Tishk International University (TIU) Vernacular architecture

Vernacular Architecture

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Lecture 3: Vernacular architecture Asia

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This section delves into the unique characteristics of **vernacular architecture across Asia,** examining the various factors that influence its **design and construction.** Drawing from global experiences, and explore the **techniques employed in these traditional buildings .**

Yurt, Asia

Portable Dwellings

Usually **found in Central Asia,** a Yurt is a **portable, round tent**, which allows for easy **transportation** and assembly.

Traditional Construction

Consisting of a **wood or bamboo frame**, the structure of a Yurt is both **sturdy (strongly) and flexible**, covered in **skins, canvas, or felt**.

Cultural Significance

As a dwelling that is closely associated with the **nomadic cultures** of Central Asia, Yurts are a **symbol of the region's heritage**.

Malay House, Malaysia

Southern Style

The Malay house in the southern region of **Malaysia** showcases a distinctive architectural style.

Architectural Elegance

Characterized by its **elegance(attractive)**, the southern Malay house is a **symbol of cultural heritage.**

Interior

the interior of a Malay house blends **functionality** with **aesthetics**.

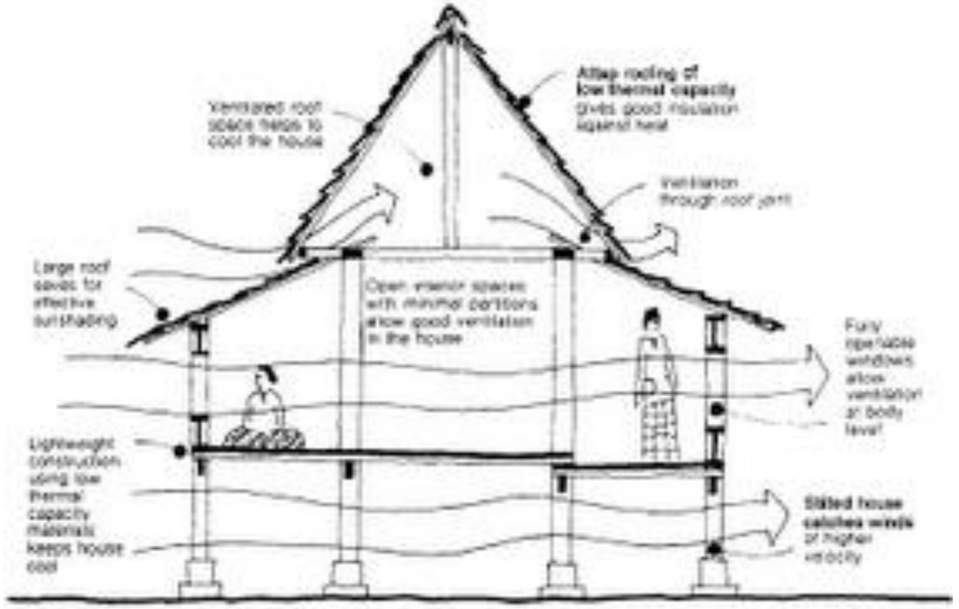
Malay House, Malaysia

Throughout South-Eastern Asia, the traditional **Malay houses** are a testament to architectural **ingenuity and cultural heritage.**

These homes are ***raised on timber stilts*** and are primarily constructed **of materials** which were ***easily available*** from the **tropical** forests, such as **timber, bamboo, rattan(palm), tree roots, and leaves**.

Malay House, Malaysia

Typically, Malay houses feature **pitched roofs**, *verandahs or porches* in front, **high ceilings**, and **numerous large openings** to facilitate **air circulation for *ventilation* purposes**.



While these characteristics are **common in all Malay houses** throughout Malaysia, it is interesting to note that their ***shapes*** *and* ***sizes differ*** **from** state to state, **giving each home a unique identity.**

Adobe homes of Shibam, Yemen

Western Asia

Adobe homes of **Shibam, Yemen,** stand **tall as a testament** to the region's **architectural heritage**.

Architectural Marvel

These **towering structures** are a defining feature of the city, showcasing the ingenuity of **ancient construction techniques.**

Historical Significance

Recognized as a UNESCO **World Heritage Site,** Shibam's adobe homes are a window into the **past of Western Asia**.

