

Folk House Types at Dodra-Kwar Village, Shimla District, Himachal Pradesh

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ABSTRACT

In this analysis, the study will discuss the typology and characteristics of the traditional folk houses of DodraKwar, an isolated village group in Shimla district, Himachal Pradesh. Dodra-Kwar lies between 31° 11' 49.9596"N and 78° 3' 23.2704"E and an altitude of 2, 400-2,800 meters, and because of the extreme climatic conditions, high snowfall, and a historically isolated environment, the region has maintained unique architectural activities. Fieldwork incorporated both photographic and documented records coupled with measured drawings and semi-structured interviews with local masons, households, and elders in order to document both material and cultural aspects on house construction. The analysis shows the presence of three large types of houses, Type A (Traditional Timber Houses), which is constructed with almost entirely deodar wood, with slate roofs; Type B (Stone-Timber Hybrid Houses), which is composed of the integration of stone masonry to provide balance with timber superstructures; and Type C (Modernised/RCC Houses), which consists of reinforced concrete, cement walls, and roofing made of corrugated metal. All typologies represent a distinct equilibrium of climatic adaptation, resource utilization and socio-cultural meaning. Whereas Type A and B reflect vernacular strength and artisanal tradition, Type C reflects on modernization at the cost of thermal comfort and historical appearance. The results point to a persistent transformation of the resource-based tradition towards the market-based modernity that puts the issues of sustainability and cultural conservation into question. This paper summarizes by emphasizing adaptive conservation as a solution approach to combine both traditional and modern innovations to guarantee architectural continuity within Dodra-Kwar.

Keyword: Dodra-Kwar, timber houses, RCC houses, folk houses

1. INTRODUCTION

The purest meaning of architecture can be described as a reaction to the environment, culture, and society of a nation. Folk housing is the product of the two in the Himalayan area in India where the conditions of climate are extreme, and the settlements are always closely associated with the natural resources. A good example of such architectural adaptation is the village cluster of Dodra-Kwar located in the upper parts of the Shimla district in Himachal Pradesh. Dodra-Kwar, surrounded by the Rupin Valley with an altitude of about 2,400-2800 meters, has long, severe winters, falls of great amounts of snow and brief farming seasons. This has been maintained by its geographical isolation, which until the recent decades, had not been reached by a motorable road, thus maintaining its building traditions and cultural culture. Dodra-Kwar built environment is not just a utilitarian shelter but a means by which the community has to compromise with climate, the land, the material resources and the social tradition. The research of folk houses types in this area is thus not only important to the architectural documentation

but also to the concept of the socio-ecological context of mountain societies.(Dutta et al., 2022)(Dhar, 2022)

The Himalayan vernacular architecture is highly informed by the environmental imperative. Timber, stone and slate are all local materials that are used in their forms that add warmth to the interior, structural strength and functionality. The houses of Dodra-Kwar are evidence of such adjustment measures through the small size and multifunctional structure, as well as their steeply sloping roofs that shed snow. The construction of multi-storey houses has been possible since the use of deodar wood which was traditionally valued due to its resistance to pests and durability and hence used to house animal shelters, storage and living quarters in one building. Meanwhile, the decorative wooden ornaments on facades and balconies show the aestheticism and symbolism of the culture imprinted in the architecture. These characteristics emphasize the point that folk housing is not an object but a vibrant practice whereby practicality meets with culture. The continuity and change can be depicted by the typological diversity that can be seen in Dodra-Kwar today. The settlement is dominated by three types of houses. The traditional houses made of wood, entirely wooden, are the most climate-efficient and culturally significant and diverse construction. The houses are becoming scarce because of lack of timber and the escalation of the cost of maintenance. Stone-timber hybrids were a more pragmatic compromise, which saved on timber by replacing the lower floors with masonry of stone and conserving timber to the upper structures and rooftops. This type remains popular since it has struck equilibrium between longevity and cultural identity. The third form is modernized houses made with reinforced cement concrete (RCC), corrugated metal roofing, and cement tiles, reflecting the impact of the existence of road connectivity, market accessibility as well as the evolving aspirations. Though these houses do not need much upkeep, they tend not to give the thermal comfort required to live in high altitudes and are not a part of the aesthetic harmony of the traditional village landscape. The analysis of such kinds gives us the understanding of the main processes of modernization, adjustment, and cultural change in the Himalayan villages. (Sarkar, 2013)(Belz, 2015)

