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Habitat Geography

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Foreword

The study of habitat geography is essential for understanding the deep connections between human settlements and their natural, cultural, and socio-economic environments. In architecture, this understanding provides the foundation for creating spaces that are not only functional, but also contextually and culturally responsive. This course, designed for second-year architecture students, explores the complex dynamics between geography, population, environment, and the built form.

Through eight comprehensive courses, students will investigate a wide range of topics, from environmental settings and landscape perception to the interrelationship between habitat and human activities, as well as the evolution of urban forms and traditional housing. Special attention is given to the methods of site analysis in urban planning, population dynamics, and the processes shaping built environments. The final chapters focus on Algeria's traditional housing, offering a valuable perspective on the adaptation of architectural forms to geographical and cultural contexts.

This polycopied material is not only intended to deliver theoretical knowledge but also to develop students' critical thinking and spatial analysis skills. By integrating geographical perspectives into architectural practice, future architects will be better prepared to design sustainable, inclusive, and resilient habitats in a rapidly changing world.

We hope this course will serve as a meaningful guide and reference throughout your academic and professional journey in architecture and urban planning.

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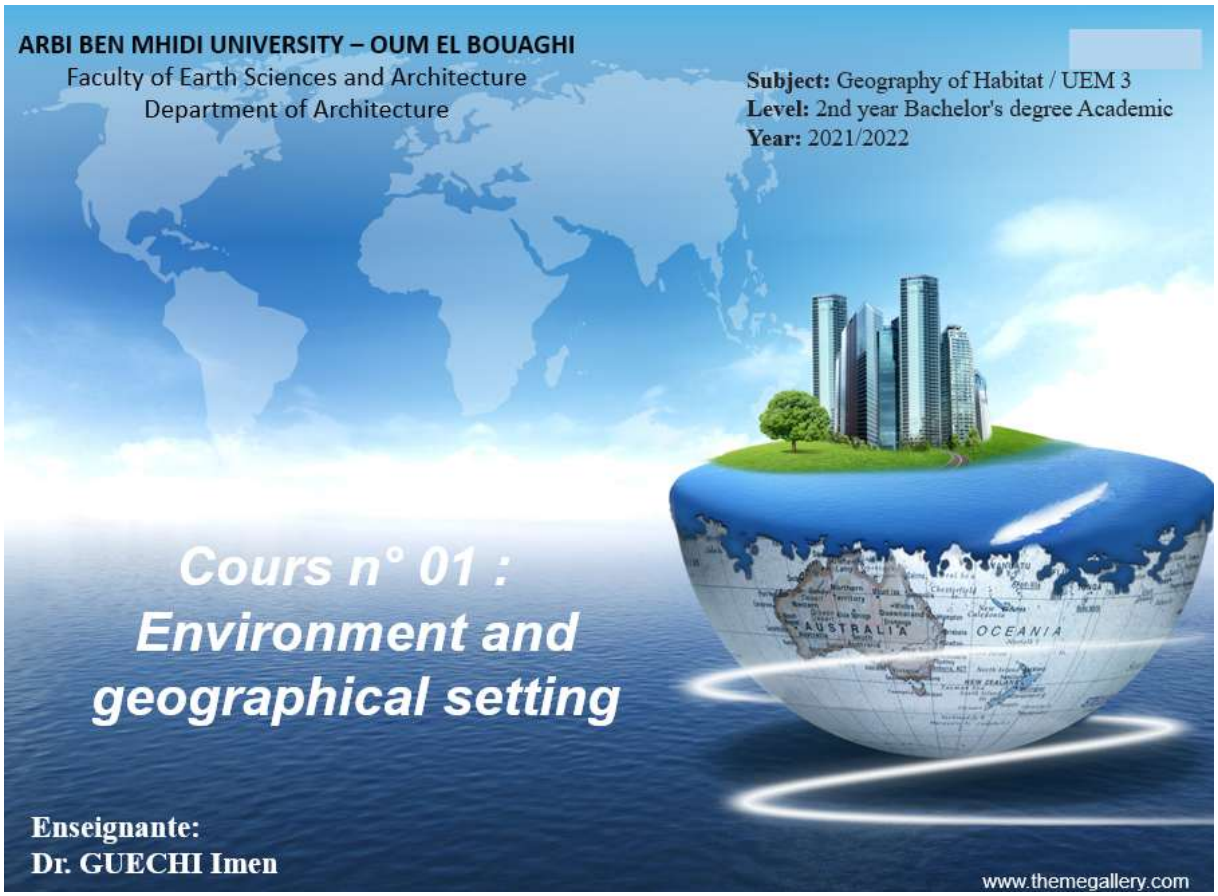

Introduction

Why do some people thrive at high altitudes while others prefer shaded areas, and why do some regions rely on vegetarian diets over meat consumption? These questions highlight geography's role in shaping cultures and societies. Different groups formed in various geographical contexts interpret the world uniquely; for instance, Eskimos have around one hundred words for "snow," while cultures that lack exposure to it lack the vocabulary to describe it. Geography serves as a social science explaining interactions based on location and the consequent influences on societies. Since ancient times, geographical examinations have significantly impacted lives and developments. The concept of Geographical Environment studies human and environmental relationships, addressing themes like location, human-environment interaction, place and region, and migration. Understanding these themes clarifies why communities inhabit certain areas and what defines those locations. The geographical environment comprises soil, mountains, rivers, and plains, which humans utilize and influence. Human activities modify the land, as seen in practices like building with stone terraces that support crops, reflecting spatial management of the environment. For example, farming practices and architectures closely relate to environmental conditions, as flat-valley inhabitants cannot farm in mountains. Ultimately, those from lower altitudes find it easier to settle near the ocean if they clear the land. (Waltman, 2008)

1. Definition of the Geographical Environment

This definition of the geographical environment and the related discussion of its components and characteristics, including the way in which various factors such as climate, terrain, and resources interact within this environment, is a preliminary and necessary introduction to the environmental factors that are visualized and are responsible for the interactions with different types of groups displayed in images introducing five themes of geography (Waltman, 2008).

The same areas may display different interactions, depending on the context; and human-environment interactions are site-based queries addressed. It must be stressed right in the introduction how the geographical environment is defined, since this term tightly relates to visualizing tasks. The geographical environment is defined here as "a particular geographical

and regional configuration of the natural and human-made features and characteristics of an area that come together to form a distinctive or unique aspect or setting".

This is interpreted to encompass such features as the climate, terrain, and resources associated with a location, as well as human-made features and characteristics such as building style, infrastructure configuration, land use planning, and land management practices. It is implicitly recognized that the geographical environment is constantly changing and evolving due to a variety of directions, including physical and chemical weathering, landscape evolution and anthropogenic activities (Nakić et al., 2017). Together with location, these are the operative key concepts required to understand the illustrated Human-Environment Interaction theme.

Indeed, a clear definition of the geographical environment is a prerequisite to addressing the attention of groups to be analyzed. Such definition necessarily involves many different elements that may be structured on different spatial and hierarchical scales. Depending on the academic discipline where this task is tackled, different conceptual angles may be employed to describe what is perceived to be the geographical environment. However, only a concise but comprehensive definition is provided here, since the goal is to introduce the environmental part of the task. Another aspect of the definition of the geographical environment that is emphasized which may be overlooked is how it may be interpreted differently across various disciplines, including geography itself.

2. Environmental Factors

1. Geographers examine environmental components and their interactions with human life, with factor analysis guiding research focus. Three key categories of environmental factors are significant: (a) Climatic factors shape natural vegetation and animal life, influencing disease prevalence and agriculture viability. (b) Geological factors critically impact human environments. People tend to settle in favorable locations, avoiding areas with poor soil, unproductive climates, or contaminated water sources. (c) Biological factors heavily influence human interactions with geography, as significant changes mainly occur within the biological environment. Human modifications to climate or soil are limited to agricultural advancements. Understanding human life on Earth requires analyzing the relationships among climate, geology, biology, and land use. The interaction of these four elements reveals environmental

dynamics, forming local geography while illuminating broader man-environment relationships on both local and global scales. Prior to analyzing these relationships, one must acknowledge the geographical environment's importance and the interplay among the environmental factors. Global environmental studies often simplify the complexity of local realities into general systems. However, numerous daily environmental factors affect people's lives and work, emphasizing the local geography's role. Stable water supplies allow farmers to plan effectively for planting and harvesting. Changes in one environmental factor can lead to widespread implications across others. (Waltman, 2008)

2.1. Climatic Factors

The importance of climatic factors in shaping both the environment and human behavior is difficult to overstate. Climatic elements such as temperature, precipitation, and seasonal patterns significantly affect vegetation, agricultural productivity, urban development, economy, energy use, and daily behavior. Temperature is a principal factor not only in determining regional associations, but also in governing glacier, permafrost, vegetation types, snow cover, and the location and size of cities. Precipitation is a determinant of aridity, wetness, vegetation patterns, agricultural viability, and the viability of urban centers. The number of rainy days and changes in the variability of the monthly rainfall can have different impacts on the developing challenges related to agriculture, urban growth, livelihood variation, and water availability. Seasonal rainfall distribution plays an additional role for crop yield and water quality, particularly in areas of water scarcity (A. Meehl et al., 2000). Also, natural hazards such as drought, extended days with very low rainfall or even with rainfall intensity too high, and thus soil erosion and flooding, are related to climate variability and are vital for the support of the dependence ecosystems and livelihoods have on the stable climate system. It is because of these variabilities and challenges that one of the first chapters in ancient writings is the story of Joseph and the interpretation of Pharaoh’s dream on the fat years that should be saved for the lean years. All of these inter-associations mean that an understanding of climate is vital for strategically sound land, water, and resource management planning (Corporation for Atmospheric Research (UCAR) The GLOBE Program, 2003). This reality keeps its importance on the agenda with the increasing awareness on global climate change. The effects of a changing climate certainly depend on the specific settings and natural conditions of the different

regions. Adding to the complex set of understandings is the recognition that the same amount of climate change can result in different impacts on different systems. A one-degree rise in global average temperature can, for example, result in a greater increase of heat extremes than the same one-degree rise has historically experienced. There is a need for an understanding of how specific temperature or precipitation changes may affect various ecosystems, and the exchange of the particular adaptation needs from region to region. The system perspectives it may encourage on human-nature interactions are timely, considering that globally a UN mode must be 'coordinated, comprehensive and sustained'.

2.2. Geological Factors

The geological formation of land on the Earth has a significant role in determining the characteristics of geographical environments. The type of soil on the Earth, its formation process and geochemical components comprise the crucial facts about land. There are continuous changes in landscapes as a result of erosion, tectonics, volcanic eruptions and the effects of these activities. Each of these natural processes can have different implications in terms of land use, agriculture, structures to be built and useful mineral resources. The landscape on which the settlement will be established includes the measure and the form of the inclination, the types of land and the use of these lands and the physical conditions for use. The topography, which can be regarded as the relief of the land, basically has its own characteristics in terms of settlement and land use (Nakić et al., 2017). The chronic land-use choices, which deny the characteristics of the topography, may cause inconveniences in terms of use and security, as well as destruction due to natural results. Climate events and climatic phenomena affecting the landscape will vary between settlement regions according to the topographic features of the area, and acute processes related to climate change may be observed. Geology with climate is almost a geographical phenomenon. The geology of a region has provided the basis for the establishment of the landscape, the generation of resources and the plant life in the region, and affects the living conditions of human beings in the region for a long time. On the other hand, these features have effects on climate discrepancies in the world (Pretorius & Hattingh, 2009). While certain geological features are naturally sheltered from these effects, there are those who exhibit this like a living in geological terms. Although the environment is soon determined as a simple nature in the interactions of the geographical environment, it is composed of very

complex and interdependent events. Understanding the interaction principle of nature with the environment properly and correctly will provide a multi-faceted usability to environmental assets for the benefit of the entire potential. Environmental resources must be properly used and must be maintained, protected and protected for the next generations. With a multidisciplinary approach, rural, urban and coastal fields uniting under the umbrella of geography and again in this framework, the transformation of the physical area of life and the quality of life of the individual, of the institution, of organizations, of the community and the society as a whole. With its visions, it can be ensured to reach the environmental assets in peaceful coexistence between the land and the human species and in addition, it creates the necessary awareness and consciousness in the sustainable utilization of environmental resources. In this respect, the geography of the environment is concerned with the understanding of the big picture that is at the macro, multi-scale, but macro-economic, natural, physical and human aspects of the large scale, and by providing solutions to the spatial problems between them. As such, the characteristics of the geographical environment can be listed as soil, water, climate, plants, valuable substances and disasters.

2.3. Biological Factors

Mountain environments are characterized by diverse flora, creating complex and multi-layered vegetation profiles. The variations in land altitudes and aspect angles form a complex and dynamic landscape. Cold mountain environments attract animals with their hiding and hunting opportunities and cooler air temperatures. Plant biomass is the major energy source in food chains and ecosystems, and altitude decreases temperature, leading to a reduction in vegetation height and biomass. Low-growing and cold-tolerant vegetation displays steep landscape solar gradients. On the other hand, southern landscape sun exposure is more homogenized and steep relief is less dominant. On the steep faces of high eastern peaks, cool and moist environments are observed with smooth transitions in vegetation types. Mountain environments provide suitable habitats similar to cliffs and gorges. (Wani et al.2023)

Various sapling forests in the wet center of the Bosphorus are found. The strait creates a north shelter effect and air temperature decreases from the warm and dry climatic conditions of the Mediterranean macroclimate. The sharp closure of the small valley to the north prevents the

penetration of dry summer air species. Such topographic conditions show the holding functions of geographical environments to biological diversity. The possible approach to improve the ecosystem environment is to deepen the structural planning, as most applications from now on will rely on this and need to consider landscape elements. Commonwealth, unity, and wholeness concepts in the definition of sustainability encompass harmonious, sustainable and healthy human-environment interactions related to biological, ecological, environmental, geographical, landscape and sociocultural phenomena. The term ecosystem health is an indicator of ecosystem balance, balance and potential to overcome biotic and abiotic pressures. Essential biodiversity is the basis of landscape health and is related to biological diversity. Ecosystem services emphasize the benefit of ecosystems for natural and human uses and include the process, goods and other benefits obtained from ecosystems. Service benefits, such as clean water, food, clean air, shelter and fuel, can be immediate, short or long term. The vital current for environmental sustainability is to protect the ecosystem services of a system of pervasive common land and cultural use in a tight place. Individual and local ecological services emerge from this place-based relationship where traditional practices seek to preserve species and their habitats. Thus, it supports a variety of species and habitats from the pressure of changing or destroying traditions, practices or customs anywhere in which they have arisen. Nevertheless, the area-based approach of the post-2010 biodiversity contract intentions notes that an ecosystem may include a patchwork of bigs and small patches. Besides spatial-based conservation efforts, the approaches shall be vertical, traditional practices reverse the negative trend and lead to a significant positive change in species, habitat structure and near-natural ecosystems. (Osland et al.2021)

3. Interactions between the Environment and Humans

Human populations have long interacted with their ecological environments in multifaceted ways, giving rise to diverse perceptions regarding the nature and intensity of these interactions. Positive human-environment interactions are typified by sustainable land use systems, harmonious interactions with non-human biota, and dynamic conservation practices. Negative human-ecological impacts are often observed in cases of deforestation, overpopulation, urbanization, and the rapid exploitation of valuable resources. The reciprocal nature of these interactions, however, underpins the widely-held view that the environment can greatly

influence human decision-making, behavior, and cause of migration, with significant effects on local or regional resource utilization. Rapid population growth, institutional failure, financial instability, and contrasting geographic conditions often drive social changes that lead to profound environmental impacts.

Socio-economic factors can lead to ecologically irrational decisions and unsustainable bio-physical developments, triggering undesired outcomes on the local or regional ecological and demographic systems. These considerations highlight the importance of developing a solid framework for assessing human-environment interactions, resource oscillations, environmental degradation, and anthropogenic processes that can pave the way for the implementation of sustainable demographic and economic practices (McNicoll, 2000). Those involved in the demographical or landscape systems are simultaneously motivated to highlight conditions that favor the sustainability of underlying ecological and demographic systems. This is a daunting and multi-layered task that prompts the physical, biological, economic, political, and cultural analysis of complex causal mechanisms underlying human-ecological interactions. A common poise often considers demographic factors the most important in the study of human-environment entanglements. Countries with dwindling demographic growth are praised as being less vulnerable to ecosystem degradation. While there is some truth to this argument, its validity holds only under very specific conditions that might already exist in more developed countries (A. Rappaport, 1996). In low-aggregated and high density urban areas the rapid exploitative consumption of bio-physical assets can have a profound effect on local and regional ecological systems. On the other hand, natural or reservoir-based economies can lead to boomerang population fluctuations and large-scale limitations on resource availability. Thus, attributing a unique importance to any single component of the rich web of human-ecological connections can result in over-simplifications and the bearing of misleading conclusions. It is advantageous to maintain a balanced view on human-environment interactions and thoroughly evaluate the effects of demographic fluctuations and resource utilization in varying socio-economic and geographic settings. This comparative and comprehensive attitude can greatly benefit future research and set coherent guidelines for the sustainable restructuring of local environments and economies.

3.1. Impact of Human Activities

Being a holistic approach to understanding the geographical environment and interaction between human activities and natural resources, it is important to discuss the impacts of human activities on the integrity and functioning of the systems involved. Recently, research interest has been focusing on ecosystem analysis to develop appropriate policies and management strategies and to ensure an equitable and sustainable exploitation of the goods and services they provide. Understanding how natural ecosystems interact with anthropogenic systems is essential to make this analysis and finally to define sustainable exploitation policies (Zurlini et al., 2008). An ecosystem can be defined as a group of plants, animals and microorganisms interrelated with the environment in which they live and cycle of materials and energy. Thus, this section will focus on activities, management or influences from anthropogenic systems that may affect community dynamics, ecosystem structure, and ecosystem function. This key point is sometimes difficult to determine, but ecosystems must be evaluated through the functioning and structure of ecosystems.

Human activities can have significant effects on the earth's systems. Since the beginning of industrialization, there have been substantial changes to ecosystems and the world's landscapes. Rapid urbanization, industrialization, and the rapid growth of the population have resulted in large-scale and quick changes providing profound effects on environmental degradation (Guleria et al., 2019). Deforestation, habitat destruction, agriculture, urbanization, and industrialization, as well as mining, are considered to be these significant activities. Given the rise of air, water, soil pollution and noise pollution, the environment has been monitored worldwide for decades. Furthermore, there is concern about the role of toxic substances in the creation of environmental problems as well as evidence of health hazards due to such substances. Broadly, the anthropogenic activities fill the most variables on the earth in most cases uncontrolled and unplanned. That might be risky in the future because of the depletion. Environmental problems are closely related to individual behavior. While their awareness and knowledge may be the earliest, the issues being the most effective are of public and private paths. Governments can provide sufficient programs and projects in order to generate the necessary balance.

3.2. Natural Resource Management

Natural science is the study of the physical environment. People, though often left out of definitions of the environment, are an integral part of natural science. Their actions have a powerful impact on physical processes─almost always stronger, these days, than the power of physical processes on people. The discipline of geography is fundamentally the study of the natural environment and human interaction with it. Geographers concern themselves with both sides of the equation: the geographical environment and human interaction with it. Natural science and social science are complementary sides of geography. The natural environment forms the physical landscape and is the setting for human activities, shaping the livelihoods and the ecological rôles performed by people. Human activities, in turn, reshape the environment, often with profound implications for land cover, land use and, increasingly, for climate and the water cycle. Geography, uniquely among the disciplines, provides the tools for understanding the critical interaction between people and the natural environment upon which they depend.

Man and woman's interdependence with the environment is more apparent in poor countries and among indigenous peoples, but it is universally true. The geographical, natural environment is made up of a suite of resources and constraints, often linked together in intricate ways: a climatic suite which may mean too much or too little water, inappropriate timing of rainfall, glaciers, cold and hot extremes or other hazardous weather; a biotic suite which may provide too many pests or diseases, too many predators, too little energy or may be infertile, a lithospheric or geological suite that does not provide workable minerals, that cannot hold water or a suite of human-induced problems, like salinisation. This list is not exhaustive. Additionally, the environment can change, often quickly and unpredictably, threatening to make previous knowledge invalid and turning the normal map of resources and constraints on its head. Violence is often a feature of this change, which can reinforce a sense of insecurity and enhance environmental degradation, producing a vicious cycle that is ethically unacceptable and unsustainable. At the most basic level, a geographical environment is a scalar phenomenon: its attributes, potential and permanence change with scale in a way that physical systems do not. Minor rainfall variability on a global scale translates into desert or rain forest at a local scale. Since people interact with the environment at the local level, the physical sciences have to be modified or supplemented to deal with geography. This is the job of biophysical scientists, a

discipline of little pedigree but of high importance. Any successful development strategy has to be based on books which are suitably attuned to geography.

4. Ecosystems and Biodiversity

Ecosystems are as variable as the physical environments they inhabit. They vary in size from vast tundra stretching across the far north of Eurasia to desert ephemeral pools in Australia, as well as the various marine ecosystems worldwide. Groups of ecosystems are referred to as biomes and these are usually separated by latitude (with some key exceptions). Biotically, too, ecosystems differ from the towering temperate forests of North America to the ephemerally flowering steppes of Mongolia. Every ecosystem is a delicately balanced web of inter-connectedness. Species within ecosystems are connected in complex ways: all species form a shifting web of predator-prey relations, parasite-host, and competitive relations. As a branch in the complex web dies out, the neighbouring organisms suffer and the whole ecosystem becomes destabilised (E. Gordon & F. Barron, 2013). This is something that is often lost when popular discourse on biodiversity loss concerns like charismatic mega fauna and mega flora only extends to them. However, these species are nevertheless of inestimable value to a particular ecosystem in the way they too are connected to the literally millions of other organisms in that ecosystem. Each is just as important for the survival of that ecosystem as any other organism, even if their role may not be immediately obvious (or even known). A component of the ongoing “Sixth Mass Extinction” event is the loss of key species from ecosystems that may serve as yet unknown or unexpected ecological niches. The threats that confront the world’s biodiversity now confront its ecosystems as well as their provision of goods and services. Of the aforementioned processes, habitat loss has been considered by far the greatest threat. It directly impacts on biodiversity levels while also negatively affecting their provision of ecosystem services. As forests disappear, the habitat and attendant services disappear with them. The SDGs recognise the centrality of biodiversity in the overall campaign for humanity’s survival. The importance and primacy of terrestrial ecosystem management and increasing their resilience for sustainable development and mitigation against CC makes its centrality in that regard crucial. Ecosystems provide many critical services for humanity. They protect against natural disasters, provide water and water purification technologies, and regulate the atmosphere amongst other things. Ecosystems are fundamentally essential for humanity’s

survival, and along with the recognition of geodiversity and subsequent investments in its protection should underpin many strategic imperatives in the ongoing campaign for sustainability.

