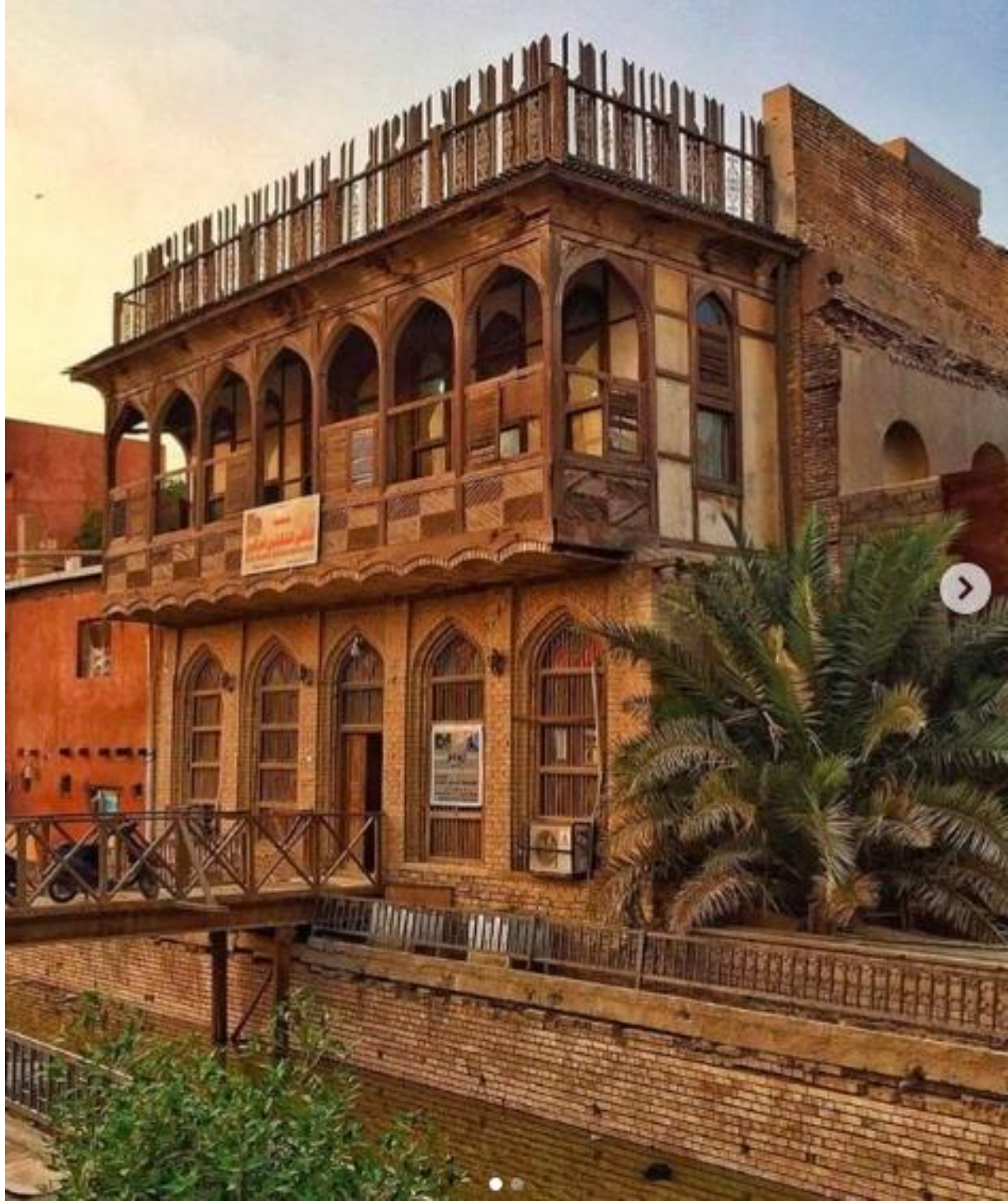
Tishk International University (TIU) Vernacular Architecture

