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AFFORDABLE AND SUSTAINABLE HOUSING IN DEVELOPING COUNTRIES BY USING VERNACULAR ARCHITECTURE

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ABSTRACT

Due to human population increase, natural catastrophes, and war, global demand for housing has reached unprecedented levels, which is felt most acutely in developing nations, which have faced disproportionately high demand levels owing to their inherent fragility. Most established methods to housing delivery in emerging nations still rely on ineffective building technologies and implementation processes, characterizing them as troublesome and destructive. Affordability and sustainability are major issues in international development for sheltering the poor in developing nations to meet long-term goals and requirements. The research aims to provide architectural, sociological, and economical alternatives for low-cost house design and to solve connected challenges with appropriate vernacular solutions in Kish Island in Iran and other third-world countries such as Kenya and Bangladesh (Afshar).

Keywords: Vernacular Architecture, Affordable Housing, Sustainable Housing, Developing Countries.

I. INTRODUCTION

Emergence of vernacular architecture can give suitable solutions to the requirements of the population ((Thomann). Using vernacular architecture to construct inexpensive homes for low-income people, some requirements ought to be addressed. The architecture must balance sociological approval with cost and environmental impact to be acceptable to the public, and it should also consider physical attributes (Susilawati).Consequently,s improving low-cost dwelling designs to promote vernacular architecture was this research's aim; to help low-earning Kish Islanders and others in third world nations. In addition, this study investigated the social and economic factors that might influence the affordability of homes on the island, which was done to guarantee that low-income people in this region can afford to purchase new homes in other sections of the island.

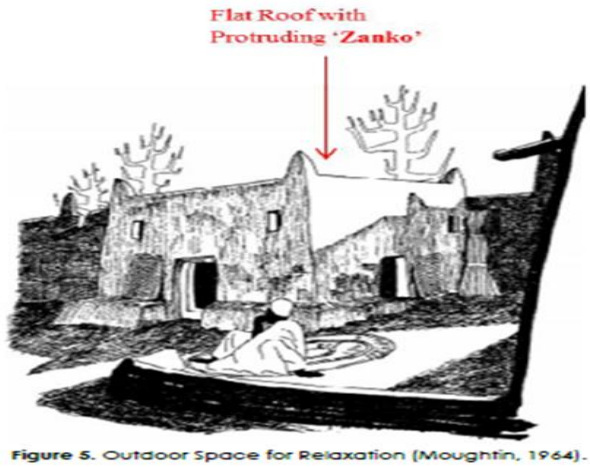

Figure 1: Depicts Nigerian vernacular architecture in its natural setting.

II. RESEARCH OBJECTIVES

2.1 Research Goals

Develop an architectonic, vernacular, and sustainable housing proposal to help with territorial planning, especially in developing countries with a housing shortage of social importance. In order to achieve this, one must:

An architectural, vernacular, and environmentally friendly housing concept is proposed. Using the methodologies specified, illustrate the results of the analysis.

2.2 Context of Study

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This article aims to show how sustainable and affordable housing can be built in developing countries using vernacular architectures. In developing countries, the issue of affordable and sustainable housing is critical. There are now more people than ever before residing in urban areas due to increased urbanization. People cannot afford to live in these areas, which is a problem. Numerous individuals lack the financial wherewithal necessary to either rent or buy an apartment or house suitable for their particular set of requirements or requirements. Implementing a more cost-effective and, therefore, more accessible architectural, colloquialisms, and sustainable design will alleviate some of the difficulties faced by homeless people. Cities worldwide have seen rapid population growth, often outpacing available housing.

For the first period in world history, more than halves of the world's population now lives in urban regions. More than a dozen cities globally have populations greater than 10 million, including 35 in India (Habitat). Many remedies can be designed to address these issues on a domestic and global scale. 'Habitat also finds that affordable means more than just economics; it also means that a house is fit for human habitation if it is not overcrowded and unhealthy. Household expenses (housing, water supply, electricity, and gas) must also be considered to accurately picture the actual cost because they make a house comfortable and suitable for a living (Habitat, -a). Architectural style as a theoretical foundation in the personal share program paired with a design that represents the society's identity and links with the area is more expense and efficient. This configuration allows users to build in a way that best suits their needs, whether for specific cost-saving, limited resources, or weather resistance.

