

Investigation of Settlement Pattern and Dwelling System of the Tea Workers' Community in Chittagong Region, Bangladesh

Nusrat Jannat

Department of Architecture, Chittagong University of Engineering & Technology, Chittagong-4349, Bangladesh

Abstract— As a developing country Bangladesh plays an important role in tea production in the world. The tea industry helps economic development of the country through export earnings. Being an agro-based activity, tea industry is primarily labour oriented where vast numbers of tea workers are engaged in growing, cultivating and plucking tea plants. The tea labourers who are an integral part of the industry were brought by the British companies from different states of India about 150 years back. These ethnic communities have their own indigenous culture, historical background and lifestyle, which are manifested in their significant housing and settlement pattern. The tea workers' housing which is called the 'Labor lines' is built by themselves according to the British system. The workers' original settlement pattern and British imposed system originated a new type of settlement. The objective of this study is to identify current settlement pattern characteristics of tea workers' community in Chittagong region, Bangladesh. The method used in this study is descriptive explorative, based on information collected from tea estates of Chittagong. The study focuses on the impacts of imposed built-form construction policies on traditional community living and lifestyle of tea estate workers.

Index Terms— Dwelling characteristics, Labour line, Settlement pattern, Tea workers' community.

I. INTRODUCTION

Due to globalization and economic liberalization the growth of tea industry increases around the world. Bangladesh is one of the important tea producing countries in the world which contributes around 2% of the world tea production [1]. The first tea industry of Bangladesh was established by the British company in 1840 at Kodala in Chittagong region because of its suitable physiographic and climatic conditions for tea production [2]. After that in 1857 commercial cultivation was started at Mulnicherra Estate in Sylhet [2]. At present there are 172 tea gardens in the country among them 24 are situated in Chittagong (Bangladesh Tea Board). The tea estates in Chittagong are classified into three categories according to their production capacity: A (producing an average 113000 kgs/annum or more), B (producing on average 45000-113000 kgs/annum) and C (producing on average less than 45000 kgs/annum) [3]. Tea industry directly engages around one lack twenty thousand poor people where 50% of them are women [4].

Initially to establish a tea industry it needs hard work like cleaning jungle, planting trees. Local people were not

interested to involve themselves in the garden work. For this reason, with the help of British colonial government the British companies brought a huge number of poor labourers from famine areas of Assam, Bihar, Odisha, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, West Bengal and other places of India to work in the tea gardens. Among them majority are from lower-caste tribal or Hindu communities. In tea estate these ethnic communities got new identity, "Coolie" [5]. The British applied an effective "Divide and Rule Strategy" on the tea estates in order to rule the workers. They placed heterogeneous work force in same tea garden to avoid formation of any kind of organization to win their right [6].

The British provided a distinct housing pattern called "Coolie line" or "Labour line" to accommodate the workers within the boundary of the tea garden (Fig. 1). In the labour lines the rooms are arranged linearly and generally the size of the room is 7'x14'. Life in the labour line is miserable due to insufficient water sources, unhygienic sanitation, poor education and medical facilities and so on. The daily wage including other allowance earned by a worker is still negligible. Moreover being socially isolated by the local people most of them pass captive life in the tea estate. Within this socio-economic exclusion and unsatisfactory living conditions the workers try to maintain their own tradition, culture and religion.

Based on the above background the study aims to identify the characteristics of settlement pattern of tea workers' community in Chittagong region, Bangladesh. The study is conducted based on two types of data i.e., primary data and secondary data. Primary data are collected by physical survey among the tea gardens of the Chittagong region. A structured questionnaire is used to collect data. On the other hand, the secondary data are collected from the newspaper, published documents and reports.



