

PATHS OF WATER

THEMATIC 1 - IMMATERIAL CULTURE

YAHYA -ASEEL-FERIEL-EMNA-JOAN-SAMAA



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CASE STUDIES**

	Politics (Governance & Power)	Techniques (Engineering, Knowledge)	Society (Social Structure)		Human & Nature (Ecology, Resilience)	Culture (Traditions & Symbols)	Wellbeing (Public Health & Lifestyle)
Itzer "Desert"	Governed by “Orf” Tribal Customary Law,Decisions are collective and consensus based among elders (Jama'a), Tribal Agreements (some could say it's an early version of Tribunal de las Aguas)	Mountain Diversion Stone-linedchannels and snow-melt harvesting. Knowledge relies on reading the geology of the High/ Middle Atlas to capture seasonal f l ows	Water as a Social Bond Seasonal movement(transhumance) and the shared maintenance of irrigation infrastructure define tribal identity and communal cohesion.		A Symbiotic Ecology The culture is deeply tied to the rhythms of the Atlas. The architecture and landscape are adapted to harsh, high-altitude extremesand seasonal	Water as Vitality/Survival Folklore and songs often revolve around the arrival of rain and the health of the mountain springs. Water is the "ancestral inheritance" of the Ait people.	Food Sovereignty and Resilience Wellbeingis tied to Food Sovereignty and Resilience. The seasonal availability of mountain-fed crops sustains the health of isolated communities where water is synonymous with life-sustenance.
	Currently in the Atlas, the state struggles to codify traditional, often informal, water-sharing rights into modern legal frameworks	Agriculture is focused on small scale cereal patches and livestock integration			Itzer: Dry and arid		
Fes-Saiss Plain	Centered on “Habous” and “Amin” Religious endowments andWater overseers. Managing the medina’s flow, centralized around religious institutions	Gravity-Flow Hydraulics Intricate underground"sekaya" networks, thermal regulation through hammam engineering, and complex water-lifting systems (historically) for tanneries	Water as a Social Leveler Access to public fountains and hammams created a shared urban social space. Water quality historically defined neighborhood status.	Language and Vocabulary In the Atlas regions, the use of Tamazight terms for specific hydrological features (springs, seasonal flows) versus the Arabic terminology used in the urban medina of Fes. The language often carries the "memory" of how to manage the water in that specific terrain.	A Controlled Ecology The cityacts as a human-made oasis. Today, the challenge is the disconnect between the urban medina and the rapidly drying Saiss aquifer due to industrial agriculture.	Water as Sacred/Cleansing The flow fromthe Oued to the Mosque is a spiritual journey. Water has significant importance in Islam (Water is the source of life). Water is the primary aesthetic element in the Riad (courtyard).	Urban Sanitation Historically, the system was a pioneer in Urban Sanitation, with a high density of public bathhouses (hammams) promoting hygiene and social interaction as a pillar of community health.
	Currently, the Saiss plain, relies on state-led deep-well irrigation systems (aquifers), and is increasingly undergoing industrial-scale agricultural shifts		Islamic Water Ethics In Fes, the mosque is traditionally at the end of the water distribution chain — water enters the medina via the Oued and flows through the mosque (for ablutions) before reaching the street level and tanneries. This hierarchical flow mirrors a social and religious order.		Fes-Saiss: Lush green plateau		
Dahar region	- Tribal organization - Customary law (orf) - Role of councils of elders (jamaa):	troglodyte settelments Jsour System for water managment	Amazigh tribes and clans, later mixed with Arab tribes over time. - lineage (family → clan → tribe) - territory (mountain zones, valleys, ksour areas)		Human settlement in Dahar is a response system to environmental constraints, not a transformation of nature.	- Farming is not industrial—it is familial and inherited - Knowledge is transmitted orally across generations - Agricultural tasks are linked to seasonal rituals and social cooperation	- Controlled water use for washing and cooking - Shared cisterns and wells managed collectively - Prioritization of drinking water over other uses
Valencia Huerta	Tribunal de las Aguas Democratic, oral, public legal system resolving issues by peer-elected farmers. A third-party judicial layer.	The Acequia Grid A scientific,tiered distribution system. The technique is defined by precise measurement (fila or water-share units) that dictates the entire landscape grid		Water as Civic Identity The ritual of the WaterCourt reinforces the social identity of the farmer (regante) as a guardian of the city's lifeblood	A Constructed Garden TheHuertais a highly modified, "artificial" ecosystem that functions as a natural flood buffer for the city. It is the ultimate example of humans engineering their own climate.	Water as Ritual The weekly meeting of the Tribunal de las Aguas is a living tradition, recognized globally. The Acequia is the cultural backbone of Valencian identity.	Psychological and Physical Health Water as Psychological andPhysical Health. The "Green Belt" (Huerta) serves as the city's lungs. The Mediterranean diet and the cooling effect of the irrigation channels provide a unique urban microclimate that enhances the quality of life
	The Huerta is a protected space. It's the direct interface where the city IS the garden.						

1. POLITICS AND GOVERNANCE
2. HUMAN AND NATURE
3. SOCIETY
4. CULTURAL EXPRESSION
5. WELLBEING
6. TECHNIQUES



MORROCCO

AREA/ SIZE: 446,300 KM²
POPULATION: 38,7 MILLION



FES SAISS PLAIN

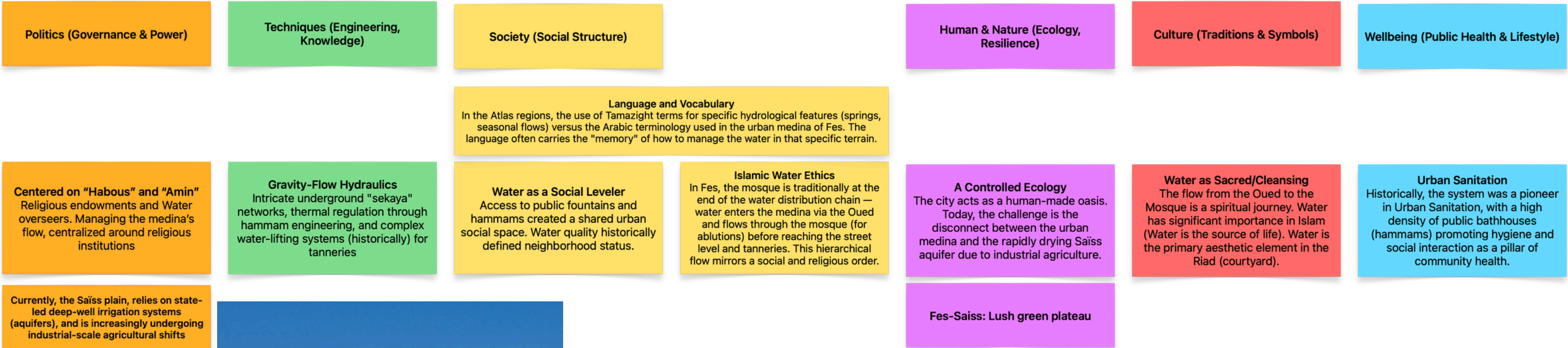
01

02



ITZER - MIDELE (ATLAS)

1. FES (THE CITY AND THE SAISS PLAIN)



Fes is built on the convergence of rivers (Oued Fez). Architecture is defined by the medina's intricate network of canals and channels that feed hammams, mosques, and tanneries.

Urban Hygiene/Industry

Habous is a Moroccan term for "waqf" (plural: awqaf), an Islamic charitable endowment. It's property, land, buildings, shops, or other assets that are permanently dedicated to a religious, charitable, educational, or public purpose.



2. ITZER - MIDELT (HIGH ATLAS MOUNTAIN RANGE)

Politics (Governance & Power)	Techniques (Engineering, Knowledge)	Society (Social Structure)	Human & Nature (Ecology, Resilience)	Culture (Traditions & Symbols)	Wellbeing (Public Health & Lifestyle)
Governed by "Orf" Tribal Customary Law, Decisions are collective and consensus based among elders (Jama'a), Tribal Agreements (some could say it's an early version of Tribunal de las Aguas)	Mountain Diversion Stone-lined channels and snow-melt harvesting. Knowledge relies on reading the geology of the High/ Middle Atlas to capture seasonal flows	Water as a Social Bond Seasonal movement (transhumance) and the shared maintenance of irrigation infrastructure define tribal identity and communal cohesion.	A Symbiotic Ecology The culture is deeply tied to the rhythms of the Atlas. The architecture and landscape are adapted to harsh, high-altitude extremes and seasonal scarcity.	Water as Vitality/Survival Folklore and songs often revolve around the arrival of rain and the health of the mountain springs. Water is the "ancestral inheritance" of the Ait people.	Food Sovereignty and Resilience Wellbeing is tied to Food Sovereignty and Resilience. The seasonal availability of mountain-fed crops sustains the health of isolated communities where water is synonymous with life-sustenance.
Currently in the Atlas, the state struggles to codify traditional, often informal, water-sharing rights into modern legal frameworks	Agriculture is focused on small scale cereal patches and livestock integration	Language and Vocabulary In the Atlas regions, the use of Tamazight terms for specific hydrological features (springs, seasonal flows) versus the Arabic terminology used in the urban medina of Fes. The language often carries the "memory" of how to manage the water in that specific terrain.	Itzer: Dry and arid		



Melk → private property with ownership rights.
Habous → religious endowment property.
Guich → land historically granted in exchange for military service.
Soulaliyate → land owned by a tribe or community.
Orf → rights based on local customs, traditions, or informal agreements.

Agriculture/Survival

Itzer sits in the high altitude (limestone terrain). Water management is about capturing snowmelt and seasonal springs before they disappear into porous geology.

3. COMPARED TO THE HUERTA

Politics (Governance & Power)

Tribunal de las Aguas
Democratic, oral, public legal system resolving issues by peer-elected farmers. A third-party judicial layer.

The Huerta is a protected space. It's the direct interface where the city IS the garden.

Techniques (Engineering, Knowledge)

The Acequia Grid
A scientific, tiered distribution system. The technique is defined by precise measurement (fila or water-share units) that dictates the entire landscape grid

Society (Social Structure)

Water as Civic Identity
The ritual of the Water Court reinforces the social identity of the farmer (regante) as a guardian of the city's lifeblood

Human & Nature (Ecology, Resilience)

A Constructed Garden
The Huerta is a highly modified, "artificial" ecosystem that functions as a natural flood buffer for the city. It is the ultimate example of humans engineering their own climate.

Culture (Traditions & Symbols)

Water as Ritual
The weekly meeting of the Tribunal de las Aguas is a living tradition, recognized globally. The Acequia is the cultural backbone of Valencian identity.

Wellbeing (Public Health & Lifestyle)

Psychological and Physical Health
Water as Psychological and Physical Health. The "Green Belt" (Huerta) serves as the city's lungs. The Mediterranean diet and the cooling effect of the irrigation channels provide a unique urban microclimate that enhances the quality of life