2.3 Approach/Methodology/Design

One way of conducting research is to compare and contrast examples of reinvigorated structures, then group them according to the degree of interference each one has had with the structure. The study's methodology included recognizing the research problem, creating a research framework, conducting a thorough literature review, and publicizing the concepts of housing affordability and vernacular architecture. Because of this, a vernacular architecture methodology was used to advance affordable housing projects for low-income earners in developing countries to minimize environmental impacts and maximize social acceptability. For this study, researchers focused on low- and middle-income countries in Asia and Africa that are home to most of the world's poor.

Four methodological approaches were integrated into the methodological procedures: 1) Qualitative, 2) Quantitative, 3) Mixed, and 4) Ethnographic. QFD "Quality Function Deployment methodology" was also used as a quality management method based on satisfying the user's needs and preferences (Vernacular) and adding strategies to make sure that users have these homes at an affordable cost. As a result of this methodology's emphasis on bringing together residents of the same population in order to create housing security and distribute resources fairly, the housing shortage problem has been exacerbated, resulting in so-called "location segregation," which is defined as the social exclusion of certain social groups from urban resources, and the so-called "housing deficit" (Fross et al.). Each architect's goal should be to maximize the effectiveness and efficiency of the design solutions they propose, to diagnose and meet the needs of their clients correctly, to implement priority investment goals as a business, and to look to the future in terms of object sensitivity and to anticipate all of the repercussions of their choices.

It was decided to conduct a preliminary and "fast" evaluation of the architecture designs based on observing and interviewing people in the surrounding vernacular building designs. Reviewers used the respondent's point of view to conduct an all-inclusive assessment. An evaluation was conducted by a group consisting of two architects and a facility manager. In the beginning, it developed an evaluation program centered on the QFD technique. The information about the current subject state of the building and the most critical data on the wants and needs of its users were gathered and analyzed. Three buildings from the 1970s in the 20th century was

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subjected to evaluation. Various methods were used in the evaluation, such as interviews with specific individuals and walkthroughs of buildings and equipment. To collect data quantitatively, a sample must be a subgroup within the population of interest that is representative of the general population as a whole. That subgroup must be precisely defined and demarcated in advance.

Our next step is to quantify the information we have gathered using the National Social Housing Program Project's 2013 methodology. If one is working on a project with social, environmental, and economic implications, one will want to use a method like multi-criteria decision analysis (MCDA) (Groat and Wang). Using the TOPSIS technique, a multi-criteria decision-making method, one can rank alternatives from a finite set of options. Choose the option that is farthest from (but not as close to) (negative ideal solution) and farthest from (positive ideal solution).

2.4 Basic Conceptual Framework

2.4.1. Framework for theorizing

Local planning considerations were discovered by understanding the subject matter: Investigating the urban environment's social characteristics. While this paper seeks to introduce the fundamental analytical ideas used in the study of urban neighborhoods, it also aims to show how these concepts are intertwined with the physical and social components that make up a specific neighborhood. According to the findings of this research, people's requirements and affordability were not met by the dwellings in developing countries. As a result, proposals for ways to make housing more affordable might be an essential part of developing housing policies worldwide. As a second part of the study, the authors conduct empirical research to see whether professional residents of areas with significant social and urban structural changes have different perceptions of the community. It is found that the community as a commodity evolves more clearly in higher-quality neighborhoods through qualitative methodology built on interviews with sample participants in two types of suburbs (one subjected to social filtration and another to the process of gentrification) and that the suburb as a negative context (cultural and physical) prevails everywhere.

Using the country's vernacular architecture as a foundation for affordable home development, this article provides a framework for steering the process. In developing nations, housing projects and housing policies are expected to benefit from the proposals. In both neighborhoods, the value of mutual assistance and reciprocity has grown, fostering a more incredible feeling of community. Respondents' perceptions of security differed significantly, primarily because of the different social contexts in which they resided. In addition, the layout of the room impacted the amount of felt security. There are no significant variations in the amount of social capital that may be mobilized via intermediary institutions in any region studied. People prefer to pay for services rather than become involved in neighborhood activities. This is seen in their preference for using the private sector to handle local issues rather than relying on the government for help. It aims to create a long-term strategy for engagement in the local community.