Fig. 1 Labour line in Chandpur Tea Estate, Chittagong

II. ECONOMIC CONDITION

The tea industry of Bangladesh is one of the major sources of income for national economy through export earnings and employment generation. About 3.3% of the total employment of the country is directly or indirectly related to the tea industry [7]. A huge number of women are directly engaged with this sector due to a popular belief that they can pluck tea leaves more efficiently than men because of their nimble fingers. On the other hand men are involved in tree plantation, jungle cleaning and other factory works [8]. The productivity of the workers also depends on their age and experience. Generally a worker having over 20 years experience is considered as a good plucker [9]. In tea estate two types of worker are seen, i.e., permanent worker and temporary or seasonal worker. The permanent workers get better facilities than other workers. The working hours of leaf pickers are roughly 9 hours with an hour lunch break starting from 8am in the morning and finishing at 5pm in the noon. In most of the tea estates Sunday is the weekly holiday keeping the British influence on the timetable. The wages of the tea workers are still very low compared to the rural urban workers in the country. Many factors are related to the earnings of the workers such as skill, health, working hours, category of the estate, working seasons, type of the workers etc. Most of the workers are paid on daily basis and some of them are paid a fixed amount of money monthly. Sometimes temporary workers earn money depending on how many kilograms of green leaf they pick. Besides the daily wage they also get other allowances like risk allowance, attendance incentive, provident fund, leave benefits etc. At present basic wage for a permanent worker in A category tea estate in Chittagong district is Tk.138 per day and for B and C it is Tk. 69 per day. Workers can also get double payment by working overtime. Moreover the permanent workers get rations (rice or wheat) weekly. Besides the daily income they earn additional money by farming cattle, poultry, cultivating vegetables, selling fruits, fire wood and so on. Though a few estates provide some basic facilities like education, medical care etc, it is difficult for them to bear their leaving expanses with this negligible payment.

III. LIVING CONDITION

In almost all the tea estates the housing facilities of the tea workers are provided by the authorities. Workers get the house as a part of the fringe benefit. Each permanent worker gets a single room house which belongs to the estate's property. In a family when both husband and wife work permanently in the same garden they get only one house. A permanent worker has right to live in the house with his/her family. As an additional advantage of their job they have permission to use open spaces around the houses. A child of a retired permanent worker can get the house only when he/she works permanently in the same garden. Living condition of the workers in the house is outrageous. The average family size of tea workers' community is 5.35 persons being a little

bit higher than the national average family size which is 5.20 persons [10]. For this family unit the management provides around 222 square feet area which is insufficient for living. In most of the case a single room is used for both living and cooking purpose. Sometimes cattle and poultry are also kept at a corner of the living room by providing partition. Due to poor maintenance of the houses living conditions of the workers become miserable. During rainy season they suffer more as rain water gets into the room through broken wall and roof. Though the authority is responsible for maintenance and repair of the houses but most of the time workers themselves do it at their own expense. Moreover they have to bear expenses for extensions or construction of new houses with the permission of estate management. Table I illustrates the variation of room area depending on the category of the tea estate and the types of the workers.

Table. I Allocated room size according to tea estate [3]

Tea Estate Type	Worker Type	Room Size (sq.ft.)
Category A	Male	238
	Female	234
Category B	Male	220
	Female	222
Category C	Male	210
	Female	219.3

IV. SOCIO-CULTURAL ACTIVITIES

Community of tea workers is composed of different ethnic groups who have their own culture, language, tradition, religion and social background. Despite of their distinct cultural background they had to interact with each other to minimize communication gap. As a result they adopt a common language which is a distorted form of Hindi [8]. Some of them speak in a language which is mixture of Bangla and language of Orissa known as "Deshali". The workers had limited access to the outside of garden because of their language barriers and dissimilar physical outlook. The local Bengali tea workers considering them superior always keep a distance from the non-local workers and do not reside in the labour lines.

A large number of the tea workers are from tribal communities and lower Hindu castes. The tribal communities mostly practice their forefathers' religious belief but living in touch with the Hindu community they have embraced some of the Hindu caste traditions. At present regardless of different caste and community, the tea workers celebrate some common festivals like durga puja, lakshmi puja, saraswati puja etc. Holi, kali puja, manasha puja, dolpurnima etc. are other important festivals of these people. A minor portion of the workers are following Christian religion. In labor lines different ethnic groups are living side by side which helps to transform their social relations into open community relations. As a result intercommunity marriages are seen in the tea tribe community. Moreover divorce and widow marriage are also observed among those groups [11]. According to their original social system most of the tea workers' family desire to have female child [12].