4.1. Types of Ecosystems

Each type of Earth's diverse range of ecosystems has specific functions and characteristic biota. Despite these differences, each of these ecosystems is threatened by human activities and is currently undergoing a range of disturbances, as evidenced through the anthropogenic transformation of the landscapes, and increasingly by documenting the decline and extinction of species. Understanding the diverse global range of terrestrial and aquatic ecosystems and the characteristic ways in which these biomes are utilized by people is an essential pre-requisite for effective conservation and sustainable ecosystem management. The distinction between ecosystems based on their dominant life-forms is the most relevant for identifying characteristic ecological functions, although the added dimensions of geophysical and hydrological setting are also relevant in many cases. However, more detailed sub-classifications are necessary to bring out important ecological differences for management purposes (A. Keith et al., 2022). Ecosystems are complex, interactive systems of biota, physical environment and ecological processes that include characteristic functions, features, and outcomes. These have evolved within a specific geophysical and hydrological setting, and are strongly influenced by the large scale density of energy flow and its subsequent partitioning. Ecosystems fall along a continuum in these variables, but for the purposes of analysis these continuous gradients are best conceived as a series of adjacent, relatively discrete classificatory units. The way in which ecosystems are utilized by human societies may have a crucial influence on their subsequent diversity and sustainability. Even before the emergence of complex agricultural societies, people were shaping the landscapes around them in both negative and positive ways, often enhancing local biodiversity richness. In many cases, such practices continue today, with certain cultures shaping their environment in ways that preserve both biodiversity and ecological processes.

4.2. Threats to Biodiversity

The topic of ecosystem research is defined and interpreted broadly to consider the topic's spatial scale and the time scale of ecosystem properties and processes. A set of research areas is

identified and approached using a simple ecosystem model that integrates spatial and temporal scales. Understanding the relationship between the geographical environment and the human response requires a perspective that transcends the disciplines that study both. Due in part to the close connection between space and the environment, the research areas appearing in the geographical domain have long been place oriented. For instance, it is impossible to comprehend the human-environment relationship without considering the regional system and its differentiation. However, the topic's area of interest extends beyond processes at or near the Earth's surface. The human response interacts with the environment at many different spatial scales, over time scales ranging from a few seconds to millennia. Ecosystem properties and processes vary over similarly expansive spatial and temporal scales. The need to integrate across different ecological and environmental sciences researchers has long been recognized. However, a widely accepted conceptual framework for such integration is still lacking. (Van et al.2022)

5. Environmental Change

Within the complex web of geographical environments, various environmental changes are influencing the context in multiple ways. These changes are due to various factors – both natural and anthropogenic. There is a need to discuss these in some detail as a dynamic example of the analysis of context. Environmental change can be understood as a change of the environment – biophysical or physical, as a significant transformation of features. It should be stressed that many environments have never been stable - change has always been the name of their games (Nautiyal et al., 2016). However, present-day rates and extents may represent that complex, historically changing equilibrium is being lost, indicating fundamental shifts rather than fluctuation around a “normal” state. Such transitions can have far-reaching impacts on society as contexts for life, doing, thinking.

Climate change is often regarded as the most far-reaching environmental change, with far-reaching interconnected effects. It is a multi-faceted environmental transformation, with multifaceted effects on both ecosystems and human systems, interacting and feeding-back to each other in variously entwined dynamic ways. On the one hand, warming temperatures have increasingly water-related impacts, from flooding to droughts, from hurricanes to el Niño - La

Niña events, to the (possible) "fast ice-free" projection for 2020, significantly challenging mostly by now rather fixed systems of living, since the Holocene emergence of sedentarism (Washington University Facing the Future, 2013). On the other hand, it is the slower changes that may change the (biological, hydrological, meteorological) niche first slowly altered and then carved and reshaped by the "domestication" of plant and livestock spheres and (quasi-)permanently set by the building of the artificial nutrients' supply and other infrastructural and non-infrastructure elements of Western Agriculture Science's Mining and Manufacturing Expansion Model. Another major aspect of the alteration of the environmental equilibrium is pollution, a significant anthropogenic driver of environmental degradation.

5.1. Climate Change

Climate change is one of the most important challenges the world is currently facing, transcending borders. There are many aspects to understanding its broad and intricate nature. Iran is a particularly interesting case, considering its unique staggering geographical features, including high-altitude mountains, deserts, and proximity to the Caspian Sea. This is coupled with high post-industrialization carbon dioxide and greenhouse gas (GhGs) emissions entering the atmosphere, as well as geopolitical and sociopolitical factors. The country's actions in the face of climate change will also depend partly on its particular location, geographical conditions, emissions, and vulnerability (Nda et al., 2018).

Climate change is rising globally, posing both high environmental costs and safety risks. It is one of the foremost environmental issues of current times, requiring a thorough investigation about its ecological effects. Climate change causes natural disasters, which are predicted to increase further, such as droughts, famines, floods, and other ecological damages. This will disrupt various ecosystems and impair their regular functioning. It can lead to widespread farmland degradation, altering local biodiversity, and impacting other ecosystems. Climate change and anthropogenic activities endanger the stability of various ecosystems, even though society is highly dependent upon them. The vulnerability and potential risks posed to long-lasting ecosystems should be investigated and implemented as early as possible. Climate change-induced distress in Iran is potentially very high, culturally, environmentally, and politically (Nautiyal et al., 2016). Large empires have been eternally absorbed in conserving

these environments, usually dousing the Persian Gulf enmity. Modern changes are mainly due to industrialization, the surge in GhGs that cause global warming. In 2013, Iran was number eight in the world for carbon dioxide emissions, with a 1.9% rise in emissions compared to 2012. It therefore has a role to play in any potential superpower agreements on capping emissions.

5.2. Pollution and Its Effects

Pollution and its effects have turned out to be one of the paramount issues concerning the world today. There are four types of pollution: air, water, noise, and soil. Pollution has its causes either due to natural or man-made products. Also, pollution can harm the economy as well as the living habits of the people. Air pollution is caused by the emission of industrial gases from huge chimneys, vehicles, and chemical sprays; there are natural processes that emit harmful gases, too, such as sulfur dioxide in volcanic eruptions. Air pollution is harmful to various ecosystems. For example, sulfur dioxide high in the air can fall back down as acid rain, which interferes with the plants' ability to take up nutrients, succumb to diseases and other pollution, and this can alter the ecosystem to the demise of various plant species. All in all, such processes are detrimental to biodiversity. Water pollution is caused by the dumping of untreated sewage and industrial wastes into rivers and lakes. Collectively, sewage is created by domestic waste and the effluent from industries; even though it can be treated, the majority is not, so it first kills off fish and various other species in the aquatic environment, then everything else dependent on those species collapses. (Mihai et al.2021) The same goes for noise pollution in that it can disturb people's ways of living, though not so much of a problem compared to the other types. For soil, people till in the use of chemical sprays that contain pesticides and insecticides. This is damaging, not only for the land to bear anymore crops, but it is even more so for the people that ingest them. Needless to say, these various forms of pollution are detrimental to the environment and living habits of people either residing locally near the sources or at the receiving end. The correlation between the environment and health has always been indubitable. The plethora of advertisements ranging from laundry detergents to purchasing the latest diet books, certain models and DVDs, park and outdoor scenes presented are always clean, but, in reality, this is hardly the case in comparison to the urban scene with factories and vehicles surpassing their limitations. In the absence of conducive advertisements, literature,

too, dispenses the image. On the one hand, wildlife sanctuaries, parks, serene beaches adorned in brochures; on the other, real scenes depict the hustle and bustle of overcrowded urban centers, job losses, receding forest lines; all attributes of globalization. Until nations rise to the occasion and incorporate laws, severe penalties for violators are necessary. Moreover, inadequate funds provided to the relevant authorities for their allocation, considering the essential role they have in overseeing industrial and domestic waste will be fruitless. There should be appropriation in funds for the aforementioned reasons and the training of those involved. (Kılıç2021)

6. Land Use Planning

Land use planning is a critical domain of human interaction with the geographical environment. The choice of land uses directly influences the geographical appearance of the country and determines the success of national development endeavors. Land use is generally prearranged in the form of GIS land utility records, and consequently, precise land uses and positions can be extracted. Spatially, various land uses are intermingled then further concentrated with urban expansions showing an excessive trend from concentric towards irregular patterns since the middle 1980s, implying unmoderated urban sprawls (Yao et al., 2019). Among the most significant phenomena of urban growth are spatial structure transformations, which include the growth of cities in terms of areal dimensionality and the delicate arrangements of land use patterns occurring within them.

Land use planning refers to approaches and frameworks that guide decisions about how to utilize land resources in urban and rural areas. Planning often involves mapping potential land uses, which can be based on current land characteristics or desired future characteristics. For example, farmland may be zoned for commercial or residential development when flat, fertile land becomes scarce, or low land quality areas may be zoned for industrial use. Balancing conflicting economic interests in land use – because the availability of land is limited – is often a key incentive for planners. Land use planning and control is a process in which different actors participate, including government, developers, and communities. The success of land policy management depends greatly on the effectiveness and consistency of these actors (Ki Kim, 2005). Land tenure systems define the formal rules and informal practices that govern property rights, access to land, and land transactions. Land management, including land use change and

land ownership transfer, often involves the resolution of disputes over land disputes or competition for resources. Community participation in land use decision-making can improve the local people's sense of ownership towards development projects, and provides a non-elite perspective to the planning process, which can help identify the conditions that need to be addressed. The role of community participation in shaping land use planning outcomes is gaining acceptance among government, non-government organizations, and the research community. An understanding of local environmental knowledge can help planners make appropriate decisions. On the other hand, uncertainty in environmental knowledge can be interpreted in various ways and lead to irrational outcomes, especially when significant external stakeholders are involved. In the context of global environmental change, there is an increasingly urgent need to better integrate environmental considerations into land use planning processes. On an international level, environmental considerations have been explicitly linked to land use planning in efforts to encourage development strategies that are more sustainable. On a national scale, work has examined the diffusion and impact of environmental impact assessments for planned land use changes. On a local level, a number of general questions related to how ecological information can be better incorporated in land use decisions. (Poku-Boansi, 2021)

6.1. Urban Planning

Urban design has complex and intricate aspects, especially when considered within the land use planning spectrum. Essentially, urban design must provide for the land uses that we are accustomed to, such as transportation needs, housing, commercial spaces, industrial and manufacturing, open and green spaces and public uses, with the added concern of infrastructure to facilitate all of the preceding. The complexities of urban design considerations represent the ways in which the land uses that we are accustomed to can be arranged in a way that is stylistically affecting yet creates a desirable place; a place which is accepted and wanted by the community for which it has been designed (Grant, 2012).

The first and foremost consideration in urban design is that the designed environment must respond to community needs, while being a component of a comprehensive spatial construct to initiate usefully unobtrusive land use patterns. Since the inception of the railways,

environmental rhyme patterns have seemingly become a standard in urban geography. The challenge was in providing sustainable spaces that did not hinder the environment to grow nor grate upon the eyes, but rather fade to mundane perusal of the natural order it begins. Urban designers need to keep this challenge in mind as they lay pen to paper or polygon. The perspectives and psychology of the urban dwellers must find representation in any urban design endeavor, as the inaction of public sectors breeds the seeds of discontent in the urban future of their kin and kith.

The cities were beginning to flourish, and the embarked upon great wealth which bolstered the creation of new spires and crenellations. Hundreds upon hundreds of laborers and their hesitant overseers built towering spires and vast bridges of masonry all day in the harsh, cold rain of southern England. But their cost had to be sustained, and many a poor man in those cities had new burdens laid upon them; the land which was once common, and ready to all for their cotes and geese, was fenced off, and the patricians and marchantes took the gras that was once for the serfs and swine. Times of plenty became times of trial, and the magnates found themselves holding cities of gaunt, starved wretches, with dead, heaped flesh being carted away by the manure-men amidst the rain and ridiculous grandeur. (Son et al.2023)

6.2. Conservation of Natural Areas

When an area of natural land or water is preserved (kept in balance) by the efforts of humans, the ecosystem it contains is said to be protected or conserved. Natural areas of land or water come in many forms: forests, deserts, savannas, wetlands, coral reefs and open ocean, among others. One of the fundamental aspects of conservation is the protection and management of such naturally-functioning ecosystems, which provide habitat for the continued survival of a rich tapestry of living things: plants, animals and micro-organisms. Beyond this requirement to support the living creatures with which it shares a ‘home’, a healthy ecosystem is also an effective storage and supplier of the many basic life support structures and processes that are provided by the world’s natural environment. These structures and processes are what make the earth usable: the production of clean air, fertile soil, fresh water, food and fuel (Allison Smith, 2007).

Without the continuity of these resources, not a single one of the world's seven billion humans, nor indeed any other species, would have evolved. The concept of protected areas exists to ensure that the world's processes and structures (commonly known as 'ecosystem services') continue to be available. Humans have had the ability to change the use of land—cleared to make way for farmland or urban development—since beginning agricultural practices many thousands of years ago. In recent times, the impact of the vastly increased population and technology has meant that these activities are having a global impact, with the effect of agriculture, grazing, mining, pollution and other activities resulting in more than half of the earth's ecosystems being now damaged or changed. Unless steps are taken to ensure that the remaining intact ecosystems on earth are protected so that they may continue to exist in a natural state, it is certain that many will be lost and the 'built' environment that follows will not be a substitute. For this reason, one of the fundamental aspects of conservation is to set aside areas of land and water that are protected from such impact and that conserve the natural forms and processes of the ecosystems they hold.

Conclusion

Humans are tightly linked to the environment in which they are found. This includes how they adapted to that environment, what limits this environment proposes to them and how they can change the environment at hand to ameliorate limits or to better exploit its resources (Moos, 2009). Furthermore, moving to more specific details, humans live in a physical environment which they might perceive in different ways. Cities, for instance, can be thought of as containers of human experience which images are built upon people's external perceptions and internal "daydream" of its spaces. These perceptions and images evolve through time with the alteration of the mental, social and, last but not least, physical structures standing in and around the city.

The metabolism of the city can also provide a powerful tool to read and interpret the forces of interaction that in the past and in the present define the urban spaces. Therefore, cities and their metabolism can be thought of like a living organism, a production factor of spaces and social relations, adapting to the changing environment at each time slot. Thanks thus to the knowledge of past metabolism, it is possible to understand current development and go on to shape new ways of growth which are going to be hopefully more sustainable. As a matter of fact, the main

thesis defended is that contemporary towns, besides the drive for development, should look carefully at the ways they have been approaching sustainability. In particular, attention is brought to the fact that the city can be extremely productive in wealth terms, but only at the cost, in a long-term view, of wealth itself. Therefore, in order to avoid collapses or spirals of growth which would eventually bring to the extinction of the city itself (considered as an actor), a sustainable commitment to build settlement patterns is needed. Betwixt the lines it is shown how the application of certain simple equations format the optimisation of resource exploitation offers a new worldview about the urban spaces and their treatments.

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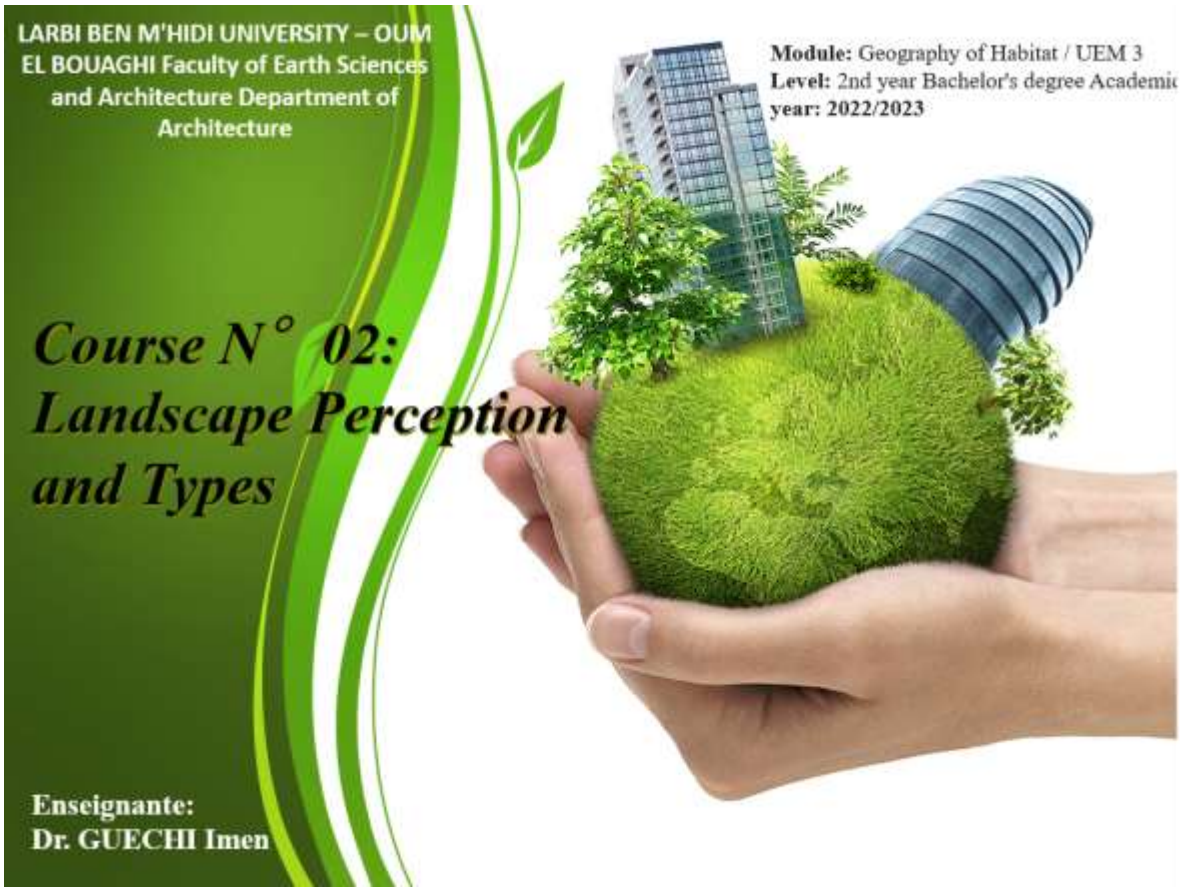
Course N°02: Landscape Perception and Types



Introduction

Throughout history, people have sought to perceive, describe, and categorize their landscapes. This engagement with the environment reflects a community's culture, economy, ideology, and social organization. Studying landscapes provides insight into social organization and cultural practices and environmental attitudes of the inhabitants. Individual perceptions of landscapes, often subconscious, are significantly influenced by personal traits and cultural backgrounds. Consequently, research on these psychological aspects shapes human environment studies and informs planning and design. Aesthetic appreciation of landscapes influences environmental evaluations, similar to visual design in car prototypes. Perception of an object evolves based on comprehension, emotional attachment, or relationships with other objects. Changes can occur incrementally or dramatically, impacting experiential understanding. Such shifts often indicate structural developments in the object itself. In landscape perception, this means recognizing mental frameworks or seeing landscapes as texts that encompass buildings, streets, and natural elements. One perceives a landscape as one encounters its components. As environments are variable, current surroundings can sometimes escape consciousness, appearing as landscapes perceived through knowledge frameworks rather than their appearance. Effective interpretation involves a deep analysis of details and non-evident aspects of perception. (He et al.2022)

1. Definition of Landscape

Landscape is a complex system comprising both spatial and temporal elements, which generally surrounds or is within someone's view. It is also affected by and affects the spatial activities of the observer. The concept of landscape changes over time and there have been many different definitions and approaches across academic disciplines. However, it seems that the term can broadly be divided into two major viewpoints. One perspective emphasizes a natural environment while the other favors a cultural environment . In recent decades scholars have argued that landscapes should be considered as a human phenomenon that originates from man's interaction with space and considers both the natural and cultural dimensions of the landscape (Miklós, 2019). The concept of landscape always includes both the physical and the cultural; the interaction between them constitutes the form of landscape. The definition of landscape is not only understood relative to geographic space, but also within the context of

different cultural beliefs and practices. The landscape approach places equal weight on each of these two selves. That is, the landscape should embrace an aesthetic sense of the environment applying to a visually or physically taken environment and then stretched to broader sets of features that might not even be physical.

Landscape can be understood both as part of the environment and as an object of view. The physical view or aspect of landscape concerns the structure and meaning in the environment but the metaphorical view of landscape provides a trough through which analysis may be made of individual cognitions or social ideas of the environment. Landscape can thus be understood as both reified and perceptual: it literally affects the human eye as do other environmental objects. However, it also carries deeper perceptions or cultural meanings which are vested in those visible objects by social conventions or individual experience, ways of life or beliefs. (Petty, 2021)

2. Perception and Reading the Landscape

We experience the world primarily through our senses, and, individually and cumulatively, they provide an emotional and cognitive reading of our environment. Movement entails sightlines and is also regulated by physical structures, natural or built. Additionally, people inhabit landscape with memory and anticipation, knowingly or not using a mental interpretative framework, determined in part by personal and hereditary background. Landscapes of a certain scale and complexity should not be read in the same way: a good landscape design will work at different scales, offering different rhythms and levels of understanding (Plit & Myga-Piątek, 2016). Landscapes potentially contain many focal points that will read at macro, human and micro scales. Focal points may be incidental or permanent, planned or fortuitous, with scope for meaning or delight (Milton, 1982). There may also be rhythms, spatial or temporal, that will guide the reading of a landscape, effects that may be intended or not, but will be part of the observer's experience and evaluation.

