

Unveiling Hango's Architectural Legacy: Sustainable Building Traditions Through A Community-Centric Approach

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Abstract

Hango, an enchanting village nestled in the picturesque Hangrang valley near the Indian-Chinese border, occupies a remarkable position at an elevation of 15,000 feet in the Kinnaur District of Himachal Pradesh, India. This research paper introduces the distinctive architectural practices of Hango village, focusing on the materials sourcing and processing methods, construction techniques, and the challenges encountered in preserving these practices amidst the growing influence of modernization. Through extensive field visits, interviews with the local community, and careful thematic analysis, this study uncovers the community-centric approach to architecture in Hango, emphasizing the sustainable practices of wood, stone, and mud sourcing, as well as the communal building traditions that shape the village's unique architectural heritage. Hango's strategic location, deliberately positioned away from the path of glacier melt, and its close proximity to the Huyu khud rivelet have significantly shaped the village's setting and agricultural fields. The villagers' deep connection with their environment is reflected in their architectural choices and construction methods. This research not only explores the technical aspects of Hango's architecture but also delves into its community values. The study reveals how architecture manifests the community's identity, history, and social cohesion. It underscores the need to safeguard these traditional practices through a comparative analysis between the traditional and modern practices since they contribute to the village's sustainable development and provide a sense of continuity, belonging, and pride for the resident

Keywords: traditional architecture practices, Building materials sourcing and processing, Sustainable construction techniques, Community-centric approach,

INTRODUCTION

Vernacular architecture is the poetry of place, the celebration of materials and craftsmanship, and the embodiment of cultural identity [1]. It becomes a storytelling medium, where every detail speaks of a deeper connection to the land and its people. It is through this language that the spirit of a place is

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preserved and perpetuated, creating a sense of belonging and fostering an appreciation for the place. “We cannot study change before we know what is changing”. It's important to understand what this “indigenous science of construction” is about before addressing the concern of Modernism leading to the neglect of vernacular architecture. Thus The paper aims at documenting the construction and architecture of Hango village to bring to light the practices that have been followed by the indigenous community for generations. Further addressing the concern of rapid transformations which pose as a challenge for

preserving the traditional practices and architecture.

Situated in the captivating realm known as the 'LAND OF FAIRYTALES,' Kinnaur, Himachal Pradesh is home to two main valleys: the Sangla Valley and the Hangrang Valley. The Hangrang Valley, the second largest after Sangla, is nestled close to the Indo-Tibetan border in Comprising eight towns—Nako, Chango, Leo, Hango, Shalkar, Sumra, Yangthang, and Malling—the Hangrang Valley has a rugged and spiky landscape. Due to minimal rainfall and severe cold temperatures, the valley lacks vegetation allowing only resilient species like shrubs, mosses, and lichens to thrive. Nestled in this picturesque valley, [2] Hango is a breathtaking village at an altitude of 15000 feet located in Pooh Tehsil, Situated approximately 47 kilometers north of the district headquarters, Reckong Peo and showcases the most intriguing perspective over the scene of rivulets and the scope of the mountains among which the town sits.

RESEARCH METHODOLOGY

Data Collection

This research paper utilizes a qualitative research approach to explore the architecture of Hango village. The study primarily employs primary and secondary data sources to gather comprehensive information and insights.

Primary Data Collection

Interviews: interviews and oral surveys were conducted with the local community, including villagers, craftsmen, and experts, to gather their perspectives and insights on the cultural and architectural practices. They provided insights into the sourcing of materials, their processing methods, construction techniques, and community practices.

Field visits: Author visited and stayed in the Hango village for a week with the local community itself to observe and document the architectural features firsthand. It involved documenting the building construction details through sketches and photographs.

Secondary Data Collection

Literature Review: Relevant literature and academic research on vernacular architecture, traditional building techniques, and sustainable practices were reviewed to provide a theoretical framework for the study and to gain insights from previous studies conducted in similar contexts.

Documentary Sources: Documents, reports, and publications related to the architecture and cultural heritage of the kinnaur region were reviewed to supplement the primary data and provide additional context.