Lecturer : Darbaz Pirot

2025-2026

Lecture 5: IRAQI VERNACULAR ARCHITECTURE



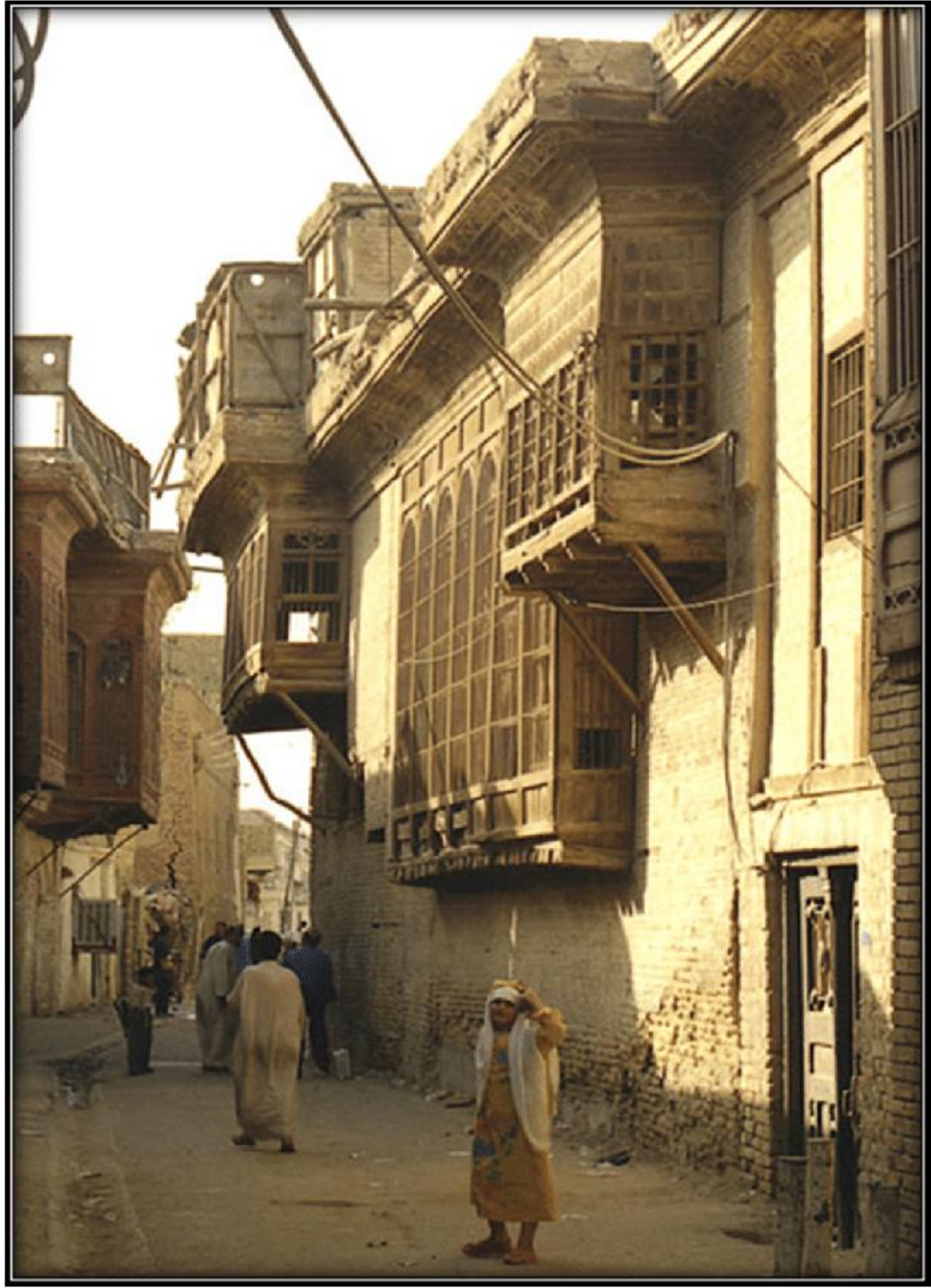
IRAQI VERNACULAR ARCHITECTURE

Vernacular architecture is the traditional way of building that's perfectly adapted with Iraqi environment. In Iraq, **where the climate is mainly dry**, this style of architecture is evident in several key aspects:

1.Organization of Households: How homes are laid out and structured to **maximize comfort** in a **dry climate**.

2.Shape and Size of Buildings: The overall design and dimensions of buildings are fitted **to reduce heat** inside and make **living spaces more comfortable**.

3.Functional Design: The specific design features of buildings that make them **suitable for their environment**, such as spaces and **elements that are useful for everyday life**.



1 Vernacular Architecture and Buildings Specific

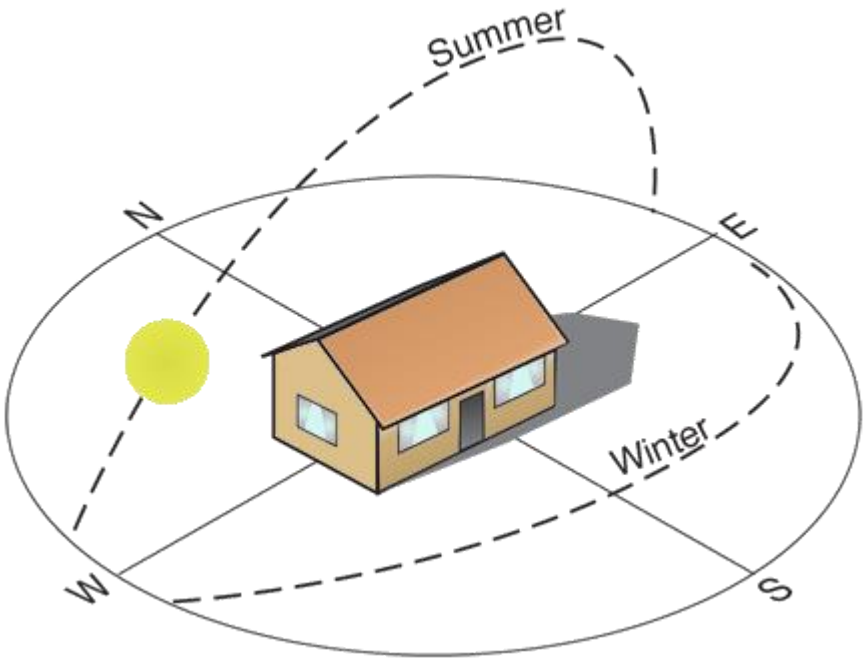
A distinctive feature of Iraqi vernacular architecture is the **strategic use of shadows.** This is achieved through:

A) Architectural Details and Building Volumes: Structures are designed **to cast shadows that cool** the buildings, **reducing** the need for **artificial cooling.**

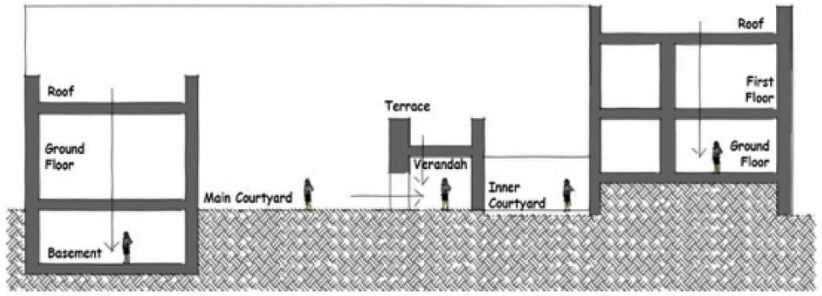
B) Natural Elements: Incorporation of **vegetation** and **water** features not only enhances the **beauty** and **functionality** of spaces but also contributes to **cooling,** adding to the **unique character** of local architecture.

This approach not only ensures buildings **are comfortable** but also shapes the **architectural identity** of the region, making these structures **iconic representatives of local culture** and **environmental adaptation.**

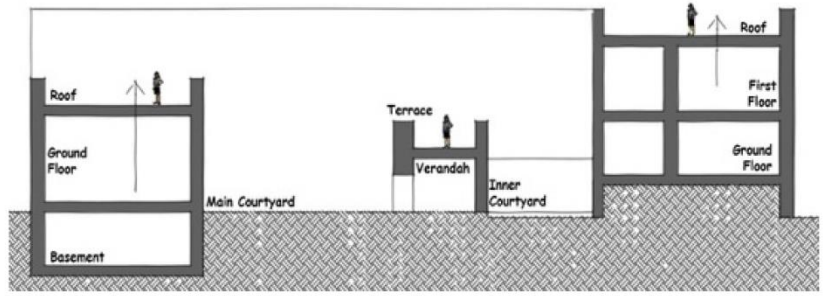
- **Optimal Orientation for Summer Rooms:** In Iraq, rooms **oriented north are ideal** for summer use, **staying cooler** by receiving indirect sunlight, which provides light **without excessive heat.** These rooms are designed with specific depth and width to create shaded areas, crucial for managing intense sunlight. This orientation is fundamental in architectural planning for hot climates, **making indoor-outdoor transitions more comfortable.**



- **How People Adapt Their Homes for the Climate:**
- **Daytime in Basements**: During the **hottest hours** of the day, people often use basements. These underground spaces **stay cooler** because they are **insulate**d from direct **sunlight**.
- **Nighttime on the Roof**: At night, rooftops become **sleeping areas.** They are cooler than indoor spaces after sunset, offering relief from the day's heat.
- **Selective Heating**: Only the **rooms** that are in **use are heated**, conserving **energy** and maintaining comfort without overheating the entire home.
- These adaptations are **practical responses** to the **arid climate** in Iraq, illustrating how **traditional** architecture **and lifestyle work together** to enhance living conditions naturally.