V. SETTLEMENT PATTERN

A. Historical formation of the settlement

Labour line is a common housing pattern in most of the tea gardens developed by the British. In the labour line two rows of houses are arranged along both side of a linear circulation. The linear circulation helps to connect all the houses with common facilities. Labour lines are intentionally located in different parts of the garden to allow fast labour organization. Generally the labor lines are surrounded by the tea garden and hills. Sometimes lines are situated alongside a river, pond or a chhara (canals of fresh water from hills). There are cultivation lands seen by the side of the labor line which belong to the tea estate.

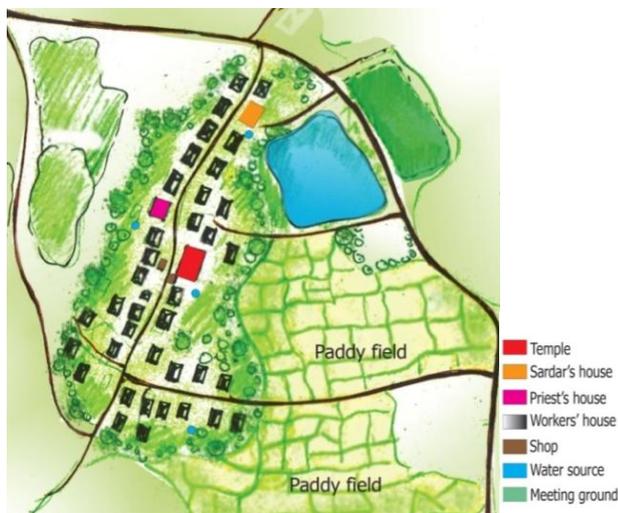


Fig. 2 Settlement plan of a labour line

Each line is numbered and monitored by a line “Chokidar” and a “Saradar” who also reside in the same line. This arrangement helps the supervisors to control the manner of the workers in better order and bring them out to work in the morning timely. Settlement growth in the labour line is horizontal till now. When the number of family member increases, new dwelling is built adjacent to the old one. Fig. 2 shows a typical plan of a labour line.

B. Facilities in labour line

Road Network: In every tea estate the primary road connects the factory to the garden and the secondary roads link the residential quarters to the primary road (Fig. 3). Usually the primary road is constructed with brick soling and other roads are unpaved. These unpaved roads become a big problem for both the workers and the management during the rainy season. In most of the tea gardens transportation facilities are in worst condition. In the tea estate there is no public transport. Most of the time workers have to walk a long distance to reach home.

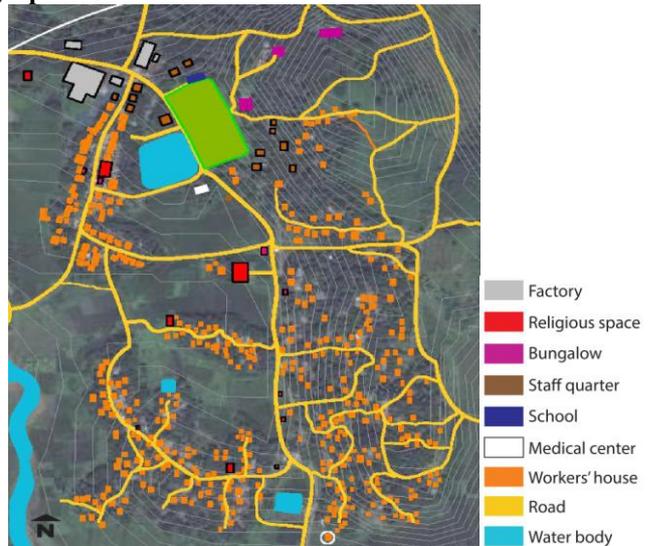


Fig. 3 Satellite image of road network of Kodala tea estate, Chittagong

Education and Health care Facility: According to the Tea Plantation Labor Rules, 1977, the employer has to establish a primary school in every tea estate to provide free education and the school should be within one mile from the labor line. From the field visit it is found that a few number of tea estates provide a primacy school which is usually built near the factory alongside the main road. In case of secondary education children have to go to the nearest village school. In almost all tea estates the company provides free medical services to workers and their dependents that are entitled to rations. Some of the tea estates establish small medical center at easily accessible location. If the authority is unable to provide medical facilities within the garden, they send them to the nearest outside medical center.