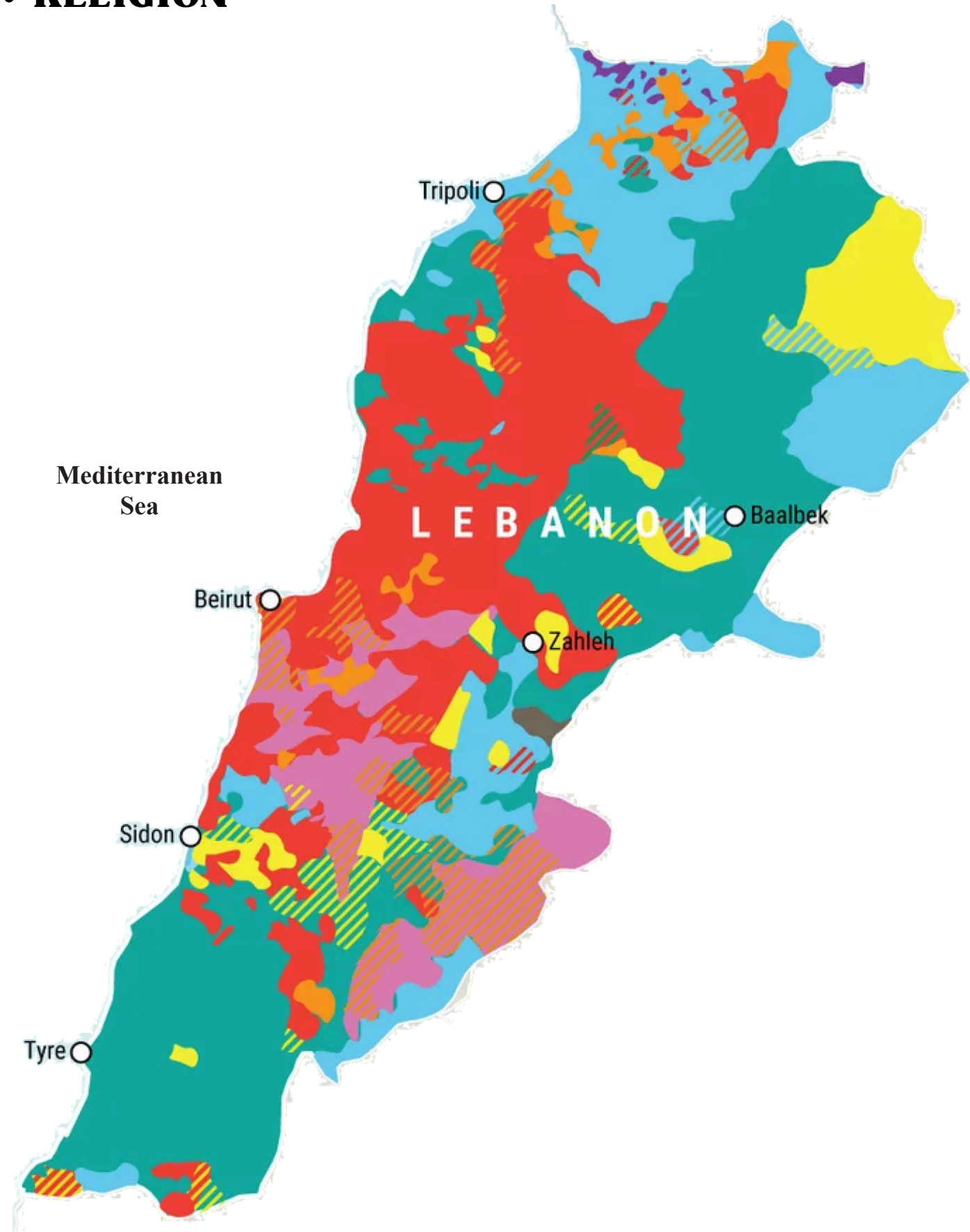


LEBANON

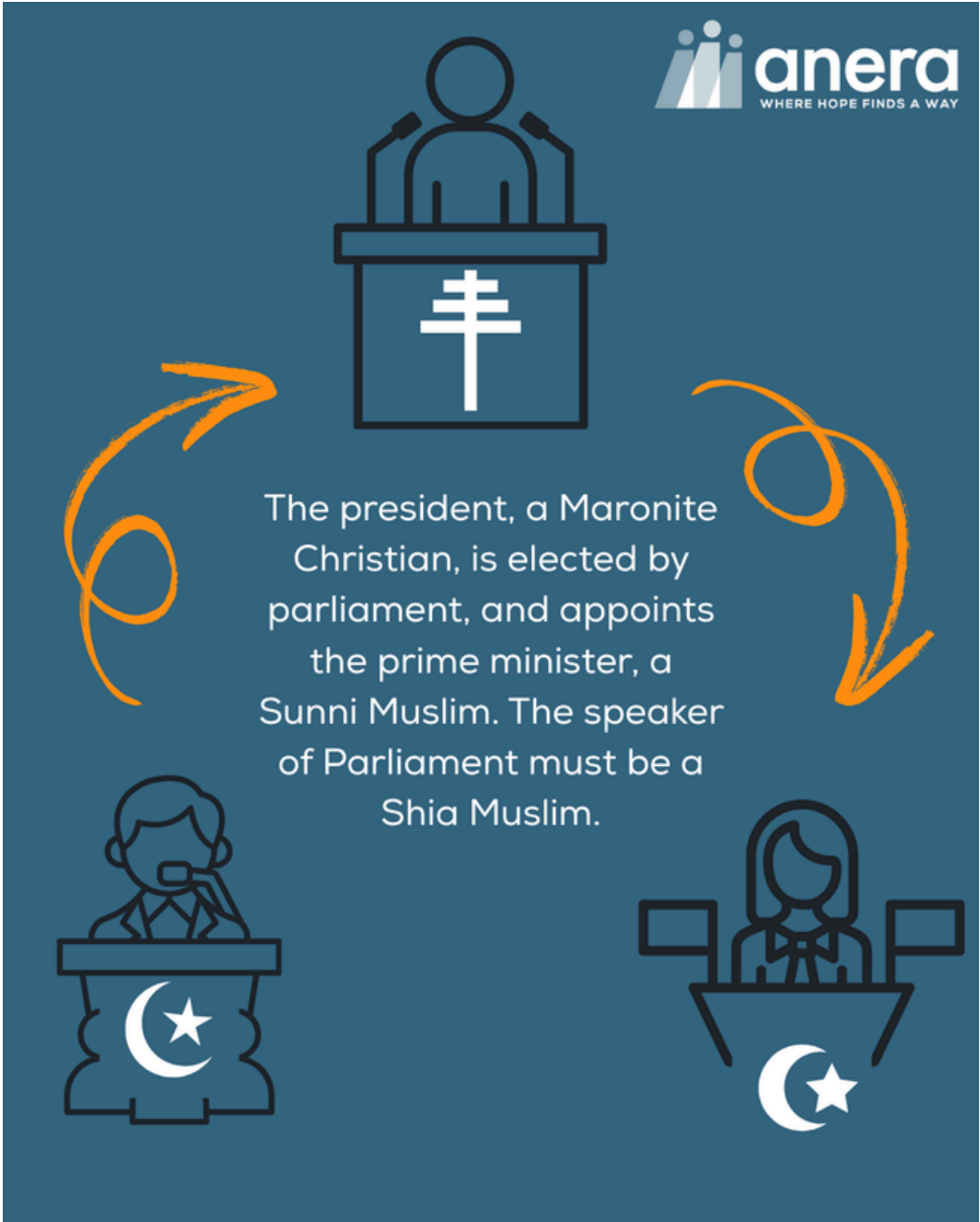
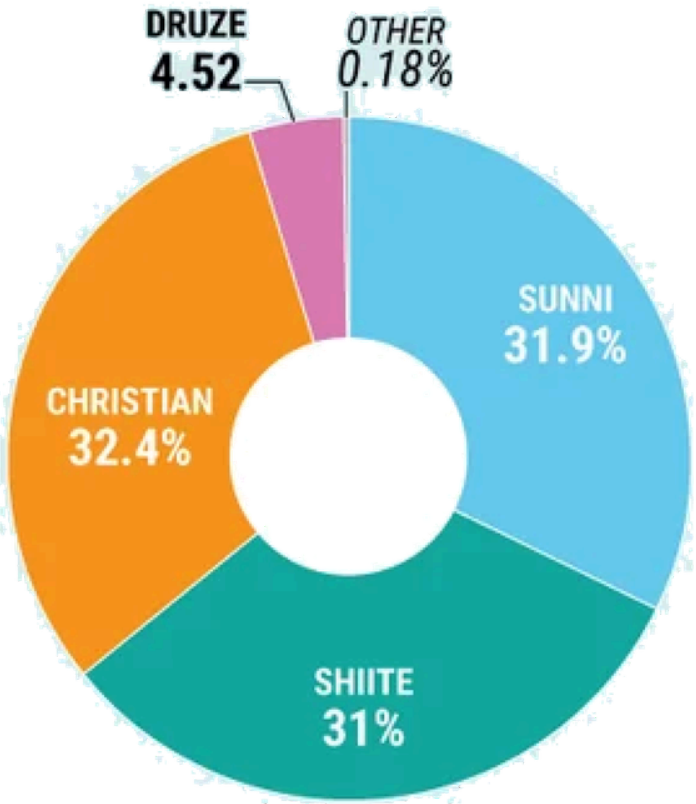
AREA/ SIZE: 10,452 KM²
POPULATION: 6 MILLION

SOCIETY (SOCIAL STRUCTUER)

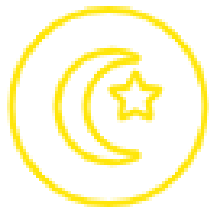
• RELIGION



Agriculture is practiced across its all religious sects.



• **RITUALS, CELEBRATIONS AND TRADITIONS**



RAMADAN



EID



CHRISTAM



EASTER

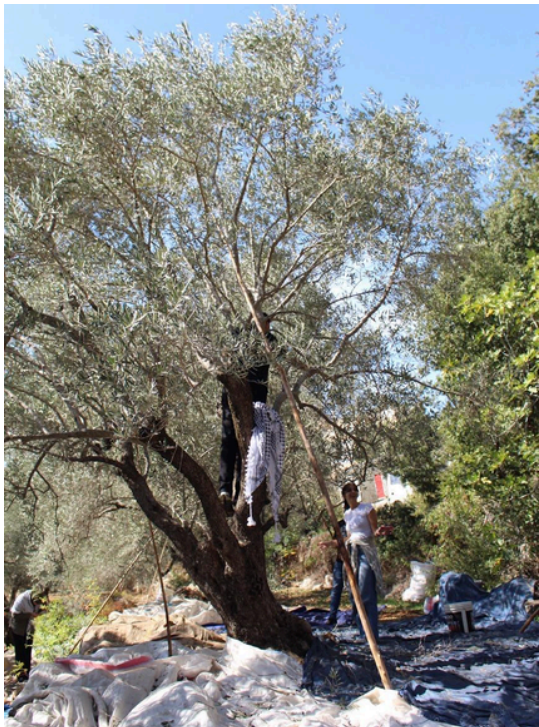
People of different religious backgrounds often join each other’s celebrations, showing a strong culture of coexistence. These occasions usually revolve around food and family. Weekly gatherings with extended family around the table are a key part of life, helping maintain close social and family ties.

Several seasonal agricultural festivals and harvest celebrations are hosted across different villages in Lebanon.

Hammana Cherry Festival



Olive Harvest



CULTURE (TRADITION AND SYMBOLS)

• MUSIC AND SONGS

Fairuz is one of the best cultural sources because many of her songs romanticize the Lebanese village, mountains, seasons, fields, and rural life like Taht El Rommaneh" and “El Bosta”.



