nearly 4inches in diameter on which the woven cloth wrapped this is generally placed in front of the weaver. Myrlon Khlieh consists of two wooden pieces; one wood that holds the warp threads and the other holds that whole warp thread wood in position. Dieng Luwi is a stick used to wrap the threads to keep the warp threads in straight position. U Sdang or heddles is a stick that holds on the thread which forms a shed in warp so that the weft threads can pass. Myrlon Luwi this holds the Sdang to the roof or to a stand so the weaver can pull the wrap threads that also acts as one of the heddle. Ka Shier the stick with both ends pointed to hold the selvage of the cloth in position. Ka Snad this is a bamboo reed made according to the thickness of the hand spun yarn. Ka Wait literally meaning Sword this is made by a wood cut from a betalnut tree or palm tree which is believed to be strong and with time it becomes smoother to use. It is tapered at one edge. Ka Saphum this act as the second heddle to complete a weaving where two division is required in a warp for getting a simple plain weave cloth. Dieng Long and Ktang Ksai (Fig.2.21) these are the Bobbin or shuttle-stick to
hold the weft thread and container of keeping the Bobbin or shuttle-stick so that it passes
the warp threads easily.\(^{60}\)

The name of the different part of the Kor Thain Jain \(^{61}\) or ground loom differs from village
to village where weaving are done in the Khasi and Jaintia hills. The above names are from
the Bhoi village in the West Khasi hills. The advantages of the weaving done in ground
loom are that various sizes of looms are made depending on the textile made. The Weaving
pattern is composed of two sets of elements both essentially parallel and interworked,
crossing each other at more or less right angles. The variations of a textile structure are
affected by the numerical order of arranging the various colour threads used for the warp
and weft used during interlacing. The simplest numerical order is over one and less than
one interworking producing a plain weave, which is each weft, passes alternately under and
over each successive warp end. The ground loom used by these tribes has the most basic
device to form the shed for a plain weave is a shed stick called Ka Wait and a heddle called
Ka Saphum. The shed stick is placed between the alternate warp ends which have been
separated, one from another, during the warping. It is either round that is a section of a
bamboo stem or flat. With a round shed stick the shed is visible all the time. With a flat
shed stick, the shed will be visible only when it is put on edge. The second or counter shed
is required for the second passage of the weft in a plain weave, is obtained by a heddle.
This is made by using extra threads to picking up with a loop over a stick, or a heddle
bamboo each second warp end. When the heddle stick or bamboo is lifted, the warp ends
caught in the loops are lifted also and the counter shed is opened. Shed stick and heddle rod
are thus worked alternately to obtain shed and counter shed. The ground loom is the
primitive loom invented by man to create textile which has been improvised with the
development of technology. But till date the interior villages in the Khasi and Jaintia hills
used this primitive loom instead of the new improved looms because this regions get a lot
of rainfall during monsoon season so as mentioned earlier. The ground loom can be easily
rolled and kept as well as shifted to different locations if required. Therefore the basic idea
of stretching the warp threads between two beams can be found in most of the weaving villages in the Khasi and Jaintia hills.\(^{62}\)

**Design Patterns:** The design pattern woven by these tribes are mostly on plain weave. The most common and tightest of basic weave structures in which the filling threads pass over and under successive warp threads and repeat the same pattern with alternate threads in the following row, also known as taffeta weave a basic style of weave in which the weft and warp threads intertwine alternately to produce a checkerboard effect.

The check board effect is got by arranging different natural dyed threads. Like the traditional shawl worn by the women of these tribes is a combination of red and yellow endi yarns (Fig.2.22). The Jain Khyrwang (Fig.2.23) cotton cloth worn by women of these tribes as wrapper or Lungi on the waist covering the lower portion of the body is mostly a stripes of white and red, or red and black, or white and black. Even checks (Fig.2.24) of the mentioned colours are seen to be woven. The cotton cloth used for carrying a baby called Jain It\(^{63}\) (Fig.2.25) is woven in plain weave and white in colour only rib pattern of white or red colour is seen few inches before the ends of the cloth. This cloth is given by the mother-in-law to the daughter-in-law on the birth of a child. The white colour rib pattern cloth is given on birth of a first child where as the other colour rib pattern cloth only on birth of second child but never earlier. The traditional shawl worn by the men of these tribes are white that is of endi threads not dyed at all. Jain Kyrshah (Fig.2.26) the apron worn daily by the women of these tribes is checked cotton cloth of and colour combinations.

Extra warp design patterns are woven in Bhoi region on the cotton or endi cloth used as belts used in their traditional attire. The design pattern is a diamond shape called Khmat Shrieh (literally meaning monkey eye)\(^{64}\) (Fig.2.27).