Water supply and Sanitation: Previously well was the main source of drinking water located near the starting point of labour line. Nowadays hand pumps are the most common source of water supply in the tea garden which is provided to a cluster of family on the flatlands. Other water sources like ponds, thin shallow canals are found close to the line. Sanitation condition of the workers is very poor in every tea estate. The majority of the workers use open space as toilet. Some of the workers use pit latrine at the back yard but in damaged situation due to improper construction and ill management. Fig. 4 shows water sources in labour line.



(a) Well

(b) Shallow canal

Fig. 4 Water sources in labour line

C. Community Spaces

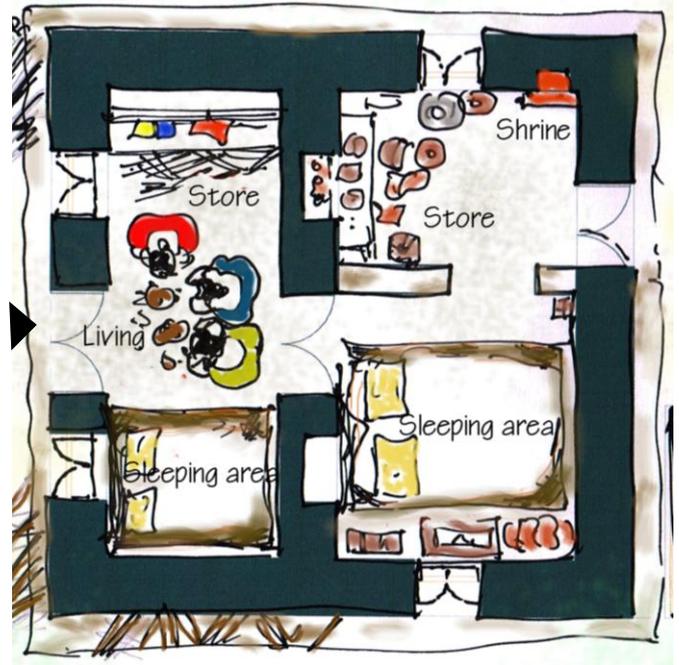
As most of the tea workers in the Chittagong region are Hindus, a good number of temples are seen in the labor lines. In some of the gardens church is also found. These religious spaces are the main gathering places for the workers easily during the time of festivals. The weekly open air market locally known as “Haat” is another gathering place for the workers where people from nearby villages come with their goods for selling. Most of the time it takes place near the payment office on the payment day. Moreover the workers spend their leisure time by gossiping and playing cards in the small grocery shops located alongside the labour line roads. The linear circulation and the open spaces around the houses are also a major gathering point during the time of festivals and celebration. In every tea estate a 6-16 member committee exists known as “Panchayat” which holds regular meeting in front of the Sardar’s house to solve the internal problems and organize the union activities among the tea workers.

multipurpose use like living, cooking, dining, storage, laundry and sleeping space at different time. The open spaces around the housing unit hold the kitchen, toilet and cattle shed. Usually the rooms are partitioned by mud wall or bamboo mat wall. A typical housing unit plan and section are shown in Fig. 6.

VI. HOUSING UNIT

A. Built form

In the labour line when a new house is to be constructed, the priest of the locality decides the actual position of the house. Generally the houses are positioned in the east west direction according to their religious belief and every house has entrance through the front yard. Most of the houses of tea workers are single storey mud hut (Fig. 5). The estate provides a 7’x14’ room for each permanent worker which they call “Shat Chowddha”. A room of 8’x12’, 8’x8’ is also seen in some of the tea estates. In order to maintain privacy the dwellers use vegetation or CI sheet barrier to isolate their house. Most of the houses are decorated with colorful mud plastering. Different types of decoration patterns like om, swastika, foliage, leaves, creepers, crescent etc. are seen on the exterior walls.