We find that by examining the literature on social interest housing, we may conclude that: Providers of Social Housing Should Use a Multidisciplinary Strategy. Study of a Specific Situation Ecuador's capital city of Cuenca is located here. Because public housing in Ecuador and other Latin American nations is too expensive for the lower socioeconomic strata, the only option left is to build one's own home. Get a place to live at this level of society. Using a multidisciplinary and qualitative methodology, the social and human habitation circumstances of Cuenca's low-income C-strategy population are examined to identify their spatial and constructional needs. The social research group's housing plan should be sustainable and inexpensive, assuring that the city's housing deficiency is covered, increasing the users' sense of quality of life.

The vernacular design process for social housing was discussed in the literature. Investigating the potential re-

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sale value of traditional Indonesian homes throughout Asia: Nepal, Bangladesh, and China are three countries in the region. Nepal and much of Asia are known for their vernacular settlements that reflect the values and cultures of local populations. Until recently, these villages and their traditional architecture identified many towns and cities. In the face of rapid urbanization and a lack of interest in the local vernacular history, many significant cultural structures have been demolished or removed. If these behaviors continue, a city or town's identity and cultural variety might be lost. These traditional houses, which may be found in communities throughout Asia and Africa, including Kenya and Nigeria, are examined in this paper to see whether their potential worth might be used as a valuable resource for posterity. An expert assessment technique is used in this publication, which examines and assesses two traditionally built mud dwellings from an architectural perspective. Traditional mud buildings, which are presently unoccupied, were surveyed to see whether the residents considered their vernacular history worthwhile and whether or not they would be interested in utilizing them for future use. These findings show how a value assessment can help guide long-term preservation efforts in Asia's housing reserves by examining the interplay between societal, cultural, and environmental values. Theoretical Structure

2.5 Methodology Framework

The Ampel Mosque Surabaya's "priority is to preserve the dependability of sustainable construction." A recent study by Sedayu found that Raden Mohammad Ali Rahmatullah established the Ampel Mosque in 1421. Semampir District in Indonesia's East Java province is home to the Ampel Mosque. The Ampel mosques were constructed in Japanese-style architecture with a few Arabic Islam elements. Local culture (local knowledge) and Hinduism may be observed in the mosque's construction due to acculturation. Maintaining sustainable buildings at the Ampel Mosque is the focus of this investigation. According to the research findings, the "Importance of Performance Analysis" (IPA) and "Quality Function Deployment" (QFD) to enhance structural components' maintainability and ease of use are the most critical customer demands. Non-hazardous construction materials are the essential thing to increase. Non-hazardous construction system design and setup is the primary goal. The mosque management organization may take these factors into account while making repairs and improving the upkeep of the Ampel Mosque.

Previously conducted research provided the data utilized in this study. The mosque's current state and past research variables were used to determine the mosque's maintenance parameters. Users' relevance in sustaining the dependability of a structure may be determined by conducting an Importance-Performance Analysis (IPA). The following is an explanation of the significance categorization diagram, which is broken into four sections:

Quadrant A comprises aspects that people deem significant but in which they express little pleasure. Managers always strive to enhance performance in this area.

Quadrant B features elements that customers value highly, as seen by their high satisfaction scores. Quadrant C, aspects that people deem less significant and, in reality, is less important, may be found in this quadrant.

A user's perception of the importance of a particular element is reflected in this quadrant's weighting. QFD improves mosque structure based on client demands. HoQ, which is an integral aspect of QFD analysis. Analyzing how well an administrator's technical reaction may improve the mosque's building quality is a goal of Quality Function Deployment (QFD). Finally, the FCM and TOPSIS methods of weighing multicriteria judgments were used to build and assess this IPA analysis, resulting in intriguing quantitative data for the inquiry.

III. RESULTS

3.1 Research Results

Study phases corresponded to specific functional, behavioral, technological, and aesthetic requirements quality.