The contribution of the research to the broader discussions on heritage conservation and sustainable development is also that the study of folk house types in Dodra-Kwar. With the influx of infrastructural integration and contact with external markets, the rural communities face the danger of losing the value of their own localized systems of knowledge in favor of standardized building techniques which are ill-adapted to local climatic conditions. The same tendency can be observed in Dodra-Kwar where the number of RCC houses equipped with metal roof has been increasing; this may seem as a sign of development, but on the contrary, it undermines many years of climatic adaptation. The disappearance of the traditional crafts especially the skills in wood carving and roofing with slates also poses a threat to the intangible heritage of these houses. The knowledge of the architectural typologies of Dodra-Kwar is thus of primary importance to the process of policy and practices of the country that would not violate the cultural identity but rather allow the modernization.(Hansda, 2018)(Merdassa, 2021)

2. LITERATURE REVIEW

(Kant & Lakra, 2023) Regardless of location, a building's design will always reflect the local topography, climate, socioeconomic status, and, most significantly, cultural norms and values. Because of the extreme environment, indigenous architecture is fundamental to the indigenous people's social and cultural system. The building process in indigenous architecture is mostly manual labor, with occasional assistance from neighboring villagers. Traditional building knowledge is transmitted from one

generation to another via first-hand accounts told orally or acquired through years of apprenticeship. In the Indian state of Himachal Pradesh, namely in the Kangra area, there is some remarkable indigenous architecture. In this study, we take a look at the local indigenous building styles. The energy usage, pollutants, and garbage produced by residential constructions are rather high. We should evaluate the potential for energy saving in the housing sector across the whole life cycle of the building since it is substantial. Several phases of residential building development, such as product manufacture and construction, have their energy consumption and environmental impacts studied using Life Cycle Assessment (LCA). The total embodied energy of two different home types—a modern contemporary house and a traditional vernacular house built with dry stone—were compared in this study.

(Pardo, 2023) Crafted by those without formal training but benefiting from inherited wisdom, vernacular architecture reflects local conditions in terms of topography, climate, materials, customs, and culture. Traditional structures are not only historically significant, but also exemplary of sustainable design because of the way they make use of existing resources in a way that reduces costs, energy consumption, and negative impacts on the environment. Given that vernacular architecture accounts for over 75% of the world's existing structures, its preservation poses a significant problem in the contemporary context of globalization of construction methods and increasing demands for spacious homes. This paper presents a qualitative analysis of the current areas of research on vernacular architecture. It is based on a study of selected peer-reviewed literature indexed in the Web of Science for the period between 2000 and 2022. The paper takes a close look at topics such as the scope of the studies, traditional building materials and construction techniques, preservation problems and solutions, climate adaptation, and the reuse of abandoned vernacular buildings. For the purpose of preserving vernacular architecture for future generations, it is recommended that research be conducted in multidisciplinary teams with an emphasis on fieldwork in under-researched areas. Additionally, existing vernacular buildings should be retrofitted with modern materials and solutions to meet current comfort standards without drastically altering their core characteristics.

(Dabaieh et al., 2022) Many practitioners, politicians, and even private investors have been pushed to create new rules, procedures, and approaches to attain more sustainable building practices as a result of the growing climate change catastrophe and the fast urbanization of cities. Many people believe that buildings are major sources of pollution, resource depletion, and trash accumulation. In recent years, the idea of a "circular economy" (CE), sometimes known as "circularity," has become more popular. Applied to the construction sector, CE stems from the principles of sustainable construction, which aim to lessen man-made harm to the environment while simultaneously improving indoor air quality and completing the lifecycle of building materials. Many of the fundamental ideas behind vernacular architecture and the principles of the circular economy are same. The purpose of this article is to examine the ideas of vernacular architecture and the circular economy as they pertain to the built environment. Using vernacular construction methods and local building materials, the research shows how circular principles might be realized. Examining the origins of circularity in ancient vernacular settlements and how they might inform modern circular behaviors, this talk will center on Egypt, one of the world's oldest civilizations with a rich vernacular past.