Data Analysis

Data analysis: The collected data from field visits, interviews, literature review, and documentary sources were analyzed using thematic analysis. (Figure 1) Themes and patterns related to the materials used, sourcing methods, construction processes, community practices, and the impact of modernization were identified. The findings were then synthesized and organized to develop a comprehensive understanding of the architecture of Hango village.

TRADITIONAL MATERIALS AND ARCHITECTURAL PRACTICES IN HANGO VILLAGE: A REFLECTION OF RESOURCE UTILIZATION AND COMMUNITY ESSENCE

The Natural Setting of Hango

Hango boasts a unique geographical placement as the village is strategically built off-centre to the barren mountain lying to its southwest, a deliberate decision by the locals to avoid the path of the glacier melt that cascades [3] down from the mountain. Additionally, (Figure 2) Hango is built in close proximity to a water rivelet, Huyu khud (referred to as huyu lumbu in the local dialect) ensuring

easy access to this vital resource for daily activities. The village's agricultural fields are intelligently placed on the lower plains, taking advantage of the fertile soils found near the stream as well as the nutrient-rich sediment carried by the glacial melt. The Fuche, Khachooni and Petu mountains around the village along with the Sharabganga grasslands (at an elevation of about 18000 ft) in the Hangmat region.

Architecture Down the Decades

Along with its natural setting, the architecture of Hango reflects the essence of the community and its practices that have emerged over the years as will be demonstrated below. As one navigates the labyrinthine paths that wind through the village streets, they are greeted by a diverse array of house elevations, each showcasing the materials and techniques used by the locals. The traditional houses in Hango predominantly feature walls constructed with stone and timber, embodying the timeless wisdom of using locally available resources. Over time, newer houses have emerged, incorporating a blend of brick and cement alongside the traditional materials. Nevertheless, the spirit of Hango's architecture remains rooted in its cultural heritage, where the use of stone, mud, timber and other natural elements preserves the connection between the community and the environment.

Until recently, the village of Hango had limited access to basic amenities, with electricity becoming available only 22 years ago and a road leading to the village established just 11 years ago [4]. As a result, the architecture of the village has been shaped solely by the local community for generations. Every aspect of the architectural process, from procuring and processing the materials to constructing and ornamenting the buildings, has been carried out by the villagers themselves. Drawing from the resources of their natural surroundings of the Hangrang valley, the villagers source all the necessary building materials from the nearby settings.



Figure 1. The setting of the village (*Source: Author*).



Figure 2. The natural village setting (*Source: Google earth*).

Sustainable Material Sourcing and Processing Practices in Hango Village

Wood Sourcing and Processing: Sustainable Practices for Poplar Wood in Hango Village

The local community has long relied on the very few varieties of trees available as a vital source of wood, particularly the maal tree, for their building needs. Since the forest cover is less and not in a close proximity, the initial saplings of the trees is grown on the 'banjar zameen' of the petu and khachuni mountains for about 4 years and later brought by the respective families on their agricultural fields. (Figure 3) The families generally grow them in 1-3 bigha of land to fulfill the requirement of poplar wood for their houses. After carefully selecting mature poplar trees they cut down the thinner branches after 8-9 years and the thicker ones after 11–12 years of planting, [5] they ensure the replenishment of the trees by planting double the no. of newer saplings than what they had cut down. Guided by a deep understanding and respect for the environment, the community has developed responsible practices to ensure the preservation of these scarce woodlands. Next the wood is allowed to dry and naturally season for about an year before it is used for construction. Local craftsmen and the community convert the harvested poplar into sturdy beams, columns, and waffle slabs mainly used for making the floor slab in the house, the wooden granaries and the temple.

Stone Procurement and Processing: Harnessing Local Resources for Sturdy Structures

Due to a limited forest cover considering the extreme climatic conditions, Another valuable building material is the stone, sourced from the nearby stream i.e the Huyu khud and the surrounding mountain of Terkulumbu. Whether it be constructing sturdy foundations, durable walls, or the pathways, the locally sourced stone is an essential component to the village's architecture. (Figure 4) The villagers come together to gather the stones from the stream bed of Huyu and quarry the mountain sides of Terkulumbu. These stones are then meticulously sorted, cut and shaped to suit the needs of the community's buildings. However The stones procured from the stream are generally small in size and can be used directly however there aren't many left now and thus need to be sourced from the mountain and cut to appropriate sizes on the source itself. They are then transported back to the village on mules referred to as churu in the local language, owned by a fraction of the population.