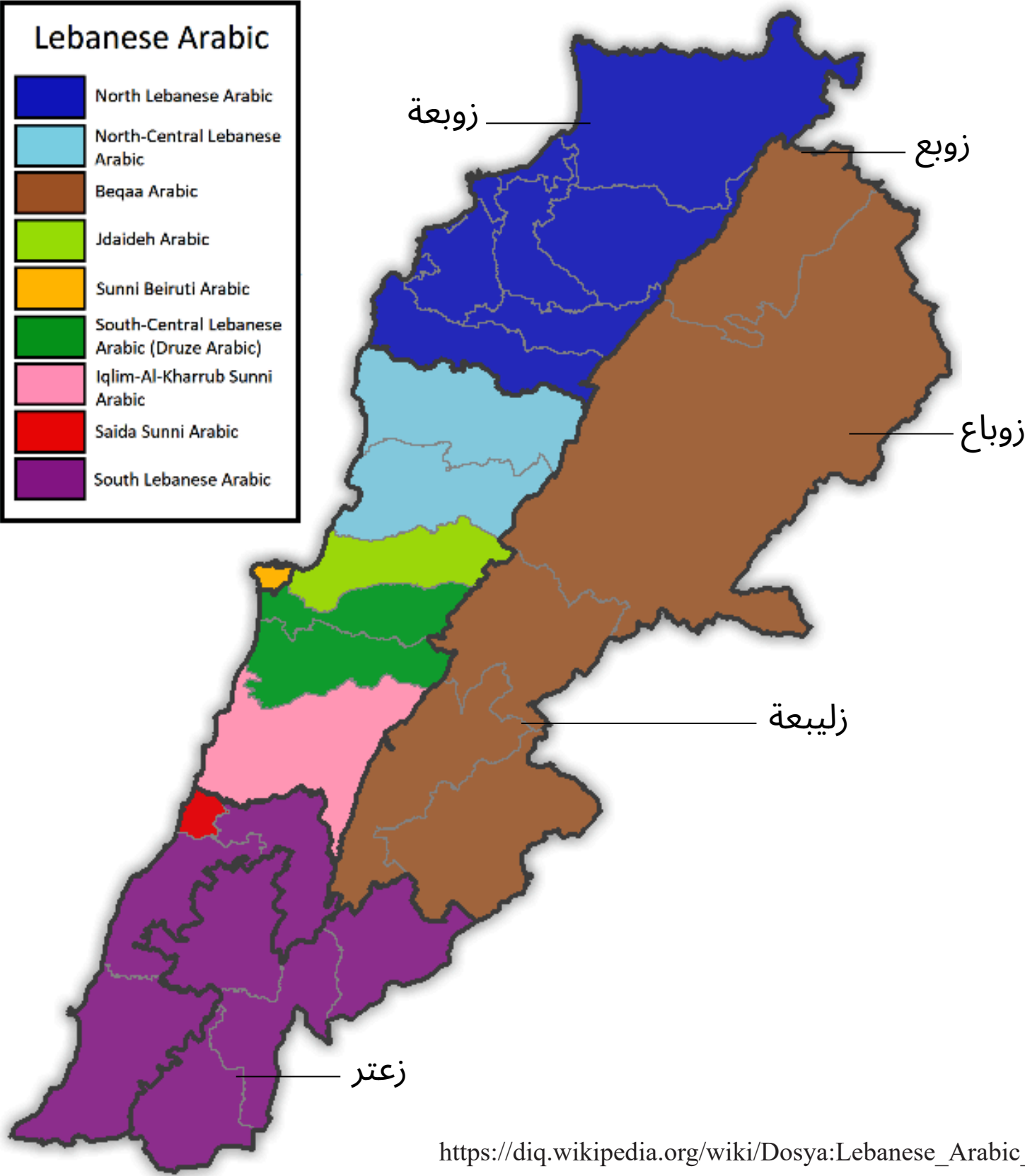
• ZAJAL



• DABKE AND FOLK DANCE



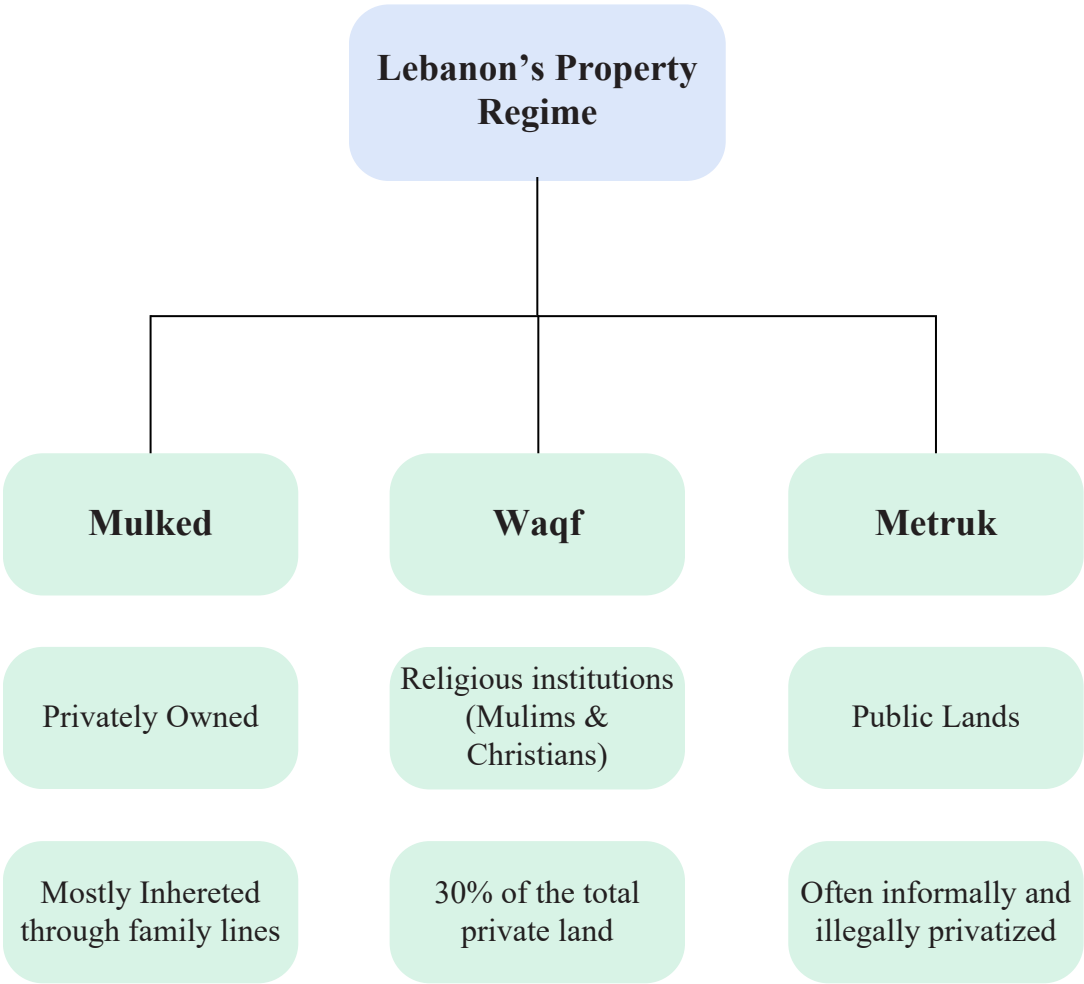
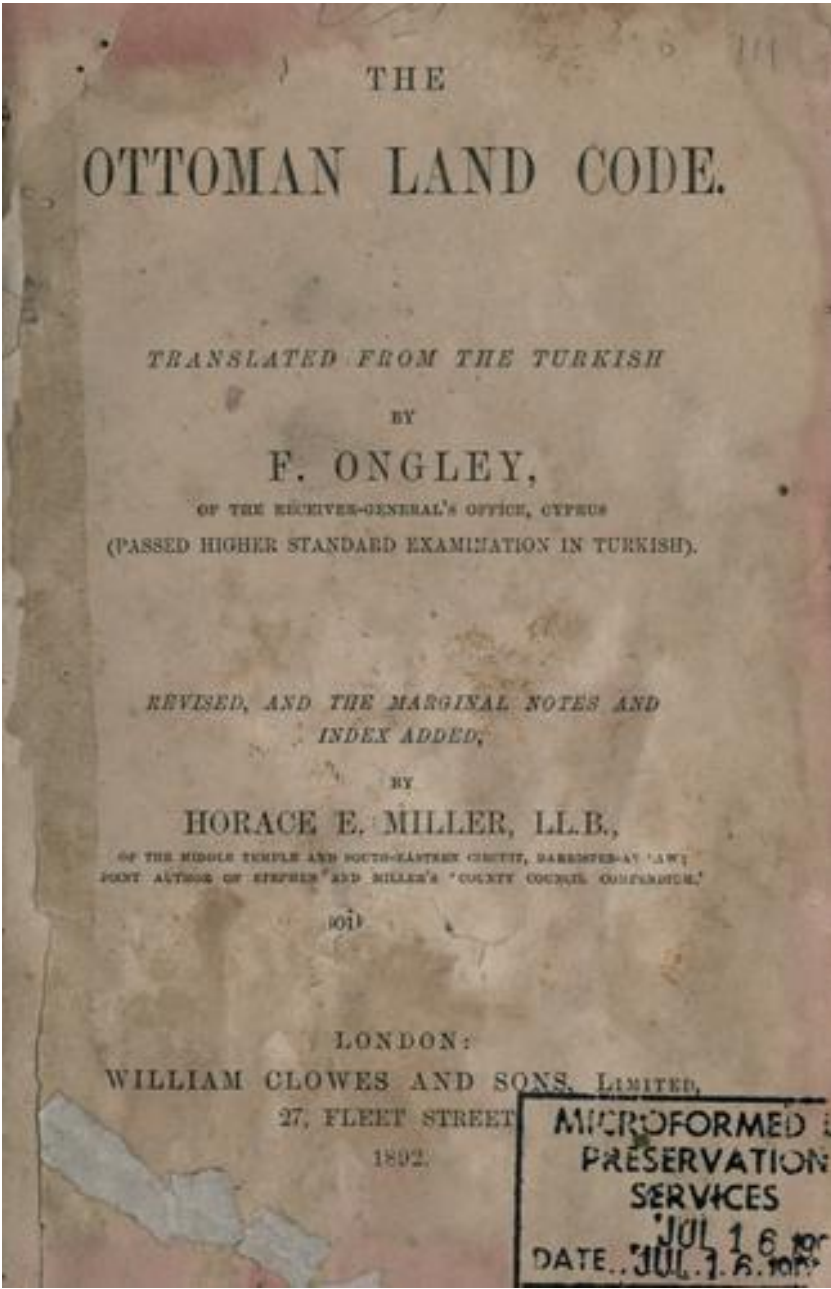
• **LANGUAGE AND DIALECTS**



POLITICS (GOVERNANCE AND POWER)

• LAND OWNERSHIP

Lebanons property regime still follows the ottoman land code of 1858

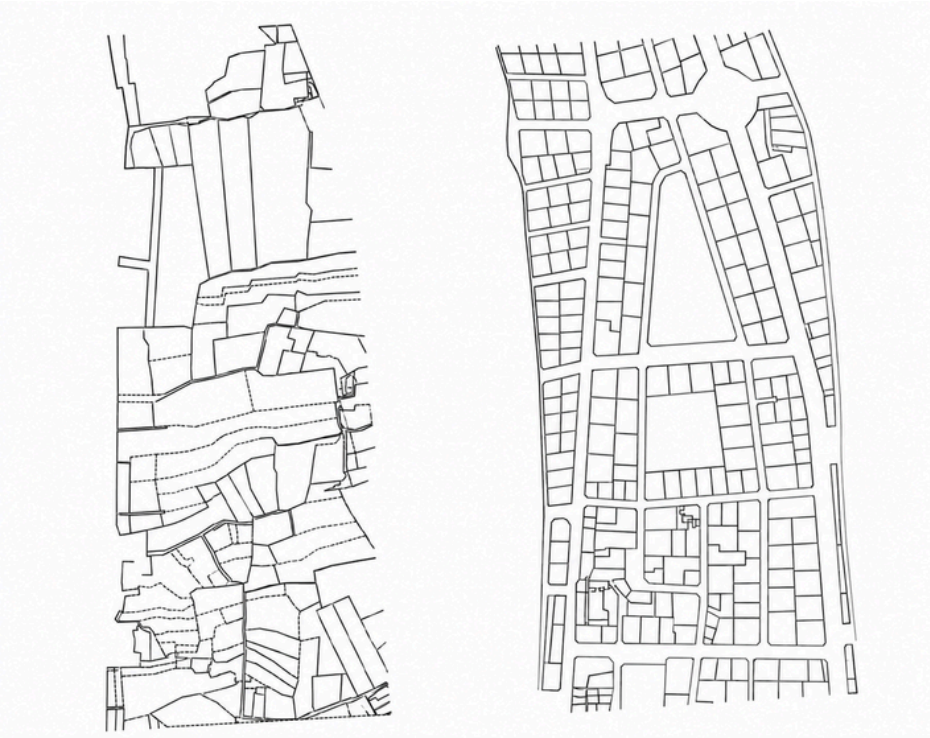


• DRIVING POWER

Political influence and clientelism often shape decisions related to land use and infrastructure development. In Saida, for example, the construction of modern roads has come at the expense of agricultural orchards, resulting in the loss of productive farmland and altering the area's traditional landscape.



A timeline of a land readjustment and urban expansion project in the Wastani area, Saida, Lebanon.



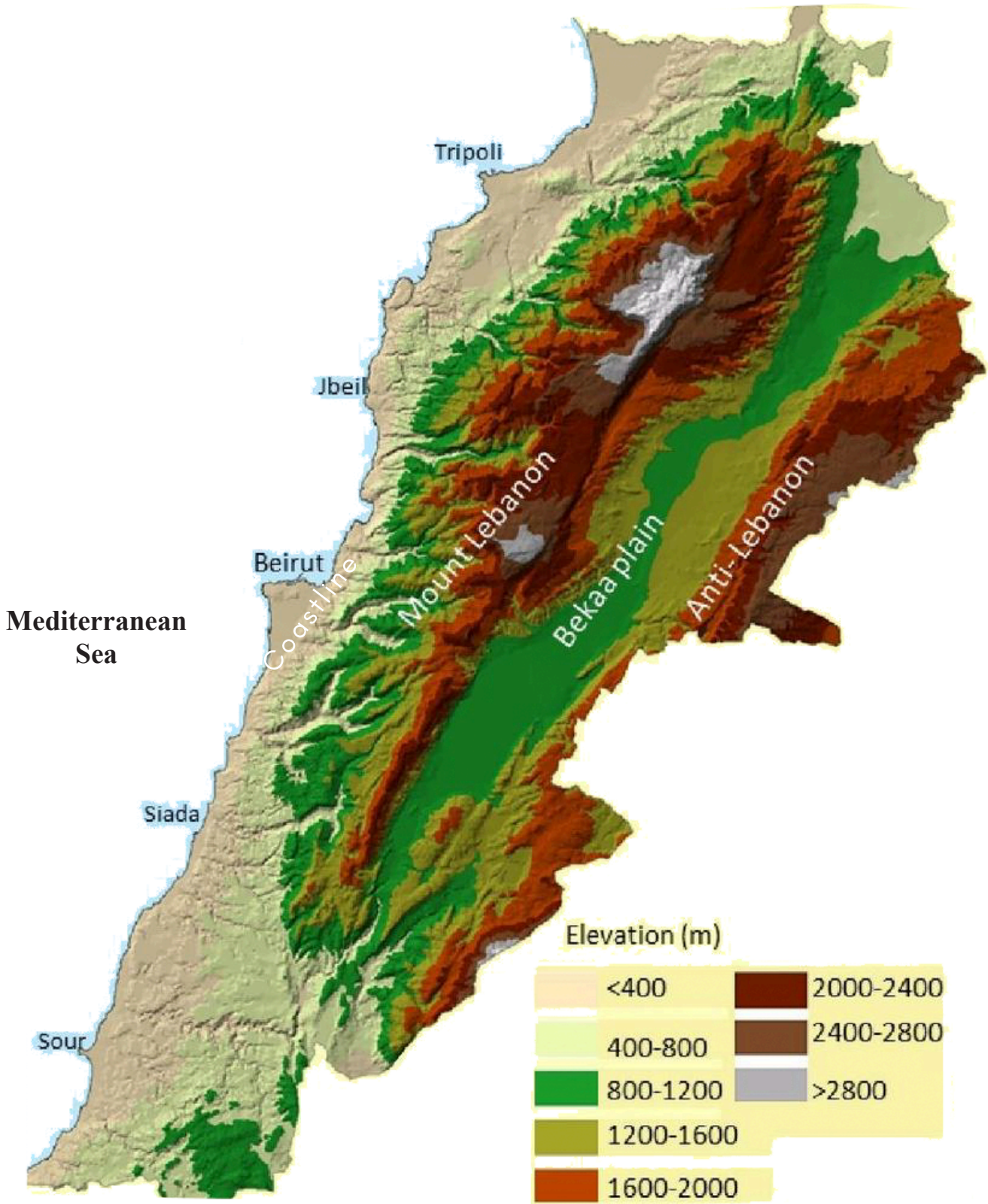
This power is also evident in the agricultural sector. In Lebanon, the top 10% of landowners control approximately two-thirds of agricultural land, reflecting significant inequalities in land ownership.