(Stanimirovic et al., 2023) The Balkan Mountains, or Stara Planina, and the areas around them have been working hard to upgrade their tourism offerings in recent years. There is a lengthy administrative process for constructing additional structures on the property since it is legally protected as a natural park. Houses in the country are often renovated as part of the building process, which makes the work

much simpler. Conventional wisdom holds that industrial materials used in renovations have a multiplicity of negative effects on the environment, beginning with their creation and continuing forward. Traditional mountain homes in Serbia and the Balkans are often built from local, sustainable materials. Renovation of such homes using natural materials to increase their utility while decreasing their impact on the environment is therefore the focus of this article. A typical home from Staraplanina is used as a case study example for the examination. Analysed are the benefits of using natural materials while restoring a classic home. In a typical climatic year, four scenarios were considered in the TRNSYS software: the existing condition, walls separated with sheep and hemp wool panels, EPS, and the entire amount of energy used by the home. The environmental effect of these materials was further investigated using Life Cycle Analysis (LCA). The most promising findings were integrated into the study synthesis in relation to the preservation and sustainable development of the built environment. Natural goods provide the required thermal comfort and are much less harmful to the environment than their synthetic counterparts, according to the research. Sustainable restoration of Serbia's vernacular architecture was the focus of the study's suggestions.

3. STUDY AREA

Dodra-Kwar is a remote twin settlement located in the upper reaches of the Rupin Valley in Shimla district, Himachal Pradesh which is geographically extended between $31^{\circ} 11' 49.9596''\text{N}$ and $78^{\circ} 3' 23.2704''\text{E}$. It perched on steep terraced slopes at elevations ranging between 2,400 and 2,800 meters above mean sea level, the villages are surrounded by dense coniferous forests and rugged mountain terrain. The climate is harsh, characterized by long, cold winters with heavy snowfall that often isolates the region for several months, and a short, cool summer that supports limited agricultural activity. Traditional livelihoods revolve around subsistence farming, pastoralism, and forest resource use, which directly influence the built environment. Historically, Dodra-Kwar remained cut off from the rest of the district due to the absence of motorable connectivity, preserving its vernacular architecture and cultural practices. With the introduction of road access only in recent decades, patterns of construction, material availability, and socio-economic life have begun to change, bringing both opportunities and conservation challenges.

