

Analysis of Portable Spaces in Context with North East & North East Tourism

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Abstract—Travel and tourism is the largest service industry in India. Tourism has been a major social phenomenon of societies all over the world. Tourism involves activities of persons travelling to and staying in places outside their usual environment for leisure, business and other purposes. In the context of a globally growing sector like tourism, Northeast India with both physical and human diversities is one of the most promising regions of the country in respect of tourism promotion, even then, the region failed to take the advantage of its regional, national and international linkages developed so far in the tourism front. Demands of tourists have changed over the years. The region still follows the same old system (infrastructure, transport, etc.) of tourism irrespective of its environment and investments. Being believed as the cleanest and moderately developed part of India, North- East states are underdeveloped facing the problems of sanitation and good hygiene and more than 90% area of region is rural. This paper is based on introducing and studying the impacts of a PPF (Portable, Pre-fabricated and foldable) space on North-East and North- East tourism. This space is going to be used as a replacement to the conventional methods being followed.

Index Terms— Prefabrication, Furniture, Elements

I. INTRODUCTION

PPF space is an amalgamation of three kinds of spaces: Portable, Pre-fabricated and foldable space.

A. Portable Space

A portable, demountable or transportable building, is a building designed and built to be movable rather than permanently located. These can be constructed with wheels or can be constructed in a way to make them easily transportable through lorry or cranes.



Fig. 1. A portable structure that can be transported using a lorry

Portable spaces have been in use from history. Earlier they were used in form of caravans and chariots. Today, we can find these spaces in form of vanity vans, camper vans, food trucks, temporary cabins and as residence and travelling vehicles in foreign countries.



Fig. 2. a) caravan, b) vanity van, c) residence

B. Prefabricated Space

A space, who's parts or the space as a whole is manufactured and constructed using prefabrication



Fig. 3. A building being constructed using prefabricated walls and other elements

C. Foldable space

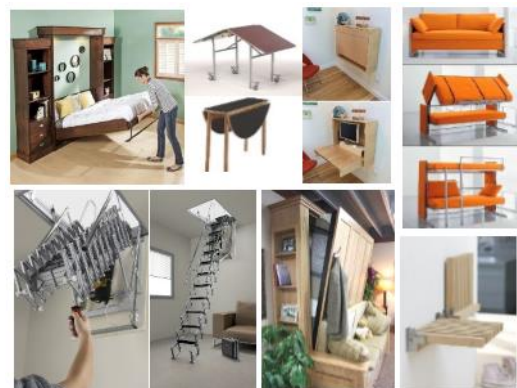


Fig. 4. Some examples of foldable element

A space that can be transformed so as to significantly change its size. This is more of interior part of any space. This can be done by using foldable furniture or sliding elements or multipurpose elements. The main idea behind this is to use minimum space for placing objects that are to be used for human comfort and keeping the entire structure light weight.

II. NORTH- EAST & NORTH- EAST TOURISM

A. Introduction

As a zone of convergence of diverse ethnic stocks, North East comprises eight states – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.



Fig. 5. Map showing eight states of North-East

It is also known as ‘Paradise Unexplored’. Northeast India with both physical and human diversities is one of the most promising regions of the country in respect of tourism promotion. Siliguri Corridor in West Bengal, with a width of 21 to 40 kilometers (13 to 25 mi), connects the North Eastern Region with East India. It is a zone of high seismic activities and has suffered from two great earthquakes ($M > 8.0$) – 1897 Assam earthquake and 1950 Assam-Tibet earthquake – and about 20 large earthquakes ($8.0 > M > 7.0$). North East states are underdeveloped. Only the famous cities are provided with satisfactory facilities otherwise 90% above area still comes under rural category.

