

Redefining Sustainability in Today's Scenario

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Abstract—Housing has been the most sought out subject and much researched one over the years. Yet it opens many avenues in the form of its design and approach. The most vulnerable and the most challenging part is to make it a self sustaining concept. Though at individual scale many have achieved the same. But at the mass scale experimentation are in process.

The biggest challenge in making the government and private entrepreneurs realize the significance of sustainability through the eye of financial and commercial aspect. Lest we do not indulge into the financial aspect and involvement of rapid construction techniques with the idea of fast completion and involving the government to become a participant in fixing the rates of materials etc this whole idea of sustainability at a mass level would be a mammoth task to achieve. Government would have to intervene in this process as a regulator and monitoring agency.

Establishment of special building bye laws region wise and geographical understanding, special permissions from the context of land profiles, land capacity, water levels, etc, would be a great boost to this segment of sustainability, which would create a better scenario of urban ecology: Lest we like the hard core concrete jungles which have made our all regionally and contextually different places look like. And defaced our urban forms.

The tragic part is that sustainability is being looked as a simple tool and uniformly spread pan regions on similar justification. Sustainability with today's understanding of vernacularism. Which has changed its perception to introduce the element of flexibility and multiple usage structuring not only of the spaces, but of the structural grids, essential building services, public interface and levels of interaction of community as a whole and allow the resident to see the physical links as spaces for the community to interact at different times of the day/year.

The above would be supported by certain live and conceptual case examples to prove that a willful act can only be performed once all minds put into the process move in a similar thought process.

1. INTRODUCTION

Sustainability, in its refined form (natural mechanism) co-exists in the nature, in the land, sky, air, animals. etc, in a bio ecological process to sustain in the nature now. However, the sustainability in its crudest forms is in the present scenario, where sustainability had reduced its meaning to survival of the fittest, in the commercial status.

Not recognizing the geography, region, context, climate, the urban sustainability has reached the point of mathematical calculations, fast life, gadget life etc, which has put in lot of pressure on our natural reserves including the forest, river, seas, etc and disrupting the ecological balance in it. What we need is to deliberate on projects/ development which put all natural effort in redefining the relationship of nature vs man to understanding a new sustainable ecology. The man-made interventions are such that they abrupt in accelerating the human bend to live a natural life, with nature in its close vacancy which includes farming, vegetation, recycling, and at a cost effective concept since the human mind hones on the idea of economic balance.

We have put an effort through a case example of mass housing (affordable) project to explain an approach of sustainable living in today context where the nature and man-made not only co-exist but also reproduce materials/foods for their fun and living.

Sustainability is an act of balancing and creation of a process which now eventually lead the society to live happened, longer with all the emotional connection between the human and nature kind.

Materials and systems that simplify and reduce maintenance requirements require less water, energy and toxic chemicals.

2. VERNACULAR-ISM AND SUSTAINABILITY

Vernacular architecture is popularly known as an architectural style that is traditional, static and not relevant with the ever growing architectural styles. However, with the increasing concerns for the environmental safety and sustainability, solutions has to be derived using the same techniques with reference to technological advancement.

Vernacular architecture is supposed to be a method of designing spaces required to accommodate a life.

It requires active participation of the people who will later occupy this space. It involves understanding the lifestyle of a community and formulating it into the built form. A structure can not be called vernacular even after being climate responsive and sustainable, until it caters to each and every need of its future residents.

3. CONCEPTUAL EXAMPLE

To understand the relevance of the above mentioned statements, a conceptual example is stated below.



