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# Tiny Houses

ROSHNI CHOUHAN

## INTRODUCTION

Urbanization and population growth have raised many people's concerns about the amount of consumption that will occur. Especially in the home market, this is an issue. Where houses are getting bigger. The majority of the world's regions experience rising housing costs despite declining or stagnant earnings. Most people's pay checks are frequently used to pay their rent or mortgage. Their remaining funds are reduced, leaving them with less for essential requirements including food, healthcare, education, and transportation. Due to this unsettling economic inequality. Initiation of the tiny house movement.

The tiny house movement pushes people to reduce their living spaces and other aspects of their lives. Smaller than a shed but not quite large enough to qualify as a home, tiny houses are residential structures that are usually smaller than 400 square feet- larger than a shed, but not quite big enough to be called a cottage. They have almost all the amenities and rooms that a typical home has, but in a smaller space, free of all the "extra" space.

The fundamental idea behind tiny houses is to provide housing for individuals in need of the most basic essentials in response to the housing shortage in expanding, crowded cities. Such a unit should take into consideration people's daily needs and allow occupants to live in compact areas while yet having all the features and conveniences of a typical home, including a bedroom, a kitchen, and a bathroom. Those that purposefully minimise their living space are the focus of the tiny dwelling trend. The initiative places a strong emphasis on reducing living space and amenities to save money on building supplies, energy use, and other daily expenses.

## ABSTRACT

Urbanization and population growth have raised many people's concerns about the amount of consumption that will occur. This is particularly problematic given the expanding size of homes on the property market an analyse show the advantages of consciously downsizing in favour of smaller homes that nevertheless offer a high quality of life in an effort to solve the issue of overconsumption. Compared to huge conventional homes, tiny homes have a clearly lower environmental impact. The programme places a strong emphasis on reducing space and residential amenities in order to reduce the use of building materials, energy resources, and daily living expenses.

There is considerable worry about the amount of consumption that would emerge from India's growing population and urbanisation. India is a nation with a diversified social and cultural landscape. Every location has unique social values and traditions. A completely diverse system of home design is required by norms relating to resident privacy and security, lifestyle, indoor/outdoor activities, cooking, etc.

The environment and site requirements in India must be taken into consideration when building a modest house there. Since low cost consumption would be a key factor to concentrate on when building a tiny house, the type of building material used in the construction will also be greatly dependent on the site surroundings and availability. The tiny house's architectural specifications can adapt and transform a space with flexibility in designing by using minimal space requirements, low-cost materials, and local techniques that are adaptable to the context of the region, which may help preserve these cultural practises in the modern era.

## LITERATURE STUDY

### SMALL HOUSE, BIG IMPACT

This study comprehensively examines how tiny homes affect communities and the environment. A great room unites the kitchen and living area in a typical tiny house to make the most of the available space. Additionally, it involves creating multipurpose areas through the use of numerous innovative shelving options that address storage problems.

Because of the rising expense of living and lack of access to huge spaces, tiny houses have gained popularity despite their small square footage. In less space and for less money, a tiny house can provide a sustainable way of life. Because it creates conditions that make it simple for people to make ethical decisions on a social and environmental level, the small home can challenge established narratives.

## GROWING TINY HOUSES

Urbanization and population growth have raised many people's concerns about the amount of consumption that will occur. To thrive, more people need more food, products, and space. Population growth and ongoing development have produced an unsustainable level of demand.

According to statistics, up to 80% of the environmental impact over the course of a product's lifecycle is made up of transportation, food, and the construction and demolition of homes. This is particularly problematic given the continued growth in home size in the housing market. Since 1950, the typical single-family home size in the United States has doubled, having a significant negative impact on the environment. Larger homes take more raw materials to construct, more energy to heat and cool them, and less permeable surface area, which increases the amount of storm-water runoff.

