Abstract—As you go closer to nature, you get a divine feeling. That is what anyone experience in a green hill station like Nilgiris in South India. Evolution of civilized man brought across many ideas through his incessant, tedious discoveries on creating a comfortable shelter. Every traditional human habitat belongs to a particular region which is influenced by physio-geographic factors like physiography, geological structure, forest cover, climatic conditions, soil properties etc.

This paper looks into the constructional details as well as every other intricate factors regarding Toda architecture which belong to a minority group of people called Toda living in and around Ooty, Tamil Nadu. If a Toda is contended to live in his hut, perhaps a person living in metros would find joy in spending holidays in such dwellings which adapts completely with the microclimate of the region. The author tries to give certain primary modifications for the better design patterns of these Toda huts without losing its original qualities and grace.

Keywords—Alternative Construction Technique, Climate Responsive Architecture, Primitive Settlements, Toda Architecture.

I. INTRODUCTION

TODA is a religion; the people of which are also called Toda. In the year 1950, under Article 342 of the constitution, the President of India notified some communities of primitive traits as Scheduled Tribes in which Toda population fall, though they have a prestigious heritage.

Originally, only communities called Todas, Badagas and Kotas lived in the high altitude of Nilgiris, harmoniously. The occupation of Todas was dairy farming who depended on Badagas for agricultural products and Kotas for metal tools and ornaments, as [1]. Toda women are engaged in making their traditional attire.

External migrants did not intrude the pristine Nilgiris until 1822, when Sullivan, who was then the Collector of Coimbatore, built a bungalow at Doddabetta, highest peak in Nilgiris. Later other British followed him to set up their roots on Badagas for agricultural products and Kotas for metal tools and ornaments, as [1]. Toda women are engaged in making their traditional attire.

The summer in Nilgiris begins in March and peaks in April-May. By June monsoon starts and by November winter begins. The district receives both southwest and northeast monsoons. Normal annual rainfall is around 1920 mm. Humidity goes upto 90% in the afternoon. Daytime temperature ranges from 22.1°C in summer to 5.1°C in winter. Sometimes the night temperature in winter falls to 0°C. Pre monsoon depth to ground water level varies from 1.2 m to 17.2 m, as [2].

Toda Settlements consist of few semi barrel shaped huts, such similar shaped dairy temples, sometimes a circular temple with conical roof, fenced off open shed for buffaloes, rectangular sheds for calves etc. Case studies were carried out at Munjakal mund, Thalpathery Mund and Cogere Mund.

These structures, though specially suited for the place, aesthetically and functionally; some minor modifications have to be incorporated so as to meet the present day human needs and comfort.

II. TODA ARCHITECTURE

A. Toda Settlement

Through a questionnaire survey conducted among the community author could understand that there are 14 villages and 60 sub villages for Todas in Nilgiris. Also there are only...
around 1800 Toda people living in these villages. The main occupation of Toda men is dairy farming. They grow mainly buffaloes. Toda women are engaged in making their traditional embroidery called *puttukuli*. They make crimson and black designs on homespun off-white cloth. There are varieties of styles for designs and are typical of Todas (Fig. 2). But this must have been in practice introduced in the later years because the picture as shown in the book of Ilay Cooper gives a strong feeling that the people previously wore plain white cloth with small lines at the ends, as [3].

![Fig. 2 Toda Women worn in *puttukuli* shawl](image)

Soil structure is such that the heavy rains seep down immediately when it falls on the ground. Surface drainage is also well thought of while planning. People of the *mund* originally depended for water on the nearby water body. But these days they have water supply given by the Government. Presently all the *munds* have availed electricity connection. They even have television in their homes. Previously they used oil lamps (Fig. 3) for light.

![Fig. 3. Traditional oil lamp of Toda](image)

In ancient times communities like Todas, Badagas, Kotas, Irulas, Kurumbas, and Kattunayakkans lived very happily helping each other. But now most of the population in the region are migrants from all over India settled here this past century. Now Ooty is a primary destination of tourists. The large number of tourists and other development programs in the locality brought a lot of changes in the lifestyle of Toda. Today Toda people have also become the main attraction for the tourists.