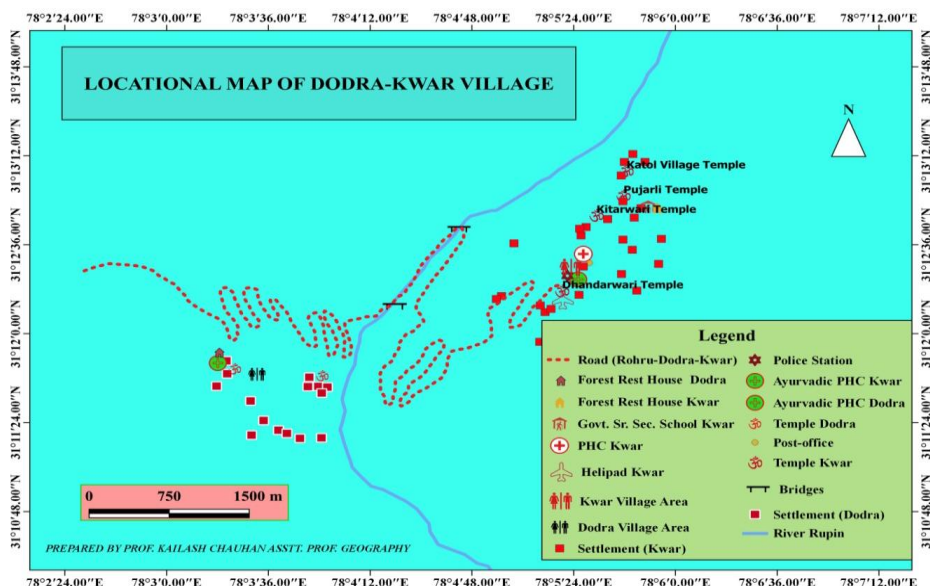


Figure 1.1 Locational Map of Dodra-Kwar

4. METHODOLOGY

The study employed a mixed qualitative and descriptive approach to document and analyzes the folk house types of Dodra-Kwar village. Primary data were collected through intensive fieldwork conducted during multiple visits to the area. A purposive sampling strategy was adopted to select 50 representative houses across different groups, construction styles, and socio-economic households. Each house was documented through detailed photographic surveys, measured sketches of plans, elevations, and sections, along with observations of materials, structural systems, and spatial organization. Semi-structured interviews were conducted with household owners, village elders, and local masons (kathkars) to gather information on construction techniques, functional use of spaces, seasonal adaptations, and cultural significance. Participant observation was also employed to understand repair and maintenance practices. Secondary data, including settlement reports, travel literature, and published works on Himachali vernacular architecture, were reviewed to provide comparative insights. Data were coded thematically and classified into typologies based on structural composition, roofing systems, and degree of modernization. Triangulation of visual, oral, and textual sources ensured reliability and validity. The methodology thus combined architectural documentation with ethnographic techniques, allowing for a holistic understanding of how Dodra-Kwar's built environment reflects environmental adaptation, material availability, and cultural continuity.

5. RESULTS AND DISCUSSION

5.1 TYPOLOGY AND FEATURES

Field observations in Dodra-Kwar revealed three major house types that reflect variations in material use, construction systems, and levels of modernization. These typologies are based on the local environmental condition and practices but also indicate the recent changes brought by the outside influences. These three main types are Type A: Traditional Timber Houses, Type B: Stone- Timber Hybrid Houses and Type C: Modernized/ Partially RCC Houses.

Table 1: Classification of House Types in Dodra-Kwar

House Type	Structural Features	Roof Type	Foundation	Storeys	Functional Aspects
Type A: Traditional Timber	Entirely wooden frame and walls of deodar; compact joinery without nails	Gable roof with heavy slate/stone slabs, broad eaves to shed snow	Low stone plinth	2–3	Ground floor for cattle/fodder; upper floors for family; carved facades with motifs
Type B: Stone–Timber Hybrid	Stone masonry walls up to first floor; timber upper structure	Pitched/slate roof on timber rafters; moderate slope for snow shedding	Thick stone base	2	Combines thermal mass of stone with lighter timber; functional durability
Type C: Modernized/RCC	RCC pillars/beams with cement	Low-pitch corrugated metal sheets or cement	Cement-concrete plinth	1–2	Market-driven design; reduced maintenance but

	walls; larger windows	tiles; minimal eaves			weak climatic response
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5.2 TYPE A — TRADITIONAL TIMBER HOUSES (FULLY WOODEN)

The oldest type of dwelling in Dodra-Kwar is the traditional timber houses which are made entirely of deodar wood and with a very complicated joinery and casings. Their window design is small and features compact designs that reduce heat loss in periods of extreme winters. The slate gable roofs are heavy with a wide eave that makes them very climate sensitive and culturally meaningful in terms of their durability and resistance to snow.



