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PORTABLE PARTITIONS – A SUSTAINABLE ALTERNATIVE FOR WALLS IN INTERIOR DESIGN

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ABSTRACT

Shelter is a basic necessity of a human being. Humans need an enclosed space to live and work. Interior designing is an industry to design these enclosed spaces. Interior designing is designing a built-up area; it can be an office, residence, shopping complex, multiplex, restaurant, hotel, hospital, schools, colleges and many more. Interior designing is a flourishing discipline that utilizes a lot of natural resources and is also responsible for creating a huge amount of waste that harms the environment. So, the designers are shifting towards sustainability as the natural resources are getting exhausted. Designers are working for sustainability by choosing vernacular materials, opting for natural construction techniques, reducing the usage of plastic, concrete, and other harmful raw materials, etc. Increase in population is leading to migration towards cities for better education, healthcare facilities and job opportunities. This migration is posing a lack of horizontal building space in the cities giving rise to smaller interior spaces. It is the design and art of the interior designer to provide all the amenities with proper functioning and aesthetics in the constrained space. Fixed walls in the interiors take up a lot of built-up area and require a lot of time and resources for their construction. Light weight portable partitions can be a sustainable alternative to replace these fixed walls. This study focuses on portable partitions that provide space flexibility but retain the qualities of fixed walls by providing privacy and maintaining the aesthetics of the space.
For this study primary and secondary data have been collected. Interior designers were contacted and were asked to answer a questionnaire based on portal partitions, their benefits, and the way in which they can prove to be a sustainable alternative. The primary and secondary data so collected was analyzed and results were drawn. Certain suggestions are discussed to increase the concept of sustainability in interior designing and lastly, based on the results and suggestions, conclusions have been drawn.

Keywords: Sustainable Interior Design, Sustainability, portable partitions, fixed partitions.

1. INTRODUCTION

The world today has been knitted into a small network as a result of globalization. Globalization has also brought development, and now even the developing countries are progressing at a very fast rate. In this modern world there is development everywhere and in each field. Urbanization is increasing in developing countries. In the cities, more and more land is being acquired for construction purposes, be it residential or commercial [13]. As a result of this rapid development the horizontal land space is getting exhausted. The rural population is also moving towards the urban areas, and this too is adding on to the problem of space scarcity in the cities. Land is being consumed to build residences, hospitals, educational institutes, commercial buildings, etc. Construction of these buildings require a lot of resources, energy, and raw materials like bricks, cement, concrete, wood, stone, paint, etc. [15]. The envelope of the building is usually made using cement, brick, and concrete for strength. These materials are manmade and cause harm

to the environment in their manufacturing process [19]. Natural resources too are getting exhausted day by day and so need to be reserved. Sustainable materials can be used in the interiors of the building, like avoiding brick walls and making wooden partitions. The interiors can be worked upon with different materials and options can be thought of to reduce the usage of cement, concrete, and brick in it [14]. Interior designers are working upon this concept of reducing the harm caused to the environment and opting for ecofriendly materials and construction techniques.

Interior Design-

Interior designing is one of the most flourishing disciplines that deals with luxury and functionality at the same time. The art of interior designing is to provide comfort, beauty, and functionality to the space. It is a field where enclosed spaces are designed with a design concept or theme. Interior designing is being done to enhance the aesthetical beauty of the space while keeping the functionality intact. Interior design can vary as per the age of the client, the social, economic, and cultural background of the client, geographical location of the space, budget of the client, prevailing climatic conditions, and the trending fashion of the market. Interior design of any space means designing its ceiling, flooring, furniture, walls, fenestrations, lighting, furnishings, landscaping, air conditioning, accessories, etc. [21]. Designing of all these elements utilizes a huge number of resources which are getting lesser leading to their scarcity in the market. Designers are looking for more sustainable materials and techniques for the designing of spaces that could be at par with the traditional materials and techniques [22].