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The transportation and traffic linkages between the University and the surrounding area were examined during the first phase. The locations were also included in a generic inventory. Stage II dealt with the quality of the technology.

A high level of expertise in engineering, technical, and structural conditions of the buildings and infrastructure technology conveniences should be safe and straightforward to utilize. The first criterion to be analyzed was the safety of persons, and the property was the primary concern. The upkeep of the structures and the area around them were also examined. Aesthetics and conduct were the focus of stage III. Way-finding, among others, was among the criteria for evaluation. The campus's aesthetic impressions and social integration are important factors to consider. Spaces linked with teaching and learning and social integration were the primary focus of the assessments conducted on university campuses. Buildings for higher education are increasingly being designed to facilitate integration, meetings, teamwork, and formal and informal connections. The author examined both older and newer university buildings in light of their ability to meet students' requirements and expectations.

Quadrants

Quadrant A:

An architectural style known as "vernacular" is one in which structures are constructed outside of formal educational institutions and without the assistance of professionals. There are many building kinds here, with a diversity of construction techniques.

Figure 1: Ancient Chinese housing settlement

Quadrant B:

An even more interactive workshop was held the next day, including participants of all ages, to reach a consensus on a final location where everyone felt comfortable continuing their work. Respondents overwhelmingly selected the "Hausa" high-profile architecture linked with wealth or the front hall, which the residents used for pleasure and repose. In turn encouraged to contact neighbors who arranged different events such as parties, livestock, or children's sports.

Figure 2: Nigeria's most well-known vernacular building type.

Quadrant C

Women homemakers are now being counted since they are the ones who feel most comfortable in their homes and are functionally familiar with all of the rooms. They reasoned that the backyard, planters, and even the din-

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ing room are the minor significant locations since they are only used for temporary transitions and are not intended to be shared with the family.

Figure 3: Kenyan vernacular architecture shows us the house's leftover space.

In the D-Quadrant:

A roundtable discussion with a delegate from each parish and the use of graphics to gather feedback from residents in each of the three participating neighborhoods revealed that the dining room, which is shared by the living and dining rooms by design minimums, is the most overrated space and deserves some redesign, according to the representative.

Figure 4: A photograph was taken at one of the UTE's workshops

IV. DISCUSSION

Inequalities have been exposed as a result of the continuing COVID-19 epidemic, particularly when it comes to the uneven distribution of architectural resources among individuals. Those who could manage it, for example, left their major metropolises and moved to their second houses in the countryside during the outset of the epidemic. We've also seen how impoverished individuals in cities like Mumbai, for instance, lack proper access to green areas, which are an important aspect of human health. Within this discourse, there is also the topic of social housing, which is known by many different names throughout the globe, and how future social housing should adapt to ever-changing global demands. The problem of tenant displacement and rent severe restrictions has been one of the major economic elements of the COVID-19 epidemic. Because millions of individuals lost their jobs so suddenly, many found themselves unable to pay their rent. As the economy improves and more people resume work, the moratoriums are being challenged, with landlords and renters disagreeing on how to proceed with future payments. Tenants are still unable to pay their rent, and landlords are struggling to make ends meet. But what this standoff actually reveals is how out of range living prices have gotten in some of the world's most densely populated cities, and how accommodation has been viewed as a luxury, not a need or a fundamental right—even in the face of a worldwide epidemic.

4.1. The Building of a New Home Development on the Island of Kish

Kish Island is just around 18 kilometres away from the southern coast of the mainland. There is an area of 90.5 km2 on the island. Its current population is roughly 22,000, according to current estimates. According to some

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estimates, many Iranians have migrated to the island in search of employment possibilities. There were around 4,400 households in 2000 and approximately 10,360 homes in 2005.

According to Reza (1995) centuries, the island was at its most developed according to (Reza). The island has not altered much from the fourteenth century until the latter decade of the twentieth century. The island of Kish had no more than ten tiny settlements until 1968; (Afshar). Both Masheh and Saffein were the two most populous cities in the region.

The Kish Development Organization was formed when Kish Island was granted a "Free Tourism Port."