Figure 1: Site plan

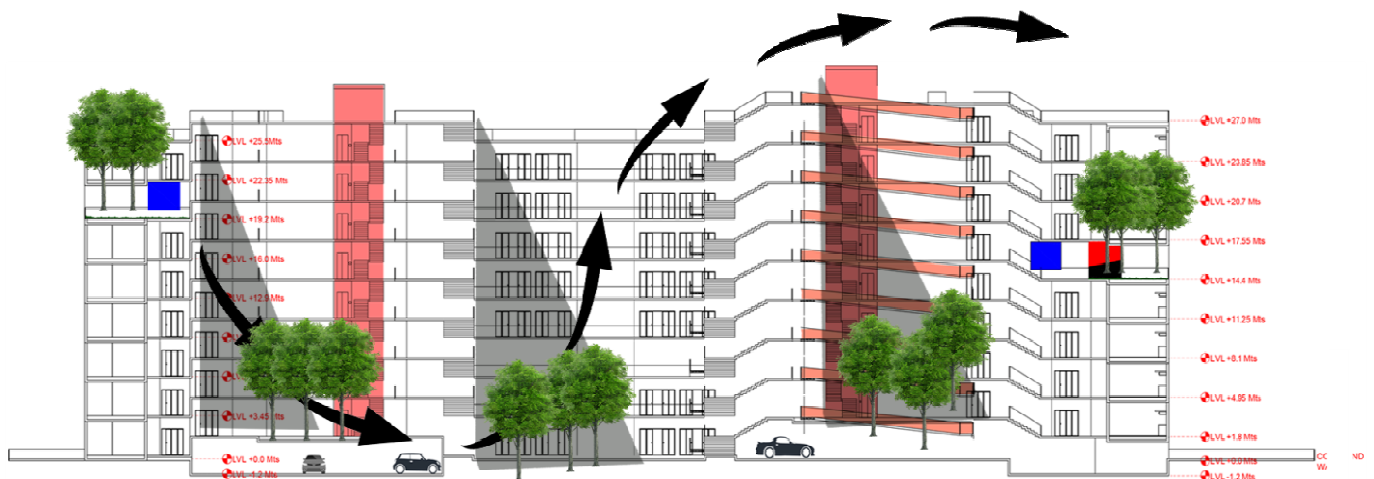


Figure 2: Section

The community target for this project were the people of low income category, known to be living in areas called slums. Their thinking of living habitat is way different in sense of spaces inside and outside their homes.

This community does not believe in private housing schemes. Daily interaction on the streets, random social gatherings and roadside gossip sessions are a part of their daily lives. Looking at the current scenario of the urban housing, we need to work on the following concerns raised-

- 1) Flexibility in the structural system
- 2) Flexibility in usage of the spaces
- 3) Activity expansion into the streets
- 4) Possible extension and activity expansion
- 5) Cost effectiveness through natural design

3.1. Site Layout

The site we chose to explain our concept is based in majorly north-south aligned. (Figure 1) This gave us an opportunity to design the flats facing east-west for proper sunlight and ventilation. The ground has been treated with soft grass pavers and garden spaces to create a green environment. The shell space is one which the design shall provide and allows for flexibility and multiplicity of space and activity structure.

3.2. Street culture

A single floor is disintegrated into different platforms by gradual rising levels so that one can perceive it as a street. The corridor act as the horizontal streets joining various living units, with platforms/terraces acting as open spaces for social interactions.

While the four staircase and lift cores vertically connect the levels, the platforms are also connected through a horizontal system of steps and ramps (Figure 2).

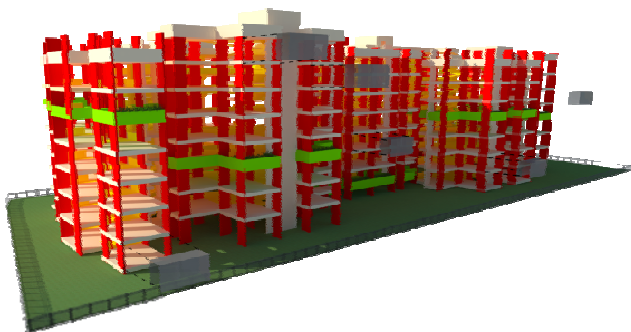


Figure 3: Conceptual 3-D

Visual connectivity between the levels ensure impromptu conversations and spontaneous social gatherings (Figure 4).