1.1 SUSTAINABILITY-

Sustainability can be explained as making use of resources in such a way that the needs of the current generation is met without compromising the needs of the future generations. It has three

basic concepts that are social, economic, and environmental. The main aim of sustainability is to reduce the environmental footprints and conserve the natural resources available [20]. Sustainability aims at creating a productive harmony amongst the nature and human species. This can be achieved by causing no or minimum damage to the environment. Sustainability means controlling our lifestyles and opting for healthy options for a living that have least harm on the environment. This will lead humans to achieve an environment that is net zero and cleaner energy resources will be made available for the future generations [21].

1.2 SUSTAINABLE INTERIOR DESIGNING

Sustainability is utilizing resources in such a way that there is ample available for the future generations. In the field of interior designing sustainability can be related to using raw materials that are naturally available and can be recreated easily without harming the environment. Construction techniques should be such that doesn't leave a negative impact on mother nature. Transportation of materials should be reduced to lessen energy consumption. Thus, utilizing locally available materials, making the maximum use of the resources, and adopting sustainable techniques for construction can be summed up as sustainable interior designing [3]. For example, avoiding false ceiling made up of plywood or MDF (Medium Density Fiberboard) and using bamboo or strawboard, avoiding the structure of internal brick walls and designing partitions instead [4].

1.3 PARTITIONS

Partitions are structures that are used to divide spaces. They are also known as walls or space dividers. Partitions are built in interior spaces to gain privacy, visual or audible. Walls are made up of brick, cement or concrete blocks and then usually are finished with paint or paneling. Partitions

can be made up of various materials like Wood, Engineered wood (Plywood, Medium Density Fiberboard, High Density Fiberboard, Particle board, Blockboard), Polyvinyl Chloride, Fabric, Glass, Aluminum, Metal Sheets, Acrylic, etc. [12]. Partitions made up of conventional materials like aluminum, plywood, glass are not sustainable. Experiments can be done by using sustainable materials like wood, recycled glass, bamboo, natural fabrics like cotton, jute, etc. to construct sustainable partitions [4].

Depending upon the requirement of the partition, the materials can be selected. For example, if blocking vision is needed, then opaque material like wood or metal can be used and if the partition is made to just distinguish between two areas, then materials like recycled glass and recycled acrylic can be used for its construction [5].

Based on the size of the partitions they can be divided into two types that is full height and half height depending up on their height. Full height partitions are ceiling to floor high, whereas the height of half height partitions can vary from 4'.0" to 7'.0". Based on the type of construction partitions can again be of two types that is fixed or portable. Fixed partitions are attached to the ceiling, flooring, or adjoining walls with the help of fasteners, D-button, clips, or other hardware. Fixed partitions include walls too. Portable partitions are also known as movable partitions [17].

1.4 PORTABLE PARTITIONS-

Portable partitions or movable partitions are those that can be moved from one place to another with ease. Portable partitions are usually made up of panels. These partitions can be sub-divided into 4 categories on the basis of the hardware used.

a. Sliding Partitions- Sliding partitions slide on channels. These channels can be mounted on the ceiling or flooring or both. Sliding can be done manually or can be automatic with the help of a remote control [2].
b. Folding Partitions- Folding Partitions have hinges in between the panels with the help of which these panels fold and gather at a corner [2].
c. Sliding Folding Partitions- Sliding folding partitions have both channels as well as hinges. Every panel joint has hinges so that the panels can fold whereas alternate panels have rollers that are attached to the channels, because of which these panels fold and slide at the same time [2].
d. Rolling Partitions- Rolling partitions have castors at the bottom of their panels and they can be rolled from one place to another with the help of these rollers [2].

These above mentioned are the basic types of portable partitions that are being used in interior spaces as room dividers and obtain privacy.

2. LITERATURE REVIEW

A Vikram Singh and Ar. Saurabh Saxena, 2023, "The Evolution of Green Architecture: A Lens into Sustainable Building Practices": Green architecture creates a fine balance between the natural environment and the human activities. The authors here have focused on the evolution history of green architecture, studied the impact of green architecture on the world through case studies and understood the principles of green architecture. They have studied the economic, environmental, social and health benefits offered by green architecture and the way it affects the city landscapes and human life. Implementation of green architecture does have many challenges but can be achieved by education, technology, and regulatory support. In future green architecture can be achieved in many ways like net-zero buildings, resilient building designs, biophilic designs, smart buildings, urban agriculture, and principles of circular economy. The author states that it is the collective of everyone to promote the concept of green architecture, to follow sustainability, and create vibrant and resilient spaces for the upcoming generations. This research is done for engineers, architects, policymakers, and all those who are interested to study the effects of green architecture.