The world is too rich and complex a work to be understood as a single image. The ways we have devised to describe, order, and analyze that which surrounds us also determine what we can see and how we see it. One of the ways to perceive and describe landscapes is in terms of their visual openness. Openness, closedness, and degrees of openness and closure can be used

as a lexicon of a kind of visual geography. Openness may then become a way of classifying, analyzing, and mapping existing landscapes and memplans, much like other landscape structures that have been analyzed in the past, in a manner open to diverse interpretations and future developments. Using a common core of words and ideas shared by professional disciplines may then generate themes that are closer to public understanding and perception. (Gálvez-Campos, 2025)

2.1. Open Landscape

Open landscapes hold significant potential for development. This text aims to analyze the open landscape, primarily characterized by rural, agricultural, and protected areas like national parks. The term ‘open’ encompasses agricultural land, waters, gardens, meadows, pastures, villages, roads, and other rural structures. In landscape architecture, an ‘open’ landscape reflects geographical openness and is synonymous with the landscape of cultural transformation, as per the Landscape Reception Study and the European Landscape Convention. The study defines ‘open’ landscapes as areas unencumbered by forests or urbanization, primarily consisting of cultivated fields, pastures, wetlands, and natural meadows. In contrast, ‘closed’ landscapes are those that, while not blocked by natural vegetation, are urbanized through cities and sizable rural settlements. The evolution of landscape ‘openness’ or ‘closure’ is a complex historical-cultural process influenced by environmental, economic, and social factors. Generally, the degree of landscape ‘openness’ has fluctuated over time, with urbanization and industrialization contributing to its decline. (Plit & Myga-Piątek, 2016)

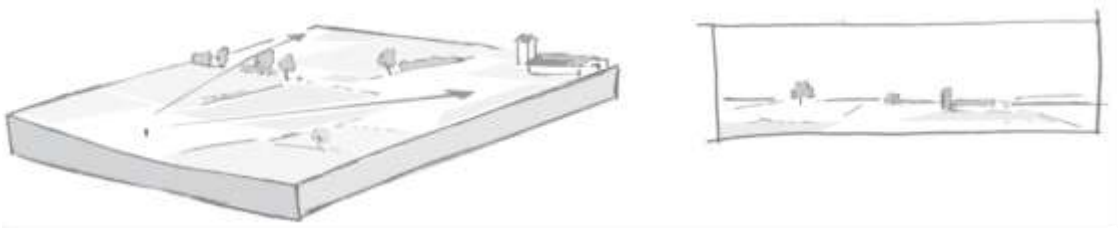


Figure N°01 : Open Landscape

2.2. Closed Landscape

The closed landscape offers obstructed views in confined spaces, creating privacy. These landscapes evoke feelings of being hidden or enclosed, as opposed to open landscapes that feature broad views of dynamic nature and vast horizons. Urban landscapes present wide streetscapes rather than narrow buildings. The sense of enclosure is crucial for closed views, linking to psychological factors like safety, security, and strong boundaries, which enhance privacy. Visually restricted landscapes impose constraints on views, allowing for a quicker sense of place while making navigation more challenging. Natural visually restricted landscapes are favored over artificial ones, suggesting a cultural stability and fostering place attachment. Closed landscapes also provide a sense of refuge and safety from potentially hostile environments. This text discusses the physical interaction with architecture, emphasizing the role of closed landscapes, their relationship with human-built environments, and the advantages of landscaping around human habitation for survival. An informative table outlines various types of closed landscapes. (Plit & Myga-Piątek, 2016)

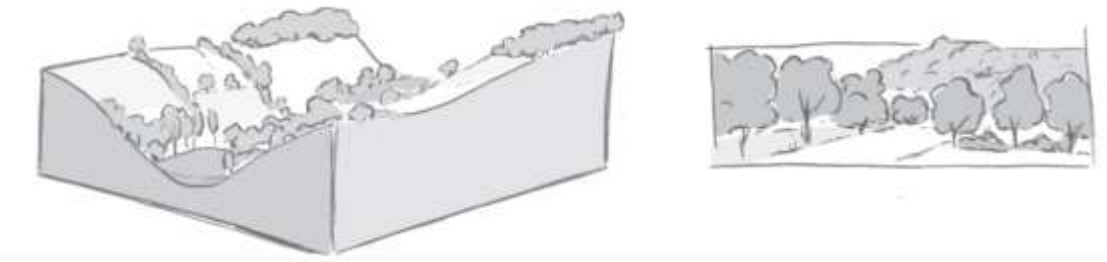


Figure N°02 : Closed Landscape

2.3. Semi-open Landscape

Humans perceive landscapes in varied ways, yet certain landscape types emerge from balances between attributes like enclosure/openness and near/far. Semi-open landscapes combine expansive vistas and framed views, creating psychological and perceptual differences in observers, evoking feelings of curiosity or contemplation. No single landscape type prevails in eliciting responses, as complexity defines the relationship between observers and landscapes. Semi-open landscapes display foreground elements seen from both outside and inside, linking

near and far spaces. Examples include urban parks and rural areas, revealing the nuanced viewer perspective. Landscape preference is influenced by social and physical activities, suggesting that visual and physical attributes of semi-open landscapes may mediate this relationship. These landscapes offer diverse visual elements and richness in attributes such as nature and historical symbols, alongside sounds that may clash with the environment. The balance effect in semi-open landscapes prompts a reassessment of how openness and enclosure interact, suggesting they aren't merely a balance of quantities but a qualitative experience. The perception of these landscapes can be affected by surrounding elements that sway the interpretation of space, whether open or enclosed, highlighting the complexity of viewer interaction with semi-open landscapes. (Plit & Myga-Piątek, 2016)(LE YAOUANC et al., 2014)

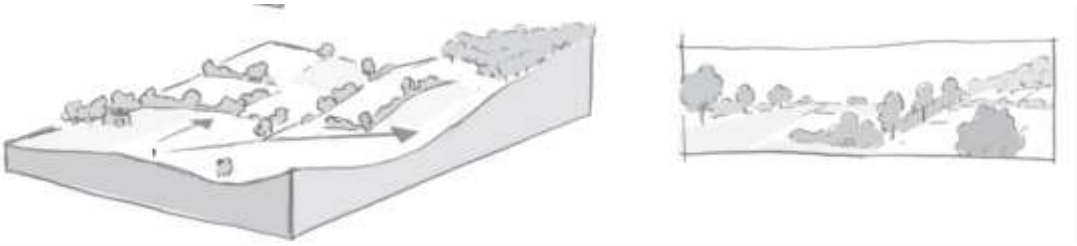


Figure N°03 : Semi-open Landscape

2.4. Framework

Considerable work has been done to elucidate the structures that govern landscape perception, dating back to foundational studies on cognitive models and mental maps. Evidence shows that both the structure of the world and its physical attributes influence how places are perceived and imbued with meaning. Structure directs attention to specific features in a landscape, allowing for the creation of meaning amid the chaos of stimuli. This understanding has often been overshadowed in geographical literature by a focus on tangible elements. Environmental psychologists criticize this as experiential reductionism, reducing individuals to passive observers reacting to discrete landscape elements. Instead, the world's structure actively shapes experiences, organizing sensory data into recognizable forms. Perception actively engages with the environment, reflecting the relationship between the body and space. Additionally, the salience derived from the environment's structure and the cultural meanings ascribed to it are

crucial guiding factors in environmental experience. Landscape transcends merely being a collection of objects; it embodies both integrity and diversity in its physical form and how people interpret it. Consequently, spatial representations of landscapes extend beyond traditional methods to encompass various depictions of individual thoughts and conceptions of space. Thus, research outcomes can offer insights into how people experience and navigate landscapes. (LE YAOUANC et al., 2014)(Gao & Liu, 2021)

Figure N°04 : Framework Landscape

2.5. Scale

The concept of scale is essential in understanding landscape issues. Scale can refer to both the size of objects and as a way to distinguish stimuli. Perceptual units in landscapes can be categorized as points, lines, or areas. Points reflect a local minimum of perceived density, while lines are characterized by the lateral displacement ratio nearby. Areas are connected surfaces set apart by boundary detectors. Various scales exist in landscapes; large features like rivers and mid-scale elements like large animals can be noticed first, while smaller elements such as trees and small animals appear later. The coexistence of scales influences visual experience, emotional responses, and cognitive interpretation. For instance, increased small scales, marked

by grassland or vertical features, can enhance the restorative quality during city exploration. Conversely, large-scale vistas foster contemplation within nature. Urban areas typically reveal more prominent features than rural ones; as investments grow, landscape details become finer, shifting focus from large-scale spaces. This alteration in landscape structure enhances destination legibility and expedites travel times, emphasizing that navigating cities benefits from maps or models. The impact of cognitive and mental maps on scale also plays a role; whole picture and figure-ground distinctions influence cross-scale interactions. Additionally, cultural factors affect how hierarchies and visual links are tuned and interpreted, as some cities are more deliberately planned than others. (K. Sutton, 2013)

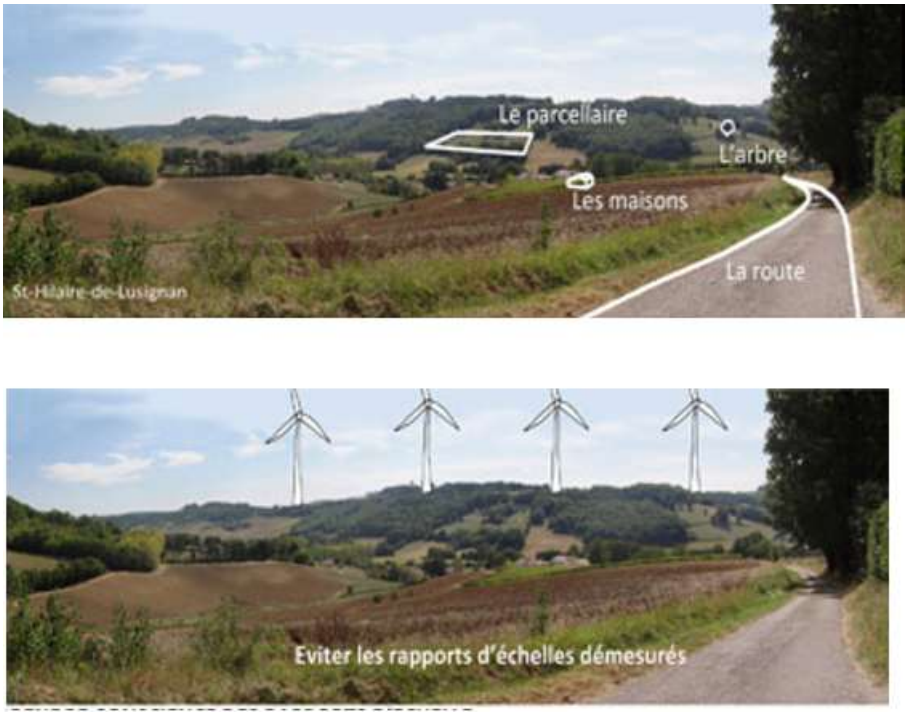


Figure N°05 : Scale Landscape

2.6. Lines of Force in the Landscape

Md Taufiqur Rahman, Sonali Chakraborty - Department of Architecture, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh. Today, the term landscape has gained importance beyond traditional concerns highlighted by industrial awareness. This shift

encourages understanding beliefs that influence human thoughts and actions, incorporating environmental preservation, economic welfare, and aesthetics. Indigenous landscape preferences reflect cultural aspects and must include sustainable features that are resilient to extreme climatic conditions. Thus, culturally and environmentally sustainable landscape design can foster socio-cultural stability and long-term economic benefits. Experts in environmental professions argue that landscape design requires input from a diverse range of fields including economics, architecture, and science, prompting discussions aimed at defining the term. Landscape is recognized as an organized sense of a geographical area, influenced by perception and physical setting. Its boundaries are defined by context, incorporating numerous disciplines: anthropology, architecture, agriculture, archaeology, botany, fine arts, geography, geology, ecology, history, horticulture, urban planning, and preservation policy, each contributing to the reality and imagination of landscapes. (Mon, 2021)

Figure N°06: Lines of Force in the Landscape

2.7. Visual Focal Points

The study of landscapes explores the interrelations between individuals and their environments, emphasizing how landscapes are shaped by culture and personal experiences. Landscape

perception focuses on how people interpret and engage with their surroundings through their senses and emotions, forming narratives or memories based on these encounters. Focal points within landscapes are critical elements that capture viewers' attention, serving as anchors in their perception and interpretation. These focal points guide individuals in understanding their environments, sparking engagement that often extends to other elements in the landscape. Designers and architects manipulate these focal points to elicit specific viewer experiences and convey design concepts. Viewing preferences for focal points are influenced not just by physical attributes but also by personal experiences and cultural contexts. People have varied preferences for different types of objects and scenes. In natural landscapes, the aesthetics of mountains, water, and forests receive significant attention, often overshadowing built structures that enhance beauty. A natural vista featuring a pagoda amid willow trees exemplifies the arcadian revolution. Various examples illustrate how focal gardens and viewing pavilions integrate art and nature, creating structured visuals within pastoral landscapes. (Cheng, 2009) .

Figure N°07: Visual Focal Points

2.8. Rhythms

The narrative explores landscape rhythms, both temporal and spatial, emphasizing their impact on human well-being. Natural rhythms like heartbeats and day-night cycles significantly influence individuals. The interplay of sound and color enhances sensory experiences; changing light forms visual rhythms. Recognizing these rhythms helps individuals notice details such as terrain's effect on movement. From a hilltop, one observes a herdsman in the valley, illustrating various landscape rhythms. This understanding fosters a connection with the environment. Human actions also shape these rhythms; footprints create circular patterns. In her garden, evening swallows' twittering aligns with light, mirroring the visual rhythm. Different light affects sound perception, where birdsongs dominate in daylight, overshadowing neighborhood noises. The volume of birds songs relates to daylight growth, highlighting artificial sounds. This also alters clothing perception, as colors stand out in early light or evening darkness but blend in daylight. Recognizing repetitive color cycles can diminish the joy of trying on clothes, creating a sense of familiarity in the changing landscape. This exploration ties rhythm perception to landscape dynamics, enriching the broader narrative.

Figure N°08: The Rhythms

3. Landscape Types

This course covers landscape perception and provides a framework for understanding various landscape categories. Landscape perception is crucial for landscape architects, geographers, and planners, involving social, personal, and psychological processes where landscapes achieve meaning through sensory experiences. A landscape extends the natural and constructed environment, encompassing physical surroundings while offering diverse experiences. It reflects the relationship between people and environments, which hold cultural significance. Individual perceptions shape the boundaries of landscapes, identifiable by scale or composition, with elements interlinked by common functions through spatial organization. Categorizing landscapes into types is vital for comprehension. Classifications can include mountain, desert, or oceanic landscapes based on characteristics, or hierarchical types based on ecological systems like alpine or marine. Human influences also categorize landscapes, such as industrial or agricultural. Acknowledging these types is crucial for land use and conservation, as each possesses unique design solutions and ecological values. Landscapes embody values associated with social and cultural meanings; traditional landscapes reflect identity linked to ancestral ties and memory through practices, while historical landscapes convey identity through past events, creating character through built constructs or sensory experiences. Architectural elements can highlight differences with modern landscapes. Understanding various landscape types enhances appreciation and reveals characteristics shaped by nature and humanity, fostering a comprehensive perspective of the earth's distinctive features. (M.S.S.D. Weese-Young, 2015)

3.1. Coastal Landscapes

Coastal environments merge terrestrial and marine systems, reflecting economic, ecological, and aesthetic dynamics. The beauty of coastlines varies from serene beaches to towering cliffs, influenced by both biophysical and cultural factors. They offer valuable services like tourism and livelihoods but are vulnerable to threats such as erosion and climate change. Inappropriate development exacerbates the degradation of these landscapes. Since the Palaeolithic era, coasts have been preferred habitats, providing resources like food and materials for shelters. They also offered access to trade and fishing. Over time, coastal areas gained aesthetic value with the rise of seaside resorts and unique geological and biological features. Currently, coastal towns and cities, along with their hinterlands, host half the global population, exerting significant pressure

on these environments. Europe's coastal areas stretch 36,843 km, with urban populations comprising 80% of the total. (BUFFA et al., 2012)

3.2. Mountain Landscapes

Lofty mountain landscapes, characterized by their rugged shapes and harsh climates, possess a powerful aesthetic appeal and diverse environments influenced by various geological and climatic factors that shape their unique ecology. They form a distinct zone within British and Irish scenery, often perceived as wild or romantic due to their sparse habitation. The journey through these landscapes rewards those who take the time, revealing stunning views of hills across rivers or from hilltops, culminating in the majestic Alps with their jagged, snow-capped peaks. This disruption of the horizon creates an aesthetic delight, captivating the eye through powerful contrast. Over centuries, mountains have inspired cultures, symbolizing strength and permanence, evident in the Roman deity Mons, who resisted conquest. Works of art and literature have explored mountain themes, such as Wordsworth's reflections on their grandeur. Today, mountain landscapes hold social and economic significance, balancing conservation efforts and tourism, attracting thousands each year with the thrill of climbing and experiencing remote cultures. This theme examines the multifaceted interpretations of mountains within different societies, including their spiritual and symbolic importance in Hindu, Buddhist, and Christian traditions, early written accounts from Classical and Medieval periods, eighteenth-century European perspectives, and contemporary scientific literature, all enriched by a tradition of myths and legends. (Schirpke et al., 2016)(Knight, 2022)

3.3. Polar Landscapes

Polar landscapes are fragile ecosystems that provide unique experiences with breathtaking scenery and wildlife. However, they are challenging to access logistically and financially, leading to fewer visitors. Enhancing visitor experiences, developing better management guidelines, and advancing understanding of environmental changes is possible. In an archipelago between Norway and the North Pole, tourism is rapidly increasing on larger islands, raising concerns about its impact. Controlling tourist behavior in landscapes with unclear boundaries poses difficulties. A management study revealed a lack of guidelines and support

for mitigating tourism's negative effects on polar landscapes. Expanding such studies requires significant financial investment. (Lyeo & Williams, 2024)

3.4. Urban Landscapes

Urban landscapes are dynamic city environments analyzed through physical and social dimensions. The physical landscape emphasizes material aspects like landforms, vegetation, and built structures, influencing human interactions. This connects urban and rural areas, highlighting a materialistic view. In contrast, the social landscape arises from human activities, melding urban ecology and sociology. Urbanization affects these landscapes by altering economic structures and population density, and reshaping both physical and social interactions. Understanding these dimensions is essential for promoting urban sustainability. Key concepts include green spaces, transportation, parks, and cultural sites. Social interactions are vital in forming urban environments, as individual actions merge with societal behaviors. Visual elements, such as buildings and decor, express the landscape. Collective behaviors create regularities that embed social significance. Recognizing diverse cultural narratives deepens the understanding of urban experiences, emphasizing differences between urban and non-urban settings. Urban design aims to balance aesthetics and functionality, informed by various theories. Challenges include socio-economic, cultural, environmental, and political issues in city-making. Historically, urbanity discussions have focused on either social inequities or biophysical pollution impacts. This duality is heightened by the privatization of urban spaces, often sparking social conflicts during unplanned urban growth. (Puskás et al., 2021)

3.5. Desert Landscapes

Deserts, with their wide expanses, arid climates, and extreme day-night temperature differences, create a unique ecological environment. While often perceived as desolate, they harbor a hidden beauty. Historically viewed negatively, deserts evoke images of dryness and death, as captured in classical literature. However, current perceptions celebrate desert landscapes as serene and beautiful. These ecosystems, characterized by organisms adapted to extreme aridity, surprisingly host rich biodiversity compared to other biomes. Contrary to the belief that deserts lack water, they can exhibit diversity at different times and places. For example, in northwestern China, inhabitants see deserts as vibrant grasslands, while in Inner

Mongolia, vast dunes are likened to a golden sea, showcasing the aesthetic value of the dune landscapes. Deserts are dynamic, embodying both emotional depth and aesthetic appeal. (Ma, 2018)

3.6. Lowland Landscapes

Lowland areas are flat and vital to ecology, often linked to flood plains. They are sensitive to land use and face water scarcity, yet are ideal for agriculture despite flooding risks due to drainage changes. These regions, including coastal plains, combine industrial, transportation, and residential uses, reflecting rich cultural and historical influences. Industrial alterations have overly managed rivers, affecting both landscape and environmental consciousness. Lowlands in Britain contrast with uplands, historically featuring structured agro-ecosystems and enclosed fields, unlike the more open uplands. Rivers in lowlands facilitate movement of goods and people, shaping landscape perceptions. Intensively farmed lowlands are often seen as less wild, leading to reduced conservation focus. Conversely, upland areas are typically less suitable for agriculture, challenging perceptions of wilderness in degraded lowlands, which may illustrate society's disconnect from nature and obscure our understanding of historically shaped landscapes. (Jakubínský et al.2021)(Huang et al.2022)

4. Kevin Lynch's Perception of Urban Form

There have been numerous studies over the past 50 years relating to the perception of urban environments. The pivotal work in this field was Kevin Lynch's (Anna Smith Loerts, 2019). Lynch considered the results of a five-year interdisciplinary search for good urban form. He sought the answers from three groups: ordinary citizens, behavioral scientists, and designers from various fields. From this applied workshop emerged the five distinctable and simply urban structures of paths, edges, districts, nodes, and landmarks, each defined by its interaction between observer and environment. The new urban studies group at MIT was born out of the recommendations made in 1980. Lynch's work is still widely referenced today in academic articles on subjects ranging from urban design to architecture, health to wayfinding. Many claims in his publications have been investigated and debated over the years, leading to differing interpretations. However, there is a necessity to consider Lynch's research in its entirety. (Guo et al., 2023)An in-depth analysis of Lynch's four major publications revealed

how and where contradictions occur. The popularity of such analytical frameworks with urban researchers indicates the acknowledgment of perception's preeminent influence on how the observer operates within and shapes urban form. The way in which cities and towns are perceived and the vividness and constraints of these perceptions and also on the selection and structure of the environment as a matter for experiment was considered. Lynch divided the urban landscape into five elements. Firstly, paths are the channels in which the observer moves. The form of path varies according to whether it is felt within District or as an irregular network unallocated put distinct units. Secondly, edges are the linear boundaries and can change the function of elements adjacent to each other. Thirdly, districts are the section of the town that has common character according to the observer. The most broadly spaced of all elements is districts that mix with each other and share common character. Nodes are points where several paths meet and can vary according to the modes of transport intersecting it. Finally, landmarks are the site; both natural and artificial that can act as turning points within the urban landscape. The conjunction, relative location and spacial proximity of these five elements are comprised of urban form. They impose strong restraints on perception and behavior and will influence the way the environment is structured. Moreover, urban landscape perception has been continued to be an active and vibrant area of study due to its practical implications for planning and design. (Niță, 2021)(Karimi et al.2023)

Conclusion

Landscapes are complex arrangements of place and space, of humans and nonhumans, the built and unbuilt environment, of the organic and the inorganic, of the beautiful and the useful, of knowledge and ignorance, of symmetry and diversity, even of harmony and disharmony with a place. As all of these terms suggest, landscapes generate meaning for us, multi-sensorial experiences of aesthetic and other senses, idiosyncratic memories, emotions, and thoughts of everyday practices, routines, and activities, individual and common history, and prospective plans and designs. Like eco/texts, they as systems have cultural, biodiversity, ecological, historical, economic, representation, and practice studies. Individuals, peoples, and organizations possess definite ideas, concepts, and theories as to how a built or unbuilt environment is or should be in a place. People usually have certain preferences of how they would like to see a particular place, unraveling what types of landscapes individuals favor or

might envision in the future. There are various different alternatives of landscapes, and place perceptions vary among individuals and societies, always taking into consideration the use and socio-ecological processes within the landscape itself. People's notions and valuations of a landscape have profound implications not only for planning, nature conservation and protection, but also community engagement and participation. Taking a closer look at the various categorical differences among types of landscapes can safely assume that the evolution of a landscape perceptually happens in a ceaseless interaction of place-specific, socio-historic, cognitive and cultural factors. Conclusively, different types of landscapes have different environmental quality attributes which, in part determine recognized visual preferences placed within a socio-cultural and ecological interconnection of space and place affecting their perception and recognizing priorities in collaborative planning regarding common desires of future landscape scenarios.