B. Common Problems of All States

- All states have 80-90% rural area
- Pathetic socio-economic condition
- Most of the cities are under developed
- Health condition is not good
- No proper sanitary facilities
- Access to safe drinking water is very less
- Unemployment

- Only a few cities from a state are properly linked with main roadways.
- The region's high rainfall, averaging around 10,000 millimeters (390 in) and above, creates problems of ecosystem, landslides and floods

C. North-East Tourism

Among the North eastern states, Assam took the pioneering step to recognize tourism as a sector of economy in as back as 1958. Since then, north –East has been a part of tourism industry. Famous for its undulating hills, plateaus, rivers, evergreen forests, waterfalls, national parks etc. and despite a long history of hosting both international and domestic tourists, tourism sector of this region is still in infancy, witnessing merely 0.9% and 0.2% of the domestic and foreign tourist arrivals respectively of the country. Recreational demand of tourists witnessed quite interesting change over the years. At a point of time tourist’s main aim was to see the places of regional importance. But at present the traditional holidaying being changed to a new trend that can be termed as “activity holidays”, where tourists prefer to take part in different recreational activities while visiting a new region. Now tourists are more physically and intellectually active than previously. More and more tourists wish to participate in recreation, sports, adventure and learn about the history, culture, natural environment and wildlife of the areas they visit. In case of North- east, people are taken only to a few famous cities or sites because of which the actual North- East remains hidden. Tourism sector in North East follows the conventional methods of constructing hotels and resorts using brick and concrete that can be found anywhere in India. The region is a home to 220 ethnic groups living in different parts of the states having their own history and style of living. Tourism sector falls weak in keeping a link between tourists and those groups that are the actual gem of the region.

D. Reasons behind Slow Progress of North- East Tourism/ Weak Points of North- East Tourism

- *Unfulfilled expectations* Tourists expect to get a real life experience while visiting North-East but they are actually taken to a few cities, shown some of the scenic landscapes, given a hotel by the side of a valley to stay and shown sunrise or sunset from some high points.
- *Less infrastructure* Due to non-availability of land for construction and a disaster prone area, the number of hotels/ resorts are very less in number. Around 69% of foreign and 77% of domestic tourist generally visits the region within six-month span of autumn and winter season.
- *Conventional methods* Construction of hotels/ resorts using brick and concrete does not only affect surrounding environment, but, is also risky to be built in a disaster prone area. Landslides, earthquake, flood, etc. are very common in this region. Constructing a brick and concrete structure is a short term investment

as the material after destruction can't be reused. The structure also turns to be heavy and can also lead to death of a person stuck inside.

- *Weak road links* Most of the areas of the region are not well linked with roads and highways that makes reaching to a place from another difficult.

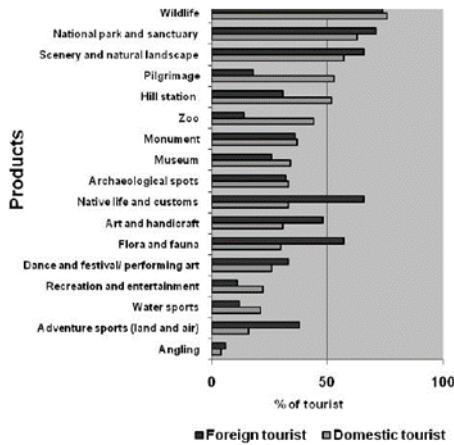


Fig. 6. Demands of tourists (source: Bhattacharya, 2004)

At least eight dead as north-east India hit by 6.7 magnitude earthquake

Five people dead in India, and three in Bangladesh, plus at least 100 injured, after strong quake on India-Myanmar border before dawn on Monday



▲ The aftermath of the earthquake in north-east India

A 6.7 magnitude earthquake hit India's remote northeast region before dawn on Monday, killing at least eight people, injuring 100 others and causing damage to several buildings.

Five were killed in India, the government said, while three people died in Bangladesh after suffering strokes or heart attacks following the early-morning quake.

Many of the deaths and injuries were caused by falling debris in and around Imphal, the capital of Manipur state, police said.

Fig. 7. A screenshot of a video showing the destruction of a conventional structure happened due to an earthquake and its effects

E. Investments

The investments made in tourism sector include accommodation (Forest lodges, tented accommodation, tourist complexes / tourist lodges, wayside amenities, restaurants, tourist reception centres), tourist transport (Mini-buses, jeeps, elephants, etc. for wild life viewing, cruise boats, ferry launchers, etc. for water transport, tourist coaches in selected circuits and special tourist trains) and road construction.