For many individuals, living in small places is a reality, but this trend goes further than that. Those that purposefully minimise their living space are the focus of the tiny dwelling trend. These folks are attempting to alter their own perceptions of what is "essential" for their happiness and quality of life. The establishment of the Tumbleweed Tiny House Company and the Small House Society in 2002 helped to further this trend in the United States. Not only do tiny houses use fewer resources, but they also frequently save money and have attractive designs. These can be utilised as home offices or guesthouses and are the ideal size for empty nesters, students, or elderly parents (Foreman, 2005). The median size of tiny homes is between 65 and 400 square feet (6 and 37 square metres), and more people appear to be moving into them.

A better knowledge of the tiny home trend's current state is the goal of this article. This goal focuses on developing a deeper understanding of the key elements influencing the trend, the driving forces and difficulties influencing the move to tiny dwelling, and the salient features of the trend.

## TRENDS OF TINY HOUSES

### A Tiny house on foundation:

As for a connection between space and place, tiny houses are often purpose a unique situation. Sometimes these houses are built on a foundation. In this case, the site is carefully selected and designed and constructed with a strong connection to it. However many tiny houses are constructed on wheels, allowing the owners to live a more adventurous lifestyle and have the opportunity to reside in different locations.

## UNIQUE AND IMPORTANT ASPECTS WITHIN A TINY HOUSE

Perhaps the most important aspect of tiny homes is multifunctional space and furniture. Carefully selected and designed to solve multiple purposes.

- Tiny houses are built from recycled materials
- Multifunctional space
- Minimal spatial requirements
- Minimal environmental impact
- Modular furniture
- Smaller or fewer appliances
- Composting toilet
- Water conserving fixtures
- Energy efficient appliances
- Garbage composting

## DATA ANALYSIS

**Building Materials used to construct a tiny house:**

Criteria & Features

WALL - Structurally Insulated Panels (SIP's)

SIPS (Structurally Insulated Panels) are a wall system that consists of an insulating foam core. Sandwiched between two pieces of sheathing. SIP's are built in a factory and only assembled at the build site.

TINY HOUSE TRAILER –

- Wood
- Dimensional Lumber
- Plywood
- Exterior Siding and Trim
- Interior Siding and Trim

INSULATION –

- XPS Boards
- Spray Foam
- House wrap and Tape

FLOORING –

- Hardwood Flooring
- Tile
- Mortar, Thin set , Adhesive
- Flooring Transition Pieces

PAINT -

- Paints and Stains
- Construction Adhesive.

ROOFING –

- Metal roofing
- Tar roofing
- Rain & ice shield roofing

MILLWORK –

- Exterior door
- Interior door
- Windows
- Shims

## CONTEXT 1 – WARM & HUMID CLIMATE

**Criteria & Features**

**Design requirements –**

- Maximum ventilation & free air movement
- Maximum shading from solar radiation
- Avoid heat storage
- Vegetation to mode4rate the solar impact
- Place the main elevation and room facing north and south to catch the prevailing breeze.
- Larger openings
- Reflective exterior openings
- Ventilated double roofs
- Vegetation to lessen the solar impact

**Orientation –**

- Along the east - west axis

**Activity –**

- BESDROOM - The east side, which is cooler in the evening, might be a good place to put bedrooms. For these spaces, proper cross-ventilation is crucial. On the west side, there may be stores and other auxiliary spaces.
- KITCHEN – The kitchen is mostly utilised in the morning & midday hours, it can be situated as west side as well.
- LIVING ROOM – Living rooms and other large rooms that are used often during the day shouldn't be situated on the east or west side.

**Building Material**

- ROOF – Mangalore tiles

  Palm trees for thatched roofs

  Broken tiles

  Photovoltaic panels

  Terracotta

  Clay

- WALLS - The shape of the roof should be designed to encourage air movement in addition to providing protection from the sun and rain. Rooftop vents efficiently create ventilation and remove hot air. To encourage airflow, a double roof with a vented area in between can also be employed.

  MUD, STONE, GRANITE BRICKS

To reflect sunshine back into the surroundings and so limit heat accumulation, the walls should be painted in light pastel colours or whitewashed. In order to reduce interior temperature, it is cheap and extremely effective to employ the right colours and surface treatments.