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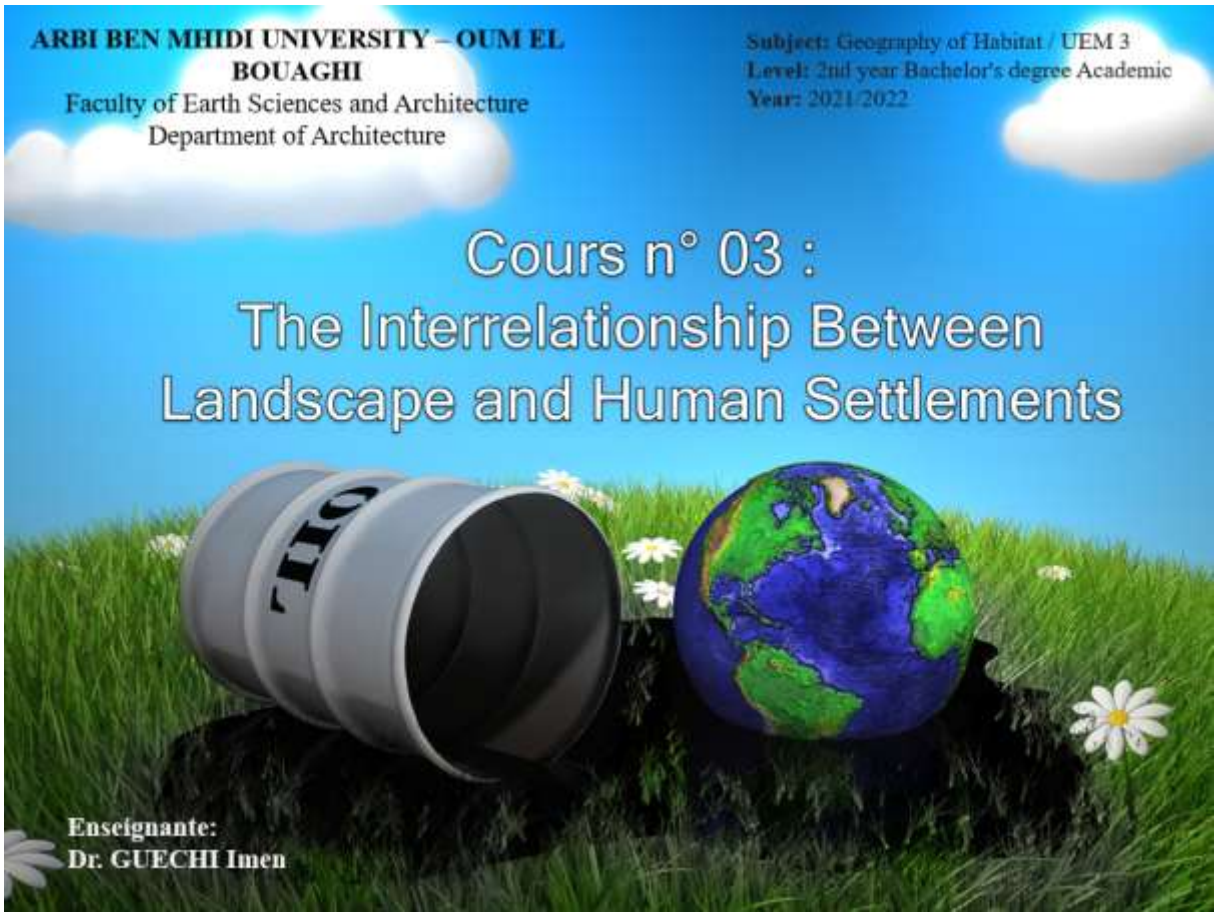
Course N°03: The Interrelationship Between Landscape and Human Settlements



Introduction

Landscape plays a significant role in the location and form of human settlements and in the development and understanding of human society. It includes both natural landscapes, like valleys and rivers, hills and oceans, and man-made or humanised landscapes, such as terraced fields, roads, cities, and so forth. In turn, human activities, community life, and various kinds of man-made alterations gradually shape and transform the landscape. At a certain moment, there is a kind of symbiosis between the landscape and settlement. While the landscape affects human settlements and the development or form of cities, the latter in turn modifies the initial landscape; thus, in many ways, the interrelationship between landscape and settlement plays an essential role in the development and life of society. With the development of contemporary urban evolution, man-made changes or alterations in the landscape are much more evident and irrevocable. Nowadays, the complexity of the relationship between landscape and settlement offers a perspective from where to address the most current challenges and offers various ways to tackle them: one of the challenges of our contemporary society is how to better design forms of spatial urban organization and management that are more sensitive to their natural environment, and how to preserve or conserve existing and valuable natural or rural landscapes. These problems necessarily involve the understanding of the interrelationship between the landscape and the organization and growth of society (James Quintus, 2011). On the other hand, environment crisis and environmental problem also call for scholars from various fields to reconsider these issues. However, an interdisciplinary perspective is much requested given the complexity of the problem. How landscapes influence where and how the human settlements develop? How human activities shape and transform the landscape? Then, in which ways and manners the developing human settlement changes the initial landscape? To what extent can and must the relationship between landscape and settlement be revealed, and with the means of which scientific disciplines and methodology? To what extent and through which analysis can the forms of spatial organization and management be carried out, taking into account a sensitive landscape? What are the effects or losses of urban development, and in what ways can the understanding of the relationship between landscape and settlement solve the dilemma of contemporary urban growth? Also, in which manner and through which approaches can an

understanding of the landscape co-evolution and co-growth of human settlements be deepened and addressed? These are the core questions, which will guide the following analysis.

1. Definition of Concepts

To understand the relationship between landscape and human settlements, we must define both. 'Landscape' encompasses the Earth's surface cover, be it natural or modified, and is vital for life, resource use, towns, and coastlines. Human settlements involve arrangements and systems related to living spaces, including dwellings and infrastructure. They vary in permanence, reflecting different cultures and the interaction between landscapes and human activities. (Angelstam et al., 2013)

1.1. Definition of Landscape

The concept of landscape encompasses both physical features like mountains, rivers, forests, soils, and climates, alongside human transformations such as buildings, parks, and agriculture. Perception plays a crucial role, as landscapes are interpreted through cultural, religious, and historical lenses. Consequently, the same landscape can invoke varied responses depending on one's cultural background. Additionally, landscapes evolve over time, leading to differing experiences from various observers. European scholars have conducted extensive research on landscape assessment and design, defining it as a complex system of visible elements, perceptions, and human interactions. They emphasize the interplay between ecological systems and human activities, indicating that advances in genetics may enhance our understanding of this relationship and contribute to evolving landscape science. Landscape engineering and design methods are also key focal points of discussion in this field. (Miklós, 2019)

1.2. Definition of Human Settlements

By definition, human settlements are diverse and can take various forms, including cities, towns, villages, and lesser-known entities such as mining camps or vacation areas. They are often categorized into urban and rural settlements: urban areas feature high-intensity living and significant infrastructure investment, while rural areas have low-intensity living with less investment. The distinction between cities and countryside emphasizes population density. Socioculturally, human settlements consist of people living closely, engaging and sharing

resources, culture, and social organization. Settlements exhibit differences institutionally, socially, and culturally, formed through a system of mutual human interactions. Landscapes serve both as settings for settlements and as outcomes of their interactions. Analyzing the interdependence of settlements and landscapes necessitates simplification, often focusing on landforms. Over time, settlements transform under various socio-economic forces while simultaneously affecting their environments through landform evolution, climate shifts, and natural hazards. The relationship between settlements and landforms can vary and is rarely one-way. Changes in settlements can modify landforms, while settlements are influenced by landform changes, climate, tourism, and energy development. Migration patterns are driven by urban economic opportunities, with flows directed towards New Economy centers. Small-scale migrations may lead to over-urbanization or marginalization of non-urban areas. These movements contribute to a complex transnational network that reshapes sociocultural and physical aspects of settlements, with population inflows redefining consumption and waste disposal practices. Twin settlements function as networks connected by dietary or ecosystem service chains. (Clemence Mhakakora, 2016)

2. Issues and Significance of the Study

As residents began to express their concern about the urban sprawl issue with the rapid loss of forest land which provided the most scenic and useful landscapes, the scenery landscape has now emerged as a very important index in the development of a rural landscape. However, by being mixed with billboard forests, farmland, golf courses which have a high potential to be developed as a residential area, there is a need to study the change in forest use. It leads identity formation of the landscape corresponding to the characteristics of development and community formation in that area. With the expectation of the positive effect of scenic landscape forming and the appendix effect of landscape as with green corridor, active interest was gathered in the effect of landscape conservation utilizing forests.

About the area supporting the extract scenery landscape forming effect, which can be understood as a characteristic of area having good natural and topographic environment, the most complex landscape map is drawn in Jangjeon-ri, Geomdong-myoen and chute area located in the highest place in Choongnam province. It is presumable because the higher the elevation,

the absolute scenery landscape area, the barren area, the wild grassland also become wide aside from basic items of forest and paddy areas. Since 1960, forest used as a residential area developed unceasingly, community formation began for district located in down mountainous area according to development of the civilization, and slope easy to be developed is divided into each area. However, comparatively undeveloped Jangjeon-ri, Geomdong-myoen and chute area kept common land used structure as forest, paddy areas and got rid of the rapid urbanization as still isolated region.

3. The Impact of Landscape on Human Settlements

The interrelationship between the landscape and human settlements is a topic that has become increasingly significant in international fora. Advances in geography, particularly in the cross-discipline field of landscape studies, provide a research approach that recognizes the mutual perception and interaction between people and their environment. There has been growing interest among both researchers and practitioners in considering the landscape as an integrating factor when sustainable development and planning issues have been addressed.

Thinking about landscape makes it possible to appraise urban and rural areas as a single entity. When people inhabit a place, they perceive and assess the overall structure, considering both the built and the natural elements around them. In this optic the landscape eventually becomes a reference for local identity, for both citizens and decision makers. The role and the perception of landscape are always present in place attachment, in the sense of not only spiritual connection but also of material township.

The landscape may present specific natural factors, such as topography, climate or the availability of water that will be crucial determinants in the location and development of human settlements. The interaction between these factors and human customs has generated existent landscape forms. For instance, local geomorphology can affect the behavioral patterns of the settlers; it may rule out some areas for settlement and farming activities, influencing the types of land use and resource allocation. Consequently, the landscape provides constraints against the expansion of a human settlement. On the contrary, other landscape forms may present valuable opportunities that can be exploited in terms of better infrastructure development for

settlement growth. Two case studies in the Ligurian Apennines and the Gallura region, respectively, are examined, showing the correlation between the landscape attributes and the turnout of urban planning strategies. Further beneficial influences of the environmental conditions on the settlement viability and settlement pattern of the villages are also highlighted, emphasizing the need for a landscape assessment as the premise for a well-informed urban planning process (Ki Kim, 2005).

3.1. Influence of Natural Factors on the Establishment of Human Settlements

Establishment of settlements on Earth is highly dependent on natural factors. Mountains, large rivers, and extensive barren desert landscapes can influence where settlements may initially develop. The emergence of large rivers and generous climate conditions may bring forth buildings and homes soon thereafter. These considerations are significant parameters of landscape architecture—especially when considering the interfacing agenda between the natural and anthropic elements; hence nobody can separate human settlements from natural or artificial items (Tong et al., 2022). Settlement patterns have had intricate historical formation, affected both positively and negatively by landscape characteristics. Large rivers have historically been a major facilitator of settlement prosperity, however the rapid modification of their ecological landscape has had multidirectional repercussions on human behaviour and societal development alike.

In spite of settlement patterns, the adaptability of settlements to their landscape constraints was mainly reflected in construction and agricultural practices. Geographic limitations to urban growth and settlement locale were often altered via hydraulic engineering works or fortified settlements. In combination, residence communities are discretized within a surrounding landscape, have morphological congruency and territorialized practices, akin to ecological understandings vis-à-vis domesticated species. In another thesis they are defined in terms of settlement-eaves assemblage, inter-settlement corridors, landscape fringe tensions, and structurations about pre-fixed natural borders (Fang & W. Jawitz, 2019). Of course, ignoring landscape characteristics in the planning of settlements has resulted in floods in unknown urban landscapes, sea-level rises in inundated ports or droughts in water-stressed cities; all preventable outcomes via basic ecological knowledge. And having particularly high

localization constraints, "not only the partitioned plateau is not designed or templated to fit in a territory, but ecological understanding of the pre-existing environment is dispelled among its cultural —burial—perimeters. More so, inter-disciplinary or holistic approach between environmental science and urban design studies has incited landscape penalty provisions to be avoided, an approach much-touted in the sustainable development agenda of emergent settlement phenomena.

3.2. Constraints and Opportunities Offered by the Landscape

Landscape has a dual role in the framework Settlement-Landscape: it offers restraints and, in the opposite, encourages certain activities. Certain traits of landscape can act as restraining forces for development such as very steep hillsides, wetlands, uneven surfaces and poor soil. These restraints make them difficult for infrastructure to overcome, or become non effective or fully usable, and unsuitable or strongly limiting place for habitation. Developed landscapes are often a source of restraints for their evolution, since transformation of its resources will lead to their loss (Adewale Festus, 2014). The relationship is not static but dynamic, contingent on technological, societal and environmental developments: these physical constraints can exacerbate or fade over time. An embarrass of geographical or climatic traits can also give the possibility for proficient hunters to live in arid mountains, for bandits to hide in endless forests, for a community to find shelter inside islands or fjords.

These same physical resources can also be, in other circumstances, a chance for success: fertile plains will permit large surplus of agriculture, facilitating the development of technical and military know-how. There are lesser visible but nonetheless perceptible landscape restraints which can explain trajectories of cities and regions from their origin. It is however difficult to know the effective role of these restraints on the trajectories of regions and cities. Moreover restraints and opportunities can be either seen as a whole together or separately.

Considering a landscape as a source of constraints may have remodelling policies implication, such as preserving or restoring natural features that would protect from natural threats. Alternatively, services can be reinforced and adaptation infrastructure considered as legitimate countermeasures. On an urban level where most of the world population now live, developing facilities favours outlet and refuge in case of incident may also diminish landscape impairments

— here military urbanism forms a good example of city planning as a way of repression and control. A different question, not mutually exclusive, is to see landscape as a resource. The underlying idea is that landscape can be looked upon as a stock of changeable assets bear by a certain geographical territory to a given historical and geographical moment by sociopolitical strategies. The landscape can be thought from a territorial point of view, as the extension of land and the physical environment, but also from a cultural point of view, as the set of images, customs, narratives, and myths that correlate populations with the geographical surrounding. In the best case scenario, one would consider both, analyzing how landscapes and the ways they are perceived and related are shaped by symbiotic, mimetic and contradictory socio-ecological dynamics. Five (or more) case studies of cities or regions that could expose traits of this approach but also new potentials offered by landscape. Landscape traits that shape or contextually impact the settlements and how they were or are considered in the exercise of power and space planning. How this hierarchical relationship translated (or not) into a status of economic and political relevance, population and activity distribution, spatial control and defence organization. Regarding more contemporary cases, one could explore how these constraints trigger formal or informal urbanization that shape within already in built landscapes other landscapes that further restrain, isolate, or control the territories. One could also relate cases that challenge or contrast with each other. Finally, comparison between remote cases in terms of time or space might reveal commonalities regarding the implications and the ways the landscapes are fashioned.

4. The Impact of Human Settlements on the Landscape

Landscape is the environment within which human activities are embedded. Although formed naturally, landscapes are shaped by human activities through villages, towns, and industries. These settlements destroy forests, disrupt food chains, and open corridors, changing landscapes into another form of life. Landscape is a dynamic and complex structure constituted by both living and non-living things in a space. The structure affects the abundance, distribution, and interaction of organisms, thus affecting the formation and survival of habitats (Adewale Festus, 2014). Festival’s definition of landscape includes language, habits, rights, and knowledge, and comprises an area that is not static but which experiences constant change over an extended

time period. One keyword is “change,” which is linked with both positive and negative things in the landscape along with time. Landscape planning has become increasingly important within the global context because natural systems and habitats are being transformed into landscapes through offending industrial activities.

Natural landscapes provide a habitat to bio-diversity. Emergent townships are built up around the plains where villages are established, they then grow on the principal roads networking settlements. Movement is important to landscape as it brings the external features within a space into human perception. A reciprocal relationship exists between human settlements and the physical landscape they inhabit (and alter in their turn). Typically, human constructions are first carried out on the best (most fertile and irrigable) lands. Agriculture is spread to uncultivated lands, which brings about habitat loss sometimes transforming natural meadows or woodlands into barren soil. Construction of towns and villages alters the landscape irreversible, indicating that a multilayered regional approach and long term strategies are required. In a landscape, urban places are initiated first and brought to a more permanent existence. Constructions are carried out in directions sensitive to that environment. At least in the initial stages of urbanization, towns and their satellite villages are first founded around low lands. Secondly, towns and villages are built in irrigated areas and last set of settlements align irregularly away from a cultivated flat area.

4.1. Transformation of Landscapes through Urbanization and Land Use Planning

Urbanization as one of the most significant transformations of landscapes, both natural and cultural, acquired a form of a process with the development of land use planning. Land use planning, as a system of policies and practices concerning the physical form and functionality of landscapes, was especially emphasized over the last few decades with growing number of scientific researches and concepts on the urban sprawl and land consumption issues. Moreover, considering recent policies such as infill development or constructing levels above certain heights, the concerns on how the transformations will reach landscapes and what will the possible impacts on landscapes have been expanded (Marconi Penteado, 2010).

Transformations of landscapes between 1930 and 2002 in Selected eastern coastal cities were analyzed. Landscapes under planning control or spatio constrictive overwere thought to be selected as focal landscapes of the city based a raster edge pattern analysis using remote sensing data. Examples of landscape transformations in Tokyo Bay Zone and Izmir Bayside Zone were considered to highlight the relationship between land use planning and landscape changes. As a result, it was understood that land use planning shaped landscape transformations, but could not avoid a loss of green spaces or meaningful alterations in established or potential ecosystems. Some concluding remarks were drawn towards how difficulties for environmental planners could be addressed to balance with urban need (Ki Kim, 2005). General concepts of planned uses such as parks or reserved lands were kept as landscapes for same development strategies; however, green field developments were continually erasing landscapes, and conversion of landscapes of undetermined uses into built environments or transportation facilities were ceased with planning restrictions. Despite active efforts to preserve landscapes, the speed and level of alterations did not.

Challenges were being discussed regarding landscape preservation or balancing with urban development would be responded responsibly by land use planning, through a set of sample policies and practices. These policies and practices were planned broadly in two parts; first, the innovative types of planning practices could be implemented for ascertaining landscape preservation. Both were considered proper with a broad, general approach, with an emphasis on long-term planning vision rather than being too much city-specific. All propositions were supported by references predicting a high rate of urbanization or expected policies to cope with a future urban growth. A set of successful urban projects were briefly introduced, which implemented and still consider a harmonization between urban needs and ecological considerations.

4.2. Efforts to Preserving and Integrating Landscapes into Urban Planning

An increasing concern in the urban regions is the importance of efforts to integrate natural landscapes and the fabric of urban planning. Although the preservation of landscape has been approached by maintaining natural landscapes as patches within the urban complexes, such as parks or wilderness in city outskirts, interest is recently shifting towards seeking the methods

to preserve natural landscape conditions within the urban settings. Protecting landscapes by maintaining their continuous patterns within urban regions is crucial to preserve biodiversity and also to enhance the quality of urban life by utilising landscape resources. It is also essential to landscape aesthetics that are beginning to be valued by housing developers and buyers to improve quality life standards (Ki Kim, 2005). Various policies and efforts to integrate landscape have been made, such as the creation of green corridors to connect green patches, scattering of miniature parks, green roofs to depress urban heat, and forest preservations between agglomerated city regions. The community is recognised as a pivotal group of stakeholders responsible for advocating the integration of environmental concerns into planning processes. Many studies address the social and legal resistance to the dominant paradigms of urban growth but, at the same time, emphasise that planning regulations and/or landscape preservation programs effectively addressed the pace and extent of land use changes. As a result, landscape design in many cities has been progressively absorbed within the realm of comprehensive planning and served as a regulatory framework setting standards and land use definitions. Four cities are discussed: Santiago, New Delhi, Vienna, and Cape Town, to suggest however that the final outcome of this integration results in maintenance of the status quo and highlights the need for a holistic approach to design. By considering still controversial issues of landscape definition and methodology, more effective ways of balancing the urban growth and ecological reserve are scrutinised. But despite the controversies and the varying approach amongst theorists and practitioners in landscape and urban design, a remarkable agreement in principles concerning the design aspects are now being reached.