Agro-political power shapes farming systems, including access to land, water, and rural territories through political and social structures.

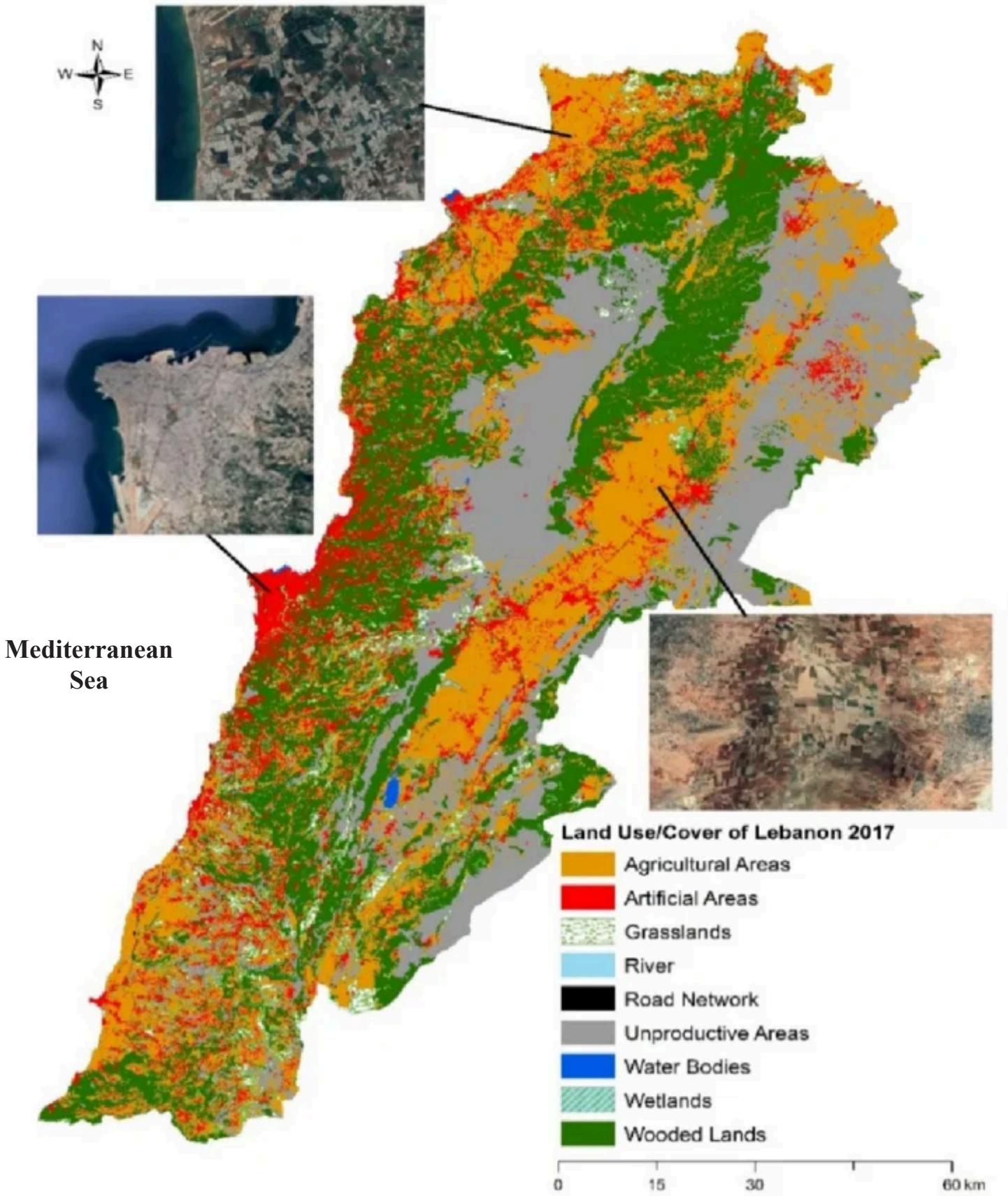


HUMAN & NATURE (ECOLOGY, RESILIENCE)

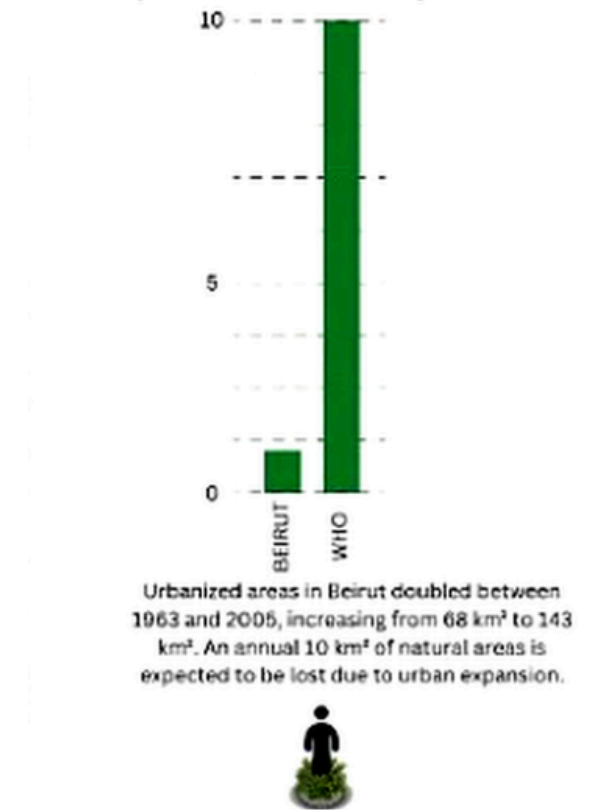
Lebanon is renowned for its striking natural diversity, where one can travel from snow-capped mountains to the Mediterranean coast within just a few hours. This close relationship between sea and mountains has deeply shaped settlement patterns, lifestyles, and cultural practices across the country.



- Nature is deeply embedded in Lebanese cultural identity, with many people tracing their roots to villages, mountains, olive groves, or family orchards.
- Even urban residents often define themselves through their ancestral village and natural landscapes rather than the city.
- Lebanese cities are relatively disconnected from nature, with limited green spaces and ecological infrastructure to meet everyday human needs.
- Nature is experienced more as a destination than a daily presence in urban life.
- Despite this, strong connections remain through seasonal migration to mountains in summer, weekend village visits, and agricultural cycles in rural areas.
- Nature in Lebanon functions as both cultural memory and a place of refuge rather than an integrated urban experience.



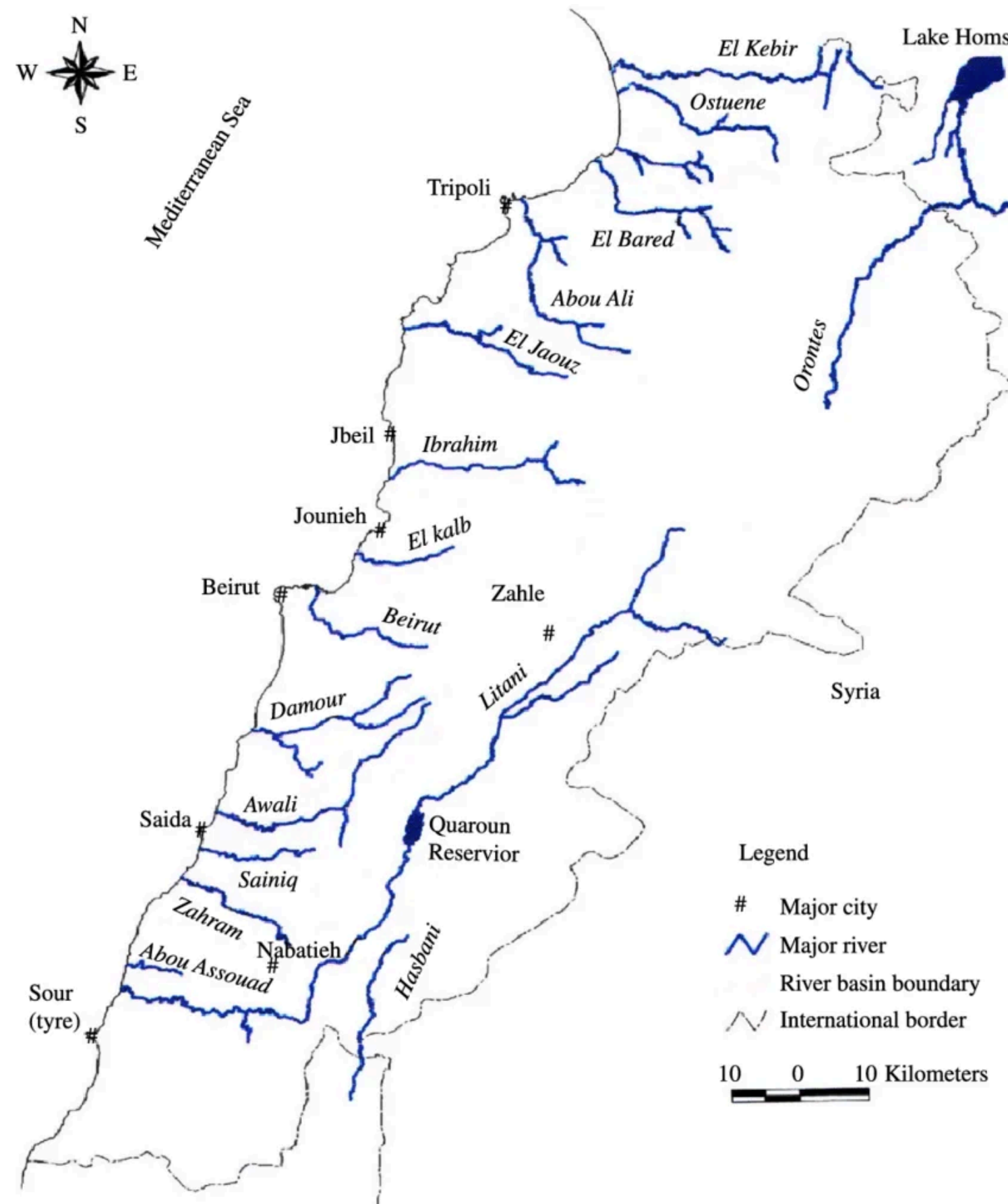
Percentage of Green Area in Beirut Compared to WHO Requirements



Amount of greenery per person in Beirut



Amount of greenery according to WHO



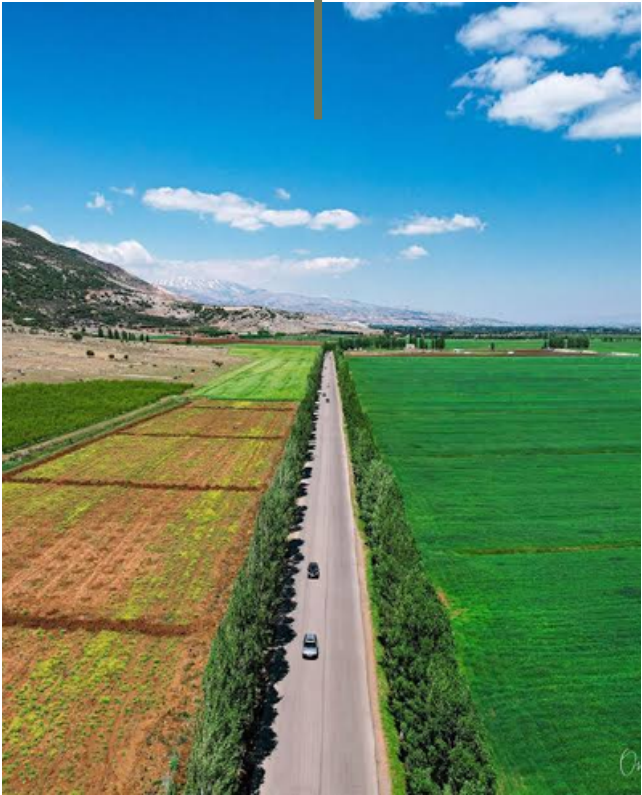
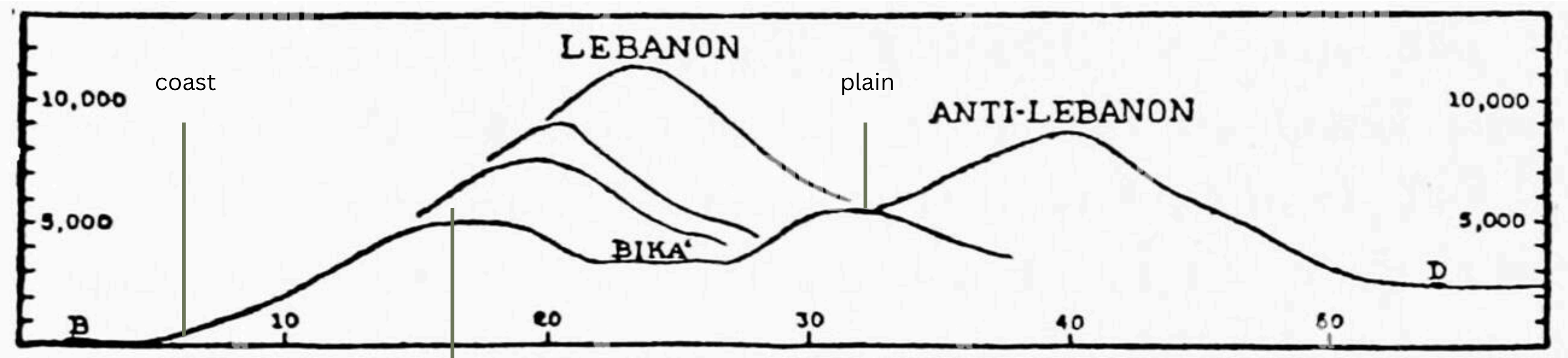
Lebanon is considered the most water-rich country in the Middle East and North Africa (MENA) region, receiving significant rainfall and snowfall that feeds approximately 40 rivers and over 2,000 major springs.