Polished wood, dressed stone and GI sheets



All the images are granary store house locally called kothar



kothar



Combined pent and gable roof



kothar



Combined pent and gable roof

TYPE A — TRADITIONAL TIMBER HOUSES (FULLY WOODEN)

The oldest and the most authentic representative of Himalayan vernacular architecture are timber houses of Dodra-Kwar. Being built virtually of deodar, these buildings are evidence of rather advanced carpentry art which has been handed down through the generations. The traditional jointery technique is applied to timber logs without using nails, which in addition to flexibility and earthquake resistance offers the ability to join those logs. The ground floor is a cattle shed or a fodder storage area and the upper floors are the family and kitchen. This is a multifunctional vertical organization that is a response to the low land supply on steep terraces. The roofs are massive gable roofs paved with large slate slabs with protruding eaves to shield the wall against snow and rain. The heavy pitch enables them to get rid of the snow and the small windows and thick timber walls help to keep off long and harsh winters. The houses are small to reduce the amount of heat that is lost and to maximize use of firewood. These houses are iconic besides climatic functionality. There are carved door frames, wooden balconies, and lattice windows whose motifs were drawn on the local mythology and nature as well as the identity of the community and their spiritual beliefs. Though this is very strong, the sustainability of Type A houses is threatened. They have become less common due to the drop in big timber supply, increase in the cost of skilled carpentry, and the maintenance requirements. Nevertheless, they are still admired because of their beauty of aesthetics, cultural continuity and capability to endure the mountain weather than the modern versions.

5.3 TYPE B — STONE-TIMBER HYBRID HOUSES

Stone-timber hybrid houses are edging typological category of Dodra-Kwar, which integrates masonry of thick stone at the bottom but timber at the top. It is durable, comfortable in terms of thermal issues, and less reliant on timber which is in short supply, and it retains local skills. The timber rafters which support the pitched slate roofs help in climatic adaptation making the houses quite practical and also culturally founded.



Wood, stone



Polished wood, dressed stone and Gable roof



Wood, stone and slate



This wooden stairs is locally called Sangard



Polished wood, dressed stone



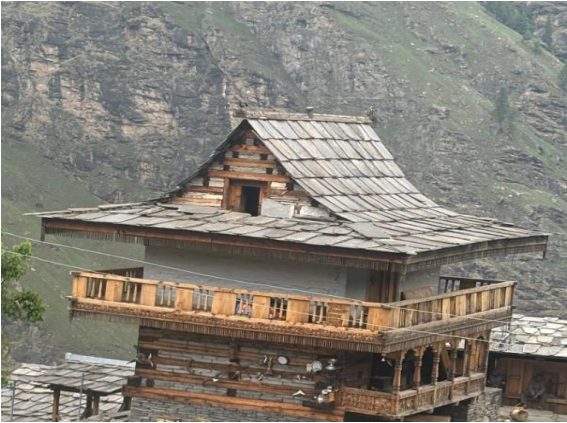
Polished wood, dressed stone



Polished wood, dressed stone



Temple at pujarli in Kwar area

	
Wooden glazing locally called baran	Upper part of small wooden window is locally called Tera
	
Polished wood, dressed stone and Gable roof Temple	Polished wood, dressed stone "Kath-Kuni" (or "Kashtkuni")
TYPE B — STONE–TIMBER HYBRID HOUSES	

A typical example of the housing typology that is in between the stone and timber-based houses is the stone-timber hybrid houses that were developed as a strategic way of responding to the limitations of resources. The ground floor and the lower walls of such structures are made with the help of the stone which is available on the territory, which gives the wall the strength, thermal mass and defense against the moisture. Above this concrete foundation, timber-built upper floors are built, which decreases the total mass and allows to focus more on the crafts of the balconies, railings, and facades. This blend strikes a balance between strength and beauty. The roofing structure mostly uses tiled roofing that is based on the timber rafters. Such roofs are averagely inclined to help eliminate snow and evenly distribute weight. The hybrid is therefore seen to maintain climatic flexibility and save on the limited timber. The spatial structure is similar to Type A houses, livestock in the lower level and human settlement in the upper levels. The pennant sandstones ensure stability among steep slopes whereas timber floors make houses warm to live in. Socio-economic flexibility is also reflected in the hybrid houses. Poorly-endowed families were unable to purchase large amounts of timber and stone masons provided a cheaper alternative. Meanwhile, the timber retained in the upper building structures offered the opportunity to the artisans who could still practice the traditional carving styles hence the continuation of the culture. But there are challenges associated with these houses. Stone masonry may

also be susceptible to seismic shocks when not bonded well and slate roof repairs are also labour intensive. However, Type B houses are perceived to be a trade off - being more traditional and practical. The reason why they are still more prevalent than fully wooden houses today is due to their relative cheapness, more convenient access to materials and comfort through withstanding the harsh weather.