Summer Day

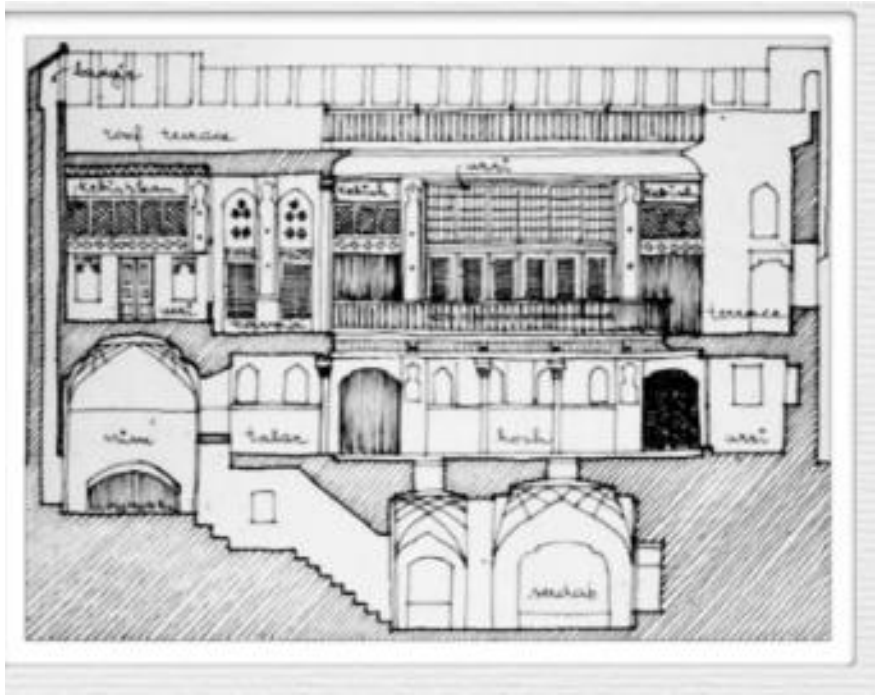


Winter Day

THE TYPES OF SPACES WITHIN VERNACULAR ARCHITECTURE IN IRAQ:

- **Understanding Space Mechanisms in Vernacular Architecture**
- In Iraq's dry climate, the design of habitat spaces within homes is **categorized into three types** based on **their function** and **exposure to the environment**:
- **Closed Spaces**,
- **Intermediary Spaces,**
- **Open Spaces**.
- **2.1.1 Closed Spaces with Thermal Roles: Functional Spaces**
- In traditional homes, particularly in Basrah which showcases vernacular architecture, functional spaces are critical. These spaces are : **Habitable rooms(livable space), guest room, kitchens, bathrooms, storerooms, and basement**

- Types of Closed Spaces **Include**:
- - **Habitable Rooms:** Main living areas used daily.
- - **Guest Room**: Spaces designated for visitors, providing comfort and privacy.
- - **Kitchens:** Designed to handle heat and smells away from living areas.
- **- Bathrooms:** Functional spaces typically isolated from main living areas.
- - **Storerooms:** Used for storing goods and supplies, usually kept separate from living spaces.
- **- Basement**: A crucial cool retreat during the hottest parts of the day, often used as a functional space during peak heat hours.



- These spaces are designed to **maximize their usefulness** while maintaining a **comfortable indoor climate**, demonstrating the bioclimatic approach of vernacular architecture in managing temperature and **providing functional living spaces.**

- **Habitable Rooms in Vernacular Architecture**
- Habitable rooms in vernacular Iraqi homes **are designed with a strong focus on climate adaptability.** These rooms are **connected to the outside environment** in several ways, including **direct openings** and **transitional buffer** spaces.
- **Key Features of Habitable Rooms:**
- **High Ceilings**: These allow **warm air to rise** during the summer, which is then **naturally expelled** due to the **temperature difference** between the warmer interior and the cooler outside air, or through specially **designed cooler air storage** areas.
- **Window Placement and Size**: Windows **are small** and typically **face the inner patio,** minimizing **direct sunlight** while **maximizing natural light**.

- **Wall Orientation and Thickness:**
- **North-facing rooms: Thicker walls** for summer use, often shaded by plants.
- **South-facing rooms: Ground-level** for winter warmth, using sunlight.

Buildings are designed for **temperature control**, **with deep shadows** and **air circulation** that cool in summer and retain heat in winter, ensuring **comfort throughout the year.**

- **B. Guest Room** The guest room in traditional Iraqi homes is designed for **privacy** and **accessibility.** It is **separate** from the **family's living** areas and typically has **its own entrance.** This setup allows guests to **come** and **go** without **disrupting** the household. Windows in the guest room often **face narrow**, **winding streets** and **feature** decorative **wooden jigsaw** panels that provide **privacy** while allowing **light** and **air** to enter.
- **Features of the Guest Room:**
- **Isolated from main living areas** for privacy.
- **Separate entrance** for easy access.
- **Windows with wooden panels** overlooking traditional streetscapes.

- **C. Kitchens, Bathrooms, and Storerooms** are strategically located for **efficiency** and **comfort** but are kept **separate** from main **living areas.**

- **Kitchens**: are placed **deep inside** the home to contain **heat** and odors and **face north** to use prevailing **winds for ventilation.** A buffer **zone links** them to the yard, improving **functionality** and **circulation**.

- **Bathrooms and Storerooms**: are **isolated** like kitchens, with *street-facing* windows to enhance ventilation **without sacrificing privacy**. Their design prioritizes practicality and ease of access.
- These design choices show **careful planning** in the placement and **orientation** of house spaces, ensuring **efficiency** and contributing to overall home **comfort** and **functionality**.