Despite this historical abundance, the country suffers from a severe paradox of being "water abundant yet scarce" due to infrastructural neglect, poor governance, and climate change.

The water use in Lebanon is split mainly between agriculture and domestic use, relying on freshwater and groundwater (heavy use of wells).

TECHNIQUES

Fertile coastal plain and Bekaa Valley between the Mount Lebanon and Anti-Lebanon ranges.

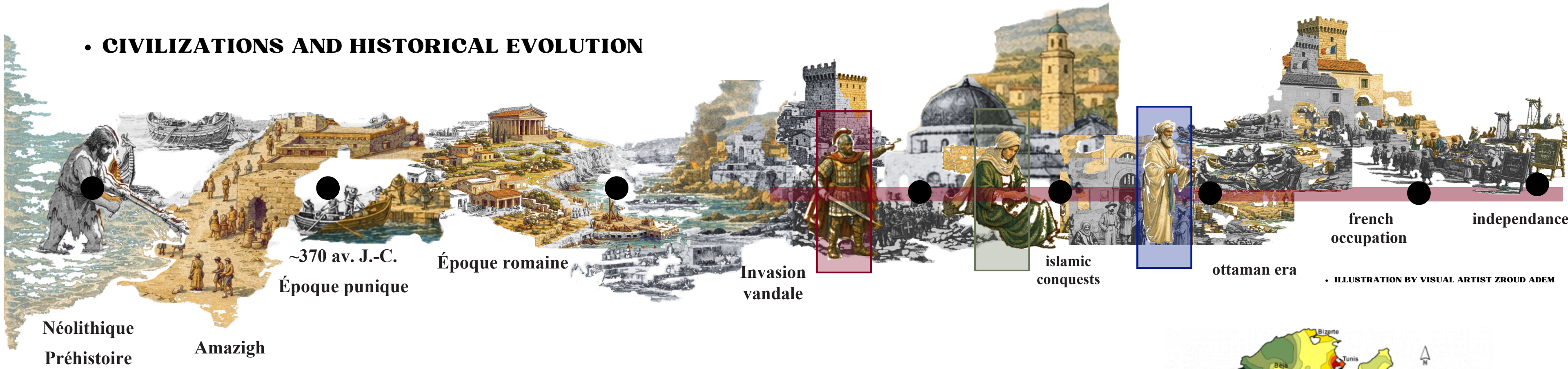


- Water is traditionally supplied by springs, rivers, and snowmelt.
- Increasing reliance on groundwater due to climate change and drought.

TUNISIA

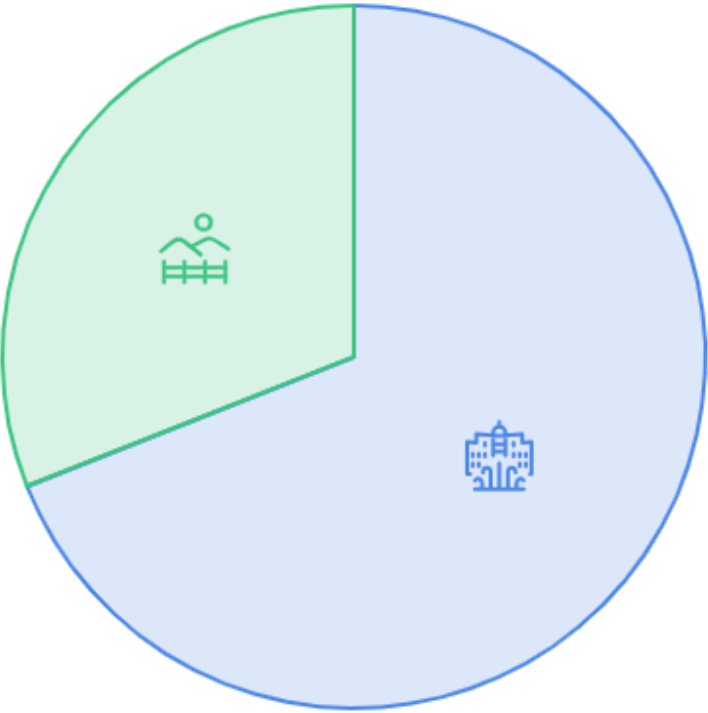
AREA/ SIZE: 163,610 KM²
POPULATION: 12 MILLION

• CIVILIZATIONS AND HISTORICAL EVOLUTION

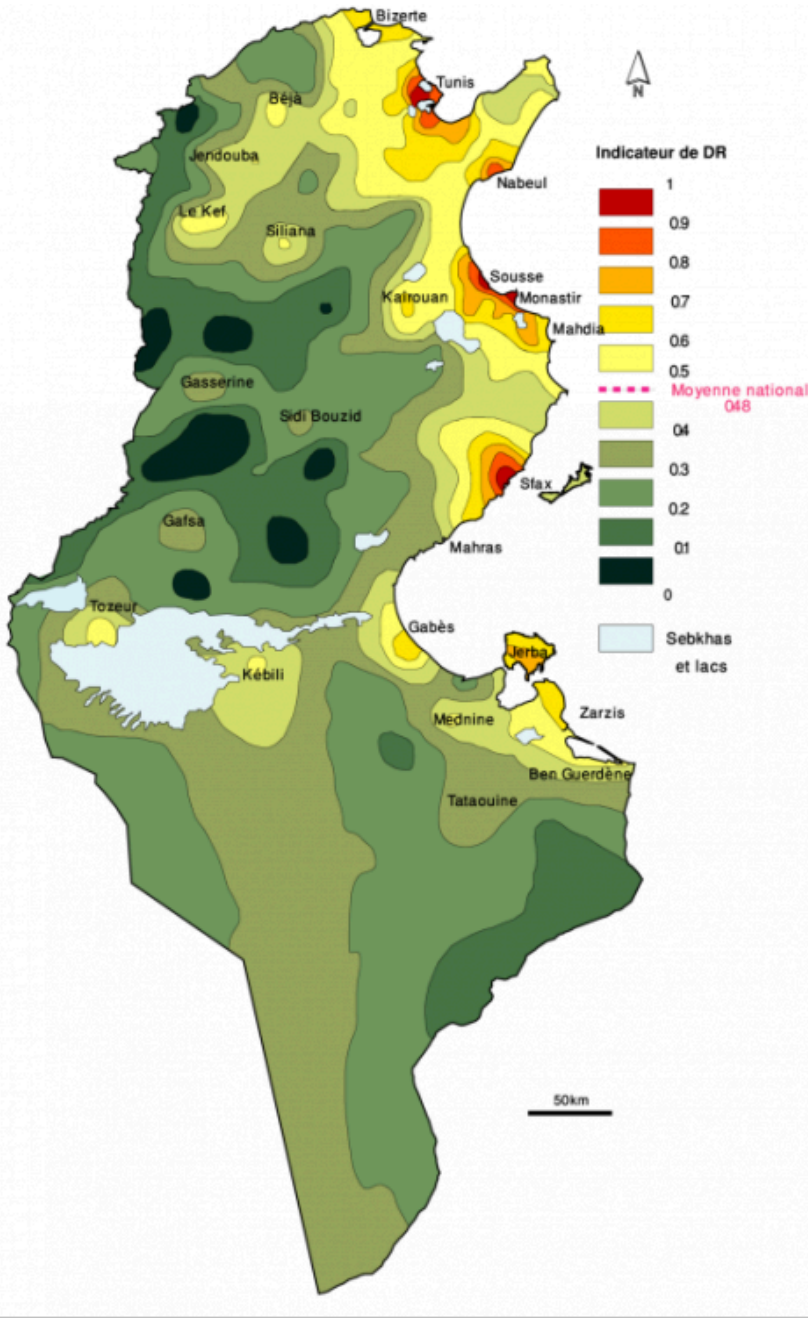
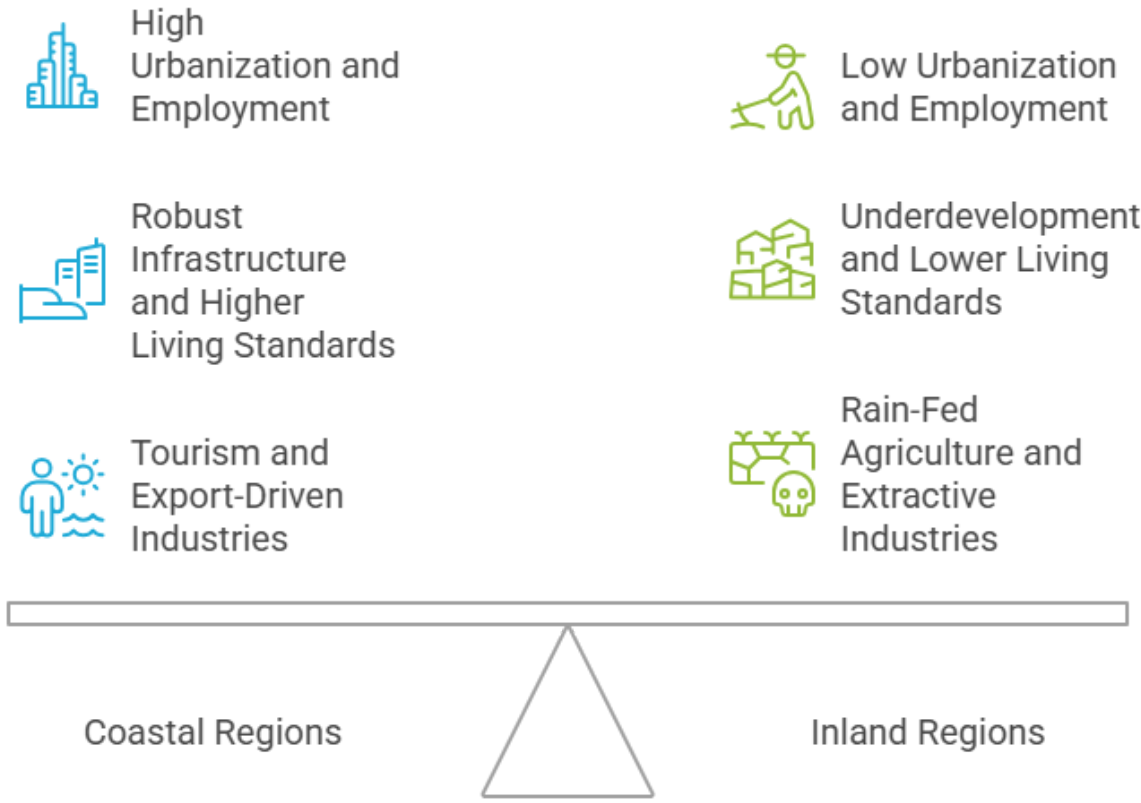


• ILLUSTRATION BY VISUAL ARTIST ZROUD ADEM

• CURRENT SOCIAL STRUCTURE



- 69% Urban
Majority of the population lives in cities
- 31% Rural
Significant portion of the population resides in rural areas



case study from dahar region Tunisia



The Dahar region (often referred to as Jebel Dahar) is a remote, mountainous region in southeastern Tunisia, nestled between the Mediterranean coast and the Sahara Desert. Spanning over 6,000 square kilometers,

The landscape

- Rocky mountains and cliffs.
- Deep valleys (oueds).
- Terraced slopes.
- Arid plains and piedmont areas.
- Troglodyte settlements integrated into the topography.