5.4 TYPE C — MODERNIZED / PARTIALLY RCC HOUSES

In Dodra-Kwar, modernized houses are built with the use of reinforced cement concrete (RCC) foundations, cement walls and corrugated metal or cement tiled roofs. They are simpler to erect, and they do not need as much maintenance, but they are climatically unsuited, losing heat during winter and becoming too hot in summer. Their emergence is the sign of shifting desire and marketability but tends to disturb the conventional aesthetics and cultural harmony.



In Dodra-Kwar, modernized houses have become popular especially in the past decades because of the accessibility of road with cement, steel and prefabricated materials. The houses have reinforced cement concrete (RCC) pillars or beams or plinths, and their walls can be made of cement blocks or mixed masonry. It is common to replace the roofs with corrugated sheets or cement tiles, which are inexpensive and easy to install compared to the normal slate. Bigger windows, flat roofs in certain instances, and painted cement walls are the signs of the longing to modernity in the city. Although these houses do save on maintenance and keep up with the dynamism in lifestyles, they do not suit the high-altitude environment well. Metal roofs, in spite of being lightweight, do not offer much insulation, and so, homes lose heat quickly in winter and overheat during brief summers. When snow is deposited on corrugated

sheets, structural risks are usually presented. Unlike timber and stone, cement and steel are not thermal responsive and therefore the interior is not so pleasant without artificial heating. Culturally, Type C houses are an indication of social mobility and modernity and are usually desired by younger generations or households with migration connections to metropolitan areas. Nevertheless, their aesthetics interfere with the traditional village picture of harmony, substituting chiselled facades and slate roofs with the monotonous, practical shapes. The excess use of imported materials also implies environmental risks as it contributes more carbon footprints than vernacular ones. In such a way, Type C houses are symbolic of modernization and comfort, whereas they undermine climatic appropriate, sustainability, and culture. Their increasing popularity signifies that the move towards traditional knowledge is declining and heritage conservation in Dodra-Kwar is not easy.

Table 2: Comparative Advantages and Limitations of House Types in Dodra-Kwar

House Type	Advantages	Limitations	Roof Type & Performance
Type A: Traditional Timber	Excellent insulation; earthquake-resistant; preserves cultural identity	Requires scarce timber; high maintenance; fire-prone	Heavy slate gable roof with broad eaves — ideal for snow load but requires periodic skilled repair
Type B: Stone–Timber Hybrid	Balanced durability; less timber required; retains traditional feel	Stone walls vulnerable to seismic stress; roofing maintenance intensive	Slate-pitched roof on rafters — good snow shedding, but heavy and labor-intensive upkeep
Type C: Modernized/RCC	Low maintenance; cheaper imported roofing; reflects modern aspirations	Poor thermal comfort; disrupts aesthetics; snow load risk on metal sheets	Corrugated metal or cement tile roofs — lightweight, quick to install but poor insulation and noisy in snowfall

6. DISCUSSION

The analysis of folk house typologies in Dodra-Kwar reveals a continuous dialogue between tradition, environment, and modernity. Each house type reflects the community’s negotiation with available resources, climatic demands, and socio-cultural values, while also highlighting the pressures of change in a once-isolated region.(Eghosa Noel et al., 2014)

Type A (Traditional Timber Houses) represent the deep-rooted wisdom of vernacular architecture. Constructed with locally sourced deodar and topped with heavy slate roofs, these houses are highly resilient to cold winters and seismic activity. Their compact layout, multifunctional vertical organization, and carved woodwork illustrate how architecture can embody both environmental adaptation and cultural identity. However, their maintenance-intensive nature and dependence on large timber make them increasingly unsustainable in the present context of resource scarcity and market pressures.(“S & T Interventions in the Traditional Architecture of Rural Areas of Himachal Pradesh,” 2017)