5. Towards Harmonious Coexistence: Solutions and Perspectives

Cities, as ecosystems, are an amalgam of spatial, social, economic, environmental, and cultural concerns. It is essential for planners, policymakers, and communities to adopt integrated and ‘intelligent’ approach to the functions of urban landscapes. Education, public awareness and training, land planning, the advancement of sustainable mindsets, debt relief strategies and innovative technologies must be gardeners of a resilient environment. Urban landscapes must be carefully planned to provide food for residents, to accommodate human and other animals, particularly endemic fauna and avifauna, and to take measures to reduce the potential for

anthropogenic climate change. Urban landscapes should also serve as cultural havens, and provide beneficial aesthetic and psychological impacts. In a rapidly urbanising world, biome transformation is essential. Flows and processes in an urban system are circular and reciprocal, such as they are in other natural ecosystems, and must be operative to ceremoniously achieve a coevolution of societal, environmental, and economic "harmony". Popularised urban development practices must be harmoniously collegial and informed of geographical, social and ecological characteristics that encourage environmental preservation and economic stability (Zarrin Mohtadi, 2016).

The integration of ecological principles and concepts into the planning process is foundational. The functionality of green infrastructure in regional and local green places should be explored, expressed fort site-planting strategies should be discussed. The green road map for achieving community-vulnerability reduction that also aims to invoke support through the development of community accessibility to natural resources is provided. The design of resilient landscapes is a future model as rising sea levels might cause increasing coastal risks and damage. Preconditioning strategies are key to the goal of preserving the societal, economic, and/or environmental features of cultural landscapes and buildings. Preconditioning strategies, however, must be environmentally safe and protective of local community rights in maintaining these critical urban ecosystems. This is especially challenging in locations with mixed chert and sulfate bedrock. For a territory which has been experiencing persistent land movement triggered by more than twenty years of mining, and inpouring into already extant problems arising from historic mining activities, the destabilization of the surrounding territory has substantial health, cultural, environmental, and infrastructural effects (Renee Major, 2015). Efforts should be made to manage risks to increase social, economic, and environmental resilience. Independent cooling, water supply can be achieved by snow packs; snow canopies and ice-storm packs provide multiple hydro-biological benefits. Existing water-conservation practices use minimal storage of snow, rain, or icestock on an impervious site base. Ranges of solutions which act as opportunities for preservation, safeguarding, and conflict mediation of resources natural and cultural landscape are analysed. Ideas of recycling inter-related flows of land, species, knowledge, and development are developed.

Successful and sustainable urban landscapes are, however, challenging and entail a complex mix of site-specific ecological health and functions, artistic and cultural values, and cultural values and spaces. Best practice must provide a picture of how cities, as part of their active participation, are addressing the challenge of fragile and resilient urban areas, and at the same time benefitting from a mix of planting in the town. Settlement planting and species selection with the aim of reducing some of the competition on resources human allotments, including timber for heating, grazing and pasturage, and traditional medicine. Take a multi-disciplinary approach to landscape health that embraces the field of ecology, sociology, psychology, community planning, and urban design. Efforts must be redoubled to develop building and transport infrastructure, to enable communities to better withstand such impacts, and time is running out. Jungle was also incorporated into the Italian garden landscape of town villas in the form of parks or pseudo-forests. Issues of ownership, management, and usability arises from the presence of land with historically particular property, legal settlements, and stable natural-ecological characteristic. The future has tight timelines for effective and resilient action on urban decision-making in order to surge the growing, city scale, problems of water scarcity and eutrophication, in addition to the broader challenges of environmental change. Urban agriculture holds the prospective to provide varied, nutritive victual nourishing one's own community and create little waste from produce unable to be sold. Consideration and tolerance of the manner well-qualified products are marketed is also addressed. Urbanization landscapes have been under continual alteration, with consequential dichotomy on the environment. Landscape quality and human wellbeing seem to go hand in hand with ecosystems sustainability and vitality. A new form of extensive urbanization and landscape modulation based on unindustrialized economy leads to the formation of quality urban landscapes. Compliance with ecological laws, the living need in town, leads to the phyloecological reorganization. Settling peoples succeed in creating a complex living landscape system in a severe climate.

5.1. Sustainable and Resilient Development

To face the challenge of sustainable development of human settlements, an effective interdisciplinary integration has to be achieved by embodying the complexities of societies and economies into landscape ecology analyses. Such integration is getting far more complex today

as landscape ecology is expanding its scope to respond to the challenges of sustainable development of human–environmental systems. With half of the global population living in urban settlements and further accelerated urbanization in the upcoming years, it is pivotal to address the new perspective in the interrelations between landscape and settlements, fostering new paradigms of research, training and operational approach based on holistic landscape ecology (RITA PASIMENI et al., 2012).

The core principles of sustainability are grounded in the need of recognizing the interconnections between components from different origins and in the importance of ensuring this knowledge to plan for desired future states of the environment. Sustainable development is largely linked to human settlements and urban systems having a crucial point in the coherence between urbanization processes and the structure of ecosystems. The quality of landscape, as shaped by biophysical features and by the interaction of these features with forms and processes of anthropic importance, has relevant implications on the living conditions and on the functioning of urban ecosystem services in terms of smart and resilient cities. On the other side, cities, settlements, and relative urbanization processes, have key importance in determining the overall structure of landscape, influencing ecosystem composition and characteristic, land uses, and land cover features. It is therefore complex interrelation between landscape and cities, and that cities are the closing point of landscape functioning represents the core point for the new paradigm of the research viewpoint. Landscape resilience could be fostering resilient human settlements with focus on green and blue elements (Suárez et al., 2016).

Green infrastructure is the most efficient way for ecosystem provisioning and regulating services in a spatially explicit urban setting to guarantee ecological sustainability, enhance everyday life, and protect citizens from environmental issues. Employment of resource efficiency is the crucial basis for successful resilience of the city and its landscape. The purpose of this discussion is to promote inspiration towards a holistic mindset to improve the interrelation of landscape and settlements and support the engagement of understanding living with landscape rather than struggling against it. For practitioners, the main goal is to foster resilient and smart solutions in an urban context, promoting the employment of nature-based features, green infrastructure and blue networks, integration of resource efficiency in every

strategy, and long-term planning based on the active participation of local communities. For researchers, the purpose is to promote new approaches and novel perspectives in social-ecological integration analysis focusing on human settlements. Optimal sustainable solutions designed to support resilient development of urban systems should be spatially explicit and context-oriented.

5.2. Role of Architects and Urban Planners

One of the challenges facing architects and urban planners is to design human development in ways that are in harmony with natural landscape, culture, and human settlement. Landscape is a continuum that includes urban areas, agricultural land, and natural vegetation. Many landscapes, however, show evidence of disturbance by human activity. Architecturally a landscape means the features of the land that determine where the settlements are and what the transportation and circulation systems are. They have to consider that every type of landscape has its own demands that have to be satisfied and the built environment should respond suitably to those demands. A key question in understanding the interrelationships between landscape and settlements is whether human is a part of the environment or whether they occupy a different dimension of existence. Urban design, landscape architecture, and environmental science exist along a continuous spectrum of questions dealing with the relationships between the design of the human environment and its environmental context. Settlements have to be places that mimetically reproduce the local landscape, deck in the trees, and undulate like the hills (Ki Kim, 2005). Since a similar formal typology either does not exist or cannot be maintained, new territories and anthropological realities demand the cooperation of professionals who know both, the general rules for designing those places, and local characters. Architects and Urban Planners are professionals that can play a decisive role in the attempt to upgrade ecological design principles within human settlements. The consequences of their decisions have a major impact on the relationship settlements maintain with the surrounding landscape. A developing country where the main centers of development experience very rapid, often uncontrolled, urbanization are regarded as a 'paradigm of contemporary global urban growth'. Considering the speed of these changes and their impact on landscape and environment, the need for a multi-disciplinary strategy blending urban design, landscape

architecture, and environmental science is critical. Some of the most remote landscapes do not correspond to the idea of untouched nature as they seem to be, sometimes suffering strong pressures arising from the attempt to contrast modernity with preservation strategies of fragile mountain environments. In this sense, the role of Architects and Urban Planners is fundamental, both as advocates of a wider vision of the role that the Landscape has within human settlements and as designers arbitrators of the relationship established by any intervention among land, vegetation, and human activity. Architects and Urban Planners have a crucial role is to encourage/facilitate the establishment of a common framework within which institutions, businesses, local communities, and different professionals can operate in synergy and thus achieve a positive outcome. There are a number of basic human needs which have to be satisfied, each of them with a different level of intervention and innovation. Should it be new or existing settlements, designers have to be creative in addressing problems and limitations given by the specific characteristics of a place, instead of merely transferring models and patterns from elsewhere. The Landscape, at varying levels of intentions, will adjust to the human settlement. An effort must be done, however, to switch from an overall reactive position toward a more proactive role in suggesting forward-looking possible developments and effects. Given the strategic perspective locally developing, a constructive dialogue has to be set up with the emerging engineers, architects, and landscape architects in order for them to design a more resilient urban environment. This asks for a significant refocusing of a sector everyone involved is as yet unprepared to handle. There is a need for greater concern and understanding of the interrelations existing between Spaces/places, Landscape and Human Settlements. Policy-makers and professionals involved in urban design and planning have to look in depth at further approaches and facilitate development of the right instruments for the eventual real application in the current practices. On a similar level of importance, also the educational systems have to undertake the commitment of providing the necessary know-how required by the new needs. Finally, a proactive stance for a long-term perspective on Landscape has to be eventually taken as the only possibility for a synergetic growth of the different components which relate to Wohnort (human settlement).

Conclusion

The relation between landscape and settlement is investigated at multiple levels of social organizations, from the mobilian hunter-gatherers to ancient civilizations. In these societies settlement patterns are determined by the interplay between historical, ecological, demographic, and social factors. A comparative analysis is conducted between Pleistocene-Holocene Wet and Neolithic settlements patterns in the Near East. The analytic scale changes from Mesolithic to Neolithic, and significant shifts in the relation between landscape and settlements emerge. Natural sites are the dominant places for Pleistocene settlements, while the historical period reflects an increasing occupation mainly of anthropic and hybrid sites. The evidence has been interpreted in terms of both changing environmental conditions and social organization stratified in village communities. Settlements are designed to face climate change and socio-economic transformations, and landscapes are greatly modified by human actions, with the transformation of forests into open country. These changes have a deep impact on human strategies of exploitation of both plant and animal resources. Recent advances in archaeology, zooarchaeology and paleobotany highlight the importance of the long-term perspective in the study of the interplay between landscapes and settlements. At the same time human/environment interactions require an integrated approach between different disciplines. This contribution is articulated in three parts, and refers to different scale analyses and local case studies. The first part addresses the analysis of the mobility strategies and settlement patterns of the mobilian hunter-gatherers in late Pleistocene/Holocene time of the Levant. In a second part the landscape management and exploitation in a comparative analysis of PPNB and Halaf patterns are compared. Finally, the late Neolithic paleocoast and its settlements are described as a case study (Adewale Festus, 2014) (Zarrin Mohtadi, 2016).

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Course N° 04: Site Analysis in Architecture and Urban Planning

Introduction

Site analysis is a fundamental aspect of architecture and urban planning, serving as the foundation for creating functional, sustainable, and contextually appropriate environments. This process involves a thorough examination of the physical, cultural, social, and environmental factors that define a site. It is essential for architects and urban planners to make informed decisions about the design, development, and use of space. From understanding the cultural and community dynamics of a region to assessing its landscape, infrastructure, and built environment, site analysis provides a holistic view of the elements that contribute to the identity and success of a place.

The study of Culture and Community considers the social, economic, and historical context of the site, guiding decisions regarding land use, urban framework, and public participation. The Landscape aspect focuses on the natural environment, including terrain, water resources, biodiversity, and climate, ensuring that development respects and enhances surrounding ecosystems. Movement and Infrastructure examines transportation systems, accessibility, and essential services, ensuring that the site can support the mobility and daily needs of its inhabitants. Finally, the Built Environment analyzes physical structures and the layout of the urban fabric, considering the history, architecture, and density of the area.

This course provides an in-depth exploration of these key areas, highlighting the interconnectedness of cultural, environmental, infrastructural, and built elements in shaping urban spaces. By conducting a comprehensive site analysis, urban planners and architects can make design decisions that not only meet current needs but also anticipate future challenges and opportunities.

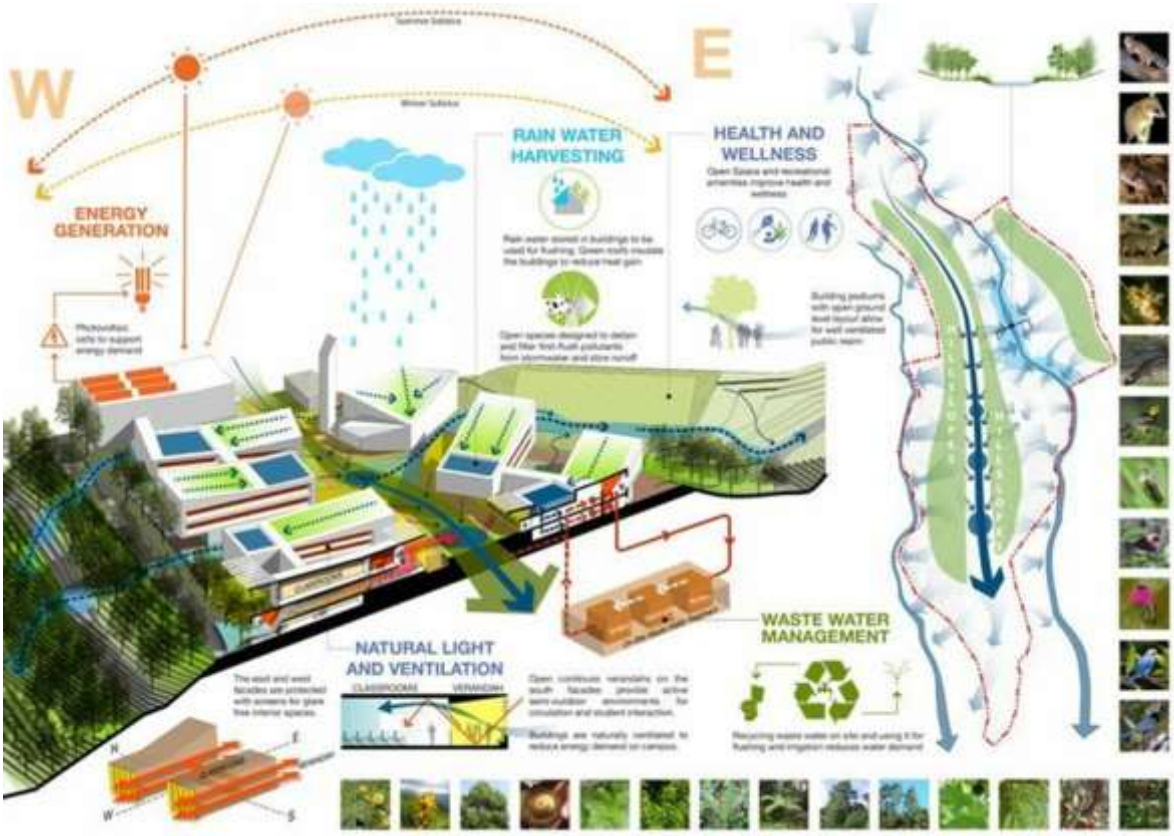

Figure N° 01: Site Analysis in Architecture and Urban Planning Terrain

1. Culture and Community

Understanding the cultural and community aspects of a site is essential in architecture and urban planning. A thorough analysis of these factors provides insights into how a place has evolved, how people interact within it, and what social, economic, and historical influences shape its character (Rezaei & Khouadja, 2022). The geographical context, urban planning framework, land use patterns, neighborhood composition, public participation, socioeconomic conditions, and market trends all play a crucial role in determining the feasibility and success of a development. By integrating these elements into site analysis, planners and architects can create spaces that are not only functional but also socially inclusive, economically viable, and culturally sustainable (Rezaei, 2021).

1.1. Geographical Context

Analyzing the geographical context is essential to understanding the influence of the natural environment on site planning. The geographical location affects climate, sun exposure, and

prevailing winds. For example, Algiers, located on the Mediterranean coast, enjoys a temperate climate with mild winters and hot summers, which impacts the design of buildings and public spaces. Terrain and accessibility also play a crucial role, as seen in El Madania, a neighborhood built on steep slopes requiring specific adjustments for circulation and construction. Access to natural resources, such as water and raw materials, influences urban development (Rezaei & Hanachee, 2022). Finally, environmental risks such as floods, earthquakes, or erosion must be considered in architectural design, as in Béjaïa, where the proximity of the sea and mountains necessitates taking landslide risks into account.

1.2. Urban Planning Framework

Regulatory frameworks and urban planning policies significantly influence site use and development. Local urban plans (PLU) and zoning define land use allocations, as in Oran, where the Master Plan for Development and Urban Planning (PDAU) restructured the city by promoting the development of new residential areas while preserving green spaces and rehabilitating the historic center. Legal restrictions and building codes ensure safety and architectural harmony (Rezaei & Nofre, 2024). Sustainable development strategies, such as the integration of local materials and resource optimization, help build more resilient cities.

1.3. Land Use and Built Environment

Studying land use helps identify territorial dynamics. A balanced distribution of residential, commercial, and industrial zones is essential for optimal urban functioning. In Constantine, the transformation of agricultural land into residential areas in the new city of Ali Mendjeli has radically altered the urban landscape and posed challenges in terms of transport and public facilities (Rezaei & Alborzi, 2019). Population density and building typology influence the design of infrastructure and services. The impact of new constructions on the existing urban fabric is also a major issue, as seamless integration is crucial to avoid an architectural disconnect between old neighborhoods and new developments.

1.4. Neighborhood Composition

The arrangement of buildings, public spaces, and infrastructure affects the quality of life and functionality of the neighborhood. Spatial and morphological organization should

promote accessibility and smooth movement. For instance, in Bab El Oued, a densely populated district of Algiers, the lack of green spaces and parking creates traffic problems and a less pleasant living environment. The distribution of services and amenities is another key factor: schools, hospitals, shops, and leisure areas must be well distributed to avoid imbalances in urban development.

1.5. Public Participation and Stakeholders

A successful project considers the expectations and needs of residents and local stakeholders. Public consultations and participatory workshops allow citizens to be involved in planning decisions (Rezaei, 2021). In Algiers, the rehabilitation of the Casbah required consultations with historians, architects, and residents to preserve the site's heritage character while improving living conditions. The involvement of local associations contributes to heritage preservation and social development, while collaboration with authorities and real estate developers ensures the feasibility and coherence of projects.

1.6. Socioeconomic Factors

Analyzing demographic and economic data helps adapt a project to local realities. The average income level and social inequalities influence access to housing and services. In Annaba, the development of industrial zones has boosted employment, attracting a significant working population and increasing the demand for housing and infrastructure. The unemployment rate and types of available jobs also affect urban dynamics and economic growth. Social and cultural diversity is a crucial factor for balanced and inclusive development (Rezaei & Khouadja, 2022).

1.7. Market Trends and Feasibility

A thorough analysis of the real estate market helps assess a project's economic viability. Demand for housing and office spaces directly influences investments and land price trends. In Tlemcen, the modernization of tourism infrastructure, such as the restoration of El Mechouar Palace and the development of hotel complexes, has stimulated real estate investment in the region (Rezaei & Alborzi, 2019). However, real estate speculation can pose accessibility issues, making some areas unaffordable for a large portion of the

population. Identifying investment and development opportunities ensures the economic sustainability of urban projects.

2. Landscape

2.1. Terrain and Elevation

The topography of a site plays a crucial role in construction feasibility, drainage management, and infrastructure planning. For example, in the mountainous Kabylie region, houses are often built on terraces to adapt to steep slopes, with retaining walls used to stabilize the soil. This type of landscape also requires adapting construction techniques to avoid geotechnical risks. The study by Lahcene et al. (2022) highlights the importance of topographic analysis in urban planning to optimize land use while minimizing natural risks.

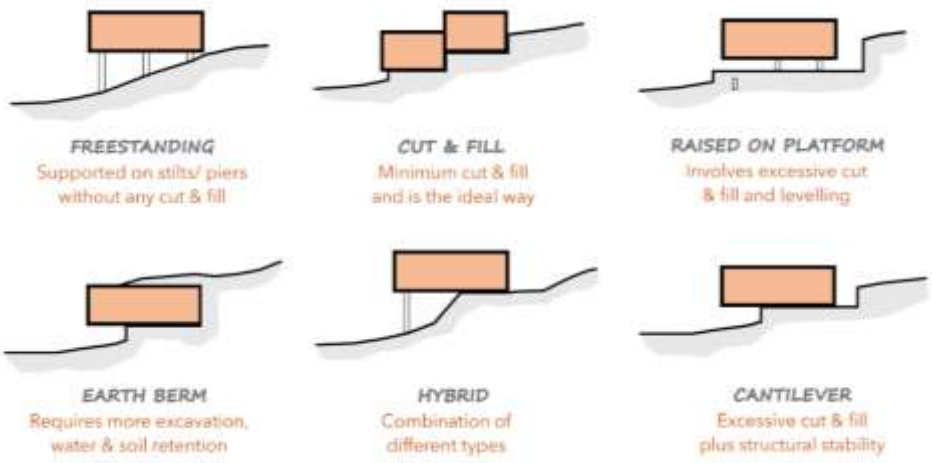

Figure N° 02: design buildings on Hilly or Sloping

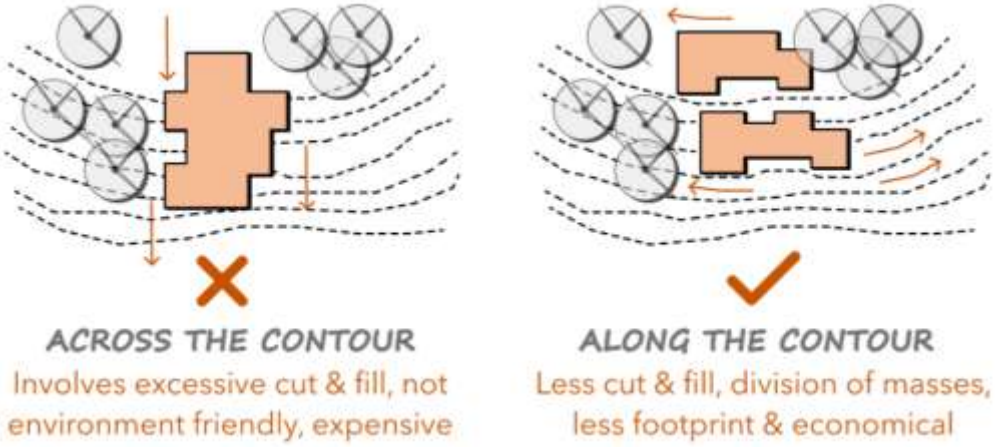

Figure N° 03: Orientation of the building

2.2. Water and Green Spaces

Water bodies and urban green spaces play a major role in maintaining ecological balance and quality of life in cities. For instance, the Mitidja Plain near Algiers benefits from an agricultural irrigation system that supports agriculture in the region. However, rapid urbanization is putting pressure on these natural resources, leading to a reduction in green spaces. The Jardin d'Essai du Hamma in Algiers is a prime example of a major urban green space, providing ecological and recreational benefits to the city. Souici (2023) suggests that creating new urban parks and reintroducing wooded areas can improve air quality and enhance cities' resilience to climate change.