(a) Typical plan of a dwelling unit



(b) Section of a dwelling unit



Fig. 5 Mud house

B. Space Organization of Housing Unit

Generally the houses are rectangular in plan and have two rooms with a verandah. One room is used for worship space sharing with storage and the other is for sleeping area. The verandah which is the extension of the house has

Fig. 6 Housing Unit of a labor line
Sacred space: The workers having better economic condition build a small family temple in their front yard. These temples are generally mud built or have bamboo mat wall with thatch roof or CI sheet roof. Other workers have a particular place for worship purpose in their house located at the north or east corner of the room which has no windows. There is a small 3” to 6” raised earthen surface on which the deity’s picture and idols are placed (Fig. 7).



Fig. 7 Sacred space in house

Kitchen: Usually the kitchen stove is placed in a corner of the living spaces. But due to overcrowding within the house some families segregate the kitchen from the living space to front yard or back yard. The kitchen is used for cooking, dining and keeping cattle at night. Usually the kitchen has no windows. The small openings in thatch or bamboo mat wall serve as ventilation. They use earthen stove where firewood and processed cow dung is used as fuel.

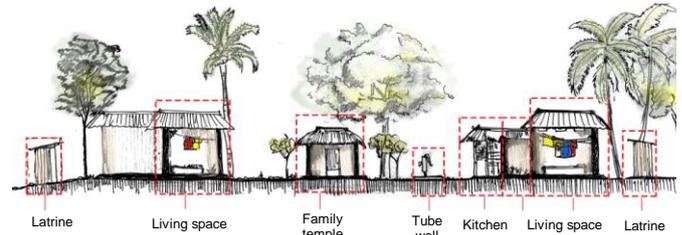
Storage: Due to insufficient spaces in the house the tea workers community has developed interesting shelving techniques. They make alcoves into the mud walls or insert wooden sticks during the wall construction on which a wooden plank is placed to hold objects.

Open spaces around house unit: The open spaces around the houses are mainly used for household chores like food preparation, washing, cleaning, firewood storage etc. The front yard is generally used as relaxing space and play area for the children and the back yard locates the animal shed, toilet and water supply area. Sometimes the workers cultivate small amount of vegetables and plants like durva grass, tulsi, bael, neem, banana etc. around their houses. Most of these plants are used for the religious purpose. These open spaces become active during the time of festivals and celebrations of birth and marriage ceremonies. Figure illustrates the use of open spaces around a cluster of houses. Fig. 8 illustrates the use of open spaces around a cluster of houses.



 Dwelling unit	 Family temple	 Kitchen and animal shed
 Tube well	 Latrine	 Kitchen garden

(a) Plan



(b) Section aa

Fig. 8 Cluster of housing units

VII. HOUSE EXTENSIONS

Primarily the authority provides a single room of about 220 square feet to a permanent worker. When the household number increases, they need to extend the house with the permission of the authority. Generally the extension is done in the front side of the house with an area of 120 square feet (Fig. 9). This extension is a multipurpose space which is called verandah. After extension the windows of the original room become inactive for ventilation and later are used as shelves in the interior side. Mud and bamboo mat wall is used for room extension. The roofing materials are kept similar to the original house. Usually the locations of windows and doors of the new room remain same as the original one. At present due to insufficiency of spaces in the labour line the authority constructs a new room next to an existing housing unit sharing a common roof and wall to accommodate a new family.

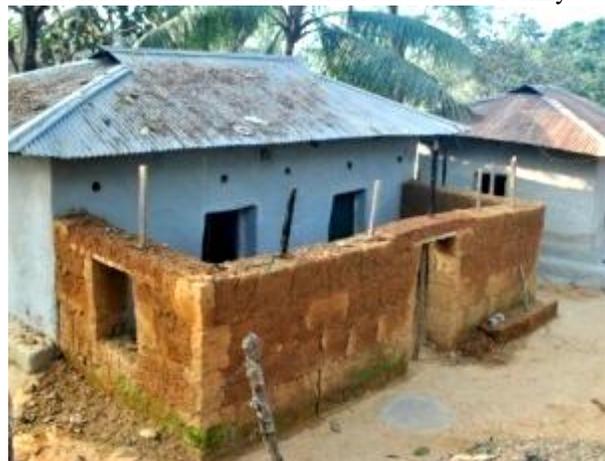


Fig. 9 House extension

VIII. HOUSE CONSTRUCTION TECHNIQUE

The winter season is preferable for tea workers to build their houses because in this season they have less workload. Usually three types of wall materials are used for the house construction, i.e., mud, bamboo, C I sheet. Mud is one the most popular and economic material which is easy to use. Different types of mud are used for construction like,