Adobe Homes of Shibam, Yemen

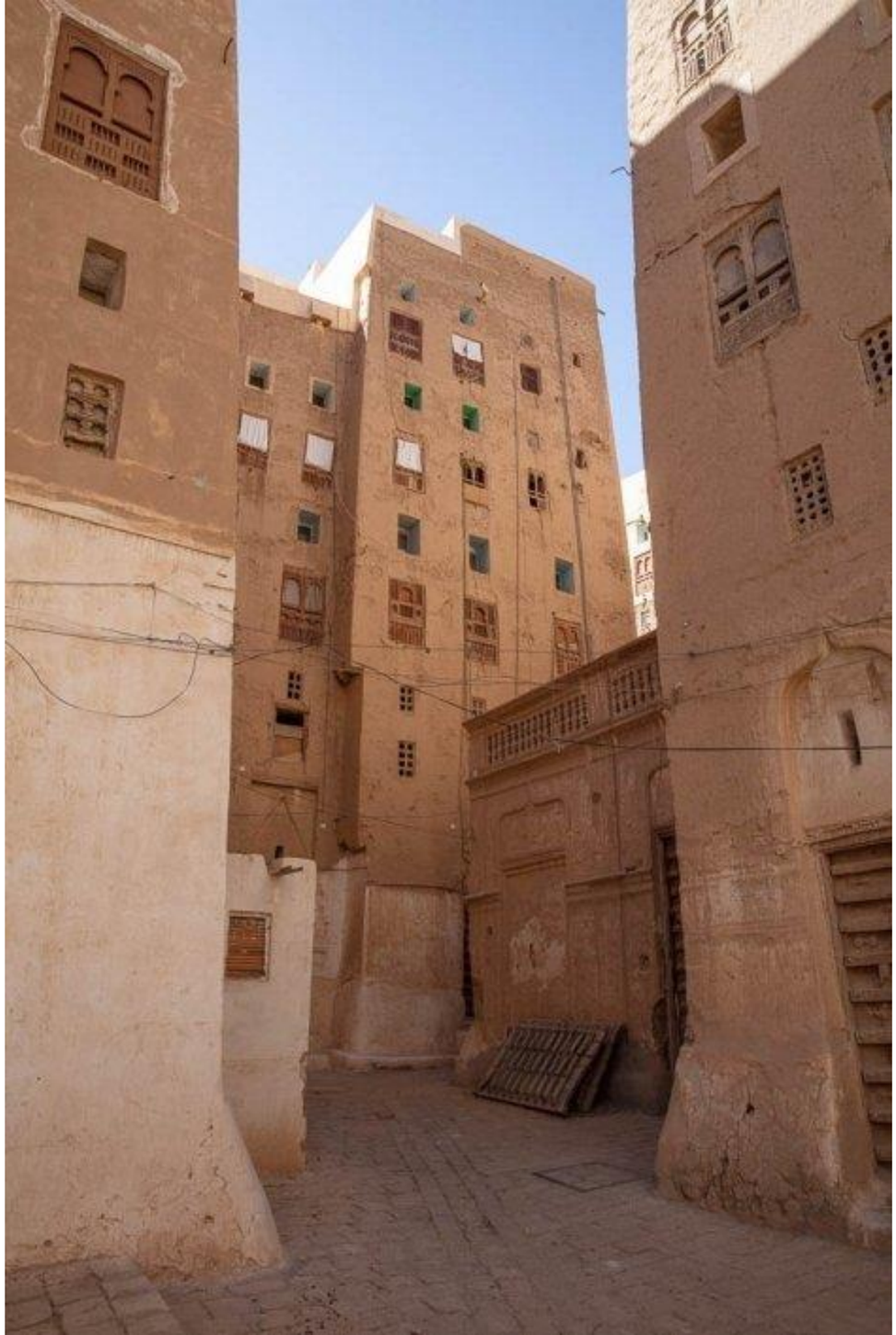
Located in **Western Asia**, the city of Shibam is renowned for its **adobe homes** which are considered the **world's first *skyscrapers*. These towering structures are made from clay,** a testament to the ingenuity necessitated by the *geographic constraints* of the site.