After it, Mercury Consultant Company produced the first Kish master plan **(**Nzau**)**. It was a residential-recreational complex, and according to (Ashfar**)**, keeping Kish Island as a domestic island and employing locals as blue-collar workers were the primary goals of the strategy. There were three types of residential zones at the time: rural districts for locals, government-owned apartments, and luxury dwellings for a second home. A tourist complex was built in Masheh Village because of its location on the northeastern beach. Each structure's design was influenced by the Pahlavi period's architecture **(**Amir**).** There is now a new Masheh Village on the island's northwest coast, adjacent to Saffein Village, as part of the master plan's idea of clustering all rural villages close together. The population of the island was 5,600 in 1977. At that time, they were considered natives of the island. In many ways, this master plan's architectural and urban design themes are still relevant to our daily lives today

4.2 African Vernacular Architecture's Influence on Kenyan Design

Due to the widespread use of mangrove pole roofing over lime and coral walled constructions, rectangular house typologies with flat roofs were developed along the coast, providing excellent protection from the harsh coastal elements (Sayigh).

In addition to their cultural customs, each of these groups had a distinct construction style depending on the materials and methods accessible to them, which meant that people could identify certain types of dwelling design with a specific town at the time. Indeed, one might argue that this building was Kenyan, despite its rustic nature (Arch).

4.2.1 Vernacular principles' effects may occur on Kenyan architecture.

Though, a new horizon for architecture has opened up as a direct result of modernity and globalization. Everyone wants to seem current and produce architecture that appeals to a worldwide audience when they develop nowadays. All these materials are held together using cement mortar. Because of this, today's units are becoming more standardized in their building methods and the shapes they take on. Because of globalization, Kenyan architecture has become quite general, and one cannot claim to be distinctly Kenyan in the developed architectural style.

When it comes to creating Kenyan architecture, one of the most effective methods for contemporary architects is to retrace their origins back to the vernacular architecture typical in Kenyan villages. A few well-known hotel businesses have done this well, constructing unique contemporary lodges with a strong Kenyan architectural flavour.

Another great technique to create Kenyan architecture is to draw architectural firms from the country's distinct material culture. Design compositions that are hard to locate anyplace else on the earth may be created by abstracting these components into a constructed form. A building's exterior and interior may benefit from repurposing these pieces as design themes. Good Kenyan architecture should have a strong local appeal, and the final arrangement does just that.

In essence, to the vulnerable architecture in Kenya, when a building's shape and morphology are evocative of architectural forms connected with specific Kenyan communities, it may be considered to display Kenyan architecture at the overall level. Detail-oriented examples of Kenyan architecture may be seen when a designer incorporates components of local material culture into a design to give it a distinctively Kenyan character. Various functional and aesthetically pleasing architectural components, including balustrades, window mullions, doorknobs, and joinery fittings, may be derived from these pieces.

4.3 Australia on its Way to Create an Affordable Sustainable Housing and Future

Although Australia has a long history of embracing technological advancement, the construction sector has remained primarily conservative. There has been a steady emphasis on cutting building charges at the cost of overall performance, lifespan, and environmental sustainability over the long haul in Australia's urban development and housing affordability debates for at least the last 50 years. We have seen the consequences of low-quality construction in Australia's severe climate firsthand, and they are not what we had hoped for. Large areas of once 'affordable' or' social housing' have long since outlived their usefulness in the rapidly depopulating suburbs. Existing homes that initially needed high energy usage levels to maintain a reasonable temperature are now burdening their owners or inhabitants with increasing long-term expenditures as they degrade.

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What is the next step in your journey? Moreover and how can we create a sustainable and cheap housing paradigm that promotes active and inclusive communities? , Neighbourhoods?

As our cities and regions develop and refresh, so do our hopes for house ownership and investment. Today, people living in intelligently designed communities seek the best design and construction quality based on environmental awareness rather than enormous tracts created for quick sale. The interaction of space, housing, and facilities increases individuals' quality of life (Gross).

