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INTERNATIONAL JOURNAL OF RESEARCH IN
AERONAUTICAL AND MECHANICAL ENGINEERING**A Literature Review on Portable / Mobile Homes –
Issues & Challenges****Palash Patodi¹***¹Research Scholar, Department of Mechanical Engineering,
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Abstract

India is known as land of villages with 6, 40,687 in number. According to Census 2011, the population of India was 121 crore with 83.3crore persons living in rural and 37.7 crore living in urban areas. More than 70% of our population lives in rural areas. Even after independence, these rural areas are still under the process of development. After the waves of globalisation, the Indian economy is blooming. The rural markets are insulated from the global meltdown. This has also affected the growth of Indian rural economy. The major attributes to this growth are modernisation of farming, expansion of education, transportation and access to better primary health facilities. The literacy rate in rural area has increased by 10.2% in last 10 years. An amount of Rs.12, 500 crores are submitted by rural India to the national income. It is observed that rural India likes to contribute in the overall growth of economy & is very proactive to adapt the new ways of modernisation and innovation. According to industrialist, “Future drivers of growth are rural India.” At the backdrop of this scenario, the present project of Portable Home / Mobile Home is aimed to put forth an inclusive model for the growth of agriculture and to provide product that can enhance the comfort and status level to reduce stress and anxiety of farmers who are involved in the hard work of farming.

Keywords: India, Farmer; Portable/ Mobile Home; Rural India; Purchasing Power; Agriculture.

1. INTRODUCTION

India, officially the Republic of India is a country in South Asia. It is the seventh-largest country by area (3,288,000 km²), the second-most populous country with over 1.2 billion people, and the most populous democracy in the world. With 1,210,193,422 residents reported in the 2011 provisional census, India is the world's second-most populous country. India is known as land of villages. Per the 2011 census, 68.8 % of the population lives in about 6, 40,687 villages and the remaining 31.2% lives in more than 5,100 towns and over 380 urban agglomerations. The improvement in literacy rate in rural area is 2 times that in urban areas. The rural urban literacy gap which was 21.2 percentage points in 2001 has come down to 16.1 percentage points in 2011.

Agriculture offers the major means of livelihood for 58.4% population of India. It contributes approximately one-fifth of total gross domestic product (GDP). Agriculture accounts for about 10 per cent of the total export earnings and provides raw material to a large sector of industries. Low and volatile growth rates and the recent escalation of agrarian crisis in several parts of the Indian countryside, however, are a threat not only to national food security, but also to the economic well-being of the nation as a whole.

Definitions for rural India abound while the most convenient remains, 'anything that is not urban'. "Rural India comprises all places that are not urban." "The Census of India defines urban India," says Gupta of TSMG. "Urban India constitutes places with a population of more than 5,000, a population density above 400 per square kilometre, all statutory towns, that is, all places with a municipal corporation, municipal board, cantonment board, notified area council, etc. and with 75% of the male working population engaged in non-agricultural employment. All non-urban is rural."

Rural India consists of 6, 40,687 villages that house 742,490,639 people. This figure represents around 70% of the total population of India and 12% of the globe's population. In fact, as per McKinsey, despite rising urbanisation, 63% of India's population will continue to live in the rural areas even in 2025. Also, rural India is insulated against global economic downturns, which adds to its attractiveness. For companies looking to tap this market, the 4P's of the Marketing mix have given way to the 4 A's of Rural Market Mix: Affordability, Awareness, Availability and Acceptability.

Manufactured housing is one of the most dynamic housing innovations of the last 50 years. This type of housing is particularly important in rural area.

A manufactured home is a factory-built housing unit designed to meet the Manufactured Home Construction and Safety Standards. A manufactured home has a chassis that supports the structural integrity of the unit and is designed to be transported to a building site.

A manufactured home is defined as a movable or portable housing structure that exceeds either a width of eight feet or a length of forty feet and constructed to be towed on its own chassis and designed to be installed with or without a permanent foundation for human occupancy. The housing structure may come in multiple sections such as a double wide or triple wide, etc.

Most mobile home were not built to any particular standards. 'Transportable home' is a term commonly used by industry and consumers to refer to dwellings that are transported (partly or wholly pre-assembled) to a site

then installed. Transportable homes are an important form of low to moderate-cost housing. 'Manufactured home' is defined as 'a self-contained dwelling that includes at least one kitchen, bathroom, bedroom and living area and that also includes toilet and laundry facilities.