Mud Sourcing and Processing: Traditional Techniques for Mud-based Construction in Hango Village

The local community has long relied on the sourcing and processing of mud for their traditional buildings. They have discovered that the surrounding mountain of Fuche provides an abundant supply of mud, which they gather and prepare for various construction purposes. For its preparation, in about 10 bags of mud, 2 bags of hay is added to get the desired mix [6]. A mixture of the solid waste of mules is dipped in water and left for 2–3 days until it turns red. The mud mixture prepared earlier is also added to it and later the excess water is squeezed out. This process makes the mud more suitable for use. For plastering walls, they employ different types of mud depending on the desired finish. Rough plaster requires a mixture of mud, cow dung, hay, and adequate water, resulting in a rustic texture that adds character to the buildings. On the other hand, for a smoother plaster finish, they use mud without any additives or reta, simply combined with adequate water. When it comes to roofing,

the locals combine mud with Bajri (a type of gravel) and sufficient water to create a strong and durable material that effectively protects their structures from the elements.

This harmonious relationship between the local community and the natural setting of Hango reflects their commitment to sustainable living and the preservation of their natural heritage.

Community Collaboration and Traditional Building Practices in Hango village

Once the building materials have been meticulously sourced, transported to the village, and prepared for use, the task of constructing the structures begins. In the process of building a house for a family, the construction starts with building by the help of the close family and friends. (Figure 5) However the entire village community comes together, offering their assistance in laying of the roof of the house. This time honoured tradition involves praying to the local deity followed by distributing halwa among all the villagers [7]. This tradition yet collaborative effort extends to everyone in the village, ensuring that support is reciprocated when others require help with their own houses. This act of communal building not only strengthens the bonds between individuals but also ensures that time-tested, traditional methods are utilized, methods that have been honed and adapted over thousands of years to suit the unique geographical conditions of the area. This harmonious collaboration embodies the essence of cooperation and produces remarkable structures that stand as a testament to their resourcefulness.



Figure 3. The seasoning of wood after being cut down (Source: Author).



Figure 4. The procuring and processing of stone (*Source: Author*).



Figure 5. The community involved in building a house (*Source: Author*).



Figure 6. A traditional house in the village (Source: Author).

Building Traditionally in Hango Village: Residential Units and Wooden Granaries (Storage Units)

Construction Techniques in Hango Village: Focus on House Walls

The construction of the house begins with a sturdy stone foundation laid by digging into the ground as per the height and then filled by stones in a pit rising to make up a plinth, and the walls, typically 50–60 cm thick, are primarily constructed using stone [8]. The walls are built using dry rubble masonry. (Figure 6) in contrast to the kathkuni style where both timber and stone are used in building of the walls due to the limited availability of poplar trees. While the outer walls remain unplastered, a protective layer of small stones and mud plaster, with a textured finish, is applied up to 2 meters high to safeguard against damage caused by animals [9]. This same technique is employed in cattle pens. (Figure 7) The walls within the living areas undergo a two-layered plastering process using rough mud plaster composed of mud, hay, and cow dung, followed by a smooth mud plaster without reta.