The settlements of Toda do not have any enclosed barrier of gate or fence, but the units of the settlement are just dispersed in the surroundings of the glorious landscape of Nilgiris. Many of these settlements in this hill station have deteriorated now. Every settlement is called *mund* which means village. Every *mund* consists of dwelling huts, fenced off circular open ground for buffaloes, sheds for calves and a temple.

Todas believe that buffaloes are the supreme power and their temples are meant to worship the buffaloes. Among their buffalo herds some are kept as sacred buffaloes and their milk is used only for the service in the temple.

During summer, women collect firewood from nearby woods and preserve in the cattle sheds. The neighboring forest have a wide variety of species of flora and fauna. Animals like elephants, tiger, bison and all live here. Toda people lived peacefully adjusting with nature.

**B. Dwelling Unit**

Dwelling unit or hut is called *arsh*. These everywhere have almost the same internal layout though the overall dimension vary a little. The construction method is very meticulous but simple. The *arsh* have a curvilinear roof starting from the ground to top and a rectangular plan. This resembles the top of an elephant in shape.

These are east facing structures. The total width of a huts which the author visited is having a width of around 4.2 m., height 3.3 m. and depth ranging from 4.5 m to 6.3m. The arch shape is maintained by the two opposite walls on either end of the hut with wooden planks erected in ground, fixed with mud mortar (Fig. 4).

On top of these wooden walls, right in the center there will be a strong pole of around 12 cm. diameter running along the depth of the structure. Thinner and strong poles of wood goes parallel to it at intervals; seven to eleven numbers on either of the arch (Fig. 5). The air gap between the roofing on its top and wall below are filled with mud plaster later (also sometimes with buffalo dung).

![Fig. 4. *Arsh* of Toda (55 year old) at Cogere mund](image)
On top of these wooden poles, bunches of thin bamboos which are tied together, circular in cross section are placed in arcuated shape at around 30 Cm. interval; meeting at top from either side which on the other end is inserted one foot deep inside the ground. On top of this ribcage, many thin round wooden sticks are tied close to each other which extend across the roof (Fig. 6). For tying, Todas use only spiral of cane or bamboo splits. The roof projection on either side of the wall is 60 Cm.

At both the extreme edges, the members forming the ribcage is tied around with grass called ‘Ovul’ (Eriochrysis genus) using bamboo splits very tightly, as [4]. This gives an elegant look to the structure. The last part is the roofing with the same grass used in a beautiful style. These grass is cut into 30 Cm. length and are tied in bunches which is ultimately tied under thin bamboo poles which again is running across the depth of the structure (Fig. 7). These bamboo poles containing grass on it are tied starting from below near the ground and by overlapping at least half length of grass underneath it.

At the topmost edge on the roof the same grass is stacked, almost 30 cm. thickness which is held tight on either end by three carved out wooden sticks erected at the edges. Two three strong wooden poles are placed on of these stacked grass as shown in figure 5. This grass roofing is replaced by the new ones after every 15 years.

For openings these huts have only a single wooden door in the front, of dimension 60 Cm. x 75 Cm. hinged on a rectangular wooden frame (Fig. 8). The bottom rail of the frame is either fully or half sunk into the floor. The door might have made this tiny in order to give protection from weather as well as sudden attack of wild animals. The floor level is just raised some 15-20 Cm. from the ground. The flooring is usually smoothened mud mortar often smeared with buffalo dung.

Right on top of the door, inside of the hut on the wall, there is a metal stand to place the oil lamp in the olden times (Fig. 9). For windows, there are two tiny openings either rectangular or circular in shape on either side of the door some 90 cm. above the top of the door. These have wooden shutters fixed from inside the hut. Centuries ago it used to snow in Nilgiris. But these days to adapt with the present climate, modifications have to be given for ventilation.