yellowish color mud which is locally known as “Holde mati”, white color mud is known as “Dhobol mati”, reddish color mud is called “Ranga mati” etc. Mud is mainly collected from nearby hill and hilly canal. The process they used to build mud houses is similar to the rural mud house construction. At first mud is collected from the sources and gathered close to the site. Site is leveled with local equipment. Hand-moulded mud blocks which are made by adding little water with mud are used for building vertical layers of the walls. After laying one row of blocks it is kept for few days to dry. This process is repeated until the desired height of the wall is achieved. During the wall construction adequate openings are kept for doors and windows. Openings in walls are linked with wooden or precast concrete lintels. Sometimes they prefer no openings for windows because of their religious belief. Generally stiff bamboo weavings, wood or CI sheet are used for making doors and windows. In bamboo mat house construction concrete poles are used as supporting element.

After the completion of the wall the roof frame is made. Usually two types of roofing materials are used in the houses depending on the economic condition of the workers, i.e., thatch and CI sheet. Thatch roof is built with bamboo bracing. On the other hand CI sheet roof is constructed using wooden frame or steel truss. In Bangladesh this roofing system is commonly known as ‘Dochala’. After completing the whole process they burnish the wall using mud slurry and decorate it with colourful mud plastering. Nowadays modern building materials and techniques are becoming popular for the house construction. Different house construction materials are shown in Fig. 10.

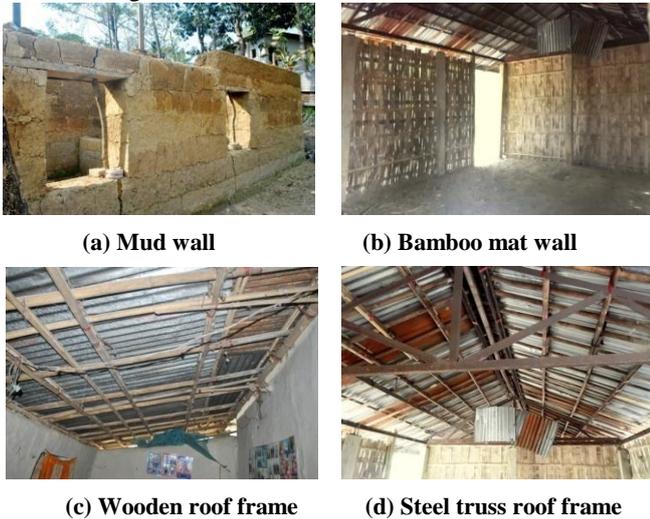


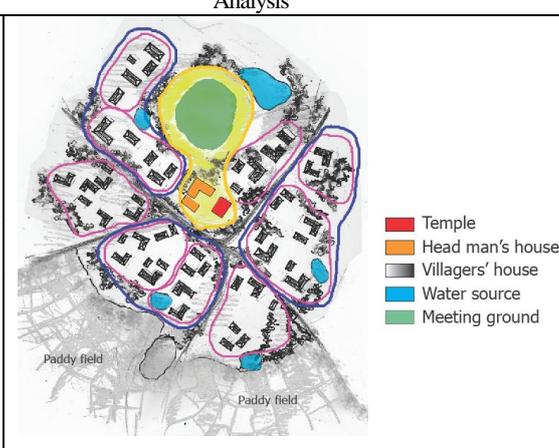
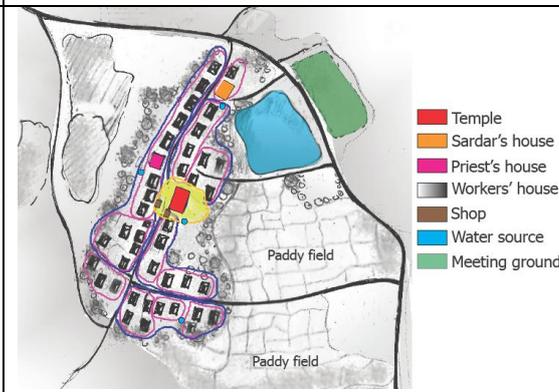
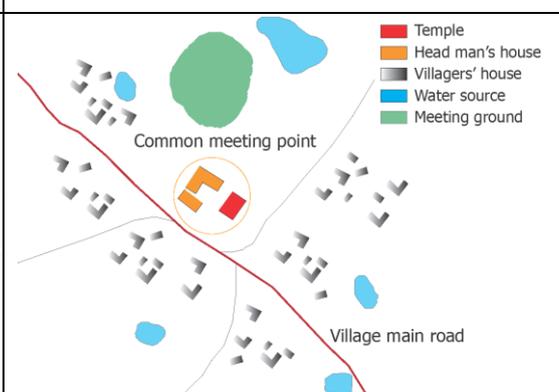
Fig. 10 House construction elements