Climate and Environmental Conditions

The region experiences a semi-arid to arid climate, characterized by:

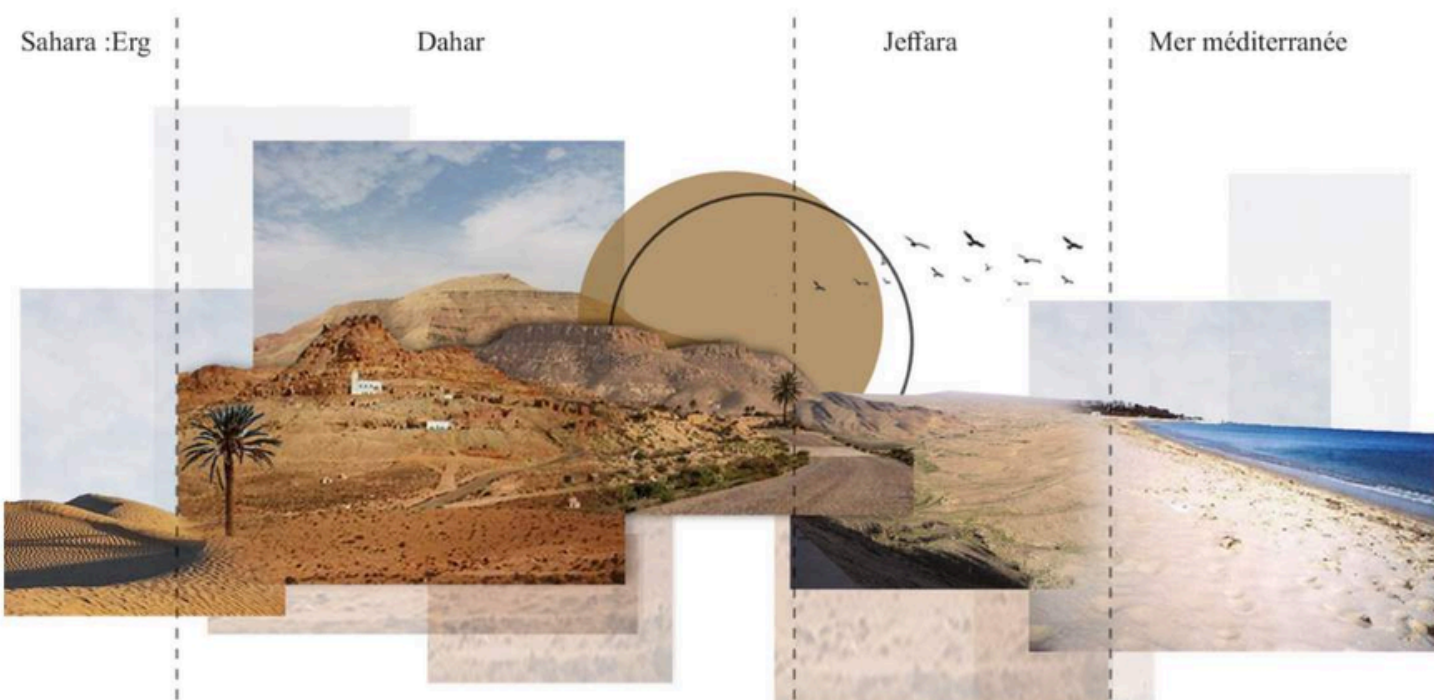
- Low and irregular rainfall (approximately 100–250 mm/year).
- High summer temperatures.
- Frequent drought periods.
- Significant evapotranspiration rates.
- Intense but episodic rainfall events causing flash floods.

Historical Background

The Dahar region has been inhabited since antiquity and has witnessed successive cultural influences, including:

- Indigenous Amazigh (Berber) communities.
- Punic and Roman presence.
- Arab-Islamic expansion.

Due to its mountainous terrain, Dahar became a refuge for Amazigh populations and developed relatively autonomous social and architectural systems.



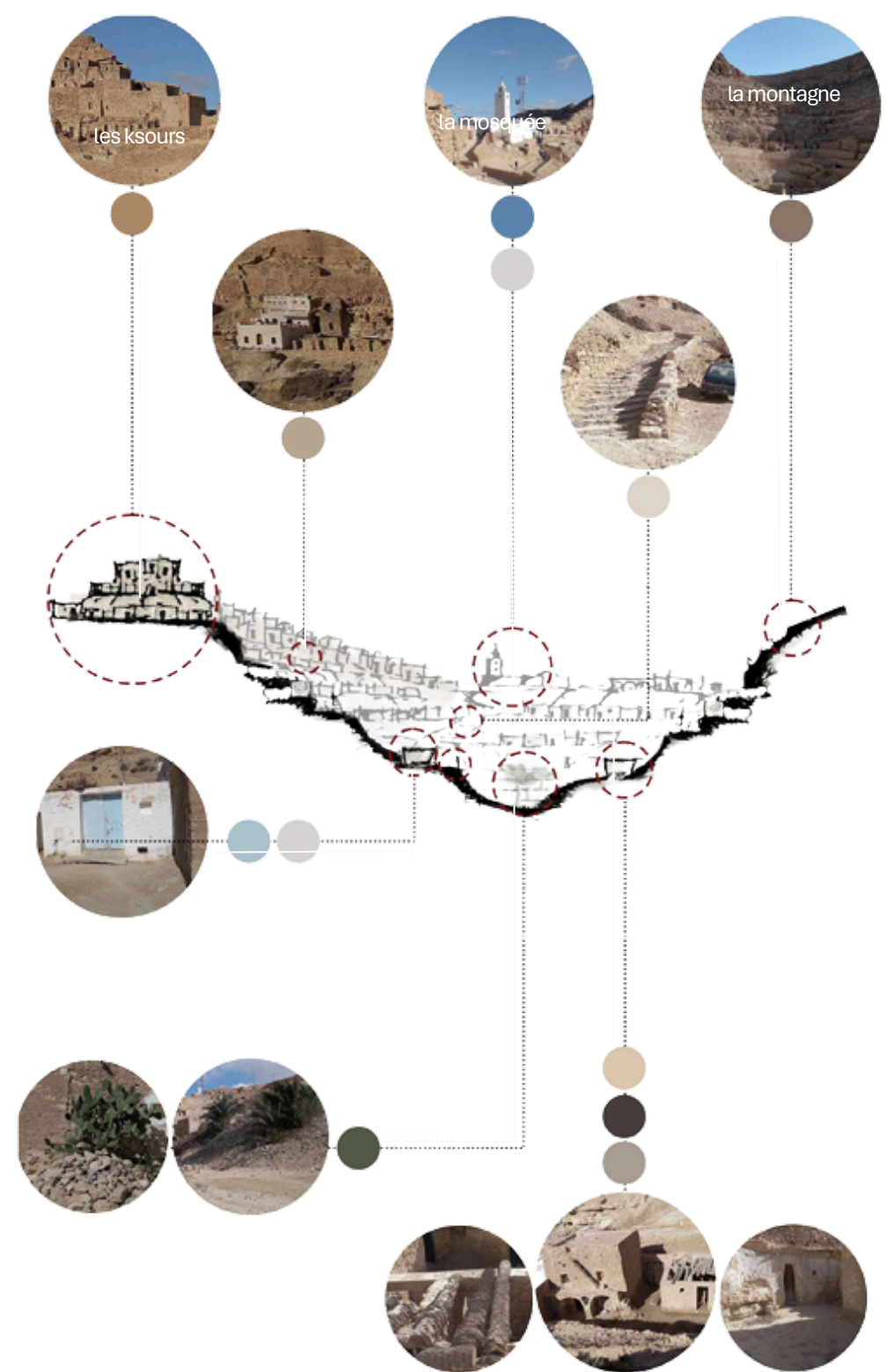
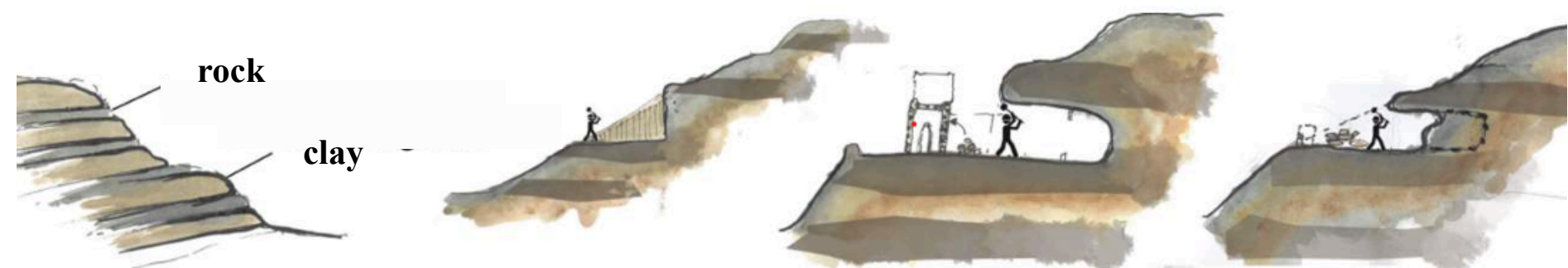
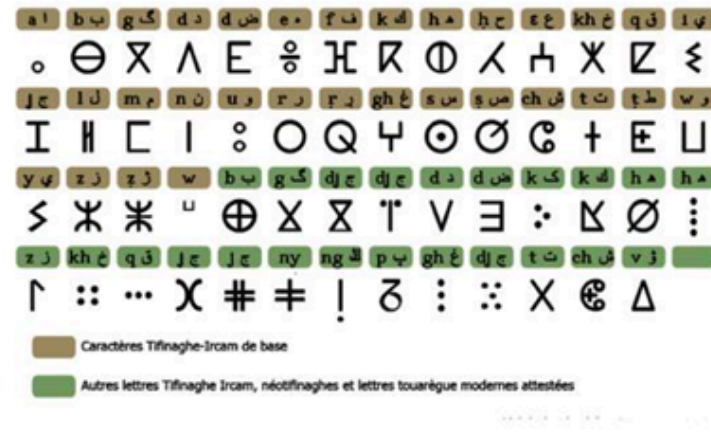
Language

The Amazigh language is natively called Tamazight (or Tamaziɣt). It is a branch of the Afro-Asiatic language family and comprises a group of related dialects spoken by the indigenous Amazigh (or Berber) people of North Africa

Craftsmanship

Among the amazigh, craftsmanship has always been a means of expression. It mainly includes weaving, **basketry, jewelry making, and pottery**. amazigh handicrafts are often characterized by **colorful geometric** motifs and designs inspired by nature. The techniques used to create these products are frequently transmitted from one generation to another.

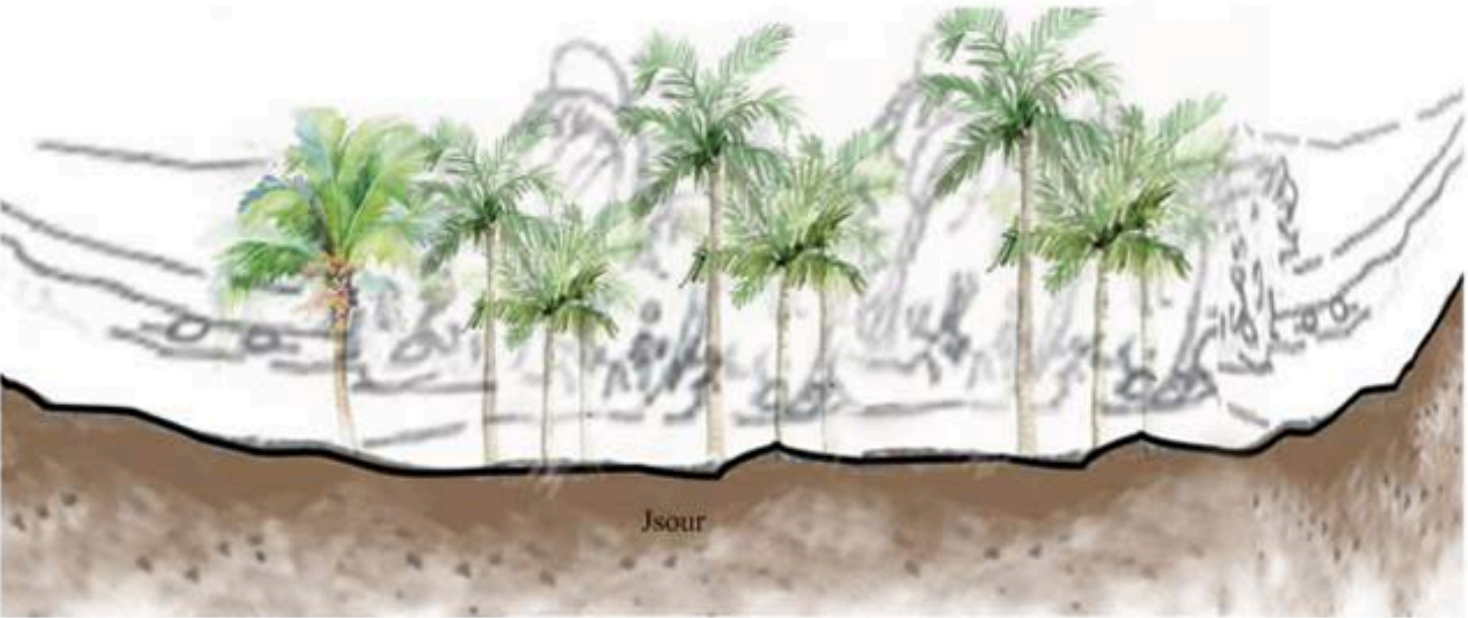
- **Politics**
- Tribal organization
- Customary law (**orf**): local rules governed conflict resolution, inheritance, agricultural practices, and resource sharing.
- Decisions concerning the construction and maintenance of jessour and cisterns were often taken collectively.
- Role of councils of elders (**jamaa**) in decision-making and social regulation.