B Natalia Shushunova and Elena Korol, 2023, "Modular Green Wall Systems as a Specific Handwriting Style in Architecture of Green Buildings": Here the authors state that the pollutants in the air causing a constant harm to the environment as well as to the human health. MGWS that is Modular Green Wall Systems are made to purify this polluted air. For this different species of plants and various green wall systems are analysed. The results of the study done show that the quality of the polluted air near the buildings can be improved by installing these green wall systems. Using this green wall systems with modern technologies, the urban design can be made sustainable and greener. This research emphasizes on assessing the green wall systems and lays down the benefits provided by them. The authors have tried to fill up the literature gaps regarding the green wall systems and its impacts as an element of biophilic architecture.

C Ibrahim Zakarya Kaddour, 2022, "Green Architecture for Sustainability Development in Algeria: Limitations and Visions": The author states that sustainability development focuses on promoting cities which respond to various social, economic, and climatic challenges. Green architecture plays an important role in architecture and urban designing as it helps to develop environment friendly buildings and urban spaces that satisfy the three pillars of sustainable development that are social, environmental, and economic pillars. Algeria is a country located in the North African Mediterranean that has a variety of climatic zones. Here many architectural practices have been attempted here to develop green architecture. Still there is no major progress or no firm framework has been developed to promote and practice green architecture in this region. So, this research tries to explore that why the environmental assessment systems are required to practice green architecture. This is achieved by studying the three pillars of sustainable development, also by evaluating the prior done sustainable approaches in Algeria, and by critical analysis. Through this

the negative and positive attributes were brought in focus and the challenges and limitations in following green architecture were known. Using this the short comings of the environmental assessing methods were discussed. This research brings forward the limitations of the existing assessment methods and the measures to amend it suggested to bring a flawless assessing system in the country.

D Pedro Fonseca Jorge, (2023) – "Mountable and Demountable Construction Systems of Interior Building Partitions: Ecology and Sustainability in the Ephemeral Use of Space": This research states that space dividing is needed to obtain privacy and since the beginning the architects have been dividing spaces using walls or fixed partitions. On the other hand the interior designers make use of movable and flexible furniture and partitions to divide these spaces. Here in this research the author has designed a new modular demountable partition that provides visual and audible privacy same as the wall or fixed partition. This modular partition is easy to install without any skilled labour and can be moved from one place to another. The installation is less time consuming and can create flexible interior spaces.

E Abdullah Badawy Mohammed, 2021, "Sustainable design strategy optimizing green architecture path based on sustainability": The author states that the designers are till date not clear in identifying the parameters to achieve sustainable designs. The green building ratings are based on its impact on the environment and are not concerned with the design opportunities and its process of assessment and the construction methods involved. This research is based on developing, assessing, and adjusting the process of rating systems of green architecture that provides a better way to optimize, generate, and produce design thoughts and concepts. Thus, the author focuses on the concept of sustainability and environment. For this, the basic principles on which the rating systems are made were collected and analysed. After that the GPRS that is the Green Pyramid Rating System was examined using sustainability and an analytical comparison system to know the obstacles of GPRS. The results showed that GPRS needs more promotion, treatment, and support for its proper functioning. A new definition of sustainable green design was evolved by bridging the concepts of sustainable design and green architecture that supports the green architecture rating systems. At the end a sustainable design strategy was designed that guided the designers to generate and employ the design thoughts and ideas based on sustainable green ideas. This research was done with the use of Delphi method. Delphi method in research refers to collecting opinions from subject experts through multiple rounds of questionnaires and the experts keep on refining their responses based on the opinions of other experts.