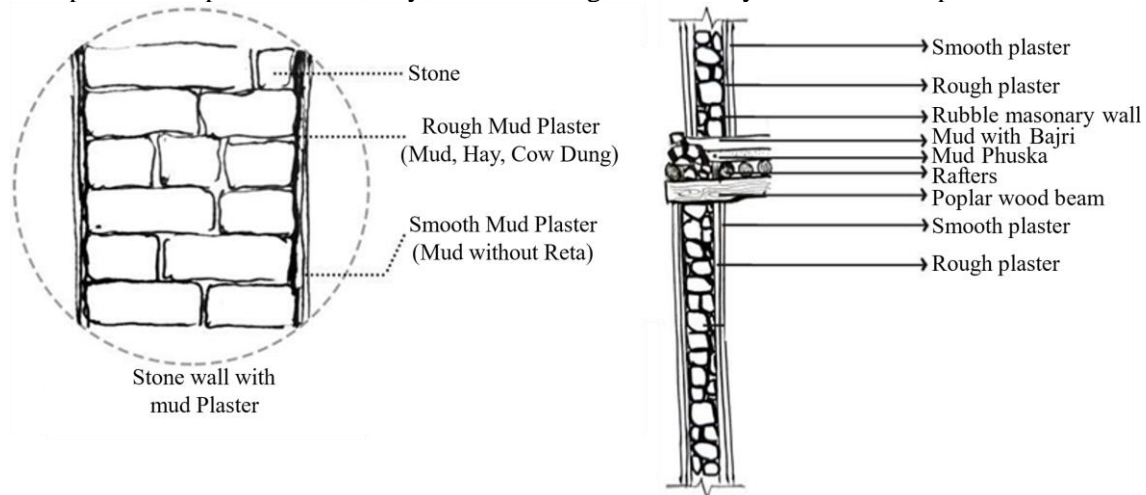


Figure 7. Wall section detail (Source: Author).

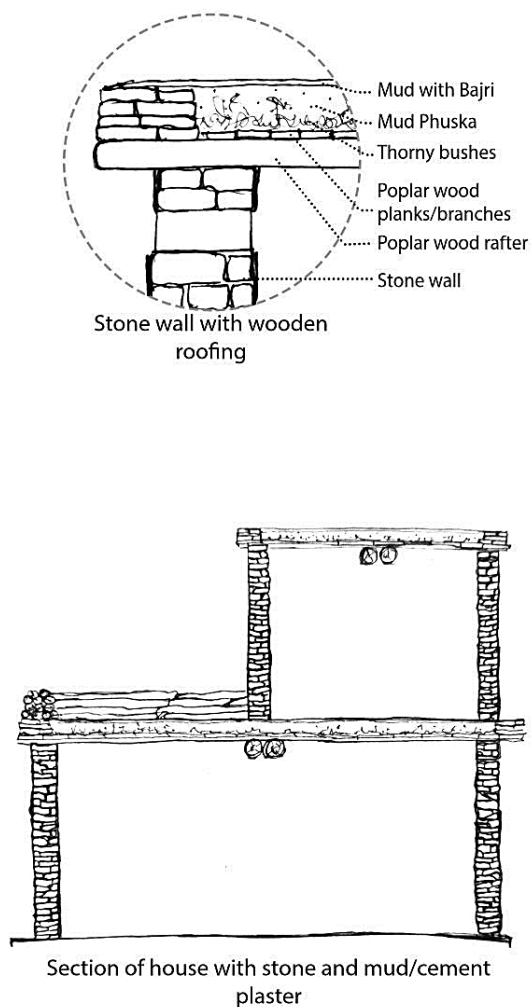


Figure 8. Roof and floor slab, section of house (Source: Author).

Traditional Roof and Floor Slab Construction in Hango Village

In the construction of roof slabs, a combination of wooden purlins and rafters, carefully embedded within the stone masonry walls, (Figure 8) serves as the base for the slab. Above this framework, a layer of resilient poplar planks or branches is added, [10] followed by an ingenious incorporation of twigs from thorny bushes mixed with mud phuska. These twigs not only enhance the structural integrity of the mud, akin to the reinforcing properties of steel rods in RCC, but also provide strength and stability. To secure these elements in place, a layer of stones is strategically positioned along the edges, exerting pressure and ensuring their firm placement. Lastly, a final layer of compacted hard mud, blended with bajri, is meticulously applied to a refined finishing touch and impart robustness. This indigenious composition of materials not only results in a solid flooring surface but also acts as a formidable barrier against any potential water seepage.

Shingbang: Wooden Granaries in Hango Village

Other structures built in the village include wooden granaries, water channels and a buddhist temple. (Figures 9, 10) The Granaries referred to as shing bangs are structures made entirely of timber. Found at various places in the the village, it has a capacity of 4-5 tonnes of grains which are harvested in the summer months of the year and used for storage of food grains during harsh climatic conditions. Placed on a stone plinth, It is made up of wooden planks arranged vertically next to each other and held in place by ring beams joined to them by mortise and tenon joint. Each of the plank is numbered so that it can be reassembled at another location easily.