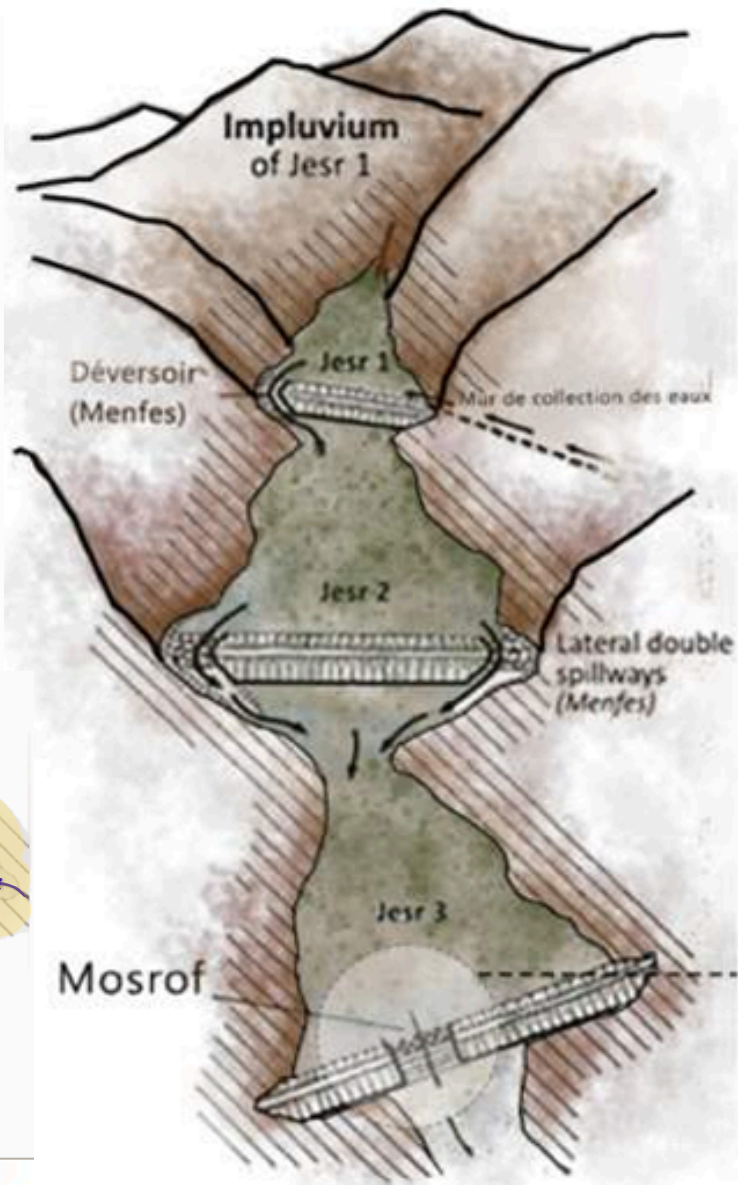
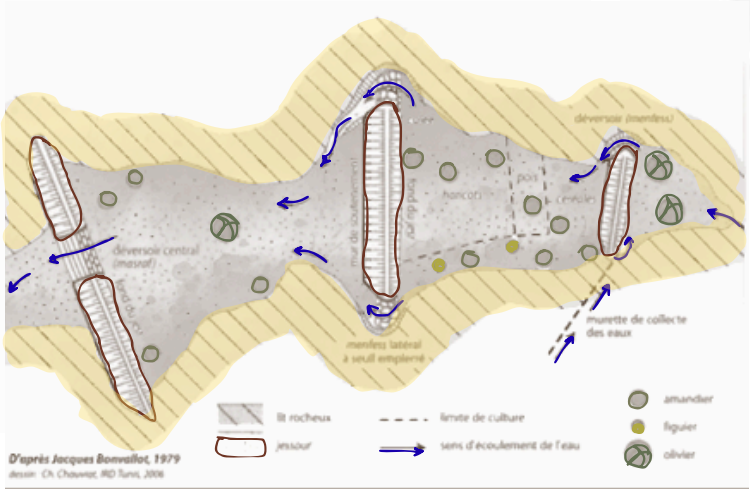
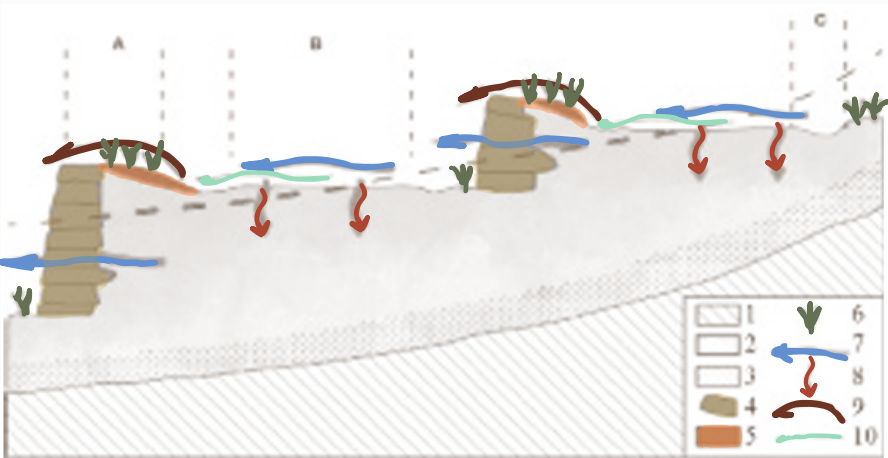
architecture, agriculture and human settlement

Traditional Rainwater Harvesting

The Berbers developed agricultural and pastoral practices adapted to mountainous conditions, using terracing techniques to cultivate cereals, vegetables, and fruit crops on stepped slopes. They also raised goats, sheep, and cattle for meat and dairy production, while utilizing the region’s natural resources to construct their houses and produce tools.



The Jessour (singular: Jesser) constitute a traditional water conservation system widely practiced in the mountainous region of Dahar. These structures are built within ephemeral watercourses to intercept runoff and trap sediments at the foot of slopes, thereby enabling the cultivation of olive trees, fig trees, and other crops. Each Jesser retains a portion of water and sediments while allowing excess water to pass through the reservoir, benefiting downstream Jessour located further along the valley.

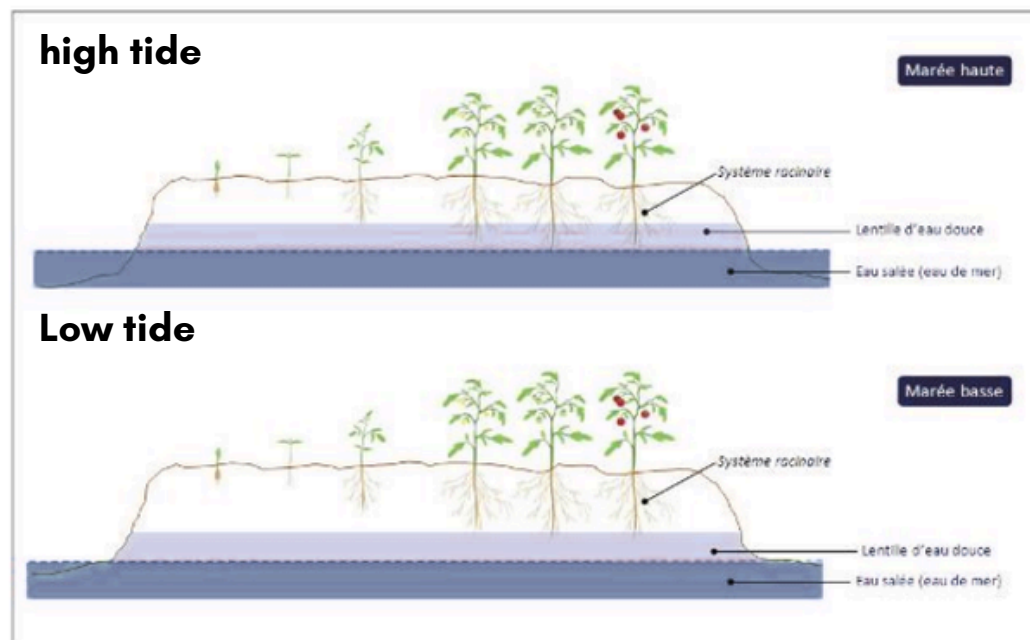


• THE RAMLI SYSTEM (GHAR EL MELH)



- The Ramli system (Ghar El Melh) is an ancient agricultural technique developed in a water-scarce coastal environment, showing adaptation to hydrological constraints.
- It is based on a passive water management system: crops are irrigated naturally without mechanical systems or artificial pumping.
- The key mechanism relies on the interaction between rainwater and saline lagoon water, where a thin layer of fresh water is naturally retained above saltwater and feeds plant roots.
- Farmers actively shape the land by adding sand and organic matter, controlling soil height to maintain the right balance between freshwater access and saltwater intrusion.
- The system reflects a precise ecological equilibrium between water, soil, and vegetation, rather than a controlled engineered network.
- Vegetation belts (trees and shrubs) act as protective infrastructure: they reduce wind, limit evaporation, stabilize sand, and protect the water-soil balance.
- Overall, it represents a traditional Islamic/mediterranean landscape logic of water paths, where water is not forced but guided, stored, and slowed through natural cycles.





The core idea of the ramli :

Position the roots to meet a natural freshwater lens that rises and falls on its own, with zero active irrigation.

The mechanism : three layers

- At the bottom : seawater, salty, unusable.
- Above it : a thin film of rainwater floating on the seawater, lighter so it stays on top. It rises and falls a few centimetres twice a day with the tidal rhythm.
- At the surface : a carefully calibrated layer of sand and manure, roughly 30 cm thick, so that the roots sit exactly at the level of that freshwater lens.

The core know-how :

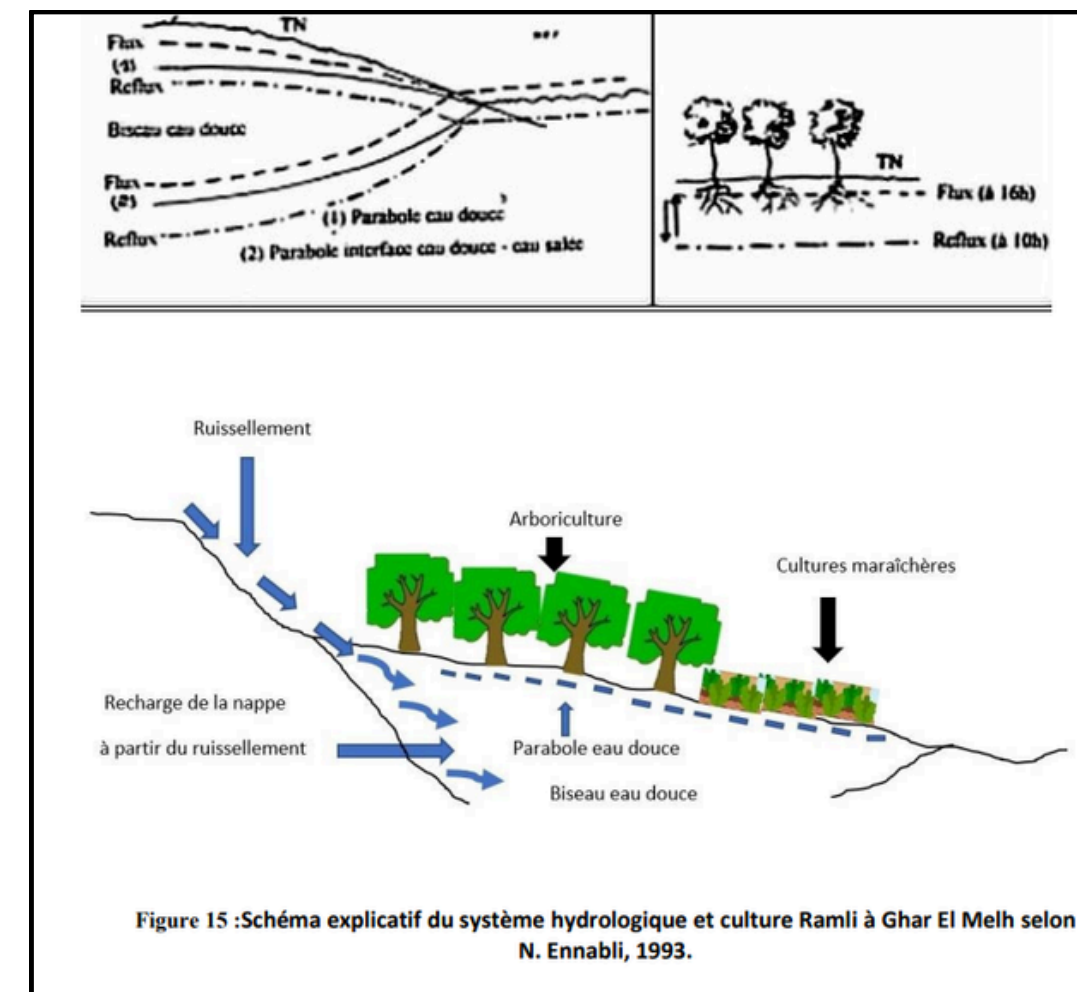
No canal. No pump. No watering.