These dwelling units have a raised platform 45 Cm. high on right side for sleeping as you enter by creeping through the small door inside. At the other end of the door is the cooking area where fuel used is firewood (Fig. 10). There is no separate chimney for the outlet of smoke!
C. Temple Structures

All temples face west side. The temples are of two types. The temples called paluvarsh have the same shape with slight differences. For this there are two rooms separated by similar arch shaped wall inside the structure. These temples have stone walls instead of wooden one. Also the wall in the front façade is decorated with dark engravings of shapes of stars, moon, flowers, and mainly buffalo heads as shown in the figure 5. One more difference here is that the door is even more small as 45 Cm x 60 Cm. (Fig. 11).

Fig.11. Front façade of paluvarsh

The author noticed two rectangular openings on the rear wall of the temple. This must be giving ventilation to the room on the rear side (Fig. 12).

Fig.12. Rear view of the paluvarsh

Only one priest will be present in the temple. While the ceremonies take place inside the temple, others have to sit outside the structure on a stone chair which is also beautifully built in stone (Fig. 13).

Fig.13. Stone chairs on the raised ground outside the temple

The other type of temple called poovarsh are cylindrical with long conical roof. This is considered more sacred than paluvarsh as the main festivals of Toda are conducted here. Only a few munds have this type, poovarsh, attached to it. The entry of people other than the priest is restricted in its surroundings. So author found it difficult to learn about the construction details of it.

The structure looks like having a diameter of around 3 m. and height almost 10 m. Material for the wall is granite stone and roofing materials remain the same as that of arsh(Fig. 14).

Fig.14. Poovarsh at Thalpatheri mund

D. Buffalo pen

A circular open ground which is fenced off with stone retaining wall is attached with Munjkkal mund to shelter the buffaloes (Fig. 15). This is called thoovarsh.
E. Shed for Calves

There are a few rectangular cattle sheds with sloping roof which are called kodarsh (Fig.16). These days Todas raise cows also.

III. SUGGESTIONS FOR MODIFICATION IN DESIGN

It can be suggested that the structure of arsh should not be enlarged in size because if it is done so, the whole scale and the beauty will be lost. Even then the structure should be given two rooms, one for sleeping and the other for cooking. The separating wall in the middle should be having only a single door to enter to the kitchen.

The air velocity of wind is more at a higher level than it is at just above the surface of the ground. For this reason perhaps it would be ideal to provide the same door at a height of 45 Cm. above the floor level. One can enter turning sideways and bending down the head a little, as [5].

Of course one more similar door has to be given for the wall on the other extreme end. The circular holes instead of two in number, can be made three or four altogether on one wall.

Thus if separate room is given for kitchen the smoke will escape out through the openings on the wall on the other end.

Toilet can be given in a separate structure of similar shape.

Ooty as such is known for its natural beauty. But to enhance and enjoy this beauty more landscape elements should be incorporated. One element is definitely the granite stone chairs of typical Toda style. Another glorified addition would be fence all around made of bamboo poles fitted with an electrical light of antique design which can be no doubt their oil lamp pattern.

More flowering plants in the surroundings will give a lively appearance. People should be also encouraged to grow these local materials in the region for easy availability of these for future use.

IV. CONCLUSION

These types of structures are extremely energy efficient, nonpolluting and durable which should not be wiped off in the urge of quest of modernism.

Toda people have to be encouraged to practice and cherish whatever they have as traditional.

Technical expertise has to be involved in further research of these construction technique.

Ministry of tourism, Government of India which is focusing more into Ecotourism, Homestay etc. can look into incorporating the design of Toda settlements.

Organizations like Ministry of Tribal Affairs, Government of India, State Bank of India, Udthagamandalam [6] etc. have to strengthen their helping hand towards more development of these settlements of Toda.

Even the private organizations in the region like Avalanche Eco-development Committee have to concentrate on protecting the tribal from being exploited in the name of tourism.

As the Toda community was the primitive offspring of the forests, it is a disheartening fact that the rules and byelaws enacted by the Ministry of Forest Department, Government of India are restricting their freedom in being one with the forest.

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