Shibam's **exterior** is characterized by its **mud walls**, which have **historically** limited outward **urban expansion**. Consequently, Shibam **developed vertically**, forming **a dense urban fabric** of about 500 homes.

Adobe Homes of Shibam, Yemen

The **adobe brick walls**, crafted from the **river's clay** mud, are designed to **get thinner towards the top of the building**. **This ingenious design reduces the pressure on the lower walls, ensuring stability.**

To protect these historic structures from **water damage,** residents apply a ***whitewash*** **to the rooftops** and the **exterior facades** of the buildings. This protective covering is **made from crushed limestone, which serves as a shield against the elements.**



The adobe beehive homes of Harran, Turkey

Western Asia

The adobe beehive homes of Harran, Turkey, are a distinctive feature of this region in **Western Asia.**

Architectural Heritage

These unique structures are a testament to the **architectural heritage of Harran, Turkey.**

5. Inside view of the domed houses numbered 3 and 2, respectively.

Cultural Significance

The beehive homes hold significant **cultural importance in the history of Western Asia.**

The Adobe Beehive Homes of Harran, Turkey

Unique Architecture

These are beehive homes in Harran, located in Western Asia. Characterized by their distinctive shape, **beehive homes are a prime example of vernacular** architecture, designed to **stay cool in the desert heat.**

Climatic Adaptation

Their thick **mud brick** (adobe) **walls trap the cool air and keep the sun out**, while having **few windows**. This design helps **maintain a consistent** and **comfortable interior temperature.**

Efficient Design

The high domes are not just for show; **they collect the hot air, moving it away from the living spaces**. Remarkably, the interior remains **around 24°C, a stark contrast to the outside temperature** extremes ranging from 35°C to 0°C.

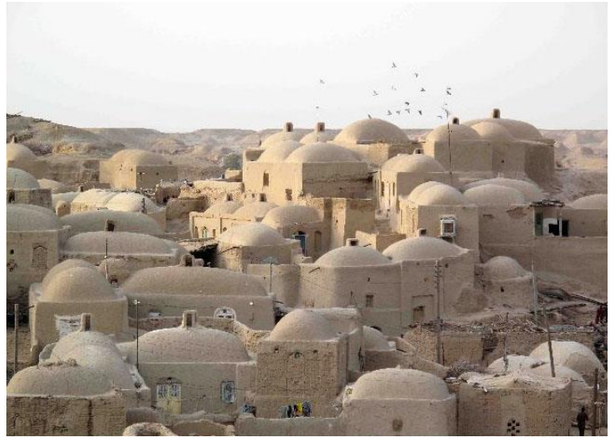
Iranian home Southern Asia

Earthen Materials

The major materials used for constructing various structures in **Iran are mud and brick** because the earth **can be found everywhere quite easily** and inexpensively.

Vernacular Architecture

The common factors creating the vernacular architecture **in Iranian are climate (harshly hot or cold)** and accessible constructional materials. **Ceilings are mostly built in the form of domes and vaults.**



Adaptation to Climate

Walls in Iranian homes are usually **thick, and windows** have to be made **in small sizes** to **adapt to the harshly hot or cold climate.**

Tulou residences, China

Vernacular Architecture

The Tulou residences of **China are a stunning example of vernacular architecture, deeply rooted in the cultural and historical context of** Eastern Asia.

Eastern Asia Heritage

These traditional communal homes are not just residences but also a **testament to the unique way of life that has been preserved in Eastern Asia.**

Communal Living

Reflecting the communal living of the region, Tulou residences provide a glimpse into **the social fabric** that has defined **communities in Eastern Asia.**