D. Basement: In traditional Iraqi architecture, the **basement plays a critical role** in managing indoor climate, particularly **in arid regions.** This underground space utilizes the **earth's natural cooling** properties to maintain a **lower** temperature than the **above-ground** areas.

- **Key Features of the Basement:**
- **Thermal Inertia:** The basement leverages the ground's ability to **absorb** and **retain** cool temperatures, serving as a **natural air conditioning** system.
- **Structural Design:** Basements are often vaulted and may feature **decorative** elements. They are typically constructed **from burnt brick**, which enhances their **durability** and **thermal** properties.
- **Air Flow Connection:** A unique feature is the basement's **connection** to the **terrace** via a structure called a **Bagdir** (wind tower), which exploits the difference in air **pressure** between the high **terrace** and the **lower** basement. This design creates a cool air flow that **naturally ventilates** the space.

- The design of the basement in traditional Iraqi architecture demonstrates how local building methods **effectively** address the region's hot climate, making it a **functional** and **comfortable** retreat during peak heat.

2.1.2 Intermediary Spaces with Thermal Role

Intermediary spaces in vernacular architecture **serve as transitional zones** that **bridge** the interior (inside) and the exterior (outside) environments of a building. These spaces are **crucial** for adapting to the local climate by moderating **temperatures** and **airflow**, thereby creating a comfortable living environment.

A. Loggia A loggia is a type of intermediary space that is **deeper than standard galleries**, playing a significant role in climate control within the building.

- **Key Features of the Loggia:**
- **Shade and Shelter**: The loggia is designed **to provide shade** and **reduce the impact** of direct sunlight and strong winds, making it an **effective buffer zone** that enhances indoor comfort.
- **Construction**: It is often enclosed with tracery made **from rectangular wooden panels**, which adds an **aesthetic** element while **also filtering light** and **air**.
- **Functionality**: This space is typically used for **hosting guests**, allowing them to **enjoy outdoor** views and breezes in a **protected setting.**

B. Gallery

In traditional Iraqi homes, the gallery **serves as a crucial intermediary** space that enhances the **functionality** and **comfort** of the dwelling. Positioned **around patios**, it acts as an **open corridor** that **facilitates movement** and provides **transitional** space between the **interior** and the **exterior**.

Key Features of the Gallery:

•**Structure and Location**: Typically, galleries are open corridors **with a roof or porch** that wraps **around the patio.** This design allows for **easy movement** around the house **while offering protection** from the elements.

•**Protective Role**: By **shielding** the **doors**, **windows**, and even the **external walls** from direct exposure to **the sun and weather**, the gallery helps to maintain the **structural integrity** and **comfort** of the home.

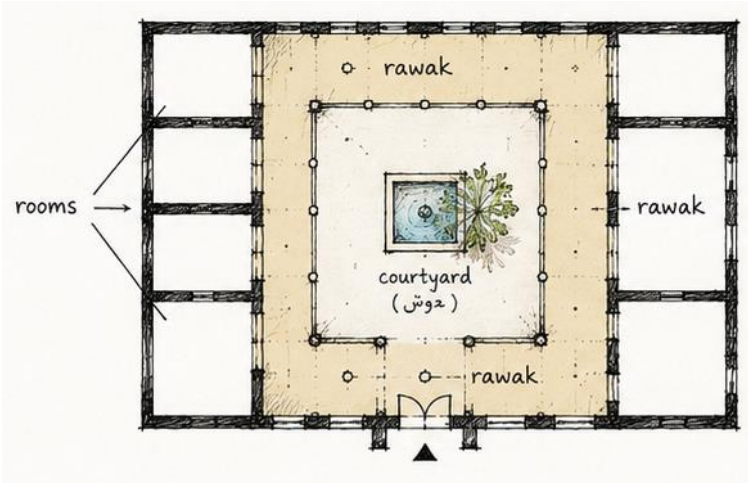
•**Usage**: Besides being **a passageway**, the gallery often becomes a place for **relaxation** or **social interaction, offering views** of the courtyard and **access to fresh air.**

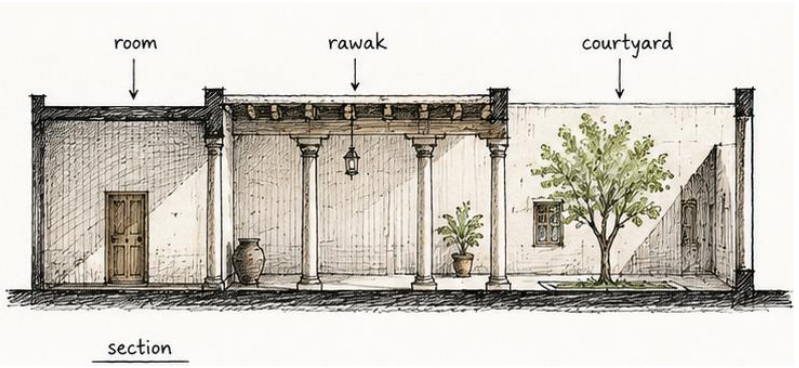
C. Iwan: The Iwan is a hallmark of **traditional architecture from Mesopotamia,** serving as a unique and functional intermediary space within the home.