2. Literature Review

The Unknown World of the Mobile Home is not a history monograph, although it begins with a historical overview of the mobile home industry. The authors are geographers, and their work reflects that training: place matters in this book; it is one of the primary prisms the authors use to shed light on the heterogeneity of life in America's mobile homes. John Hart, Michelle Rhodes, and John Morgan explore the "world" of the mobile home by using maps, statistics, and oral interviews. The authors attempt both to capture the range and diversity of the experiences of mobile home dwellers and to give an overview of the state of the mobile home world.

Mobile Home Weatherization Measures: A Study of Their Effectiveness (December 1988) by R. Judkoff, Seri, E.Hancock & E. Franconi revealed that pre-HUD-Standard mobile homes use from 1.25 to 2 times the energy per unit area of comparable site-built houses. Their unique construction detailing makes them difficult for weatherization agencies to treat effectively using the measures and techniques developed for site-constructed buildings. This poses both a problem and an opportunity. It indicated that significant energy savings can be realized with weatherization measures specifically adapted for mobile homes. Unfortunately, the vast majority of weatherization provider still treat mobile homes like site builds. The results presented here suggest that this is extremely ineffective.

Testing the Effectiveness of Mobile Home Weatherization Measures in a Controlled Environment: The SERI CMFERT Project (1990) by R. Judkoff, Seri, E.Hancock & E. Franconi stated that for several years the Solar Energy Research Institute has been testing the effectiveness of mobile home weatherization measures, with the support of the U.s. DOE Office of State and Local Assistance Programs Weatherization Assistance Program, the DOE Office of Buildings and Community Systems, the seven states within the federal Weatherization Region VII, the Colorado Division of Housing, and the DOE Denver Support Office. During the winter of 1988-89, several weatherization measures were thermally tested on three mobile homes under controlled conditions inside a large environmental enclosure. The effects of each weatherization measure on conduction losses, infiltration losses, and combined furnace and duct-delivered heat efficiency were monitored. The retrofit options included air sealing, duct repair, furnace tune-up, interior storm panels, floor insulation, and roof insulation. The study demonstrated that cost-effective heating energy savings of about 20% to 50% are possible if weatherization techniques adapted to the special construction details in mobile homes are applied.

Interpretative Bulletin for Manufactured Home Construction and Safety Standards and Notice of Waiver of Certain Requirements (1994) stated that HUD published a final rule amending the Federal

Manufactured Home Construction and Safety Standards (FMHCSS) on January 14, 1994 (59 FR 2456) to improve the resistance of manufactured homes to wind forces in areas prone to hurricanes. An Interpretative Bulletin was issued on April 15, 1994 and published in the Federal Register on April 21, 1994 to clarify some aspects of the new standards that have been the subject of questions from the industry and the public. This

Interpretative Bulletin addresses certain additional questions and announces the issuance of a waiver, pursuant to 24 CFR 3280.1(b), relating to certain exterior wall cladding.

Manufactured Home Inspection Checklist (2000) by Institute for Business & Home Safety states that More than 21 million people (nearly 8 percent of the U.S. population) live in manufactured homes in the United States. To increase the safety of a manufactured home, the Institute for Business & Home Safety has created an inspection checklist and a list of suggestions that covers areas that affect a manufactured home's ability to resist damage caused by high winds. This inspection checklist reviews considerations regarding where a new or existing manufactured home is placed, how it is secured, and additions or carports that may be attached to the home

A Feasibility Study of Mobile Home Recycling (2000) done by Vermont Agency of Natural Resources proposed that Manufactured homes comprise a sizable amount of the housing stock in the U.S., and Vermont. It is estimated that there are 19,000 - 23,000 manufactured homes being inhabited in Vermont. Of that number, it is likely that 12,000 - 15,000 are over 25 years old, having been built in an era before national codes and standards were adopted, and are becoming functionally obsolete. Unlike a junk automobile that has at least a few dollars value, or a derelict building on land that may be valuable, at some point old trailers invariably will cost someone money to dispose of. Depending on the size, condition, and location of the trailer, proper disposal can cost \$1500.00, or more. A lack of maintenance due to financial constraints is frequently the cause of an owner occupied home becoming uninhabitable, and those same circumstances often result in abandonment of the home. There simply is no money, or there are greater financial priorities than paying for disposal.

Tim Mrozowski (2002) found that well defined legal principles and statutes exist which allow for the regulation of manufactured of housing, but prohibit local governments from exercising exclusionary zoning practices or discriminating against manufactured housing. Additionally, the study found that in general the local zoning ordinances examined followed these principles and statutes, however some ordinances were found to likely be in violation of state laws. Finally, recommendations for local governments and developers regarding manufactured housing regulation and development are presented. The research is focused on assessing and examining local and state site regulatory requirement which impact the use of industrialized construction techniques in affordable housing.