Type B (Stone–Timber Hybrid Houses) emerged as a transitional form, striking a balance between tradition and practicality. By using stone for the lower floors and timber for upper structures, these houses economize on scarce timber while maintaining thermal comfort and cultural continuity. The

hybrid typology also demonstrates local innovation, adapting to economic constraints without entirely abandoning traditional knowledge. Yet, seismic vulnerability of stone masonry and the labor required maintaining slate roofs remain persistent challenges.(Alkan & Yazicioglu, 2021)(Kharwal & Rawat, 2009)

Type C (Modernized/RCC Houses) reflects the transformative influence of road connectivity, market integration, and changing aspirations. These houses signal modernization, easier construction, and reduced maintenance, but they sacrifice climate responsiveness and aesthetic harmony. Metal or cement roofs, though convenient, fail to regulate temperature effectively, making interiors less comfortable. Moreover, the shift from carved wooden facades to cement surfaces erodes cultural expression embedded in traditional houses.(Belz, 2013)

Comparing these types highlights a trajectory: from resilient, resource-intensive tradition (Type A), to pragmatic hybridization (Type B), to modern convenience-driven construction (Type C). This progression mirrors broader socio-economic changes in mountain societies, where external influences reshape built environments. The challenge lies in reconciling modernization with ecological sustainability and heritage preservation. The discussion also points to an urgent need for conservation strategies that integrate traditional skills with modern materials. Hybrid approaches — such as insulated metal roofs designed to mimic slate, or RCC foundations combined with timber facades — could offer middle-ground solutions. Encouraging local artisanship, regulating timber use, and promoting context-sensitive building guidelines are crucial for maintaining Dodra-Kwar's architectural identity while accommodating modern needs. The folk houses of Dodra-Kwar are not static artifacts but living testimonies of adaptation. Their future depends on whether development pathways can sustain the delicate balance between cultural heritage, environmental resilience, and community aspirations.(Alkan & Yazicioğlu, 2020)(Banerjee & Sharma, 2001)

7. CONCLUSION

The Folk house types at Dodra-Kwar have been described as a complex association comprising of architecture and environment in relation to the culture in the high-altitude Himalayan setting. The three typologies, namely Type A (Traditional Timber Houses), Type B (Stone -Timber Hybrid Houses), and Type C (Modernized/RCC Houses), depict a scale of architectural reactions that are based on the availability of resources, the climate, and socio-economic transformation. The local wisdom, which was established through centuries, is represented by traditional timber houses, carved fronts, slate roofs, and multifunctional design. They are very climate sensitive and culturally expressive, however, large timber volumes and high maintenance makes them unsustainable. Stone-timber hybrids are the attempt to meet halfway, being less dependent on timber yet as comfortable thermally as they are on real timber, and retaining the artisanal character. However, modernized RCC-based houses on the contrary, demonstrate the desire to be convenient and modern without the need to care about the climatic appropriateness and cultural values, which provokes the doubts regarding the sustainability in the long run and the loss of the heritage. This typological development highlights the conflict between the maintenance and change. As much as modernization cannot be avoided, there is the danger of replacing the traditional forms with the unrestrained modernization that may lead to the loss of the architectural identity of Dodra-Kwar. The findings state the significance of supporting the culture of using the context-sensitive strategy that would incorporate traditional knowledge and use of modern materials, which would guarantee resilience and cultural continuity. To sum up, folk houses are not only homes but also cultural landscapes that provide

an account of adaptation histories, identity, and transformations in Dodra-Kwar. To ensure their future conservation, it is important that the community is conscious in dealing with them, supports their conservation policies and devises new conservation measures that will enable tradition and modernity to co-exist peacefully.