Sekisui House, an international developer, is spearheading a substantial improvement in the quality of New South Wales and Queensland have master-planned communities. Architectural excellence and intelligent design are used in these houses, as well as the finest materials and construction techniques available, resulting in spacious and comfortable spaces. For example, the Sydney Central Park development by Sekisui House has already won top architectural honors for multi-dwelling quality, innovation, and sustainability in the Australian market. In Australia's suburbs, the Japa-nese-founded firm is pioneering a quiet revolution in home construction materials, procedures, and technology that reaches well beyond the boundaries of bricks (Bajkowski).

4.4 Vernacular Architecture of Bangladesh

The origins of villages in Bangladesh are rooted in agriculture, and habitation in this region extends back to ancient times. Rural Bangladesh's indigenous architecture has changed through time in response to the area's geography, climate, and the availability of local materials. The indigenous villages are constructed mainly by local laborers and members of the home and community who lack formal training. Indigenous inhabitants of this area have practiced this for generations. The structures continued to accommodate and satisfy the demands of the bulk of the population despite not being planned by professional architects. They were also effectively adapted to the local environment and resources

Bangladesh consists mainly of a flat deltaic alluvial plain. There are two primary forms of settlement: elongated-linear and amorphous, both of which are located on ground elevated above the natural floodplain. The amorphous form comprises clustered or dispersed communities. At the same time, the elongated-linear type is established along the natural levees of rivers or water channels, which are often spread throughout the landscape. In the absence of highland, towns are erected on elevated earth mounds dug from channels or ponds, while in hilly areas and some marshy terrain, settlements are constructed on stilts. In the rural parts of Bangladesh, distinct settlement patterns have formed in the various physiographic zones, each of which has its own distinct features. Different socio-cultural and economic elements also significantly influence the development of various settlement patterns and types. The layout of a typical rural home is rectangular with an open courtyard. Typically, single-story, although sometimes two-story constructions are seen on an elevated earth platform, buildings are erected. The elevated earth plinth is prevalent in Bangladesh and is a distinguishing element of the local architecture. The roof is the most challenging and costly component of a rural home. The primary roofing characteristics are pitched roofs, gable (dochala), and hipped (chocolate). In various regions of the nation, mud-walled homes, thatched houses, and bamboo huts are prevalent forms of dwellings (Rethinking the Future).

4.4.1 Houses made of mud

In the north-western districts of Bangladesh, dwellings with mud walls are frequently referred to as "mud houses"; this is a distinguishing housing characteristic of these regions. Less precipitation, a dry environment, and elevation above the flood level are the primary factors behind the growth of mud houses in this area. In certain regions, the walls are constructed from one to two inches of sun-dried mud, which helps to keep the inside cool. The combination of mud walls and thatched roofs are good for maintaining a reasonable internal temperature. Other typical roofing materials are tin sheets and clay tiles.

4.4.2. Thatched dwellings

This form of dwelling is prevalent across rural Bangladesh. Long grasses and rice straws have been used to build roofs and walls, while jute sticks have been used for flooring, mainly because reeds and long grasses are plentiful and inexpensive in marshy regions and along riverbanks. Typically, one or both sides of the materials are plastered with mud, and the roof is framed with bamboo and covered with different types of thatch.

4.4.3 Constructions made of bamboo

Bamboo is the primary building material in Bangladesh's eastern and northern areas. Bamboo may be found in various thicknesses, from very thick to extremely thin. Posts and roof rafters are made from thicker bamboo, split into a range of rigid mats and panels that may be utilized for walls, roof covering, partitions, and several other uses. The porous, screen-like walls of this affordable, lightweight material provide ventilation and thermal comfort.

4.4.4 Corrugated iron sheets

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Due to their apparent advantages, homes with tin roofs and walls are becoming more popular in the northern area, where rainfall is exceptionally high. The sheets are watertight, light, and durable, giving direct protection against heavy rain. The majority of rural households want to possess a home like this since it is seen as a status symbol in the community.

Indigenous architecture has developed over the past several decades due to dwindling supplies of natural building materials and a lack of foresight. Many structures are being created utilizing indigenous practices and contemporary innovations to develop eco-friendly un-conventional architecture to establish a more sustainable living environment.