Figure 9. Shingbang (Source: Author).

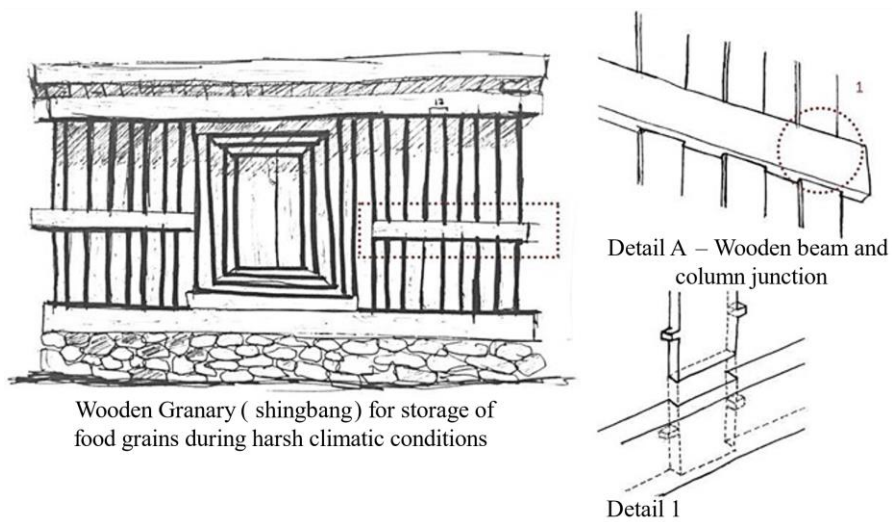
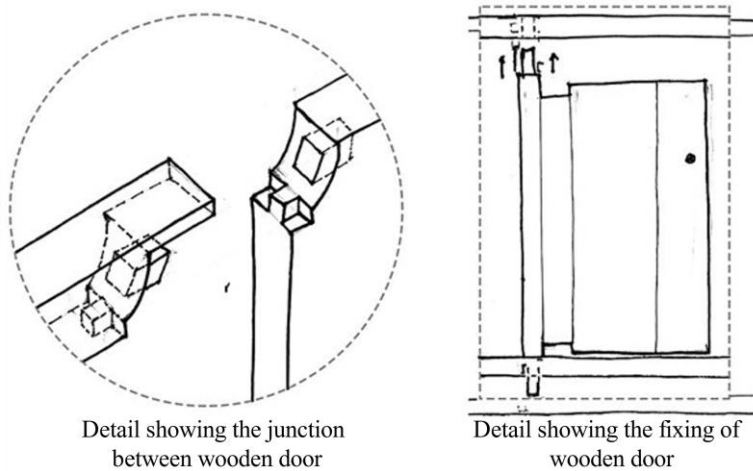


Figure 10. Construction detail of shingbang (Source: Author).



Figure 11. Doors in the village (Source: Author).



Detail showing the junction between wooden door

Detail showing the fixing of wooden door

Figure 12. Door details (Source: Author).

Comparative Analysis of the Vernacular and Modern Construction Practices

With the traditional practices discussed above, (Figures 11–12) there is a need for a comparison to be drawn between them and the new methods of construction based on three factors of effectiveness, maintenance and economics.

Table ?.

	Vernacular construction	Modern construction
Effectiveness	<ul style="list-style-type: none"> • Wooden roof provides better insulation in this harsh climate • Mud which is used for plastering has better insulation properties • Stone having a better thermal lag is more suitable in such places as a result the house remains warm in winters and cool in summer 	<ul style="list-style-type: none"> • Cement, R.C.C, and bricks used in construction lack the necessary insulation properties required to withstand the extreme conditions of Hango. Thus, houses built with these materials become excessively warm in summers and excessively cold in winters, making them inefficient in maintaining comfortable