2.3. Biodiversity and Environmental Impact

Considering biodiversity ensures sustainable development by protecting local ecosystems and supporting environmental resilience. The wetlands of the El Kala National Park are home to a rich flora and fauna, but urban expansion threatens their preservation. Sustainable architecture seeks to minimize environmental impact by integrating practices that support biodiversity, such as the use of native vegetation and reducing the ecological footprint of buildings. Djouad and Mebarki (2023) emphasize the importance of incorporating natural elements into urban design to strengthen the connection between residents and nature and support urban biodiversity.

Figure N° 04: Biodiversity and Environmental Impact

2.4. Soil and Geological Conditions

The analysis of soils and geological conditions is essential for designing stable and durable structures. In Algiers, certain areas have clayey soils that can swell and shrink depending on moisture variations, leading to risks for construction stability. Geotechnical studies, such as those conducted by Lahcene et al. (2022), allow for the selection of appropriate materials and construction techniques to minimize these risks. Considering geological conditions is also crucial for developing suitable drainage solutions, especially in urban areas prone to landslides or flooding.

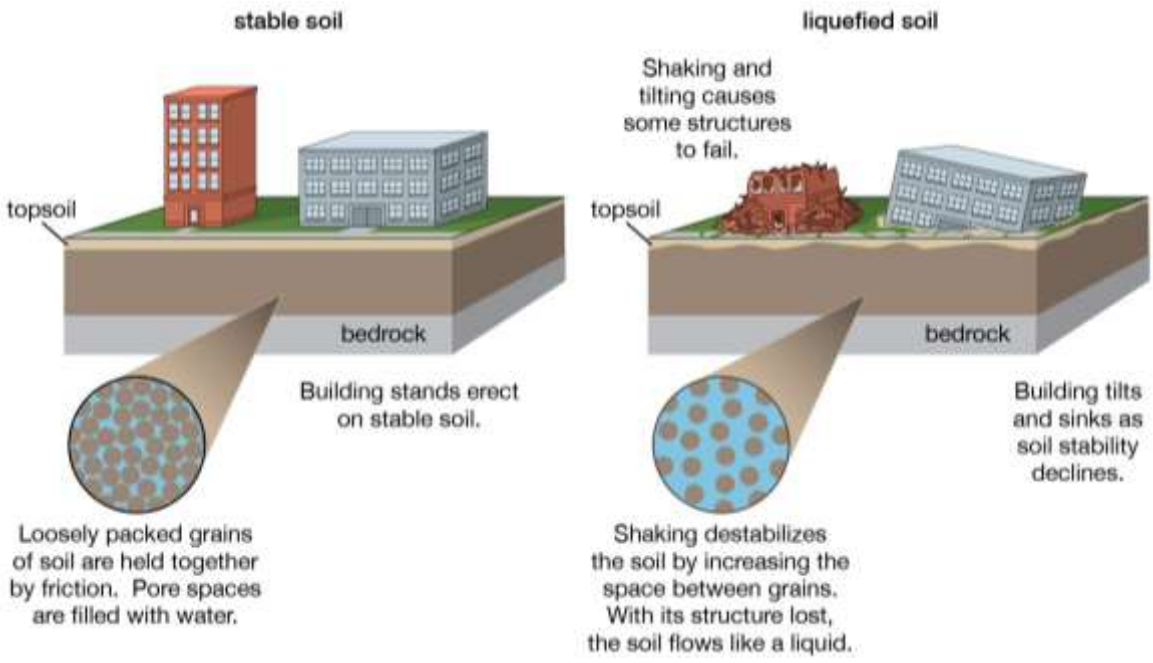

Figure N° 05: Soil and Geological Conditions

2.5. Climate and Environmental Factors

Climate has a direct influence on architectural design, particularly regarding building orientation, energy management, and natural ventilation. For example, in southern Algeria, in Ghardaïa, where temperatures can reach extremely high levels, traditional architecture relies on passive cooling strategies, such as thick walls, shaded courtyards, and windcatchers to allow air circulation. These elements strongly influence energy consumption reduction and improve thermal comfort for residents. Coastal cities like Oran benefit from sea breezes, which are used in building design to promote natural cooling and reduce reliance on air conditioning systems. According to (Rezaei and Alborzi; 2019), integrating these climate strategies into urban design helps strengthen the sustainability of cities in the face of climate change.

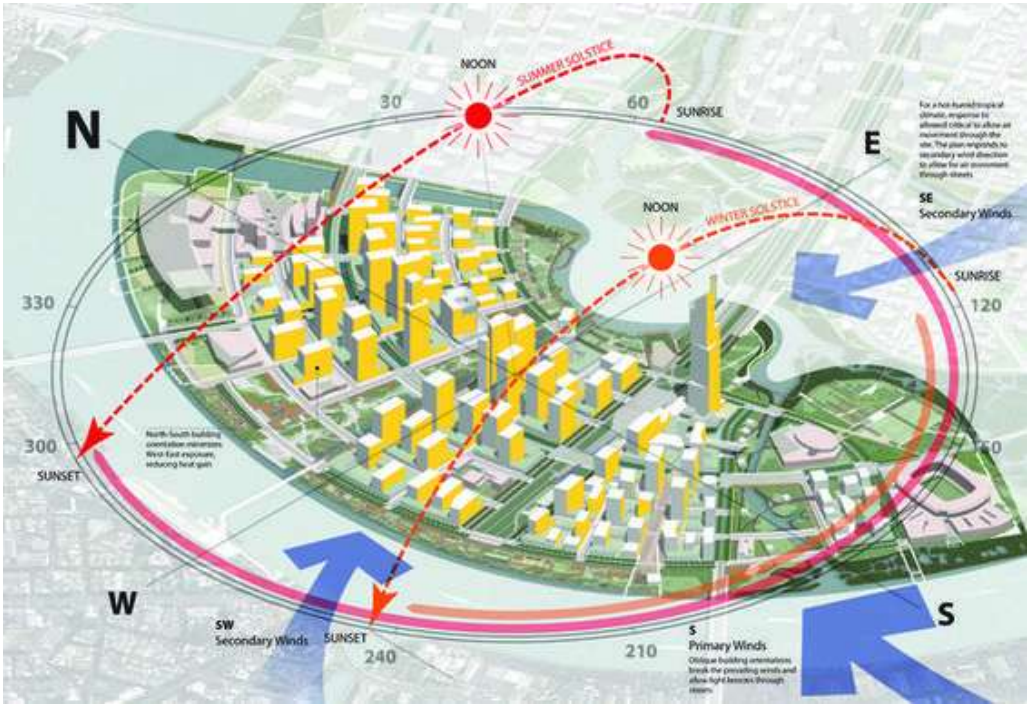

Figure N° 06 : Orientation and sunlight

Figure N° 07 : Importance of Solar Orientation in Room Placement

3. Movement and Infrastructure

The movement of people, goods, and services within urban environments is a vital component of urban planning and design. The effectiveness of transportation systems,

accessibility to essential services, and the availability of utilities directly impact the daily lives of residents, as well as the overall functionality of a city. In this section, we will explore the critical aspects of movement and infrastructure in urban environments, focusing on the transport network and accessibility, the availability of public transit, and the provision of utilities and essential services. These elements are foundational in creating cities that are not only livable but also sustainable and efficient. Proper planning and investment in infrastructure ensure that urban spaces remain accessible, foster economic growth, and enhance the quality of life for all residents.

3.1. Transport Network and Accessibility

A well-designed transport network is essential for the movement of people and goods within urban areas, contributing to the overall accessibility of a site. Accessibility refers to the ease with which people can reach key locations such as work, healthcare, and leisure activities. In Algiers, for instance, the expansion of the East-West Highway has significantly reduced travel times between urban centers and peripheral areas, facilitating easier access to business districts, residential neighborhoods, and other key facilities (Rezaei & Hanachee, 2022). Effective transport planning not only reduces congestion but also contributes to better social integration by ensuring that all citizens have access to essential services. The integration of different transport modes, such as roads, railways, and non-motorized transport (e.g., bicycles and walking paths), is essential in creating a seamless, multi-modal transport network. As emphasized by Boudiaf and Mebarki (2023), planning for transport accessibility ensures that urban areas remain inclusive, promoting mobility for all, including people with disabilities, the elderly, and children.

In Algeria, many cities still face challenges in their transport networks due to rapid urban expansion and inadequate infrastructure. The introduction of metro systems, such as the Algiers Metro, is a step toward improving accessibility, but more efforts are needed to address transportation issues in suburban and underdeveloped areas (Boudiaf & Mebarki, 2023).

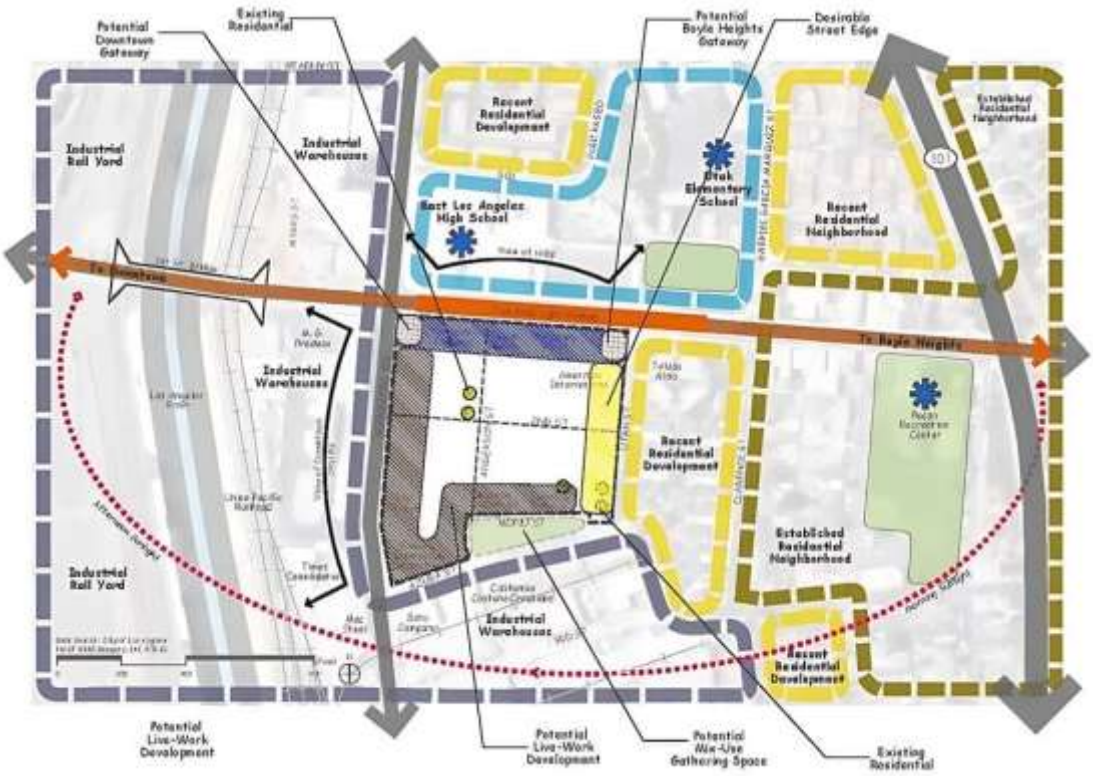

Figure N° 08: Access and Circulation

3.2. Public Transit Availability

Public transportation is one of the most critical aspects of urban infrastructure, impacting both the environmental footprint of a city and the daily lives of its residents. Cities that provide efficient public transit systems tend to have lower levels of traffic congestion and a reduced carbon footprint. Algiers, for example, has made significant progress with the expansion of its metro network, which now serves a significant portion of the population, reducing reliance on private cars and mitigating traffic congestion (Rezaei & Alborzi, 2019).

However, the public transit system in Algeria still faces challenges, particularly in reaching suburban areas and ensuring reliability during peak hours. Inadequate frequency of bus services and limited coverage outside the city center are major hurdles. According to Rezaei and Alborzi (2019), to improve public transit, cities need to invest in reliable and frequent bus networks, integrate different modes of transport, and ensure affordability for all citizens. Further investment in public transit infrastructure will be critical in reducing dependence on private vehicles, improving air quality, and making cities more sustainable.

3.3. Utilities and Essential Services

The availability of utilities such as water, electricity, and waste management is a fundamental aspect of urban life. In cities like Constantine, rapid urban growth has put significant strain on existing utility infrastructure, resulting in service shortages and interruptions (Rezaei & Khouadja, 2021). For example, many neighborhoods in Constantine experience frequent water shortages, particularly in summer months, due to the high demand and insufficient infrastructure to meet the needs of the growing population.

Urban planners must address these challenges by upgrading existing infrastructure and ensuring that future developments are equipped with resilient utility systems. According to Djouad and Mebarki (2023), the planning process must involve long-term projections of population growth and consumption to ensure that utilities can support the city's needs. Furthermore, sustainable practices such as rainwater harvesting, solar energy, and waste recycling can reduce the strain on urban utilities and contribute to environmental sustainability.

4. Built Environment

The built environment encompasses all human-made structures and spaces, including buildings, roads, bridges, and other physical elements that shape the urban landscape. It plays a crucial role in determining how people interact with their surroundings, as well as how they experience their environment. In this section, we will examine the key aspects of the built environment, focusing on urban structure and layout, the historical and archaeological significance of urban areas, the massing and density of buildings, and the architectural identity and local styles that define a city's character. The built environment is not only a reflection of the past but also an indicator of a community's values, aspirations, and its capacity to adapt to the future. Understanding how to balance functionality, aesthetics, and cultural identity is essential for creating cities that are both livable and resilient.

4.1. Urban Structure and Layout

The urban structure and layout of a city or neighborhood influence its functionality and aesthetics. Algiers, for example, exhibits a sharp contrast between its historic center, with its dense and compact layout, and the sprawling suburban areas that have emerged in recent decades. The historic layout, characterized by narrow alleys and dense building clusters, reflects the social and cultural life of the city (Lahcene et al., 2022). In contrast, the expansion of urban areas often leads to less cohesive planning, creating neighborhoods that may lack the social vibrancy and accessibility of more traditional urban spaces.

Urban planners must consider the existing urban structure and plan new developments to integrate with the existing environment while accommodating future growth. This involves creating mixed-use areas that combine residential, commercial, and recreational spaces, which can foster vibrant, walkable communities. The design and layout should prioritize accessibility and ensure that public spaces are strategically located to provide equitable access to services (Rezaei, 2021).

4.2. Historical and Archaeological Significance

Preserving the historical and archaeological heritage of a site is crucial for maintaining its cultural identity. In cities like Tlemcen, Algiers, and Constantine, historical monuments and sites play an integral role in the city's urban identity. The preservation of these sites, such as the Casbah of Algiers, a UNESCO World Heritage site, requires careful planning to ensure that new development does not negatively impact the historical integrity of the area (Rezaei, 2021).

Urban development must balance modern needs with heritage preservation. This requires the collaboration of urban planners, architects, historians, and local communities to ensure that both historical and contemporary elements coexist harmoniously. Sustainable urban development strategies also include adaptive reuse, where historical buildings are repurposed for new functions while retaining their cultural significance (Lahcene et al., 2022).

4.3. Building Massing and Density

Building massing refers to the size, shape, and arrangement of buildings, while density refers to the number of people or buildings within a given area. In Algeria, rapid urbanization, particularly in cities like Oran, has led to increased building density and taller buildings, which can create overcrowded and congested areas. Increased density, while necessary to accommodate growing populations, can have a negative impact on the quality of life if not managed properly (Rezaei & Khouadja, 2022).

Urban planners must carefully manage building massing and density to avoid overcrowding and ensure that there is sufficient access to public spaces, green areas, and community services. Strategies like vertical zoning, green building techniques, and the creation of public open spaces are critical to improving livability in high-density areas (Boudiaf et al., 2023).

4.4. Architectural Identity and Local Styles

Architectural identity refers to the distinctive features of a building or neighborhood that reflect the local culture, traditions, and history. In Algeria, cities like Ghardaïa, with its distinctive desert architecture, or Algiers, with its colonial and Islamic architectural heritage, demonstrate the importance of integrating local styles into urban planning (Rezaei & Nofre, 2024). Architectural identity fosters a sense of place and community, contributing to the social cohesion and cultural identity of a city.

Planners must consider the architectural context when designing new buildings to ensure they complement the surrounding environment. This can be achieved by using local materials, preserving traditional building techniques, and maintaining visual harmony with the existing architectural styles (Rezaei & Nofre, 2024). Ensuring that new developments respect the cultural and architectural identity of an area can significantly enhance the aesthetic appeal and livability of urban environments.

5. SWOT Analysis for Site Evaluation

Once all necessary data has been collected, conducting a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) allows architects and urban planners to assess the site's potential and constraints comprehensively. This method provides a structured

approach to identifying key factors that influence decision-making and development feasibility (Kheir & Shalaby, 2021). By leveraging the strengths and opportunities of a site while addressing its weaknesses and threats, planners can design sustainable and efficient urban projects.

5.1. Strengths

The strengths of a site are its inherent advantages that can enhance development. These may include:

- **Proximity to infrastructure:** Sites near existing roads, public transportation hubs, and essential services such as schools and hospitals offer better connectivity and accessibility, reducing costs related to infrastructure development (Rezaei & Nofre, 2024).
- **Favorable climate conditions:** Regions with moderate climates can reduce energy consumption for heating and cooling, making buildings more energy-efficient (Givoni, 1998). For instance, cities along the Mediterranean coast of Algeria benefit from mild winters and natural ventilation from sea breezes.
- **Unique landscape features:** Scenic views, water bodies, and green spaces can enhance the attractiveness of a site, increasing its real estate value and improving the quality of life for residents (Rahman & Saffa, 2022).

5.2. Weaknesses

Weaknesses are site-specific challenges that may hinder development or require additional resources to address. These can include:

- **Steep slopes and difficult terrain:** Construction on hilly or mountainous sites often requires costly excavation, retaining walls, and slope stabilization measures (Al-Obaidi et al., 2017). The Kabylie region of Algeria, for example, presents topographical challenges that influence building design and infrastructure planning.
- **Poor soil quality:** Sites with unstable or clay-heavy soils can lead to foundation problems and increased construction costs (Das, 2010). In Algiers, certain areas suffer from soil expansion and shrinkage, posing risks to structural stability.

- **Limited access to utilities:** The absence of essential services such as water, electricity, and sewage systems can significantly impact a site's development potential, requiring additional investment in infrastructure (Rezaei & Alborzi, 2019).

5.3. Opportunities

Opportunities refer to external factors that can enhance the site's value and sustainability if properly utilized.

- **Potential for sustainable development:** Sites with access to renewable energy sources (e.g., solar or wind energy) or proximity to natural ventilation corridors offer opportunities for green building initiatives (Shen et al., 2011).
- **Integration with surrounding urban growth:** If a site is located near expanding urban areas, there may be potential for economic and social integration, attracting businesses, investments, and improved services (Rezaei & Khouadja, 2022).
- **Cultural or historical value:** Locations with heritage significance can attract tourism and government funding for preservation and adaptive reuse (Bullen & Love, 2011).

5.4. Threats

Threats are external risks that could negatively impact the site's development and long-term viability.

- **Zoning restrictions and regulatory limitations:** Local urban planning regulations may impose height limits, land-use restrictions, or conservation requirements that affect development potential (Healey, 1997). In Algeria, strict zoning laws in historic districts such as the Casbah of Algiers limit new construction.
- **Environmental risks:** Flooding, landslides, and earthquakes pose significant threats to construction and long-term site stability (Smith & Petley, 2009). Coastal regions such as Annaba are particularly vulnerable to sea level rise and erosion.
- **Urbanization pressures:** Rapid population growth and unplanned expansion may lead to congestion, strain on public services, and environmental degradation (Seto et al., 2012). In cities like Oran, the demand for new housing has led to the

conversion of agricultural land into urban zones, raising concerns about food security and land sustainability.