Kevin Jewell (2002) attempted to examine one factor leading to equity building: the financial appreciation of the home. Other factors, such as the cost of financing, security of tenancy, details of the purchase deal, and physical durability have or will be covered in other reports from Consumers Union. The American dream of home

ownership shapes our public policy because home equity provides stability and paves the way up to the middle class for low-income homeowners. Home-ownership rates are at an all-time high, due in part to the inclusion of manufactured housing. West Virginia boasts the highest home-ownership of any state in the nation based mainly on the fact that 17 percent of its housing units are manufactured homes.

Manufactured Housing Appreciation (2003) by Kewin Jewel revealed that the stereotypes of manufactured housing are built upon very real differences in appreciation experienced by the people who own them. The large proportion of manufactured homes in rental parks contributes greatly to the lower appreciation experienced by manufactured home owners as a whole, as land ownership is an important driver of appreciation. High variation in the individual appreciation rates of manufactured homes also causes a higher proportion of manufactured homes, even packaged with land, to lose value over time. Even so, average appreciation rates of manufactured homes packaged with owned land are statistically in line with the site built market, and there are few inherent reasons that a home built in a factory should perform differently than one built on site. Our analysis suggests that consumers can make decisions which can improve the appreciation of a manufactured home. Land ownership, location, purchase price and maintenance expenditures are among the factors that predict appreciation, and should be considered when attempting to increase appreciation in a particular unit.

Pinellas County Emergency Management (2005) stated that no mobile or manufactured home - no matter how new it is - can be a safe shelter from hurricane force winds. Never ride out a hurricane in a mobile home—even if it's in a non-evacuation zone. Unlike hurricanes, which give emergency planners time to order evacuations, tornadoes come without warning. Sometimes, they spin off from hurricanes and other times they are created by unfavourable weather conditions. Mobile homes offer poor resistance to a tornado's winds. Hurricane straps or other tie-downs will not protect a mobile home from the wind gusts associated with tornadoes.

Upscale Suburban Development, Social Inequality and Rural Mobile Home Park Residence (2006) by Rural Poverty Research Centre, Columbia, U.S.A revealed the emerging social stratification of post-agrarian small-towns, potential effects are apt to be exacerbated for rural poor families such as those residing mobile home parks, a now characteristic rural neighbourhood form. While a mobile home park offers affordable access to the American Dream of homeownerships specific factors appear to suggest that social costs are attached to such access. This paper examines the intersection between upscale suburban development and social disadvantage. Drawing on survey and ethnographic field studies findings reveal distinct conditional features of place associated with upscale suburban development that determine the nature of how rural inequality is emerging and what the implications are for working-poor families.

Indian Infrastructure Report (2007) by Piyush Tiwari stated that rural housing has been marginalized both in wider policy discussions as well as within the debate on rural issues because rural housing needs are generally subordinated to urban housing needs in policy priority. With incomes generally lower than the urban areas

and seasonal unemployment, many households find it difficult to gain ownership of homes. It is important to view rural housing within the wider context of rural development and to understand and link other rural development policies with housing. A more integrated approach is required which may practically be achieved perhaps through the Ministry of Rural Development or Ministry of Panchayati Raj in conjunction with states (as land is a state subject) where there is smooth co-ordination between these two ministries at national level and corresponding agencies at the state level.

Mc. Clanaghan & Associates (2007) revealed that manufactured home parks are a viable and important source of affordable home ownership. Municipalities and Provincial agencies should consider ways to strengthen the creation of additional housing supply using manufactured homes. This includes strategies design to improve the overall operating viability of manufactured home parks as well as provide a favourable climate for land use approvals related to this stock. the analysis undertaken within the context of this study demonstrates that the current redevelopment and displacement pressures are generally a function of the “pull” of large capital gains arising from increasing land values and not from the “push” of diminished profitability or generalized obsolescence of existing parks. Furthermore, the study findings suggest that it is unlikely that even a doubling of yields on investment would diminish the “pull” of redevelopment.

India, Science & Technology (2008) by A.K. Mukhopadhyay, Pushpa Singh revealed that Rural Development in India is one of the most important factors for the growth of the Indian economy. India is primarily an agriculture-based country. Agriculture contributes nearly one-fifth of the gross domestic product in India. In order to increase the growth of agriculture, the Government has planned several programs pertaining to Rural Development in India. The Ministry of Rural Development in India is the apex body for formulating policies, regulations and acts pertaining to the development of the rural sector. Agriculture, handicrafts, fisheries, poultry, and dairy are the primary contributors to the rural business and economy. Rural development in India has witnessed several changes over the years in its emphasis, approaches, strategies and programmes. It has assumed a new dimension and perspectives as a consequence. Rural development can be richer and more meaningful only through the participation of clienteles of development. Just as implementation is the touchstone for planning, people's participation is the centre-piece in rural development. People's participation is one of the foremost pre-requisites of development process both from procedural and philosophical perspectives.

