

Nano Architecture in India

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Abstract—In today's condition land is limited, so there is a need to utilize it properly by keeping the future in mind. Nano houses are small dwellings which consume less space, fewer resources, less time, less energy etc. to construct. This research aiming to create the maximum quality of life on a small footprint by finding out the bare minimum areas required for the living of one person. And a survey is also conducted through a questionnaire which concludes that people in India of the targeted age group of my study happily accepts the concept of Nano houses.

Index Terms— Nano house, Resources, Spaces, Small footprint, Sustainable etc.

I. INTRODUCTION

In our growing cities, spaces are at the premium. There is a need to create a maximum quality of life with a small footprint. With the increasing number of population and lack of availability of land and resources, Nano houses are small spaces that work well. These houses come in all shapes, sizes, and forms, but they facilitate simpler living in a smaller, more efficient space. The construction process can be done easily onsite and offsite and takes time of few weeks to get completed. It gives us the opportunity to focus more on material, form, and furniture while designing and constructing a tiny house. Any space in which people live directly affects our attitude and psychology and living in small spaces are not that easy so it also strengthens the mind. It can be customized according to the owner's lifestyle.



Fig. 1. Living in small spaces

Living in a Nano House carries a much smaller footprint, reduces the number of resources, humans consume to live, and encourages us to consume less in general. They change us towards a more simplistic way of life and open up the

opportunity for a more sustainable future. The concept of Nano house relates to the idea of living in an environment that comprises necessary things and not the extra luxuries. Nano houses exist in different countries with different context, names, and laws. But there is no concept of tiny houses in India. Construction process contributes a major portion of pollution per year. With the advance in technology, it's hard to imagine the future impact. At that time we need houses that are energy efficient, consume fewer resources and saves for the future.

II. NANO HOUSE

Nano Homes are about living simply, beautifully and yet still with everything you need. It's about freedom from debt and having the economic freedom to live a bigger life, instead of having a bigger house. It is the customization of minimal space required for one's daily basic activities.



Fig. 2. Nano house

A. Types

1) Tiny house on foundation

A tiny or small cabin home that is permanent, on a permanent foundation.



Fig. 3. Tiny house on foundation

2) *Tiny house on wheels*

A tiny house built on a trailer bed with wheels. A tiny house on wheels is a great way to live portable and makes moving fairly straightforward because you just move the whole house.



Fig. 4. Tiny house on wheels

3) *Bus conversions*

Tiny house which is transformation of bus into customized livable space.



Fig. 5. Bus conversion

4) *Cob houses*

A cob home is a house built of clay, straw, and sand. You would think that this wouldn't make for a very durable home, but it does. Maximum cob houses can stand for a lifetime if taken suitable care of. There are some of these structures that have been standing around for over 500 years. It's all a matter of having the right roofing that won't allow too much moisture to get in.



Fig. 5. Cob houses

B. *Advantages of Nano Houses*

1. *Lesser expenses* A Nano house prices a lot less to

construct than a full-sized one. The average price for a full-sized house is approx. 10 times more people can use this amount for other luxuries like traveling.

2. *Lesser energy use* Nano houses not only cost less but also easy and low maintenance, Bills for electricity, fuel, water, and waste disposal are all much lower. Many tiny houses even have composting toilets, which break down waste without needing to be hooked up to a sewage system.
3. *Independence of movement* A Nano house has a minor footprint, so it doesn't require a large plot of land. Nano houses can also be built on trailers, so their owners can take them along whenever they move to a new city. For many people, this is a way to enjoy a life on the road without giving up all the comforts of home.
4. *Harmony with environment* The Nano house movement goes hand in hand with the environmental movement. Nano houses require less material to build and less energy to power. Also, their small size makes them easier to site in a place that's close to nature.



Fig. 6. Size does matter

C. *Disadvantages of Nano Houses*

1. Reducing impulse purchases.
2. Having little room to entertain guests (i.e. Dinner, festival parties)
3. Storing or getting rid of many things.

III. NEED

As per the studies conducted there were the few data's collected that could help in the study and understand the need for Nano architecture in Indian cities and help give a suggestion to it

1. India has a population of 1.3 billion. That is very huge. It covers an area of 3.27 million square km. The population density of India is 382 people per sq. km. Total land under cultivation in India is 1.6 million sq. km. Which intern reduces the land that can be used for housing? Population density for housing area becomes around 700 people per sq. km. India has large forest reserves of 700 thousand sq. km. Also, there are water bodies present which cover some area.
2. The area available for construction purposes is very small. All the area cannot be used for housing as we need roads, railways, hospitals, universities, and parks

- etc. which need a huge area.
- Now to accommodate 1.3 billion people in nearly an area of around some 500 thousand sq. km. That is around 2500 people per sq. km. It means that houses will be tinier relatively as compared to another country. High rise buildings of a larger area are an option, but that would require a lot of money. India is a developing nation, not everybody can have enough money to buy that kind of houses.
 - The average floor area size of houses has steadily grown over the past 15 years and simultaneously, the number of people living in these houses has declined.



Fig. 7. People living in these houses has declined

IV. OBJECTIVES

- To understand the minimum space requirement of

every activity according to the needs of a growing population.

- To suggest the minimum land usage as land is a limited resource and it is being largely used due to increasing population and to fulfill their day to day needs for a satisfactory quality of life.

V. CONCLUSION

The survey conducted through questionnaire and interviews concludes that people in India of targeted age group (20- 30 years) of my study happily accept the concept of Nano houses and ready to live in such spaces. And through case studies of various plans of Nano houses following are the bare minimum area required of ideal positions for the living of one person,

- Bed- 1.52 sq. m. (0.8x1.9m)
- Toilet- 1.7 sq.m.
- Kitchen- 1.2 sq.m.
- Storage- 2 sq.m.
- Study area- 2.2 sq.m.

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