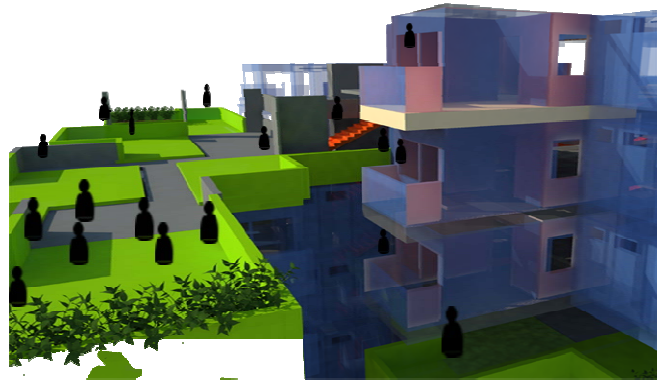


Figure 4: Visual Connectivity

3.3. Climatic Response

The 3 courtyards provided inside the building ensures proper sunlight and proper ventilation for the public areas and internal corridors below.

Modules are arranged in a staggered form stepping back and allowing each roof to become an outdoor terrace for another dwelling. Water tank provided at the terrace is used for the irrigation purpose of soft pavers, gardens and terraces (Figure 3).

3.4. Flexibility of Spaces

The platforms which are placed at different positions at different level have been provided with small shops which will act as revenue generating units. These shops which may be a pharmacy, general store or a vegetable vendor will provide basic amenities to the residents without the need to even leave the community (building complex).

At each level a few units has been removed to create gathering spaces similar to the ones that can be seen on streets. These areas act as green terraces which can be used for various community activities and daily socializing zones.

3.5. Structure

Shear wall is a structural system composed to counter the effects of the lateral load acting on the structure.

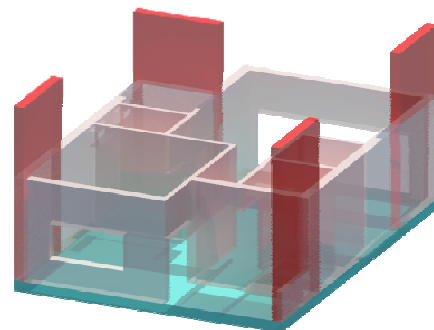


Figure 5: Structure Grid

Shear walls are designed to carry wind and seismic load. shear wall basically is a customized R.C.C. column which allow the expansion of the units. Shear wall allows easy expansion.

There are no major vertical structural members inside the module (Figure 5). Thus, there is a freedom to expand the slab in outward direction, expanding the area and redefining the facade. The circulation spaces are basically vertically stacked streets with ramps and steps symbolizing the undulations of a natural terrain.

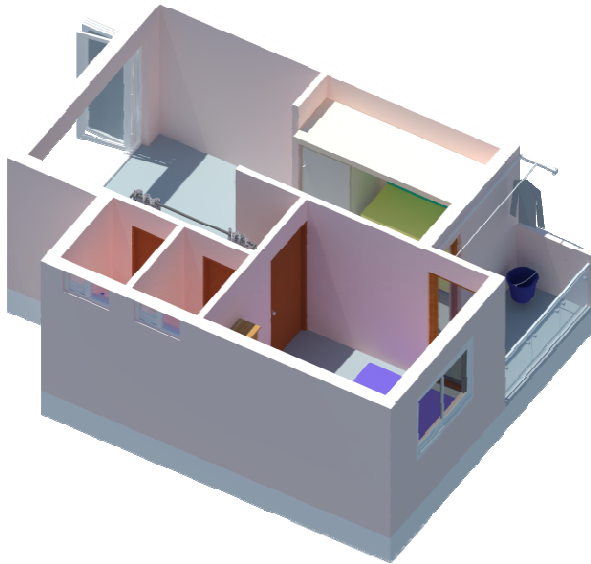


Figure 6: A Single Module

Advantages of this structure:

1. Since the walls are not load bearing members, the position of each room can be changed as per the users need (Figure 6).
2. Fast erection of the whole structure with minimum complications due to its simple form.
3. Clean lines in the facade effective from multiple grids.