	<ul style="list-style-type: none"> The buildings turn out to be a sustainable, netzero structure. 	indoor temperatures
Maintenance	<ul style="list-style-type: none"> Wooden roof and stone walls require no maintenance Mud plaster on walls repaired only incase damage or for finished look Incase of leakage of water through the roof, another layering of mud phuska is done 	<ul style="list-style-type: none"> Cracks develop in R.C.C due to extreme climate which are difficult to treat Water leakage problems in R.C.C. roof
Economics	<ul style="list-style-type: none"> Since the trees and mud are locally sourced, the cost is minimal Although sourced locally, the sourcing and processing of stone has risen to the cost ₹50 per unit due to lack of labor Since the construction is being taking place since generations, the local craftsmanship of the community is put to use and thus proves to be economical 	<ul style="list-style-type: none"> The sourcing of cement, RCC and bricks is from Chandigarh thus the transportation makes the cost almost double For these modern construction techniques, the labor has to be brought from UP, Jharkhand, Nepal and Bihar adding to the cost of construction

In summary, vernacular construction techniques, such as wooden roofs, mud plaster, and stone walls prove effective, low-maintenance, and economically favorable for habitation in extreme climates of Hango whereas the Modern techniques lack insulation properties, resulting in inefficiency and higher maintenance costs. Considering these factors, the vernacular construction techniques align better with the unique challenges and requirements of the Hango region.

CONCLUSIONS

In conclusion, the architecture of Hango village is a testament to the community's deep-rooted practices and their adaptation to the local environment. The involvement of the local community in all aspects of architecture, from sourcing to construction, has fostered unity and preserved traditional methods and also ensured the use of effective and sustainable practices of locally sourcing the materials, building with the time tested generational techniques which suit to the area's extreme weather conditions. However, as younger generations increasingly migrate to urban areas, they aspire to adopt modern building materials such as bricks and reinforced concrete (RCC), considering them as symbols of social status. Unfortunately, Building with these modern methods have resulted in the construction of highly inefficient buildings that are ill-equipped to withstand the region's harsh weather conditions.

The pursuit of social status has compelled the community to shift towards constructing permanent structures, known as "pakka" houses. This transition has had a tragic consequence, as the invaluable knowledge and techniques passed down through generations are gradually eroded.

In essence, while the involvement of the Hango village community in their architectural practices has historically promoted unity and sustainability, the allure of modern building materials driven by social aspirations has brought about unintended consequences. The community now faces the challenge of balancing preserving their time-honored practices and embracing innovative approaches that meet the evolving needs of the changing society.

REFERENCES

1. Hango Village [Internet]. www.onefivenine.com. [cited 2023 May 19]. Available from: <http://www.onefivenine.com/india/villages/Kinnaur/Pooh/Hango>
2. Relph E. Place and placelessness. London: Pion; 1976. Available from: https://escholarship.org/content/qt9zj9w6x7/qt9zj9w6x7_noSplash_32827a68f34f1a3bdce1fd251b1e2927.pdf?t=krnc0x
3. Hangrang Valley, Kinnaur, Sightseeing, Allseasonsz.com, Himachal Pradesh, India [Internet]. allseasonsz.com. 2023. Available from: https://allseasonsz.com/Himachal/Kinnaur_tourism/hangrang-valley-kinnaur.asp
4. Belz MM. Unconscious Landscapes: Identifying with a Changing Vernacular in Kinnaur, Himachal Pradesh, India. *Material culture*. 2013 Oct 1;45(2):1
5. MALOUF BELZ M. Spirit of Place and the Evolution of the Vernacular House in Kinnaur, Himachal Pradesh, India. 2012.
6. Asquith L, Vellinga M. Vernacular Architecture in the 21st Century. Taylor & Francis; 2006.
7. Shiva Chandra Bajpai. Kinnaur in the Himalayas Mythology to Modernity. Concept Publishing Company; 1981.
8. Dasgupta A. The Himalayan Vernacular An architectural journey towards its future. 2008.
9. Srivastava A, Das BK. Vernacular Architecture of India: An Overview. *change*. 2023 Jul.
10. Watas R. Himalayan Abode of the Gods. *Architecture Plus Design*. 1991 May 1;8(3):36.