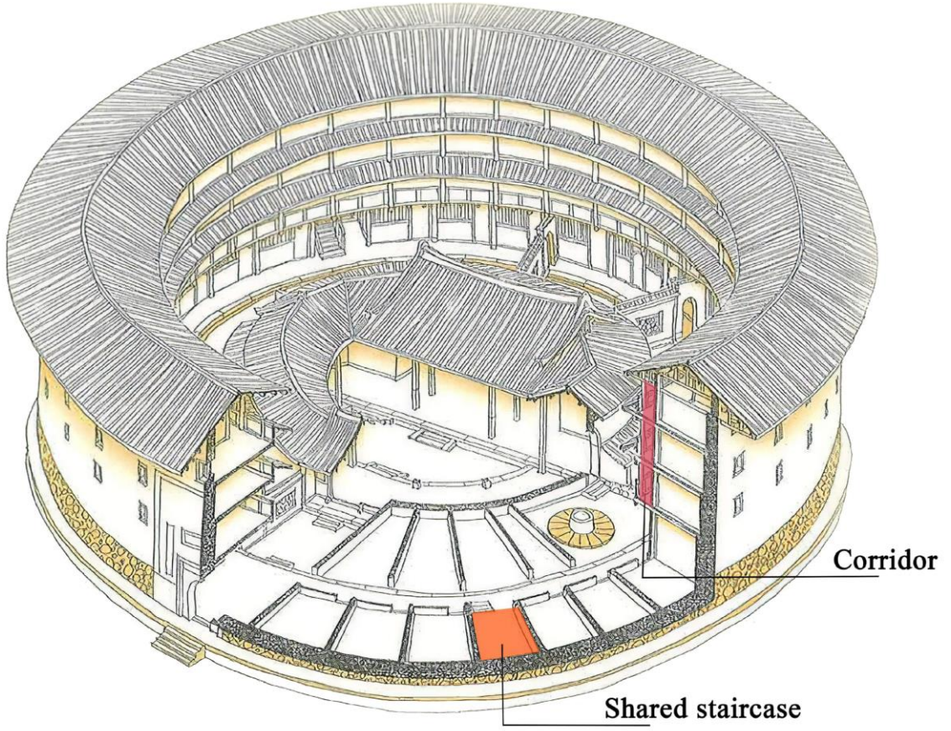
Tulou Residences in China

Eastern Asia is home to the unique **Tulou residences**, which were built by the **Hakka people**. These architectural marvels are characterized by their ***compounded earth and wooden beams*** **that form thick, cylindrical walls reaching several stories high.**

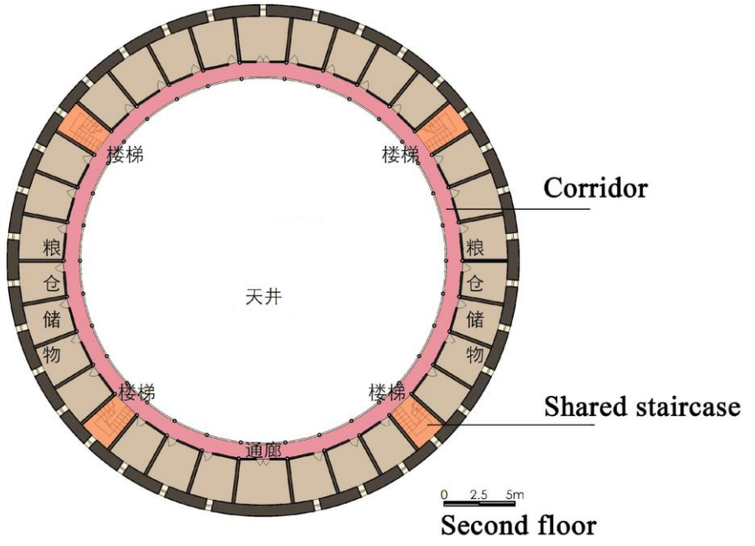
This construction was a **strategic choice in a once-necessary effort to protect the interior from attack.**

Tulou Residences in China

The design of Tulou residences is distinctive for its **defensive** features. The **outward facing walls** have only **one entrance** and are devoid of windows, a deliberate design to safeguard the inhabitants. **Conversely, all balconies, doorways, and openings face inwards,** creating an **additional layer of protection from potential danger.**



Each Tulou structure is not just a building; it is a self-contained community. It houses **hundreds of people**—an entire **clan**—and functions as a **small village**. The large, open interior provides space for **communal activities**, reinforcing the sense of **unity and shared purpose among the residents**.