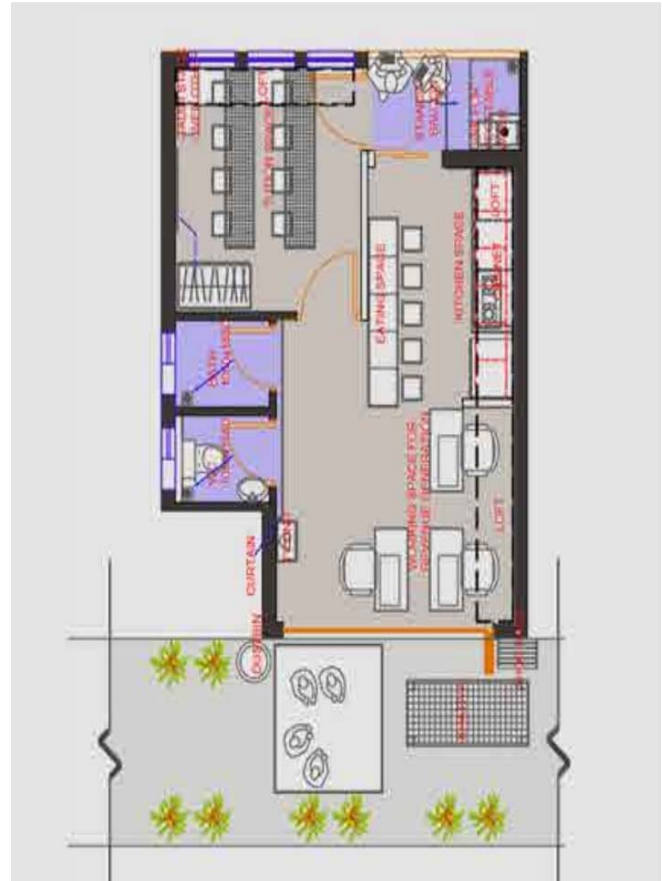


Figure 7 Multifunctional spaces

3.6. Specification

Instead of using swing door, sliding folding door is suggested. (Figure 9) By using sliding folding door expansion of space is also allowed with the streets. As sliding folding door is costly, to reduce the cost of the door, an alternative solution is suggested, with the use of steel grills and cement sheets, which reduces cost considerably



Figure 8 Multifunctional spaces

By using steel grills, the question arises about the privacy of the user? But these class of people need more flexible spaces to expand and interact, use of curtains is the solution for these doors (Figure 7 & 8).