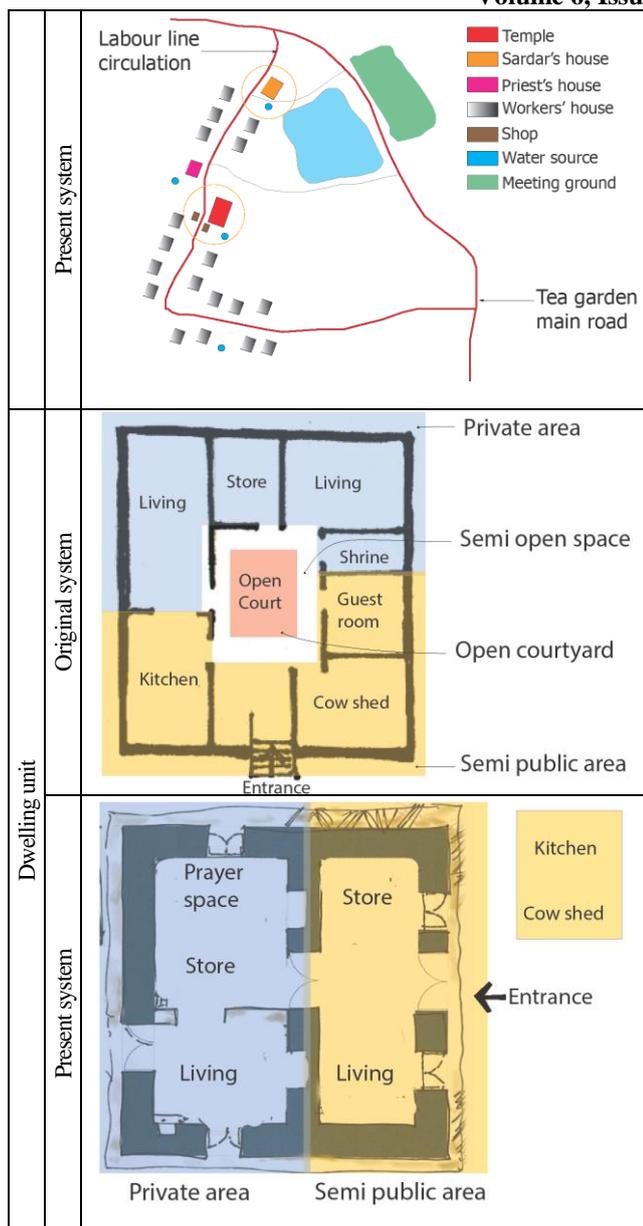
IX. COMPARATIVE ANALYSIS

The tea ethnic communities with their own socio-cultural background migrated to a foreign land where they were forced to settle in a new housing pattern, labour line. In this new pattern houses are arranged linearly rather than in cluster. Their original open courtyard system has turned into small open space in front of the house. Moreover villagers’ common

meeting ground known as “Akhra” is absent in the new settlement pattern. In the labour line a group of workers’ family lives under the supervision of a line Sardar which is similar to the original tribal society where village headman deals all the village affairs. At present noticeable changes are observed in the use of building materials which cause demolition of their original culture and architecture. Table 4 illustrates a comparative analysis between the two settlement patterns.