Now days the design patterns in clothes worn daily have widened as the mill made cloths have reached interior markets. They use unstitched cloth more as that is easier to shape it as
they wear. So the traditionally worn cloth has been replaced by printed material. Though
they wear it in their traditional way yet there is a drawback for the local weavers who find it
difficult to get a market and to compete with the low priced mill made cloths\textsuperscript{65}. 
References:


24) Ibid.Pg.425

25) As observed during the field work.


27) As seen in pictures collected from museum.

28) As seen in figures provided in the thesis collected during field work.

29) As Informed by the weavers of these tribes.


33) Ibid.Pg.425.

34) As informed by the rearing of Silk worms of these tribes.

35) As in formed by the Villagers of these Tribes where these worms are reared.


37) As seen during the stay of the scholar with these weavers.

38) As explained and observed during field work


40) As informed by the dyers of these tribes.

41) As explained by the weavers and dyers of these tribes. 42 As observed during the field work.

42) As observed during the field work.

43) As explained by the Dyers of these tribes.

44) As explained by the Elders of these tribes, because their children are not keen in learning this art.
45) As explained by the dyers to the scholar during the field work.
46) As explained by the dyers of these tribes met during the field work of the scholar.
48) As explained by the dyers of these tribes met during the field work of the scholar.
49) As explained by the dyers of these tribes.
51) Ibid. p.425.
52) As explained by the dyers of these tribes to the scholar during the field trip to these regions.
53) As explained by the dyers of these tribes to the scholar during the field trip to these regions.
54) As observed by the Scholar during the field work.
55) As explained by the weavers of these tribes during the field work of the scholar.
56) Ibid.
57) Proof of ground loom used by these tribes is as seen practically during field work. Not the back strap looms as generalized in many books.
58) As explained by the Weavers of these tribes during the field work.
59) As explained by the Weavers of these tribes during the field work.
60) As explained by the Weavers of these tribes during the field work.
61) Ibid.
62) As explained by the Weavers of these tribes.
63) As explained by the weavers of these tribes to the scholar during the field work to these regions.
64) Ibid.
65) As explained by the Elders Tribes of these regions.
Fig. 2.1  Silk moth reared at home in Khasi and Jaintia hills.
Fig 2.3. Cotton plants

Fig 2.4. Different colour check patterns of Shawals worn by Khasi and Jaintia women.

Fig 2.5. Khasi woman separate the cotton from the seed or ginning of cotton on a wooden roller operated by hand. (Don Bosco Museum)
Fig.-2/6  Khasi Woman beating the cotton to separate the lints using a bow and a stick. (Don Bosco Museum)

Fig.-2/7  The Endi yarn wound into a spoolde.

Fig.-2/8  The Endi cocoon after it is boiled.

Fig.-2/9  The Endi cocoon before drying it is thoroughly washed.
Fig. 2.10  Khasi women spinning the Endi thread from the cocoon.

Fig. 2.11  The tree on which lac is found.

Fig. 2.12  The collected lac.

Fig. 2.13  The Endi threads after it is dyed.
Fig. 2.14 The local leaves added to the lac for getting red colour.

Fig. 2.15 The Endi threads dyed in lac.

Fig. 2.16 Turmeric or Curcuma Longa a rhizomatous herbaceous perennial plant, grounded and used for dyeing.

Fig. 2.17 Endi silk or Ailanthus Silk Moth, refers to the host plant; after it is dyed in turmeric.
Fig. 2.18 Khasi women weaving on the ground loom placed indoor.

Fig. 2.19 Ground loom seen in Africa also similar to the one still used in Khasi and Jaintia hills. (The Art of African Textiles)

Fig. 2.20 A Khasi woman working on a ground loom placed outdoor on a mat.
Fig. 2.21  Ktang Kaai and Dineg Longts a bobbin made of bamboo used to pass the weft between the warp threads.

Fig. 2.22

Jain Kup (Shival) yellow and red checks shival used by Khasi and Jaintia women. Yellow dyed Turmeric; Red dyed-lac (Laha).
Fig 2.23  Tholi Saru (Strip of Black and white) wrapper made with cotton yarn and natural dyed Black cotton yarn worn by Jaintia women.
Fig-2.24  Thoh Saru (literally meaning checks of Black and White) wrapper worn by Jaintia women in festivals.
Fig. 2.25 Jain It, a cotton used for carrying a child on the back.

Fig. 2.26 Jain Kyrenah, a cloth worn as an apron across the upper part of the body by women of these tribes.

Fig. 2.27 Detail of a design seen on the cotton cloth used as belts to tie the wrapper by a Bhoi Khasi woman.