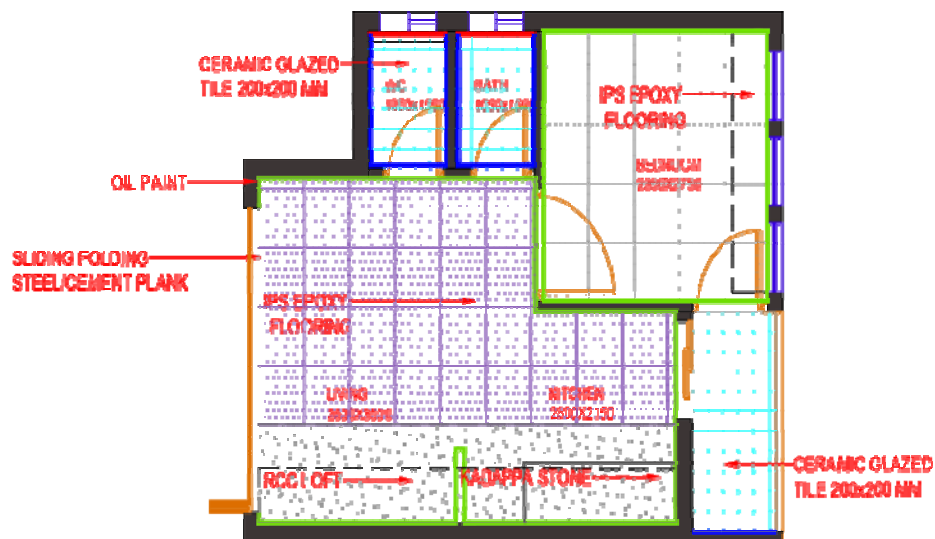


Figure 9: Specifications

Instead of regular sliding window, combination of fixed window and open able window has been used as it helps in 100% ventilation where as sliding window help in achieving 50% ventilation. Also the perforation used allows the wind movement even if the windows were closed at any time of day. The fixed glass provide ample amount of light to the room. This solution is cost effective, and requires cheap maintenance.

The walls of these units are flexible in respect to material use. The structural system does not specify on use of material such as r.c.c. only. An overall sunk of 450mm is introduced to the units for the service lines, and also provided for any future internal layout change (if the need ever arises). Since the walls are not load bearing members, the position of each room can be changed as per the users need.

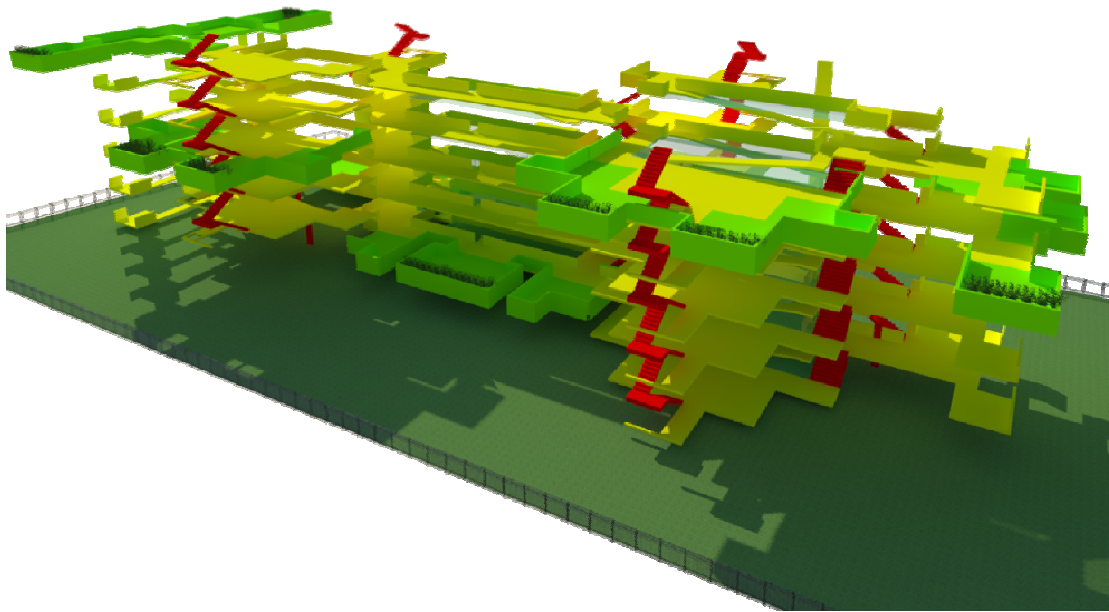


Figure 10: Green terrace

4. CONCLUSION

Here, we need to understand that in today's urban scenario, the large scale projects with huge terraces can be re-utilized for farming, creating forests and generating a bio diversity.

Large scale townships should have lakes and ponds with forest land in a mandatory insertions in the bye laws. Planting variety of trees which are a part of the climatic requirements and naturally accelerate the process of bio diversity (Figure 10). Promotion for minimum scale projects with controlled diversities and small housing projects not to be encouraged. A network of collecting waste water from STP's and channelizing them to forest lands, farming areas within this and around the project and establishing channels though out the site area should be encouraged.

Working on the module of saving man-made artificially processed energy sources like electricity and making an environmental friendly ways of circulation like ramps which can became walking track and connect two major interactive spaces, is required for the emotional bond of the community. Garbage composition, recycling set up and reusing for organic farming in the same set-up.