3. METHODOLOGY

To complete this research primary and secondary data both were collected. For secondary data literature related to sustainable interior design and portable partitions was collected and studied. For primary data a questionnaire consisting of 10 questions was designed using google form and was circulated amongst 150 practicing interior designers of Madhya Pradesh state. These questions were related to dividing the interior spaces using portable partitions, the advantages they render, materials used for partitions, preference of client and designer for installing the partitions and some suggestions for sustainable materials for the construction of these portable partitions. A random selection of interior designers working in different projects like residential, commercial,
educational institutes, hospitals, hotels, and restaurants, etc. was done. The data so collected was analyzed and results were extracted. Conclusion was drawn based on these results.

4. RESULTS

To understand the usage of portable partitions in interior designing, a questionnaire comprising of 10 questions was designed and interior designers were asked to answer these questions. The results of this survey are mentioned below.
Since it was a group of interior designers from all over the state, they were asked which type of project they work on the most. 39% of the interior designers were working in residential projects, 27% were working with commercial projects, 15% of them were designing hotels and restaurants, 11% were into designing educational institutes, and 8% were designing hospitals.
Below pie chart 1.1 shows the percentage of elements used by the designers to divide interior spaces. 44% of the designers use walls, 23% divide by placing furniture, 13% use fixed partitions and difference in flooring both and only a small 7% of the designers use portable partitions to divide interior spaces.

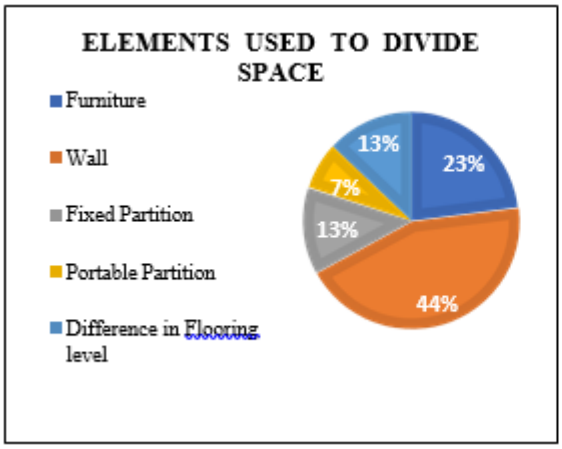

Chart 1.1

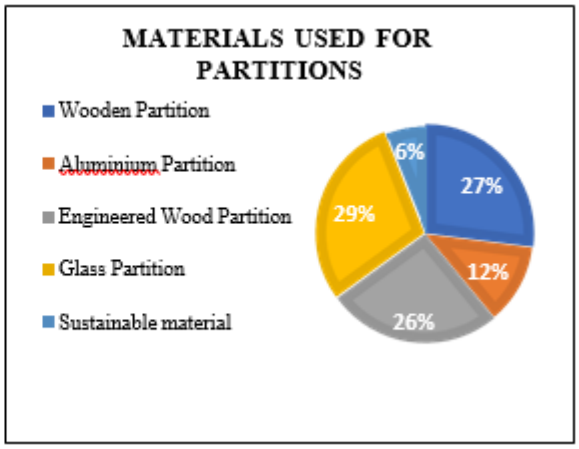

Chart 1.2

As shown in the chart 1.2, 29% of the designers use glass as a material to construct partitions, 27% use wood for partition construction, 26% of the interior designers use engineered wood, 12% use aluminum and only 6% of them use sustainable materials like bamboo for the construction of partitions.

As per the survey conducted 56% of the interior designers said that yes walls can be replaced by portable partitions, whereas 37% said no walls cannot be replaced by portable partitions and 7% were not sure about it.

87% of the interior designers agreed that partitions render more benefits as compared to brick walls in interior spaces, 11% disagreed whereas 2% of them were not sure. Furthermore, the designers stated that the advantages of portable partitions are that they can be moved easily as they are light in weight. It is easy and fast to construct and install them. They occupy less space and thus the usable carpet area can be increased. They can provide the same level of audible and visual privacy as fixed partitions. If these portable partitions are constructed of sustainable materials, then they are beneficial to human health also.