8. REFERENCES

1. Alkan, S. N., & Yazicioglu, F. (2021). Hygrothermal performance assessments of traditional timber-framed houses in Turkey by numerical analysis. *International Journal of Energy Production and Management*. <https://doi.org/10.2495/EQ-V6-N2-143-156>
2. Alkan, S. N., & Yazicioğlu, F. (2020). Hygrothermal performance analysis of traditional timber-framed houses in Turkey. *WIT Transactions on the Built Environment*. <https://doi.org/10.2495/ARC200101>
3. Banerjee, S., & Sharma, S. K. (2001). Timber Distribution Scheme (TDS) in Himachal Pradesh - Issues and perspectives. In *Indian Forester*.
4. Belz, M. M. (2013). Unconscious Landscapes: Identifying with a changing vernacular in Kinnaur, Himachal Pradesh. *Material Culture*.
5. Belz, M. M. (2015). The Role of Decorative Features in the Endurance of Vernacular Architecture in Kinnaur, Himachal Pradesh, India. *Geographical Review*. <https://doi.org/10.1111/j.1931-0846.2015.12068.x>
6. Dabaieh, M., Maguid, D., & El-Mahdy, D. (2022). Circularity in the new gravity—Re-thinking vernacular architecture and circularity. *Sustainability (Switzerland)*. <https://doi.org/10.3390/su14010328>
7. Dhar, S. (2022). Comparative Analysis of Energy Consumption in Traditional and Modern Buildings in Village Sapni, a Village in Kinnaur District Located in Western Himalayan State of Himachal Pradesh. *International Journal of Current Science Research and Review*. <https://doi.org/10.47191/ijcsrr/v5-i7-05>
8. Dutta, S., Khajuria, A., Kumar, S., & Gupta, V. (2022). An Insight into Himalayan Vernacular Architecture: The Kath-Khuni Style of the Kullu Region, India. *ISVS E-Journal*.
9. Eghosa Noel, E., Ekudayo Adeyinka, A., & Eugene Ehimatie, A. (2014). Causal Factors in Evolving Housing Typologies in Benin Traditional Architecture. *Global Journal of Arts Humanities and Social Sciences*.
10. Hansda, E. (2018). Preserving the Cultural Landscape Heritage of Bhimakali Temple and its surroundings, Sarahan, Himachal Pradesh, India. *Chitrolekha Journal on Art and Design*. <https://doi.org/10.21659/cjad.23.v2n306>
11. Kant, R., & Lakra, H. S. (2023). Vernacular Construction Techniques of the Kangra Region of Himachal Pradesh, India. *ISVS E-Journal*.
12. Kharwal, A. D., & Rawat, D. S. (2009). Ethnobotanical Studies on Timber Resources of Himachal Pradesh (H.P.), India. In *Ethnobotanical Leaflets*.
13. Merdassa, F. (2021). The analysis of architectural typology of residential buildings in Addis Ababa. *Урбанистика*. <https://doi.org/10.7256/2310-8673.2021.1.35306>
14. Pardo, J. M. F. (2023). Challenges and Current Research Trends for Vernacular Architecture in a Global World: A Literature Review. *Buildings*. <https://doi.org/10.3390/buildings13010162>
15. S & T Interventions in the Traditional Architecture of Rural Areas of Himachal Pradesh. (2017).

Journal of Environmental Nanotechnology. <https://doi.org/10.13074/jent.2017.06.172243>

16. Sarkar, A. (2013). Study of Climate Responsive Passive Design Features in Traditional Hill Architecture of Khyah Village in Hamirpur, Himachal Pradesh, India for Indoor Thermal Comfort. *Journal of The Institution of Engineers (India): Series A*. <https://doi.org/10.1007/s40030-013-0033-z>
17. Stanimirovic, M., Vasov, M., Mancic, M., Rancev, B., & Medenica, M. (2023). Sustainable Vernacular Architecture: The Renovation of a Traditional House on Stara Planina Mountain in Serbia. *Buildings*. <https://doi.org/10.3390/buildings13041093>