Design and Structure: The Iwan is **usually a square-shaped** space **open on one side**, often facing the courtyard to connect indoor and outdoor areas.
Location and Orientation: It is commonly oriented toward **the north to** reduce sun exposure and create a cool shaded space.
Enhancements: The Iwan may include **arches or vaulted** roofs that improve both appearance and function.
Usage: It often contains pools or fountains for cooling and is used for sitting and receiving guests in an open, airy environment.
Climate Role: The Iwan provides **natural cooling and climate control**, making it an important feature in traditional houses of hot arid regions like Iraq.

2.1.3 Open Spaces with Thermal Role: Patio (Courtyard)

- The patio, or courtyard, is a **central** feature of traditional Iraqi dwellings, playing a critical role in **creating a comfortable microclimate** within the home.
- **Key Features of the Patio:**
- **Microclimate Creation:** The patio serves as an open but enclosed space that helps **control indoor temperature, cooling the air through natural elements** like water pools, fountains, and vegetation.
- **Thermal Efficiency: Water pools in the patio absorb heat during the day and release it slowly** at night, maintaining a consistent temperature and making the area comfortable all day and night
- **Design Variations:** In multi-level houses, patios may be shaded with grids or lightweight tarpaulins on bars, called Rawak, to provide shade and improve airflow, enhancing temperature control.
- **A Rawak** is an open corridor or covered area that helps manage the local microclimate. It acts as a buffer zone, shielding from direct sunlight while promoting air movement, thereby enhancing environmental comfort around and within the house.





B. Terrace: Terraces are vital features in houses located in arid zones, serving multiple roles that contribute to the comfort and functionality of the home.

They come in two primary types:

B1. Front Terrace: Function and Atmosphere: The front terrace is designed **to reduce the temperature** around the entry area and **create a welcoming**, **enjoyable atmosphere.**

Cooling Features: This space often includes **shade from trees** and **climbing plants that naturally cool** the area. Alternatively, it may be covered with a **light fabric canvas to provide** shade without trapping heat, enhancing the cooling effect.

B2. Roof Terrace: Design and Usage: The roof terrace is enclosed by walls ranging **from 1.8 to 2.2 meters high**, which provide necessary shading. This type of terrace is especially useful during the night.

Nighttime Function: The roof terrace, due to its elevated position and wall cooling, is often used as a sleeping area on hot nights, providing a cooler alternative to indoor spaces.

2.2 Architectural Elements with Thermal Role: Wind Tower (Bagdir)

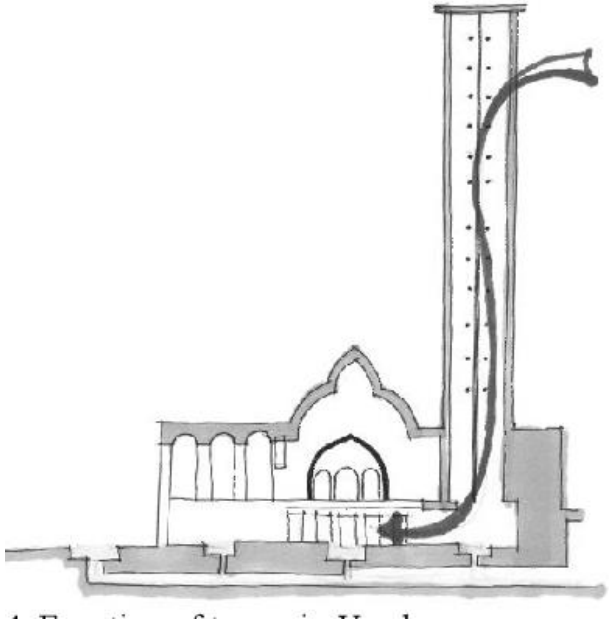
What are Wind Towers? are architectural structures designed to boost natural ventilation in buildings. They act as vertical air ducts with internal channels linking the exterior to the interior spaces of a dwelling.

How Do Wind Towers Work?

•**Principle of Operation**: The basic function of a wind tower relies on temperature and pressure differences between the inside and outside of a building, creating a "**thermal depression**" that pulls air through the tower.

•**Air Movement**: During the day, the wind tower absorbs heat from passing air, with warmer air moving down along the cooler tower walls. At night, this process reverses, as cooled air inside the tower draws up warmer indoor air, facilitating continuous circulation.

•**Ventilation Control**: The flow of air can be adjusted by opening or closing the ventilation doors within the tower, allowing for customizable climate control within the home.



Wind towers are an ingenious solution for hot climates, offering natural cooling and ventilation to improve indoor comfort without electrical air conditioning.

