CHAPTER-2

PROBLEM

The peculiarity of building site in rural areas is that it is having very narrow width say on an average 2.0m to 3.0m and the other dimension i.e. depth of site is on an average about 15.0m to even to 30.0m and more in some cases. The layout of houses in rural areas is the typical row housing pattern with common walls either on both sides or on three sides. Majority of the buildings constructed in rural areas about each other i.e. enclosed from two or even on three sides. The buildings in rural areas are constructed traditionally without thinking about the Ventilation, Lighting and the indoor Hygiene. These all are the important principles of planning. People live in such poorly ventilated houses since ages in the ignorance. We can say that they are least aware about the latest trends in building planning and construction techniques. Due to such layout pattern, practically it is not possible to provide windows in common walls. The buildings in rural areas remain poorly ventilated creating unhygienic, uncomfortable thermal conditions directly affecting the health of the habitants. Even today the buildings are constructed traditionally without paying much attention towards the principles of planning. Traditionally the small opening or a duct open to sky called as Zarokha is provided in the roof of building for ventilation purpose, but it proves to be insufficient. The habitants follow the technique blindly without thinking about its inconvenience. One of the reasons being that the practicing Engineers and Architects in urban areas are less interested to work in rural areas due to certain reasons, might be due to insecurity about their consultancy charges. Also due to unavailability of skilled labor these consultant people are not ready to work in rural areas. The mentality of habitants in the rural areas is such that why to spend on consultancy services? Instead the habitants have more faith in the local labor contractor who executes the construction work right from planning stage up to the finishing stage as if he is an engineer, an architect, valuer and even structural designer also i.e. whole and sole all in one consultant. Thus the problem of ventilation of enclosed buildings in rural areas remains unsolved even today. Social awareness and competitiveness among practicing Engineers and Architects to work out some viable, feasible, and maintenance free solution to this problem is the need of TIME.
On the contrary that is not the case in urban or city areas. The people living in urban areas are very much aware and conscious about their health and the living standard. Thus they consult Engineers and Architects before constructing their houses and they are aware about the importance of planning the building. By proper planning of the building 100% ventilation can be achieved. Also the consultancy services are readily available for them. The layout pattern in urban areas is plot system i.e. individual owner has a separate plot for building construction. Secondly buildings are constructed leaving marginal spaces from the boundaries on front, rear and side as per prevailing Building Byelaws and Regulations. The building is constructed either as a detached building or semi detached building. Due to the marginal spaces it is possible to provide the windows in all external walls of the building thus achieving proper day lighting and ventilation. All the principles of planning such as aspect, prospect, orientation, ventilation and likewise are taken into considerations while planning the building so that the habitants enjoy the natures gift i.e. sunrays, breeze, Daylight etc.

Considering individual joint family, the building site of a single joint family is shown in Figure 2.001
Figure 2.001 Site layout plan for a joint family
## ROAD FRONTAGE FOR PLOTS

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**Figure 2.002 Site layout plan for divided family**
Figure 2.003 Typical Row Housing Pattern
Figure 2.003A Typical Row Housing Pattern
As the years pass on, the joint family is divided into two/three/four nuclear families and as such the corresponding site also get divided accordingly as shown in Figure 2.002.

Figure 2.003B Typical Row Housing Pattern
Above two figures clearly show that for such enclosed site the marginal setbacks are not provided. Hence the buildings in the rural areas are constructed as abutted or enclosed buildings with common walls. For such enclosed buildings practically it is not possible to provide windows due to common walls. As such the problem of ventilation of abutted enclosed buildings in rural areas exists. The habitants living in such buildings are unaware about the ventilation, health, hygiene and comfort conditions inside the buildings. The housewives have to face several problems since very less light enters the building through traditional opening called Zarokha provided in the roofs. The light entering the building through the opening is often concentrated only below and partially around the opening whereas the corners of the room are literally in the darkness. Most of the accessories essential for daily routine activities are arranged or stacked in the periphery of the room. Thus the housewives have to use electric lamps (if electric power is available) for searching the required accessory. In other sense electric lamps are in use for whole day. However due to frequent load shading schedule for almost 12hrs to 16hrs declared by power department, practically it isn’t possible to use electric lamps during day hours. We can imagine about the difficulties which the housewives have to face. The husbands go in the farms for their routine farming work during day time and return in the evening at the end of the day. Thus they don’t have an idea about the difficulties and problems faced by the housewives. This is the major problem often neglected in the rural areas. After interviewing the habitants especially housewives, in rural areas major problems were highlighted. To name a few are as below

1. Insufficient light during day time which makes mandatory to use electric lamps for performing daily routine activities.