88% of the designers said that the clients don't prefer portable partitions, whereas 12% of them were not sure about it. As per the designers the clients till date don't prefer portable partitions as compared to fixed partitions because the clients are not aware of the advantages that a portable partition provides. The clients have a taboo of not using the portable partitions because of their operating systems. Also, the client has the notion that portable partitions are not durable and fall out to be more costly than the conventional room dividers. The client thinks that skilled labor is required for the installation of the portable partitions, and it has high maintenance costs.

Designers said that portable partitions don't use cement, brick, and concrete that are harmful to the environment, thus reducing the carbon footprint and so are more sustainable than the traditional brick or concrete walls. Portable partitions can be made up of sustainable materials that are locally available reducing the transportation cost and energy and locally available material is always climate friendly to that specific region. For example, in the regions where bamboo is locally grown, portable partitions can be made using bamboo as the base material. Portable partitions can be constructed utilizing less time and energy that again proves to be sustainable.

Portable partitions can be reused, for example, if the client shifts from one place and settles down in some other locality, the panels of these partitions can be dismantled hand then again installed in the new location; this is not possible with walls. In cities where most of the clients live and work in rented spaces, portable partitions can be very helpful. These partitions are made in panels and these panels work on channels or hinges or wheels. Therefore, it becomes very easy for the client to dismantle the portable partitions from the old place and install them again at the new place. No need of constructing or demolishing brick walls that are too time and energy consuming.

The most common material that designers suggested was bamboo and wood for the construction of sustainable portable partitions. But a few of them also suggested materials like mycelium, cork, rattan, strawboard, recycled glass, fabric like linen, jute, naturally colored cotton, etc.

5. DISCUSSION

From the above results it can be stated that the interior designers are working towards sustainable interior designing. A major step in doing so is to use sustainable materials and sustainable construction techniques like eliminating brick walls and replacing them with portable

partitions. Awareness regarding the use of portable partitions for attaining sustainability needs to be spread and below mentioned are a few ways in which this can be achieved.

a) NGO (Non-Government Organization) and government should collaborate to raise awareness amongst the common man.
b) Industrialists and manufacturers of the materials for interior designing should be made aware of the sustainable materials and sustainable production techniques.
c) Advertising campaigns should be run to increase awareness amongst the urban population.
d) Inter-college competitions should be conducted to make the design students aware of the concept of sustainability.
e) Government subsidies should be given to the designers and clients opting for sustainable designing.
f) Government outlets for selling sustainable raw materials and interior design products and accessories should come up that sell products at a reasonable rate.
g) Annual interior design award competitions should be organized where encouragement to sustainable designs should be given.
h) Renowned social heroes should be made brand ambassadors for promoting sustainable designs and sustainable materials.
i) Help of social media should be taken to promote sustainable interior designing.

These are a few ways in which sustainability can be achieved in the discipline of interior designing.

6. CONCLUSION

Portable partitions can be a good and sustainable alternative to fixed partitions and walls if wisely designed and installed. To make the portable partitions more sustainable, they can be made from sustainable materials like wood, bamboo, rattan, mycelium, strawboard, natural fabric like cotton, jute, linen or recycled glass and recycled plastic. Use of locally available materials can be made for their construction. But the research shows that portable partitions are less known and installed in interior design projects as the clients are not well aware of the benefits they provide. More awareness needs to be spread amongst the common man so that they can demand the interior designers to install portable partition. Client today doesn't know the advantages of installing portable partitions in their interior spaces. So, the interior designers have to play an important role in explaining to their clients the benefits of portable partitions. More advertisements through social media need to be done to spread the awareness of portable partitions and how easy it is to install and operate them.

Portable partitions can provide visual and audible privacy by using the right material. They make the interiors appear airier and more spacious. They are easy to install and construct without the need of skilled labor. Portable partitions made up of sustainable materials are good for the health of the inhabitants. More portable partitions should be used in the interiors as they are a sustainable solution to replace walls and fixed partitions.

CONFLICT OF INTERESTS

None

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