The Factors Influencing Vernacular Architecture

Exploring the rich tapestry of vernacular architecture around the globe reveals a variety of factors that shape its development. These influences are **deeply rooted in the cultural, environmental, and social experiences unique to each region.**

1. CLIMATE

- **Buildings in cold climates** are characterized by a high **thermal mass or significant amounts of insulation.** They are usually sealed in order to **prevent heat loss**, and openings such as **windows tend to be small or non-existent.**
- One of the most **significant influences on vernacular architecture is the macro climate** of the area in which the building is constructed. Accordingly, the design of the vernacular buildings **varies depending on the climate type.**

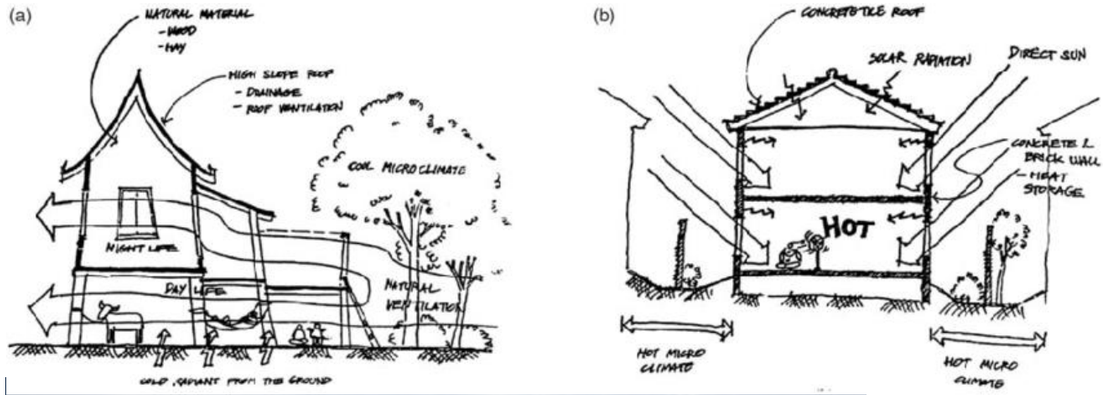
CLIMATE

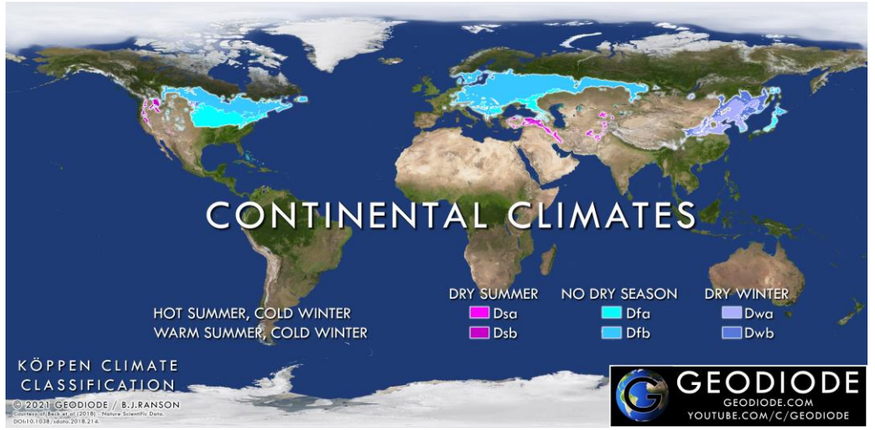
- **Cold climates region:** This area's architectural design is heavily influenced by the need to **retain (saving)heat and minimize energy consumption** due to the **harsh weather conditions**.

Adapting Architecture to Climate

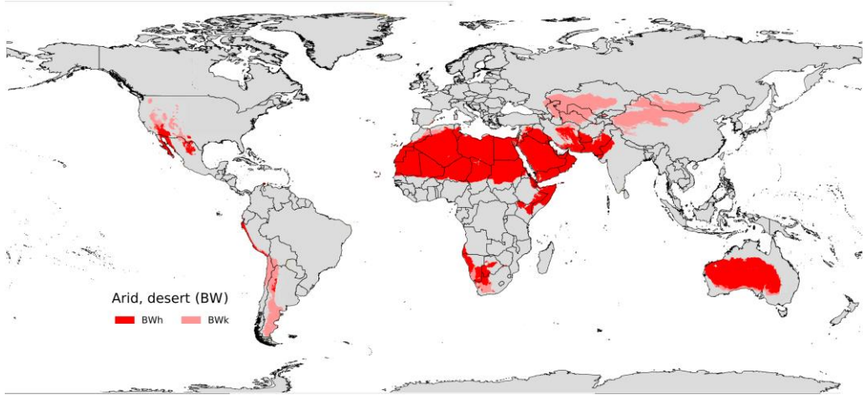
- **Warm climate region:** Buildings are typically made of **lighter materials** and designed to enhance **cross-ventilation through various openings.**