Portable Housing for Mexican Migrant Workers (2008) by Janet Corzo reveal that portable housing is a viable way of housing migrant workers in a way that is responsive to their culture and to practical considerations. It also has the added benefit of providing social and political empowerment. Whereas fixed housing typically costs about \$20,000 per bed, portable housing holds the potential to be manufactured at a substantially lower cost. This way, funds and grants allotted for migrant housing can be used to fund other resources that are not easily transportable, such as laundry facilities and recreational spaces. A precedent for this already exists with Washington

State's "Rent-A-Tent" program where licensed growers provide sanitary facilities and other resources for workers who can provide their own tent or rent a large six-person tent for a nominal fee.

A Qualitative Assessment of Rural Housing in India (2009) by D.B Gupta, D.V Sethi & Shailendra Kumar revealed in the context of rural housing, finance and land have emerged as major constraints. This is irrespective of whether a person desiring a house is poor or not. As far as land is concerned, its availability from the existing abadi and kabja categories for new construction activity is rather limited. This is also true of panchayat land. The breakdown of the joint family system into nuclear households has created additional demand. To overcome land scarcity, government lands and forests are often encroached upon. In such cases of illegal encroachment it is difficult to establish ownership, leading to problems in accessing institutional credit for housing. Banks are unwilling to risk their advances unless the title on the land is clear and unambiguous. On agricultural land only one farmhouse is permitted for construction. While such conversion is legally permitted, it is not always easy to execute and also involves additional costs.

A Study of Sustainability at Recreational Vehicle Parks (2010) by Harvard University states that the natural landscape that makes recreational vehicle (RV) travel so rewarding does not insulate the hospitality leg of the RV industry-- RV parks and campgrounds--from issues of environmental sustainability which similarly confront other travel sectors. RV industry demographics forecast rising RV sales over the next decade due to a growing U.S. population and higher rates of RV ownership, factors which further compel sustainable approaches at RV guest facilities. RV park owners concur that taming energy consumption and eliminating sewage damage would strengthen both the economic and environmental management at their parks. Overcoming the challenges of both issues will have to commit RV travelers, manufacturers, state and federal legislators, and product suppliers to share responsibility with RV park management for environmental sustainability.

Temporary Accommodation Service, New Zealand (2011) informed that Portable Dwellings are a Government supported temporary accommodation option. This option is to assist householders (both homeowners and people in rented accommodation) whose homes are uninhabitable and who need suitable rental accommodation while their house or land is repaired or rebuilt. Portable homes look like small houses, and come in various sizes (one, two, three and four bedroom units). The villages will also be small with around eighty dwellings at most. They will be designed to give each occupant as much space as possible. Green spaces will be left free for recreation and communal areas. Residents will be able to park vehicles outside their dwelling.

Housing Assistance Council (March 2011) stated that manufactured housing is an important yet often overlooked segment of our nation's housing stock, especially in rural communities. Despite its importance to the American housing sector, there is a dearth of information on manufactured housing, particularly for homes in community or land-lease settings. The Housing Assistance Council (HAC) presents a case study highlighting the process one rural manufactured home community undertook to convert from investor to cooperative resident

ownership. There are approximately 7 million occupied manufactured homes in the United States, which make up about 7 percent of the nation's housing stock. This type of housing is especially important to rural America. More than half of all manufactured homes are located in rural areas. While the demographics of manufactured housing are expanding, households residing in manufactured homes are still primarily those at the lower end of the income spectrum. The median annual income of households residing in manufactured housing is \$30,000, nearly 40 per cent less than that of households not living in manufactured homes. In turn, manufactured housing is often characterized as much by the people who inhabit these units as by the structures themselves. Negative images and stereotypes of manufactured homes, or "mobile homes" or "trailers," have been shaped in part by the fact that, historically, lower-income households have resided in this form of housing.

4. Conclusion

Rural development in India is one of the most important factors for the growth of the Indian economy. India is primarily an agriculture based country. Rural housing has been marginalised and are generally subordinated to urban housing needs. It is important to view rural housing within the wider context of rural development so Mobile Homes are viable and important source of affordable home ownership. Mobile / Portable Homes is an important yet often over looked segment of the development. In the context of rural housing, finance and land have emerged as major constraints. The portable dwellings can also act as a temporary accommodation option also. Therefore, Mobile / Portable Homes can act as a boon for the rural development.

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