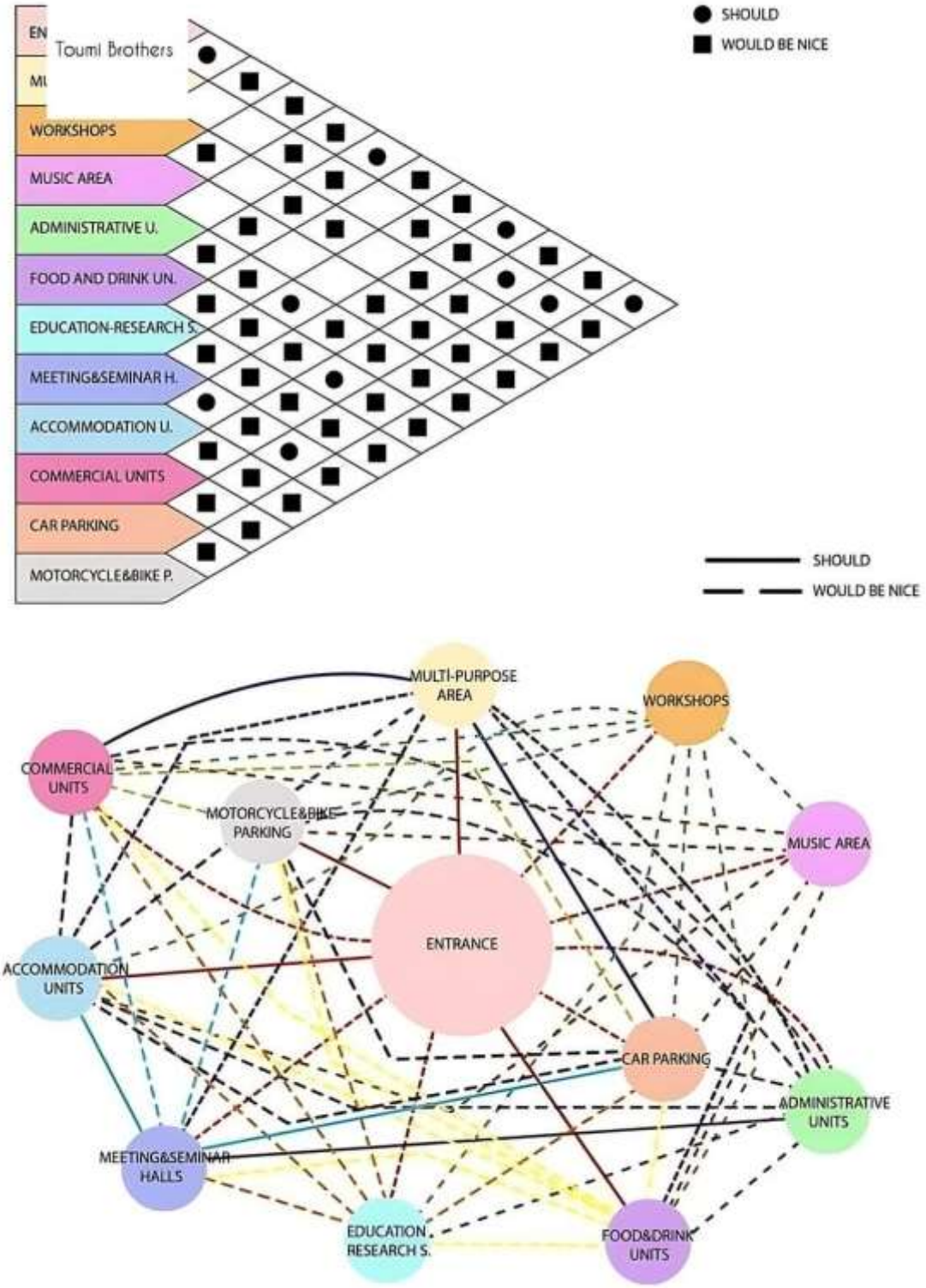

Figure N° 09: Spatial functional diagram

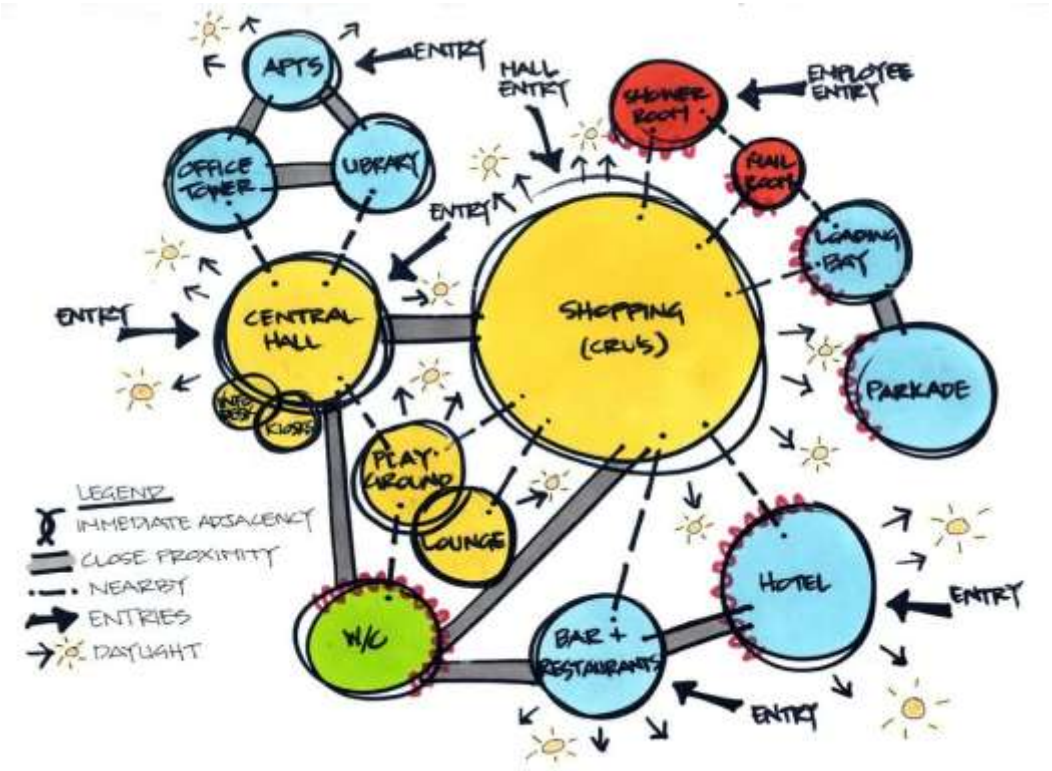

Figure N° 10: Orientation and sunshine

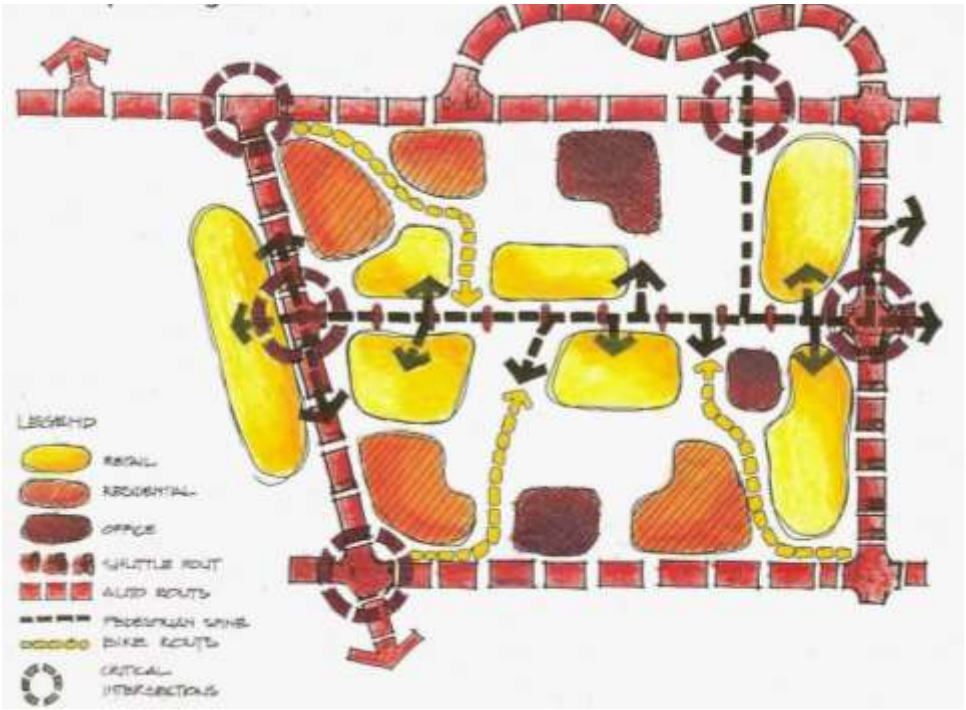

Figure N° 11: Accessibility and Circulation

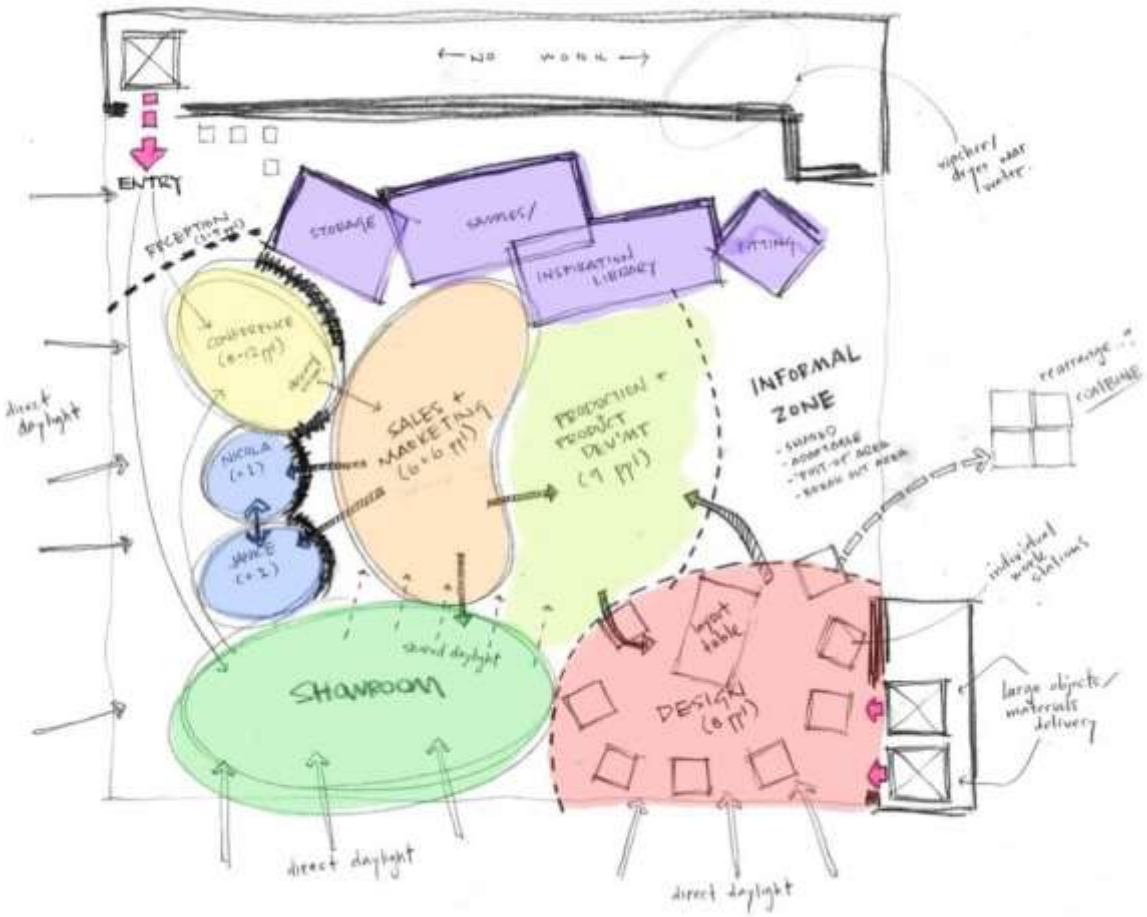

Figure N° 10: Zoning

A SWOT analysis provides a structured framework for assessing a site's strengths, weaknesses, opportunities, and threats, enabling urban planners and architects to develop context-sensitive solutions. By identifying key challenges and potential advantages, decision-makers can implement strategies that maximize site potential while mitigating risks. Integrating environmental sustainability, regulatory considerations, and infrastructural needs into the planning process ensures that urban developments are resilient, adaptable, and beneficial to both present and future generations.

Conclusion

site analysis is an indispensable tool in urban planning and architecture, enabling professionals to evaluate the diverse factors that shape a location. By studying social, environmental, and infrastructural conditions, planners and designers can develop strategies that harmonize with the surrounding context while promoting sustainability and

functionality. The way built environments interact with landscapes, transportation systems, and community dynamics greatly influences the overall success and livability of urban spaces.

Beyond guiding architectural design, site analysis also addresses broader concerns such as economic feasibility, social inclusion, and environmental conservation. A thorough understanding of a site ensures that urban development not only meets present needs but also anticipates future growth and challenges.

As cities continue to expand and transform, integrating site-specific analysis into planning and design processes becomes even more critical. By considering the various aspects outlined in this course—ranging from cultural heritage to ecological sustainability—architects and urban planners can create developments that enhance both the built and natural environment while preserving the unique identity of each location.

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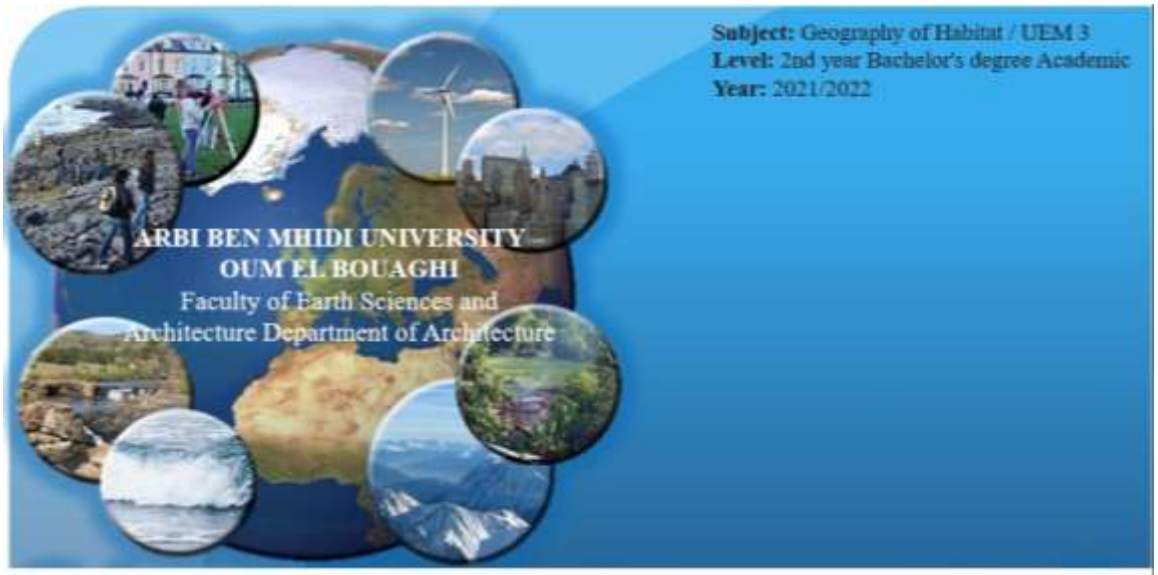
Course N°05: Habitat and Its Functions



Course n°05 :
Habitat and Its Functions

Enseignante:
Dr. GUECHI Imen

Introduction

As a fundamental element in the structuring of geographic space, housing plays an essential role in the organization and development of human societies. It not only provides a place to live, but also reflects the cultural, social and economic characteristics of a population. In the Algerian context, the study of housing offers valuable insights into how people interact with, adapt to and develop their environment to meet their needs and aspirations. Through this analysis, it is possible to grasp the diversity of habitat forms, whether in major metropolises such as Algiers and Oran, where rapid urbanization is shaping new landscapes, or in more isolated rural regions such as Kabylia or the Hauts Plateaux, where housing practices often remain rooted in distinct traditions and lifestyles.

Algerian housing, whether urban or rural, bears witness to a constant dynamic of transformation. Economic mutations, social transitions and political upheavals directly influence the configuration of living space. Rapid urbanization, the expansion of peri-urban areas and demographic growth continue to redefine the contours of towns and villages, while environmental challenges, notably climate change and natural hazards, are driving a rethinking of land use planning. In addition, the cultural and historical specificities of the various Algerian regions add a local dimension to these developments.

Geographical analysis of housing is a multi-disciplinary approach that integrates social sciences, economics, political issues and environmental considerations. Indeed, understanding Algerian housing requires a holistic approach that goes beyond the physical dimensions of buildings to include the social practices that shape the use of space, the distribution of economic activities, and the challenges of governance and public policy. This complexity is all the more marked given that housing in Algeria evolves at the crossroads of specific local dynamics and global phenomena that have a direct or indirect impact on the way space is occupied and developed.

Thus, the study of housing in Algeria is not only a tool for observing development trends, but also a means of understanding social and environmental responses to a constantly changing environment. Recent research, such as that by Bendjelid et al (2021), emphasizes that these dynamics are strongly influenced by socio-economic and political factors, and highlights the interdependence between habitat, culture and sustainable development.

Changes in Algerian housing therefore reflect not only the modernization or westernization of space, but also adaptation to local cultural specificities and environmental imperatives.

1. Habitat definitions

1.1. Geographical Definition

In the geographical dictionary by Brunet (1993), habitat is defined as the collection of constructions intended to house populations. This concept applies to both urban and rural areas. Habitat, in this perspective, encompasses individual houses, collective buildings, and more specific structures such as traditional homes or temporary dwellings. In Algeria, this definition finds a broad application, ranging from large collective buildings in urban neighborhoods like Algiers or Oran to traditional homes built from earth or stone in regions like the ksour (fortified villages) of the South, which testify to an adaptation to specific geographical and climatic constraints. This geographical context is reflected in the diversity of habitat forms, where a clear distinction can be observed between modern urbanization and traditional constructions, illustrating the differences between urban and rural Algeria.

1.2. UNESCO's Definition

UNESCO (2006) provides a broader definition of habitat by incorporating not only the physical aspect of buildings but also the social, economic, and cultural dimensions. This definition highlights habitat as a fundamental human right essential to human development and quality of life. In Algeria, the issue of habitat is particularly crucial given the socio-economic disparities between urban and rural areas. The example of policies aimed at addressing precarious housing, such as the RHP (Renovation of Precarious Housing) program in Algiers, exemplifies this integrated approach. This program not only focuses on rehabilitating the physical structures of precarious housing but also aims to improve the living conditions of the population by considering the social (access to basic infrastructure), economic (job creation), and cultural (respect for local traditions and lifestyles) dimensions. In doing so, UNESCO places habitat at the heart of sustainable development, viewing it as a pillar for improving quality of life and respecting human rights.

1.3. Anthropological Definition

Georges Condominas (1980), an anthropologist and ethnologist, provides a different perspective on habitat, considering it as a cultural manifestation of a way of life. According to him, habitat is not just a functional space but a true reflection of cultural choices and social relations within a community. These construction choices are often influenced by environmental factors (climate, geography) and ancestral practices passed down through generations. In Algeria, this is reflected in habitat forms that vary significantly depending on the region. For example, the mud-brick houses in Ghardaïa, adapted to the desert heat, or the stone buildings in the Aurès Mountains, are examples of local adaptations to the natural environment. These habitats are not just responses to the need for shelter, but also cultural and historical symbols, carrying the values and craftsmanship specific to each region.

1.4. Synthèse

Thus, habitat, beyond its physical and functional dimensions, is a valuable witness to social relationships, ways of life, and spatial organization choices. In Algeria, it evolves within a context marked by rapid modernization, demographic pressure, and the ruralization of cities, which is evident in the expansion of suburban areas and the construction of new types of housing. Moreover, public policies play a determining role in this evolution, whether through urban renewal projects, the development of new infrastructure, or social housing policies. According to Remaki (2020), this dynamic is also the result of interactions between the state, private actors, and citizens, each seeking to meet different needs while considering economic and social constraints. Therefore, habitat in Algeria reflects the tensions between the past and present, tradition and modernity, while being an essential component of sustainable development through the improvement of the population's living conditions.

2. Habitat Classification

Habitat in Algeria, in its diversity, can be classified in various ways based on several criteria, such as location, morphology, and construction materials. These classifications help in understanding habitat dynamics and identifying the specific challenges each type faces, considering both socio-economic and geographical contexts.

2.1. According to Location

The geographical location of habitat plays a significant role in shaping its characteristics and development. In Algeria, two main types of habitat are distinguished based on this dimension: urban and rural

2.1.1. Urban Habitat

Urban habitat in Algeria is characterized by high population density and rapid urbanization, particularly after independence. It includes large housing projects such as those in Bab Ezzouar and Kouba in Algiers, or industrial zones in cities like Annaba and Constantine. These urban areas are marked by strong demographic pressure and accelerated development, often accompanied by challenges related to access to basic services and urban management (Boualem, 2018).

Figure N°01 : Urban Habitat

2.1.2. Rural Habitat

Rural habitat, although less dense, remains dominant in some agricultural regions, particularly in the South and mountainous areas. In oases like Touggourt and Timimoun, homes are traditionally built around the palm groves using local materials, reflecting a specific adaptation to the Saharan climate. These habitats are often spread out and display distinct characteristics based on geographic and climatic particularities.

Figure N°02 : Rural Habitat

2.2. According to Morphology

The morphology of habitat refers to how buildings are arranged and distributed in space. Based on this criterion, several specific configurations can be observed in Algeria.

2.2.1. Clustered

Clustered habitat is typical of Berber villages, especially in Kabylie (Tizi-Ouzou), where homes are concentrated around a shared space, often for security and community solidarity. This arrangement fosters strong social cohesion and collaboration among community members (Bessaoud, 2011).

Figure N°03 : Berber villages

2.2.2. Dispersed

Dispersed habitat is primarily observed in agricultural areas of the High Plateaus, such as Tébessa and Sétif. This housing model is influenced by isolation and the nature of the arable land. Homes are often spaced out from each other, reflecting the agricultural organization of these regions.

Figure N°04 : Dispersed Habitat

2.2.3. Linear

Linear habitat is found along major communication routes, such as National Roads RN1 and RN4. This type of habitat follows the communication axes, facilitating access to both urban and rural infrastructure. It reflects modern territorial organization, where homes are aligned along roads to maximize access to services and economic zones.

Figure N°05 : Linear Habitat

2.3. According to Construction Materials

Classifying habitats based on construction materials is also important, as it reveals the technological and economic choices made based on local resources and construction standards.