## CONTEXT 2 – HOT & DRY CLIMATE

**Design Requirements** –

- Maximum shading of direct and reflected sun radiation in the hot season
- Maximum ventilation by regulated air movement
- Avoid large exposed exterior surfaces
- By using enough thermal storage mass, the temperature extremes of the day and night may be balanced.
- In hot weather, lower internal heat generation and conduction gain.
- Evaporation & heat loss by radiation
- Air circulation
- Balance the extremes of summers & winters by movable parts
- Small openings
- Reflective exterior parts

There should be more windows installed on the north facade of the compared to the east, west, and south of the structure because it gets less radiation year-round. For ventilation and natural illumination, openings are important, particularly windows

**Orientation –**

SUN ORIENTATION –

- Along the east- west axis

WIND ORIENTATION –

- The primary walls and windows should all face the direction of the predominant (cool) breeze. Air flow between rooms

**Activity –**

BEDROOM - The east side, which is cooler in the evening, might be a good place to put bedrooms. For these spaces, proper cross-ventilation is crucial.

Store and other auxiliary spaces can be located on the west side

KITCHEN - If the kitchen is mostly utilised in the morning and lunchtime, it might also be situated on the west side.

LIVING ROOM - Living rooms and other large rooms that are used often during the day shouldn't be situated on the west or cast sides.

**Building Material –**

ROOF –

- Flat roof
- Earthen pots for insulation

The shape of the roof should be designed to encourage air movement in addition to providing protection from the sun and rain. Rooftop vents efficiently create ventilation and remove hot air. To encourage air movement, a double roof with a vented gap in the middle might be employed.

WALLS –

- Sun dried earth bricks
- Mud plaster
- Concrete
- Double walls with insulation
- To reflect sunshine back into the surroundings and so limit heat accumulation, the walls should be painted in light pastel colours or whitewashed. In order to reduce interior temperature, it is cheap and extremely effective to employ the right colours and surface treatments.

## CONTEXT 3 – COLD CLIMATE

**Design requirements-**

- Maximum thermal resistance
- Maximum thermal capacity
- Increase buffer spaces
- Decrease air exchange rate

- Reduce shading
- Thicker walls
- Roof insulation, wall insulation and double glazing
- Utilize heat from appliances
- Trapping heat
- Uses of trees as wind barriers

**Orientation** –

SUN ORIENTATION –

- Along the east – west axis

WIND ORINETATION –

- To allow for the greatest amount of cross-ventilation in the rooms, the main walls and windows should face the direction of the dominant (cool) breeze.

**Activity** –

BEDROOM – Bedroom should be on south west of the house

KITCHEN – Kitchen should be on south east of the house

LIVING ROOM - The main rooms which are in use most times of the day, such as living rooms, should be located on the south side

**Building material** –

- Double wall with insulation
- The wall will be made of wood panels rather than brick or stone.

CONSTRUCTION TECHNIQUE – KATHI KHUNI TECHNIQUE

- Made of wood and dry stone masonry in alternate courses without bonding mortar.
- Strength, stability, and flexibility are provided by layering and interlocking stone and wood (earthquake resistant).
- These heavy walls allows good thermal insulation

## CONCLUSION –

The fundamental idea behind tiny houses is to provide housing for individuals in need of the most basic essentials in response to the housing shortage in expanding, congested cities. Such a unit should take into consideration people's daily requirements and allow occupants to live in compact areas while yet having all the features and conveniences of a typical house, including a bedroom, a kitchen and a bathroom. The consumers of small homes are those who are willing to reduce their wants, as well as on space and residential amenities, in order to save money on building supplies, energy sources, and day-to-day living expenses. Some of the customers include elderly couples, young couples, young families, and single people. Residents who are in need and can only afford basic amenities and a small space may also use these homes. These homes can also serve as retreat homes, studio flats, offices, and vacation homes.

The architectural specifications of a small house may convert a place with flexibility in creating by utilising the barest amount of available space. These cultural practises could be preserved in the contemporary day through the use of inexpensive materials and regional procedures that are adaptable to the setting of the area.