Table. II Comparative analysis between original and present settlement pattern

Analysis	
Settlement pattern	<p>Original system</p>  <ul style="list-style-type: none"> Temple Head man’s house Villagers’ house Water source Meeting ground
	<p>Present system</p>  <ul style="list-style-type: none"> Temple Sardar’s house Priest’s house Workers’ house Shop Water source Meeting ground
Community spaces	<p>Original system</p>  <ul style="list-style-type: none"> Temple Head man’s house Villagers’ house Water source Meeting ground <p>Common meeting point</p> <p>Village main road</p>



X. CONCLUSION

The tea workers are one of the most exploited and socially isolated peoples of Bangladesh. Originating from different socio-cultural background these ethnic communities have weakened their identity by practicing common culture and language. Moreover their settlement pattern has got new dimension due to imposed British rules and alter of topographic and climatic conditions. In present settlement pattern houses are arranged linearly where their original courtyard system has transformed into small open space in front of the house. These open spaces which are most active zones during celebrations and festivals are being occupied by new house construction and house extension. In addition house decoration art of these ethnic communities which represents their age old culture is diluted due to the use of modern construction techniques and building materials. This study presents a clear understanding about the characteristics

of settlement pattern and dwelling system of the tea workers' community which will be helpful for proposing new policies regarding their settlement growth. Opportunity should be provided to the workers to retain their original art, culture and architecture for the sustainable development of the community. Though few NGOs are working on some development programs of the community regarding health and educational issues, but it is not adequate. More research works should be carried out to help the government for taking initiatives to elevate the living condition of this deprived community.

REFERENCES

- [1] Bangladesh Tea Board, <http://www.teaboard.gov.bd/>.
- [2] T. Nasir, and M. Shamsuddoha, "Tea Productions, Consumptions and Exports: Bangladesh Perspective," International Journal of Educational Research and Technology, vol. 2, no. 1, pp. 68-73, June 2011.
- [3] P. Gain, "The Story of Tea Workers in Bangladesh," Society for Environment and Human Development (SEHD), Dhaka, Bangladesh, 2009.
- [4] K.M. Ahammed, "Investment for Sustainable Development of Bangladesh Tea Industry - An Empirical Study," Proceedings of BEA XVIII Biennial Conference, Paper No. 9, Bangladesh, Sep. 2012.
- [5] N.M.A. Varma, "Producing Tea Coolies?: Work, Life And Protest In The Colonial Tea Plantations Of Assam, 1830s-1920s," Dissertation, Doctor of Philosophy, Humboldt University of Berlin, Dec. 2011.
- [6] M. Haque, "Life in the Labour Lines: Situation of Tea Workers," Environmental Governance, Emerging Challenges for Bangladesh, A.H. Development Publishing House, chap. 22, pp. 392-414, 2013.
- [7] S.C. Majumder and S.C. Roy, "Socio-economic Conditions of Tea Plantation Workers in Bangladesh: A Case Study on Sreemongal," Indian Journal of Applied Research, vol. 1, no. 10, pp. 37-39, July 2012.
- [8] D. Jones, "Tea and Justice: British Tea Companies and the Tea Workers of Bangladesh," Bangladesh International Action Group (BIAG), London, 1986.
- [9] B. Shivaram, "Productivity Improvement and Labour Relations in the Tea Industry in South Asia," Working paper, Sectoral Activities Programme, ILO, Geneva, 1996.
- [10] "Diagnostic Study on Tea Sector in Bangladesh and Livelihood of the Tea Workers," Final Report, Project Management Training Consultants (PMT) Bangladesh Limited, Dhaka, 2008.
- [11] C. K. Magar and B.K. Kar, "Tea Plantations and Socio-Cultural Transformation: The Case of Assam, India", Space and Culture, vol. 4, no. 1, pp. 25-39, 2016.
- [12] M. Kamal., Z. Islam and S. Chakma, "Indigenous Community," Cultural Survey of Bangladesh Series-5, Asiatic Society of Bangladesh, Dhaka, Dec. 2007.

AUTHOR'S PROFILE



Nusrat Jannat is presently working as a lecture in Department of Architecture, Chittagong University of Engineering & Technology (CUET). She received Bachelor of Architecture in 2014 from Bangladesh University of Engineering & Technology

(BUET). The topic of her B.Arch thesis was “Tea Workers’ Housing”. She is an associate member of Institute of Architects Bangladesh.