- **Continental climate region:** Structures **must withstand significant temperature fluctuations** and are **often seasonally adapted by occupants.**





Adapting Architecture to Climate: Hot Dry Regions



Very high daytime temperatures, with very little precipitation, characterize these areas. **In response, Mediterranean vernacular**, and that of much of the **Middle East**, often includes a **courtyard** with a feature such as a **fountain or pond.** The presence of water serves to cool the air - air cooled by water mist and **evaporation is drawn through the building by natural ventilation** encouraged by the building's design. Hot dry region architecture leverages these elements to **create a comfortable living environment** despite the harsh climate.

Architectural Features in Arid Climates

Buildings in arid desert climates are designed with **high thermal mass** to maintain **cooler internal temperatures**.

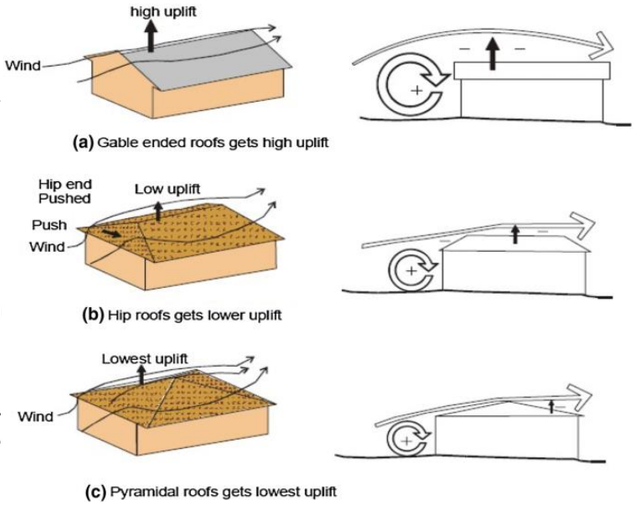
Such structures often **feature small windows,** which help in **reducing heat intake** from the **harsh sun.**

Interestingly, **many include chimneys—not for fires,** but to draw air through the living spaces for **natural ventilation.**

Regional Architectural Adaptations

- **High precipitation** region: Dwellings on stilts are a common sight in regions with **frequent flooding or rainy monsoon seasons**, as buildings take different forms to adapt to precipitation levels.

- **Flat roofs** become a r**arity in areas with high levels of precipitation**, as the architectural design must accommodate for the weather conditions.
- **High wind** region: Specialized buildings designed to **withstand high** winds are a testament to the ingenuity of construction in such areas.
- **Orientation of buildings** is crucial, with structures often positioned to present minimal area to the direction of **prevailing winds,** reflecting the impact of wind on architectural decisions.