2. The reduced indoor air change rate thus feeling suffocated inside the building i.e. one doesn’t feels fresh inside the building.

3. Defective eyesight due to low intensity light entering inside the building. Concluded after discussions with leading Ophthalmologist in the city.

4. Dampness inside the building prevails for many days especially during and after rainy season, resulting in sick building syndrome and unhygienic indoor conditions affecting the health of habitants mostly aged people, housewives and children.
5. Due to low intensity of light, cleanliness inside the building is often neglected resulting in various epidemic and viral diseases. Concluded after discussions with leading physicians in the city.

Taking into consideration the above mentioned problems faced by the inhabitants of the enclosed buildings in rural areas, the academicians and the researchers in building technique, practicing engineers and architects needs to focus their attention on this serious issue which is existing since ages.
Figure 2.003C Typical Row Housing Pattern
Figure 2.004 Typical Row Housing Pattern
PRESENT SCENARIO

At present to overcome the above problem of poor ventilation usually a small opening of size 0.45m x 0.6m is provided as shown in figure 2.005 and their effect in figures 2.006, figure 2.007, and figure 2.008

Figure 2.005 Traditional opening in the roof called Zarokha
Figure 2.006 Light entering through Zarokha opening seen concentrated below it.
Figure 2.007 Front and Rear Door ventilating only the passage.
Figure 2.008 Light entering through Door unable to reach interior parts of building
Figure 2.008A Light entering through Door unable to reach interior parts of building
Figure 2.008B  Light entering through Door unable to reach interior parts of building
From these figures it can be seen that the traditional method of providing open to sky ducts as means of ventilation in abutted enclosed buildings in rural areas is having following drawbacks

i) Light entering indoor is concentrated only below the opening thus keeping the corners and other areas in dark.(figure 2.005 and figure 2.006)

ii) The light is insufficient even to conduct routine indoor activities during the day time.(figure 2.007 and figure 2.008)

iii) Debris, dust, insects etc. finds easy indoor access.

iv) Needs covering with polythene paper during rainy season to prevent entry of rain water.

v) Privacy of the building (especially bedrooms, kitchens etc) is disturbed since the roofs of abutted enclosed buildings are easily accessible by neighbors.

vi) Major drawback of such openings in roof is that they need to be closed permanently if first floor is constructed thus creating total darkness on the ground floor inside the building.

It can be seen further from these figures and photo Charts that the light entering from entrance door do not reach up to the interior of the building since the dimension of building perpendicular to the road i.e. depth is very large as compared to the width of the building. In such situation the only alternatives in front of habitants is to use mechanical means for ventilation and lighting during the daytime for which electricity is only the main source of energy. As on today the rural areas are facing very acute shortage of electrical energy, frequent load shading is very routine phenomenon in the life of rural people. Instead an electric power is available during the night hours. Thus practically it is difficult to use mechanical means of ventilation such as lamps, fans, air conditioners and coolers. Further due to non availability of uninterrupte power supply use of bulbs, lamps during daytime is practically impossible. Electricity can be used only during night. Ultimately there is no alternative in front of rural habitants to live in uncomfortable, unhygienic conditions prevailing in their houses. As such based on visits of these areas and others following conclusions can be drawn
i) The attention towards the ventilation of abutted enclosed buildings in rural areas is urgently needed at Government level.

ii) To innovate Advanced Construction Technique to solve these problem.

iii) To train the masons and artisans’ to use the innovative technique effectively.

iv) To create awareness among the rural people to live in comfortable indoor conditions and protect their health from various deceases.

v) To create social awareness and competitiveness among practicing Engineers and Architects to work out some viable, feasible, and maintenance free solution to this problem.