4.4.5 Centre for Social Services of the Pani Indian Community

Schider Scholte built the Pani Community Center in Rajarhat, North Bengal, and it serves as an educational facility. The construction consists of two separate volumes, which are covered by a large bamboo roof. Cross ventilation, nearby flora, and the nearby pond help keep things excellent, thanks to the raised roof. It is built around materials that may be found in the area and weather conditions. Building materials include mango wood, steel from other structures, bamboo and hand-shaped brick, and recycled corrugated panels.

4.4.6 The METI College of Crafts

The METI Handmade School in Rudrapur was designed by Anna Heringer and Eike Roswag, two architects from Germany. Building methods and materials from the area are used, while fresh approaches to durability and integrity are included. Building materials include clay stones and bamboo. Earthen walls are protected by a strong brick base, which reduces moisture's influence on them. As you go up, you'll see that the top level has slatted bamboo walls that let light and air into the space. Besides the courses, there are spots for socializing and playing.

4.5 Vernacular structure of Nepal

For the Central Hills of Nepal, the vernacular environment and agricultural cycles are well-suited to the traditional architecture. Sturdy stone walls, a kitchen on the first story, bedrooms on the second floor, an attic storage room, and an expansive yard complete the ideal Hill home.

A farmer's everyday routine is taken into consideration in the design. Traditional building materials like stone, wood, bamboo, and earth are losing their confidence in Nepal as aftershocks continue to wreak havoc on the country's hilltops, which are believed to have been responsible for causing the devastating earthquake on April 25th.

When earthquakes and aftershocks cause structures to fall apart, we should check whether their fragility was caused by the design, materials, or procedures used to create them. If this is the case, what might be done to make it easier to recreate the feel of a village in earthquake-affected areas? Masons and carpenters in the area can provide some solutions. Stone blocks and wooden beams were used to build homes in the Hills until the 1970s and 1980s when wood became scarce in the area to create a "box look." So that it could move as a single "box," the structure was reinforced and could withstand earthquakes because of its seamless design.

The wooden bands framing the habitation (called in Nepali as nas or the structure's nerves) were abandoned as wood became increasingly expensive and scarce. Sumilaune, the method of generating a home's rhythm by placing cornerstones in the correct position at the right time, has been virtually abandoned in modern construction practices.

It is possible that these approaches, which were vital to Nepal's vernacular architecture and made dwellings earth-quake-resistant, may be reintroduced as preferred construction practices for the rehabilitation of homes and communities. In recent decades, Nepal's vernacular architectural traditions were unable to transfer into the current period because of professional, academic, and government neglect.

ABARI, a non-profit organization dedicated to celebrating and promoting indigenous architectural knowledge, was established eight years ago to meet this demand. They believed that by merging ancient knowledge with modern science, they might make little alterations that would have enormous social and environmental impacts."

They were also taught how to prepare bamboo for use as beams and rafters because of the high cost of wood; all of Bhutan's community woodlands have been equipped with the treatment process since it is so effective.

There is enough local know-how and technology in Nepal to build appropriate houses for the people who live there and, in the earthquake, -prone area. Building homes that can not only withstand natural catastrophes but are also more comfortable and appropriate for the current environment may be an excellent opportunity to teach people this important lesson during this recent earthquake (Adhikary and Leigh).

V. CONCLUSION

These instances show how beneficial it is to gather data using research methodologies and qualitative assessment approaches. Directly from the source, all of the information is available. Faster outcomes may be achieved by using simplified procedures. Multi-method approaches, such as observing the structure with unstructured interviews, complemented by a survey interview with the management, are ideal for this kind of research. A researcher's method of choice is determined by the scope and depth of the study being conducted on the subject or issue under consideration. An essential source of knowledge for designers is observational, pre-design, and in-use research. It is important to note that the evaluation of items is not intended to criticize the work's author but rather to draw lessons from the evaluations done for future projects so that they may be designed better and better each time. Countries benefit significantly from affordable and sustainable housing because it provides them with fast and reliable settlements, helps them justify their design decisions, allows them to verify their own decisions, and helps them improve as a designer professionally. It is simpler to manage and keep things organized when vernacular architecture is used in construction. It reduces labor and exploitation expenses while also allowing for more effective use of space.

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