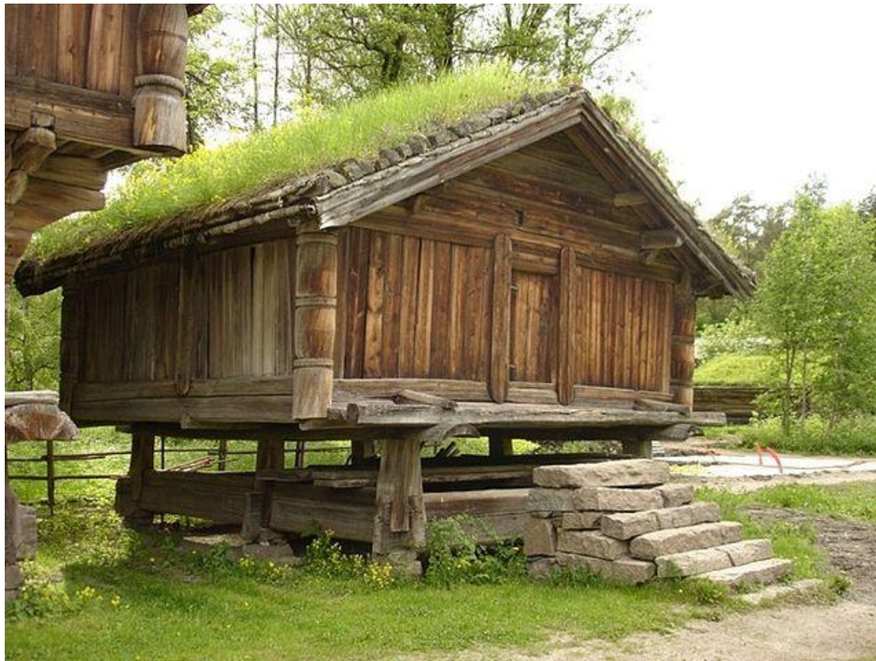


Are Such Specializations of Each Region Designed?

- Specializations **not designed**: Such **specializations are not designed**,
- Learnt **by trial and error**: but learnt by trial and error over generations **of building construction,**

2- CULTURE

Cultural factors play a crucial role in shaping vernacular architecture. The **daily lifestyle** and **usage of shelters** by **inhabitants**, including the **size** and dynamics of **family units**, **influence** the layout and s**ize of dwellings**. How spaces are shared, methods **of food preparation** and consumption, and the **nature of social interactions** all contribute to the architectural design.



Additionally, **local customs**, **beliefs**, and **cultural practices** greatly affect the appearance and **decoration of vernacular** buildings. The **contrast between nomadic lifestyles**, which necessitate **simple and transportable** constructions, and **permanent settlements** with **more stable** structures, further highlights the diversity in vernacular architecture driven by cultural nuances.

2-1- CULTURE : NOMADS

Vernacular architecture worldwide has evolved to meet the need for **shelter, adapting to local climate and customs**. This includes **simple construction** methods and, in the case of **nomadic lifestyles,** the need for **transportable structures** like **huts and tents.**

Nomadic cultures prioritize **simplicity and mobility** in their shelters, reflecting their **way of life and the need** to respond **effectively to environmental and cultural factors.**

Nomadic Dwellings: Adaptation and Reuse

- **Adaptation to the environment:** Nomadic groups often construct temporary homes using **materials readily available in their surroundings,** such as **palm fronds, leaves, animal skins, and reeds.**

- **Resourcefulness in motion (movement):** Some cultures practice the reuse of materials, **carrying them** along during their **travels to** establish their dwellings wherever they move.

2-2- CULTURE : PERMANENT DWELLING

- To meet the needs of a permanent dwelling, there is a set of properties that characterized the buildings, as a following required to construct them is a one-time cost.
- Materials used will become **heavier, more solid and more durable**.
- They may also become more **complicated and more expensive**, as the **Permanent dwellings** often offer a greater degree of **protection** and **shelter from the elements.**
- In some cases, however, where dwellings are subjected to severe weather conditions such as **frequent flooding or high winds**.
- Dwellings' architecture come to reflect a **very specific geographical locale**