Functions of a Wind Tower (Bagdir)

Primary Functions:

•**Dust and Sand Filtration**: The wind tower is particularly effective at reducing the volume of sand and dust brought in by prevailing winds, which is a common challenge in arid regions.

•**Climate Control**: The Bagdir harnesses summer breezes to naturally cool interior spaces. In winter, it can be closed to retain warmth, demonstrating versatility across different seasons.

•**2.2.2 Ventilation Gaps**

Purpose and Design:

•**Ventilation and Lighting**: Ventilation gaps are strategically placed openings at the upper parts of houses. They are often enhanced with a grid or screen that is both functional and decorative.

•**Air and Light Flow**: These gaps allow for the passage of air and light, helping to improve the indoor environmental quality by ensuring natural light access and adequate air circulation.

•**Aesthetic Element:**The grids or screens in these gaps are often crafted with intricate designs, providing visual appeal while serving their practical functions.

2.2.3 Shanashil

What is Shanashil? Shanashil refers to **an ornamental element commonly found in traditional Iraqi architecture**, characterized by intricate wooden lattices or screens made from small pieces of wood assembled like a jigsaw.

Functions and Benefits:

- **Ventilation and Lighting**: The design of shanashil allows for natural ventilation and lighting to filter into the interior spaces, maintaining a comfortable indoor environment without the use of mechanical systems.
- **Heat Reduction**: By blocking direct sunlight, shanashil helps to reduce the amount of heat entering a building. The wooden material absorbs some heat but significantly limits heat transfer through radiation, keeping the interiors cooler.
- **Airflow Management**: The patterns and placement of shanashil can influence the direction and flow of air within a space. By altering how air moves through an area, shanashil contributes to more effective natural cooling.
- **Aesthetic Appeal**: Besides its functional roles, shanashil adds a decorative aspect to buildings, showcasing the richness of Iraqi architectural heritage with its detailed craftsmanship.

2.2.4 Fountains and Water Pools (Selsebil)
Role and Importance:

•**Integration into Architecture**: Fountains and water pools are integral components of traditional Iraqi architecture. They are strategically placed within the design of a house to enhance both the aesthetics and the functionality of the living spaces.

•**Microclimate Creation**: These water features are key in creating a favorable microclimate inside the house by cooling the surrounding air through evaporation. This natural cooling effect makes interior spaces more comfortable, especially in hot climates.

•**Aesthetic and Functional Harmony**: Beyond their practical benefits, fountains and water pools add a visual and auditory element to homes, offering tranquility and a connection to nature, which is highly valued in many traditional cultures.

2.2.5 Doors and Windows

Design and Functionality:

•**Windows**: In traditional Iraqi architecture, windows are **usually small and high on walls,** controlling light and heat entry while allowing adequate ventilation. They often have wooden frames, offering natural insulation and aesthetic appeal.

•**Doors**: Doors in traditional Iraqi homes are **typically wooden and often adorned with metal decorations**. Wood enhances the doors' visual appeal and functionality, helping control airflow and maintain indoor temperature by effectively blocking external weather.

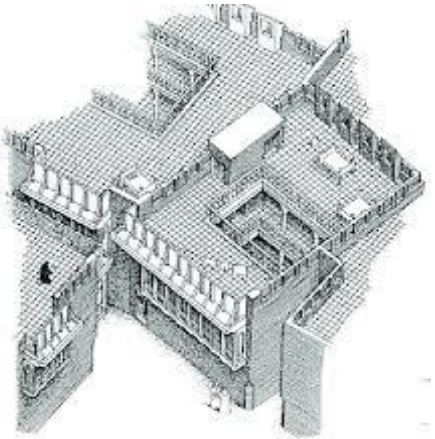
•Purpose and Benefits:

•**Air Current Control**: Both doors and windows play crucial roles in managing air circulation within the home. Their strategic placement and design ensure that air flows naturally throughout the house, **helping to keep it cool in the summer and warm in the winter.**

•**Aesthetic Integration**: The **decorative elements** of these building features reflect the cultural importance of craftsmanship and beauty in architecture, making them not just functional but also integral to the house’s overall character.

2.2.6 Outside Decoration

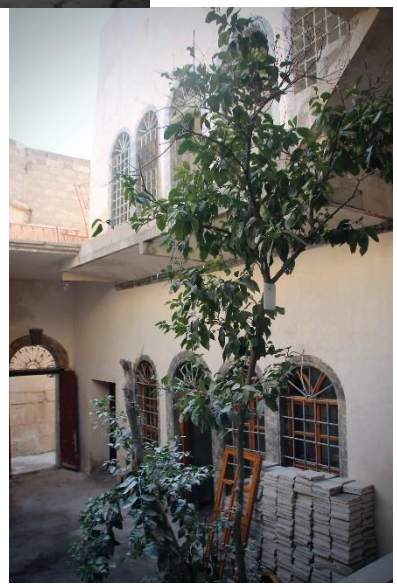
Outside decorations are shaped, bulky elements on buildings. They create distinct shadows on sunlit facades, alter the direction of air flow, and provide shade.