Just reading what you cannot see.

Too low → roots hit saltwater → plant dies.

Too high → lens never reaches roots → plant dries out.

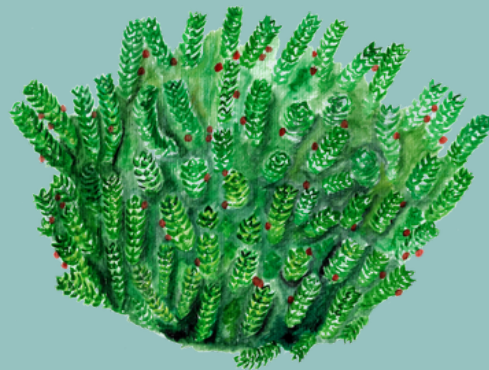
Just right → the plant drinks by itself, twice a day, carried up by the tide and two full crop cycles a year, without a single drop of water added by hand.



The Ramli cultivation system on the Edhrii cordon relies on rows of fruit trees and shrubs planted as protective hedges. These serve to shield the cultivated plots from wind and sea spray, reduce evaporation, and stabilize the sand.

The cultivated soils are covered by a 40-50 cm layer of sand, beneath which moisture is naturally retained. This stored water allows for a first growing cycle, and often a second one before seasonal rains replenish the groundwater.

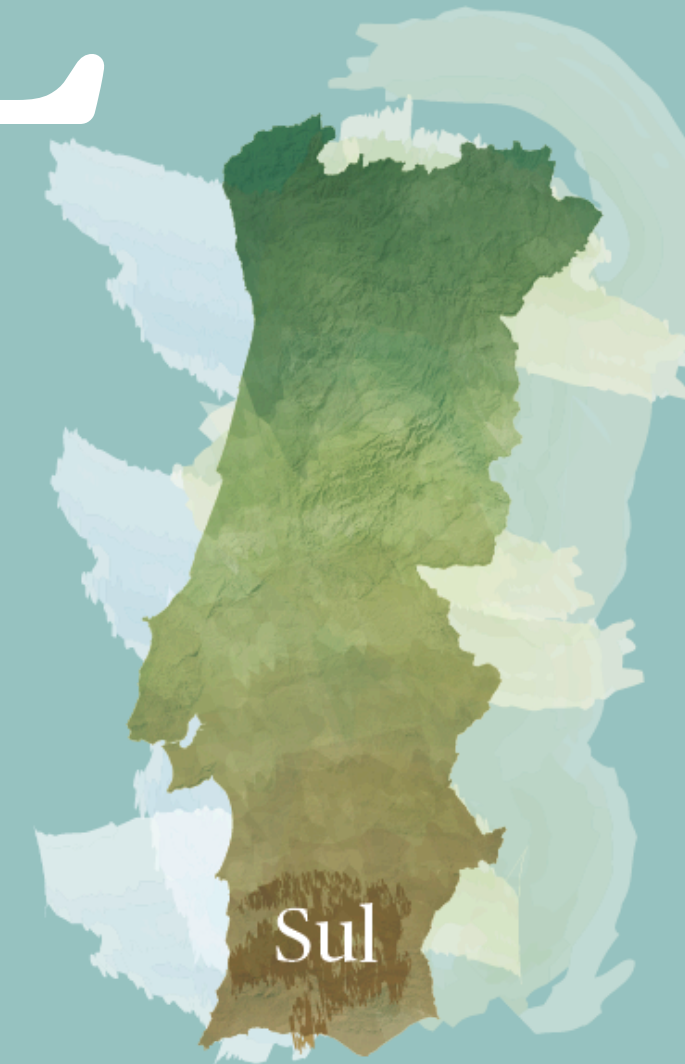
Main crops include potatoes, tomatoes, maize, onions, and peppers, grown in organically enriched sandy soils that require continuous and careful traditional maintenance.



PORTUGAL

WATER, MEMORY AND IMMATERIAL HERITAGE

AREA/ SIZE: 92,300 KM²
POPULATION: 10.5 MILLION



Land cover in 2023

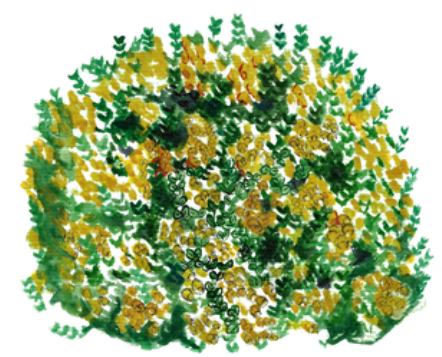
PORTUGAL

- Water
- Trees
- Crops
- Built area
- Bare ground
- Rangeland



WATER, MEMORY AND IMMATERIAL HERITAGE

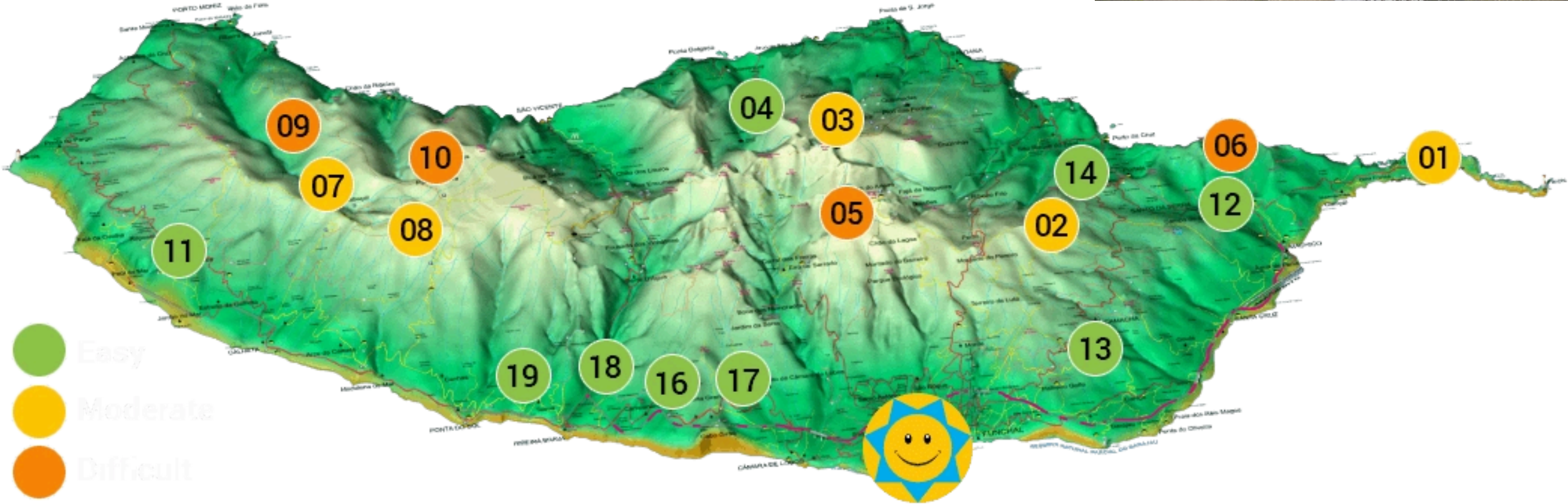
- 1.LEVADAS, MADEIRA ISLAND
- 2.BARROSO HIGHLANDS,
- 3.COMMON LANDS



©2024 Milos Popovic (<https://milospopovic.net>)
Data: Sentinel-2 10m Land Use/Land Cover – Esri,
Impact Observatory, and Microsoft

1. LEVADAS DA MADEIRA

Location – Madeira Island, Portugal.



2. BARROSO AGRO-SILVO-PASTORAL SYSTEM

Location – Montalegre, Portugal.

Where the Road Ends, Resilience Begins

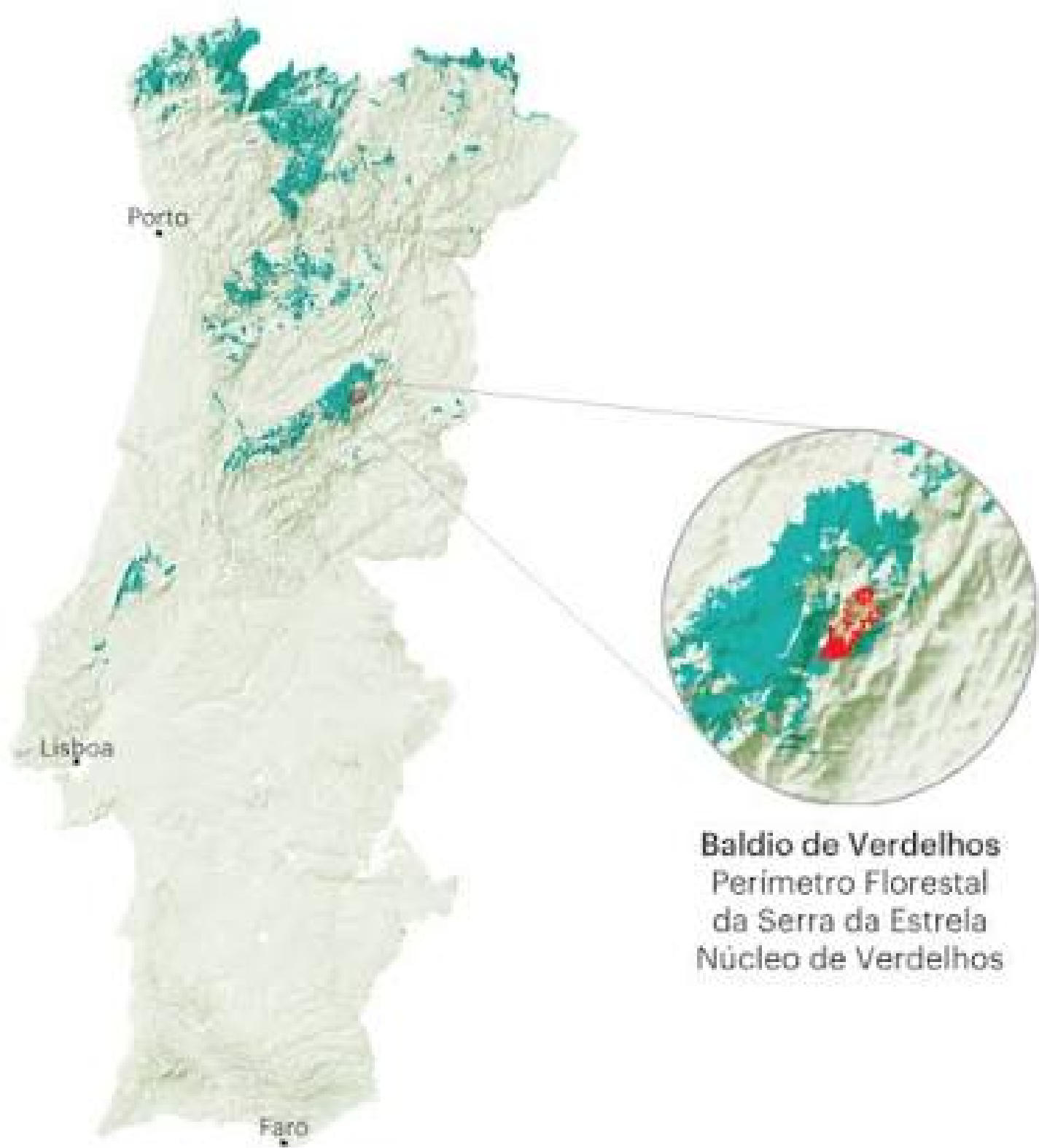




3. BALDIOS COMUNITÁRIOS

Location – Montalegre, Portugal.

Baldios submetidos ao Regime Florestal



Baldio de Verdelhos
Perimetro Florestal
da Serra da Estrela
Núcleo de Verdelhos







EGYPT

Politics and Governance

- Historically, land ownership in Egypt during the Islamic period was closely linked to possession, which goes back to the islamic concept: “Whoever revives barren land becomes its owner”.
- After the ottoman empire came, the land ownership was immediately lead by government, which distributed the lands among military leaders, nobles and aristocratic families, while farmers cultivated the land in exchange for economic compensation. Making land ownership strongly associated with social status



Human And Nature

Pigeons keeping in delta was used for several purposes such as:

- Communication.
- Decoratively.
- Ornamental value.



Art, Music, and language:

As a result of several Andalusians moving to the area of Delta, an area in example is the district of Al-Shatby (الشاطبي), whose name is associated with the Andalusian city of Xàtiva (Játiva), historically known in Arabic as Shāṭiba (شاطبة).



Politics

- The two countries also share important environmental similarities. Both Egypt's Nile Delta and southern Spain experience a Mediterranean climate, enabling the cultivation of many of the same crops. Throughout much of the 20th century, agriculture remained a major pillar of both economies. However, Spain diversified its economy earlier through industrial development and tourism, whereas Egypt remained more heavily dependent on agriculture for a longer period.