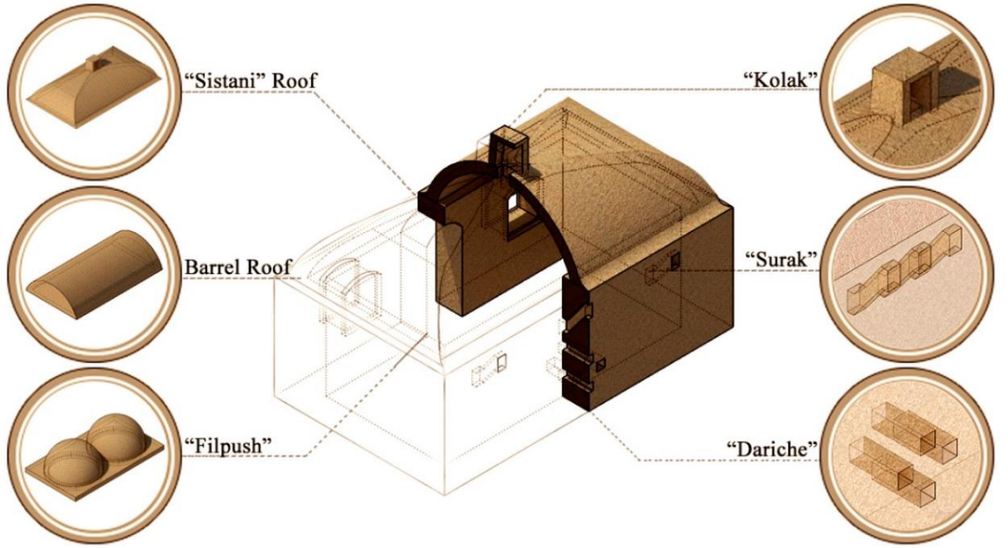
3- ENVIRONMENT, CONSTRUCTION ELEMENTS AND MATERIALS

- Areas abundant in **trees typically develop** a **wooden vernacular**, whereas regions **lacking timber** may resort to **mud or stone.**
- The **local environment heavily** influences the construction **materials utilized** in a region.
- In the Far East, **timber is** a prevalent building material, providing a d**istinct aesthetic to vernacular architecture.**
- It is common to use **bamboo in tropical climates** as it is both v**ersatile (different type) and readily available.**
- Key **building materials** that have s**ignificantly shaped the form** of vernacular buildings include **clay, stone, and various local woods.**

Materials and Elements used to give added strength

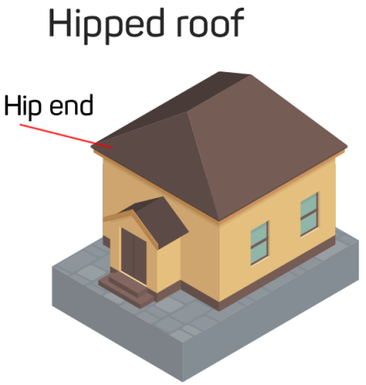
- **Adobe - (mud brick)-** are made of earth with a fairly high clay content and straw.)
- **Badgirs (wind catchers)-** a type of **chimney used** to provide **natural ventilation**, commonly found in Iran, Iraq and other parts of the Middle-East
- **Cob** - a type of plaster made from **subsoil with the addition of fibrous**
- **Mashrabiya** - (also known as shanashol in Iraq) - a type of oriel window with **timber lattice-work,** designed to allow **ventilation,** commonly found in Iraq and Egypt in upper-class homes.
- **Mud bricks** - sand mixed with water and vegetable matter such as straw.
- **Rammed earth** often used in foundations

Roof Construction Techniques in Vernacular Architecture

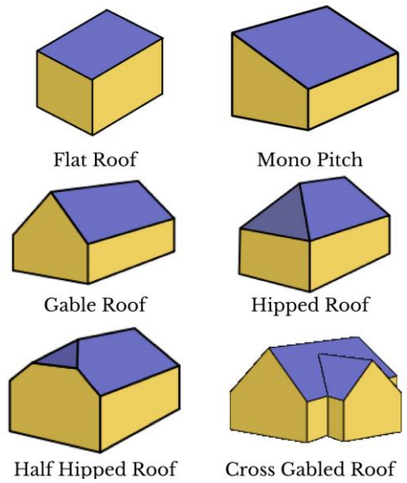


- **Flat roofs:** The simplest with timber beams resting on the two walls at the end. They are usually seen in r**egions where precipitation is very low.**
- **Conical roofs:** Constructed in areas exposed to rains, conical roofs may be constructed to **radial poles raised on a cylindrical wall structure.**
- **Pitched roofs:** The most popular form of vernacular roof is the pitched roof s**loping on two sides with gables at each end**.

From Rain and Sun



- **Pitched roofs** are found where **wood is plentiful**
- **Pitched roofs** sometimes have large overhangs to protect the wall
- **Hipped roofs** are common in rectangular buildings. They allow all walls to be built to the same height without needing a gable



- **Vault roofing (dome or arched)** is also popular in the **middle eastern countries where it is hot and dry**

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