2.3 Natural Elements with Positive Effects

This refers primarily to plants and vegetation:

- **High Trees with Thick Leaves (like Palm Trees)**
  - These trees block sunlight, lower the surrounding air temperature, alter wind direction, and cool the temperature in shaded areas on the roof, walls, and terraces.
- **Horizontal Plants**
  - These plants reduce the temperature at the ground surface and decrease sun radiation.
- **Vertical Plants**
  - These plants form cool areas near buildings by covering them with green leaves.



3 Habitat-Specific Concept

3.1 Urban Texture Specific

In this urban layout, homes are **compact with internal courtyards**, surrounded by **winding streets**. The courtyards provide **shade, protecting rooms** from direct exposure to hot air and serving as buffer zones. Each courtyard is isolated from the street by at **least one wall or building**, enhancing privacy and security.

3.2 Specific Volume

- **House Shapes and Shadows:** Houses are shaped to maximize shade, especially in interior courtyards.
- **Shady Courtyard:** Courtyards provide shade and protect rooms from hot external air.
- **Bioclimatic Design:** Flat roofs, compact layouts, and courtyard placement support climate-responsive design.
- **Interaction with the Exterior:** Shade and natural ventilation improve indoor comfort and living conditions.

3.3 Specific Habitat Plan for Arid Climates:

•**Endomorphic Design**: Houses use compact, **tree-like layouts** with living spaces deeper inside for better climate protection.

•**Intermediary Spaces: Loggias**, **terraces**, **balconies**, **basements**, and service rooms act as transition zones and improve comfort.

•**Storage Conditions:** Storage spaces **stay cool and dry using** basements or shaded areas under stairs.

•**Thermal Buffering: Transitional** spaces reduce heat **transfer** between exterior and interior areas.

•**Insulation and Design**: **Proper insulation** and **compact** layouts improve the effectiveness of thermal buffering.

•**Thermal Efficiency:** Building **form** and **spatial organization** influence **heat loss**, **solar gain**, and indoor comfort.

3.4 Specific Building Materials

•**Local Materials:** In regions where earth and sand are predominant, innovative building techniques have been developed using these readily available resources.

•**Construction Techniques:** Arches and cupolas are commonly built from burnt or sun-dried bricks, with wood used to fill gaps, while the construction of these elements is labor-intensive, often sealed with wood.

•**Finishing Materials:** Enameled ceramics made from burnt clay are used for finishing, serving both aesthetic and functional purposes.

•**Traditional Knowledge:** Drawing on traditional knowledge and centuries of experience, vernacular builders select materials and methods that provide durability and thermal protection.

•**Mud-Build:** Mud-build is a crucial material in hot climates, favored for its ability to maintain cool interior temperatures.

Conclusion

From the discussion, several key aspects emerge concerning traditional Iraqi vernacular houses:

•**Shadow**: Shadows are a distinctive feature of Iraqi vernacular houses, created through architectural details, structural volumes, and natural elements such as vegetation and water.

•**Usage of Space**: People adapt their living habits according to the climate—residing in basements during the peak heat hours, sleeping on the roofs at night, and heating only the rooms in use.

•**Spatial Hierarchy**: The layout includes an entrance leading to the main space, the courtyard, surrounded by a Rewak (arcade), with various rooms branching off. There are also exclusive spaces directly connected to the courtyard.

•**Urban Fabric**: The urban fabric of these areas is notably compact, integrating these homes closely within their environment.

References

•*Barstow, D., & Bassett, T. J. (1986). Coober Pedy: Underground opal town. Rigby Publishers. (Specific look at Coober Pedy, Australia, and its dugout dwellings)*

•*Beck, H., & Cooper, J. (2014). Underground dwellings and storage in Cappadocia, Turkey. Left Coast Press. (Focuses on the historical and contemporary use of underground spaces in Cappadocia)*

•*Danby, M. (1989). The simple home: The beauty of the vernacular. Thames and Hudson. (Celebrates the beauty of vernacular homes, including many with courtyards)*

- *Edwards, B., Sibley, M., Hakmi, M., & Land, P. (Eds.). (2006). Courtyard housing: Past, present, and future. Taylor & Francis.*

•*Golany, G. (1988). Earth-sheltered dwellings in Tunisia: Ancient lessons for modern design. University of Delaware Press. (Examines traditional underground architecture in Tunisia)*

•*Oliver, P. (Ed.). (1997). Encyclopedia of vernacular architecture of the world. Cambridge University Press.*

•*Smith, J. (2010). Underground dwellings in ancient times. Journal of Vernacular Architecture, 25(1), 20-35.*

•*Rapoport, A. (1969). House form and culture. Prentice-Hall. (A classic work examining the relationship between culture and house design, including courtyard houses)*