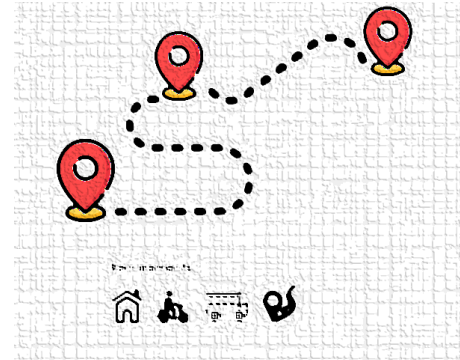


Fig. 8. Package systems are generally followed in North- East Tourism sector that include two or more cities and movement between them

III. PPF SPACE

A. Conclusions for Pre-Fabrication on Basis of Case Studies and Research Papers

The objectives and scope of prefabricated buildings are as jotted below:

- To reduce the construction time and it's cost.
- To minimize the wastes and make it environment friendly.
- To replace the traditional or conventional way of construction with modern tools and technique.
- To build light weight building and make earthquake resistant and resistant to adverse climate.
- To minimize the in-site construction.
- To minimize the use of aggregates, bricks, bars, cement and excessive water.

B. Necessity to Adopt Prefabrication Method

To develop the nation in minimum time and minimum cost without disturbing the environment.

1) Effects of pre-fabricated space

- Reduction of construction time (20%), reduction of construction waste (56%), and reduction of dust and noise on-site, as well as labor required on-site (9.5%)
- 70% reduction in waste relative to site-intensive construction was estimated
- Over a 50 year life span LCA (life cycle assessment) of modular and conventional housing (floor area of 135 m² in each case), it was found that the conventional home produced 2.5 times more construction waste than the modular home; additionally, the latter had 5% less total life cycle energy consumption and 5% less global warming potential than the former due to higher air tightness.

2) Characteristics of a PPF space (on basis of literature review and case studies of portable, pre-fabricated and foldable spaces)

- Easy availability
- Light weight for easy handling and transport, and to economies on sections and sizes of foundation.



- Thermal insulation property.
- Easy workability.
- Durability in all weather conditions.
- Non-combustibility.
- Economical
- Sound insulation.
- Sustainable
- Space can be transformed every time according to client's need.
- If the structure is destroyed, the material can be reused
- Chances of death of a person stuck inside during any calamity is reduced

C. Structure of a PPF Space

The structure uses the idea of providing all the facilities in minimum area in most comfortable way. The structure can be made vernacular by using the most available material in the region i.e. bamboo. Outer skin of the structure can be made using bamboo fitted on a steel frame that may provide strength to the structure needed during movement. The controlling cabin is permanently attached to the structure. The resting area is the one that can be transformed according to the need of hour. This structure can be run by using CNG or electrical equipment thus keeping it eco-friendly.

D. Impacts of PPF Space

- Tourism sector will only need to focus on construction of such structures and roads.
- Travelling in a region with less facilities would become easier.
- As more number of such spaces will be introduced, more people will get employed for various works such as construction, driving, etc.
- Tourists will be able to access interior areas of the states where construction is not allowed or not possible.
- This may improve the connection between the people of North- East and the incoming ones.
- Due to more interaction, people of North- east may get knowledge of advancements coming in today's life that may help them to progress in their routine life.
- Having a space that can access any area will let tourists explore the region more and more without any tension of climate, animals or searching a shelter.
- During any calamity, people will be able to move from one place to another easily.
- Availability of new jobs or a better connection with outer world may help in making the socio-economic conditions of the region better.
- Use of vernacular materials will keep the structure eco-friendly

After changes:  

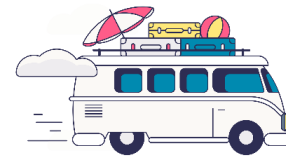


Fig. 4. Illustration showing the element of focus for tourism sector after introduction of a PPF space in North- East tourism

E. Why Not Vanity Vans or Camper Vans?

- Made using the outer skin of automobile
- Costly
- Non-attractive
- Non-affordable for middle class

F. Parks at Various Locations Need to be Made Where People Can Park a PPF Space for the Resting Time. These can be Created Using Norms Made for Caravan Parks

G. Limitations

- Module designing is not included in this study. There can be further study on designing different modules as per requirements.
- This study does not specify the success rate of portable (portable, foldable and prefabricated) spaces in North east tourism or the percentage of people using it.

IV. CONCLUSION

This paper explains analysis of portable spaces. This structure can be run by using CNG or electrical equipment thus keeping it eco-friendly.

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