2.3.1. Durable

In urban centers, habitat is typically built with durable materials such as reinforced concrete or bricks, in line with modern construction standards. This type of construction is common in Algiers, Oran, and other large cities, where residential complexes are built as part of government housing projects (AADL, 2022).

2.3.2. Semi-Durable

Semi-durable habitats, combining both modern and traditional materials, are often found in peri-urban areas like Ouargla or Batna. These homes use materials such as concrete, brick, or even clay, integrating traditional construction techniques adapted to local needs.

2.3.3. Precarious

Precarious habitats are typically found in slums or informal settlements, where buildings are constructed using salvaged materials such as sheets of metal, wooden planks, and other

non-durable materials. These dwellings often fail to provide a quality living environment, and access to hygiene and basic services is typically very limited (Aït Hamadouche, 2016).

3. Functions of Habitat

The functions of habitat extend beyond the simple notion of providing shelter. A habitat serves as a multidimensional space that supports human life in its residential, economic, social, and cultural aspects. At its core, it offers physical protection and a private sphere where individuals and families find security, rest, and emotional well-being. In many regions, especially in traditional and semi-urban settings, the home also serves as a site for economic activities, such as small-scale commerce or craftsmanship, turning it into a multifunctional space that sustains livelihoods. Furthermore, the habitat acts as a social and cultural mirror, reflecting the identity, values, and traditions of its inhabitants. From the religiously influenced urban forms in the Mzab Valley to the multi-generational family homes in Kabylie, the structure and organization of habitat embody a rich tapestry of heritage, community life, and adaptation to environmental and societal contexts. Thus, habitat is not merely a structure, but a living environment that shapes and is shaped by human life.

3.1. Residential Function

The primary role of habitat is to provide shelter and a private space for individuals and families. In both urban centers such as Tizi Ouzou and more arid regions like Laghouat, housing fulfills the essential need for physical protection from environmental conditions as well as a symbolic sense of security tied to cultural and familial values. This function emphasizes the intimate and protective nature of the home, which serves as a sanctuary for daily life and family interactions (Saadi, 2015).

3.2. Economic Function

In many Algerian regions, housing is not limited to residential use; it also integrates economic activities. In Ghardaïa, for example, many homes incorporate workshops, artisanal production areas, or small-scale commercial spaces, reflecting the traditional multifunctional nature of the habitat. This type of housing supports livelihoods directly from the domestic space, reinforcing economic resilience, especially in semi-urban or rural

communities (Zerrouki, 2019). The multifunctional habitat allows for the interweaving of economic and domestic spheres, which is essential in informal economies and traditional urban settings.

3.3. Social and Cultural Function

Habitat is also a medium of cultural expression and social structure. In regions like the Mzab Valley (ksour), architectural forms and spatial organization reflect religious norms, communal values, and social hierarchies. The design of homes and neighborhoods adheres to spiritual and social principles that dictate orientation, access, and layout. Similarly, in Kabylie, housing reflects the extended family traditions, with homes built to accommodate multiple generations and foster communal living. This reveals how habitat is not merely functional, but deeply embedded in cultural identity, social cohesion, and collective memory (Moinet, 2020)

4. Factors Influencing Habitat

4.1. Natural Factors

Natural conditions play a fundamental role in shaping the form, materials, and layout of human settlements. Climate, topography, and the availability of local natural resources determine the most appropriate construction techniques. In southern Algeria, for example, the use of rammed earth (pisé) is common due to its excellent thermal insulation against extreme heat. In mountainous areas, stone is often used because of its abundance and ability to withstand harsh weather. These adaptations are essential to ensure comfort, sustainability, and resilience to environmental constraints.

4.2. Economic Factors

Economic context influences both the type and quality of housing. Households' income levels, the cost of building materials, and the dominant economic activity (agriculture, manufacturing, or services) affect construction styles and residential density. In urban centers like Algiers, neighborhoods such as Hydra; known for its affluence; and Bab El Oued; with more modest housing; highlight the spatial inequalities tied to socio-economic

status (Benyahia, 2015). The availability of employment, access to credit, and urban real estate prices are also critical in shaping residential landscapes.

4.3. Socio-Cultural Factors

Cultural and social traditions significantly influence how living spaces are designed and used. In many parts of Algeria, extended family structures require multi-generational housing, often with separate spaces for men and women to comply with religious norms and privacy requirements. For instance, in traditional homes, interior courtyards help preserve family privacy while promoting communal life within the household. Religious beliefs, gender roles, and community customs shape not only the physical layout of homes but also how spaces are used and interacted with (Benmecheri, 2013).

4.4. Political and Historical Factors

The evolution of habitat is also deeply linked to political decisions and historical events. The colonial legacy has left lasting marks on the urban fabric, including spatial segregation and housing typologies. Post-independence, Algeria undertook several public housing programs; such as AADL (Assistance for Access to Housing), LSP (Social Housing Program), and LPP (Public Promotional Housing); to address housing shortages and social needs. Additionally, efforts to eradicate informal settlements through slum clearance policies have reshaped many urban zones (Khelifi, 2021). These state-led initiatives continue to influence urban morphology and access to housing across the country.

5. Habitat Problems

Housing challenges are among the most pressing urban issues in many developing regions. These problems range from poor living conditions and overcrowding to a shortage of affordable housing and disorganized urban expansion. In cities like Algiers and Constantine, deteriorating buildings threaten resident safety, while rapid rural migration intensifies the housing demand. Additionally, unregulated construction and a lack of effective urban planning contribute to chaotic urban growth, making it difficult to ensure sustainable and inclusive living environments.

5.1. Qualitative Problems

Many urban areas suffer from poor housing quality, including unsanitary conditions, overcrowding, and deteriorating infrastructure. In the historic districts of Algiers and Constantine, for example, old apartment buildings are in a state of disrepair, posing serious risks to residents.

5.2. Quantitative Problems

There is a significant housing shortage in many cities, exacerbated by rural-to-urban migration. In Algiers, the demand for housing far exceeds the available supply, despite various government programs and large-scale housing projects (Aït Hamadouche, 2016).

5.3. Urban Planning Issues

Uncontrolled urban sprawl and illegal constructions; common in areas such as Boumerdès and Tipaza; complicate efforts to create sustainable and well-planned urban environments. These issues hinder infrastructure development and challenge territorial governance.

6. Habitat policies

Housing policies play a critical role in shaping the urban landscape and ensuring equitable access to shelter. In Algeria, the state has taken an active role in formulating and implementing housing policies aimed at addressing the diverse challenges posed by urban growth, housing shortages, and social disparities. Key objectives include providing adequate housing for all segments of the population, reducing spatial and social inequalities, and improving the overall quality of urban life.

Since the early 2000s, major housing programs have been launched to meet these goals. The AADL (Agence Nationale de l'Amélioration et du Développement du Logement) program, introduced in 2001, targets middle-income families through a rent-to-own model. The LSP (Logement Social Participatif) focuses on lower-income households, while the LPP (Logement Promotionnel Public) serves higher-income earners looking for upgraded housing options.

In terms of implementation, the government employs several mechanisms:

- **Urban planning**: to guide spatial development and ensure infrastructure availability.
- **Mass housing construction**: to meet growing demands in both urban and peri-urban zones.
- **Regularization of informal settlements**: to integrate unplanned neighborhoods into the formal city structure.
- **Urban renewal**: including the restoration of historic districts like the Casbah of Algiers, aiming to preserve cultural heritage while improving living standards.

Despite these efforts, challenges remain, especially in balancing rapid urban development with sustainable and inclusive planning. Nonetheless, Algeria's housing policies reflect a proactive strategy toward social stability and urban resilience.

Conclusion

In conclusion, habitat is not just the physical space where people live, but a complex system influenced by numerous factors, including geography, economics, culture, and politics. This course has explored the diverse definitions and classifications of habitat, shedding light on the intricate relationships between humans and their living environments. We have examined the three primary functions of habitat—residential, economic, and social—which all contribute to the well-being and development of communities. Whether urban or rural, habitats are fundamental in providing shelter, fostering economic opportunities, and sustaining cultural values.

However, as we continue to witness the challenges of rapid urbanization, climate change, and socio-economic disparities, it is evident that the current models of housing are not always sustainable or adequate. The factors influencing habitat, from natural resources to socio-cultural dynamics, require careful consideration in the formulation of housing policies. Effective urban planning and housing policies must address both the qualitative and quantitative issues associated with habitat, ensuring that every individual has access to safe, affordable, and sustainable housing.

The problems in housing are not just about the physical structures; they also involve broader issues such as accessibility, affordability, and social inclusion. By understanding the various challenges related to habitat, we are better prepared to advocate for policies that can promote more equitable and sustainable living environments. The knowledge gained from this course will empower students to engage in meaningful discussions on how to improve housing conditions, whether in their own communities or globally.

Ultimately, as housing continues to be a central issue in both developing and developed countries, the ability to design, implement, and evaluate housing policies that meet the needs of diverse populations is critical. This course aims to provide the tools and insights necessary to understand the complexities of habitat and to contribute to the development of housing solutions that foster social, economic, and environmental sustainability for future generations.

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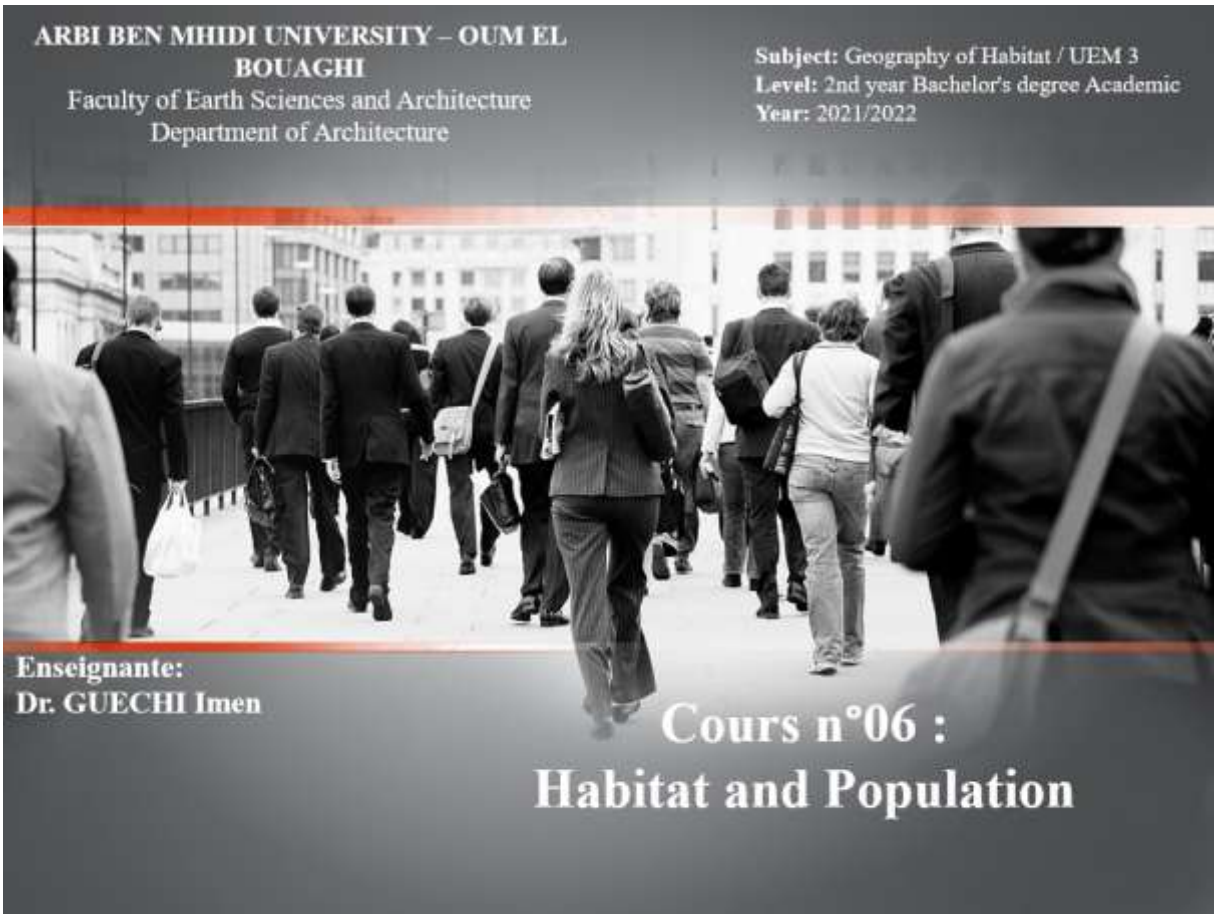
Course N°06 : Habitat and Population



Introduction

The relationship between habitat and population is a key area of study in urban geography and sociology. Habitat refers to the physical space where humans live, work, and interact, while population refers to the human groups that occupy and modify these spaces. The growth, distribution, and movement of populations directly affect the characteristics and types of habitats, just as the environment shapes the way people live. Understanding this relationship is crucial for urban planning, social policies, and sustainable development. The primary objective of this course is to explore how population dynamics influence the development and characteristics of habitats, and vice versa. We will examine the impact of demographic changes, migration patterns, and urbanization on habitat formation, and discuss the role of habitat in shaping economic and social outcomes.

1. Geographies and Population

1.1. Geographical Dynamics of Population

The study of population geographies examines how the distribution of populations across territories influences the characteristics of habitats. Urban areas, in particular, experience rapid changes in terms of density and spatial organization. Migration, urbanization, and demographic shifts alter these geographical dynamics and necessitate a revision of urban policies and development strategies.

As populations shift from rural to urban environments, the demand for housing, infrastructure, and services increases, often transforming the urban landscape. For example, in cities like Algiers, urban growth has resulted in both vertical development and horizontal sprawl, reflecting these demographic shifts (Benabbas-Kaghouche & Moyate, 2015). The geographical dynamics of population also encompass the movement of people within and between regions, affecting how urban spaces are developed and utilized.

1.2. Migration and Its Impact on Population Geography

Migration flows, whether internal or international, reshape the distribution of populations and directly affect the structure of habitats. For example, rural-to-urban migration leads to

denser urban environments, creating pressures on existing infrastructure and housing markets. Similarly, international migration brings new social and cultural dynamics to receiving areas. This shift is evident in many Algerian cities, where rural migrants often end up in informal settlements (Bocquier & Traoré, 2000).

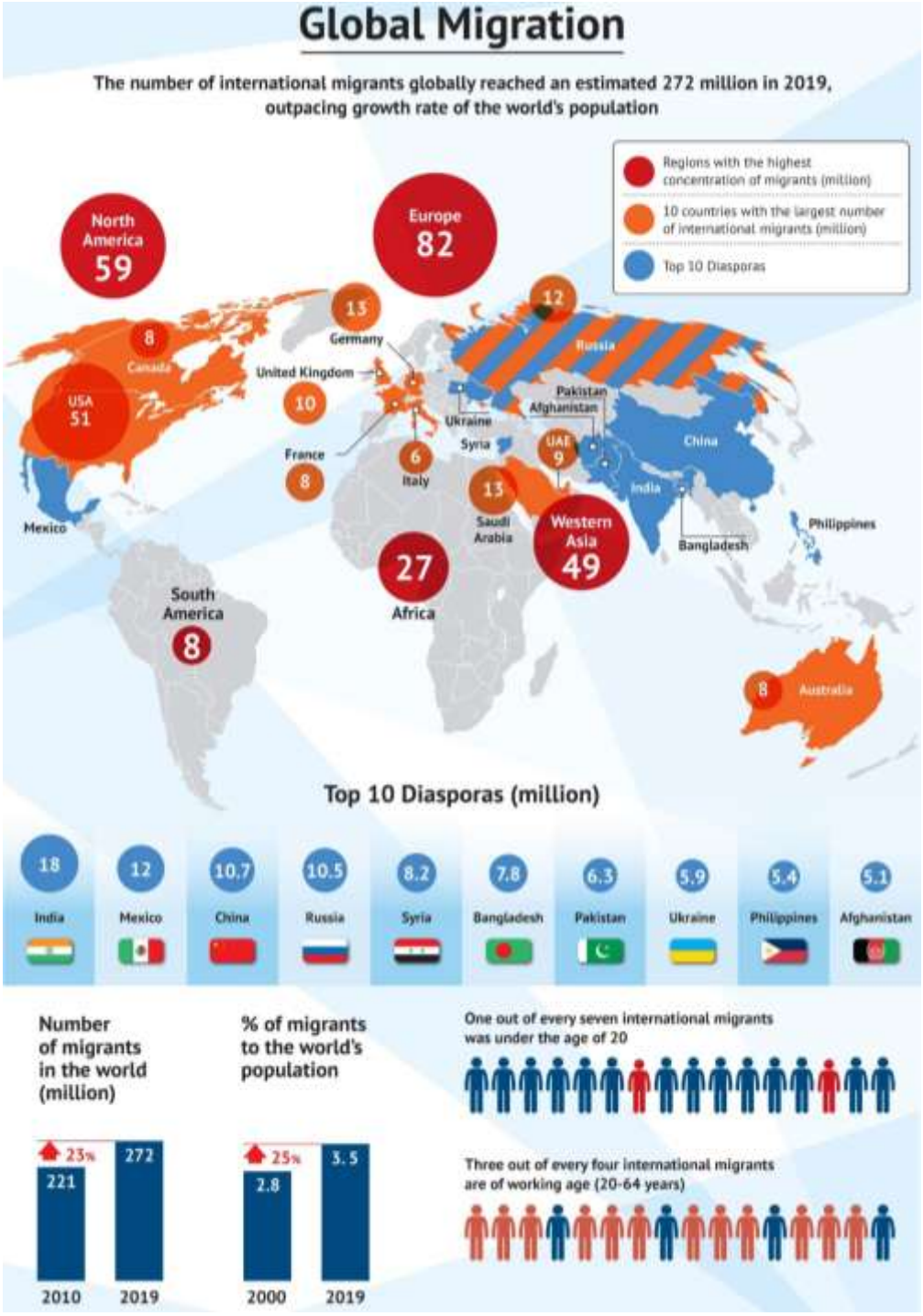


Figure N° 01: Global migration

2. Population Structure

2.1. Demographic Composition and Social Structure

Population structure refers to the distribution of the population according to various criteria such as age, sex, social class, and other demographic indicators. These structures influence the demand for housing, particularly regarding the types of housing required, as well as educational and health infrastructures and housing policies. A young population, for instance, may demand more housing for students and workers, while an aging population may require specialized housing for elderly residents.

In Algeria, the demographic composition has evolved, with cities like Oran and Constantine experiencing shifts in both the age distribution and the urban structure due to migration and economic changes (Morris, 1988). Understanding the demographic structure of a population is key to addressing housing needs and planning for future development.

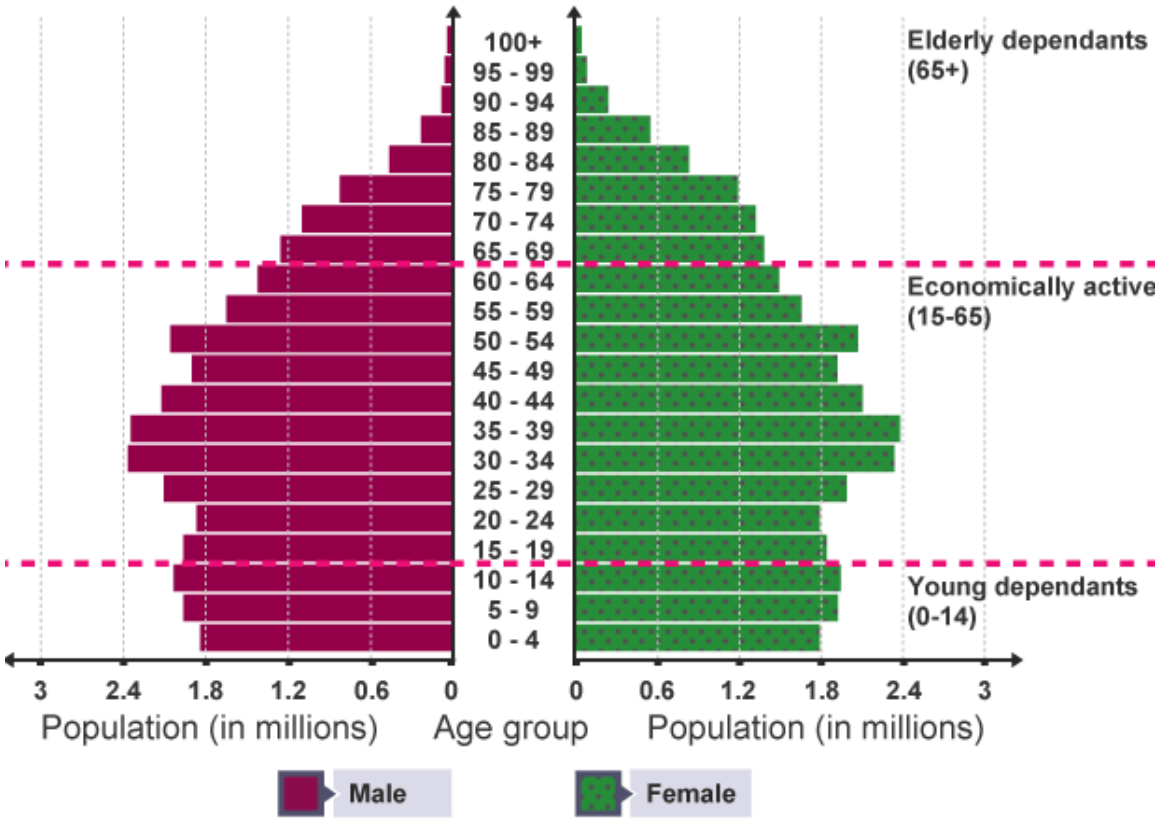


Figure N° 02: Demographic Composition

2.2. Impact of Demographic Changes on Habitats

Changes in population structure, such as the aging of the population or a growing working-age population, influence the way cities develop. A population that is aging may have different housing needs, such as accessible housing, while a growing working-age population may require more affordable housing or commercial spaces. These demographic changes have a significant impact on urban planning, influencing the design and distribution of different types of housing (Sahnoune & Messaoudi, 2020).

In cities like Algiers, which have seen rapid growth, these shifts in demographic composition can result in uneven access to housing and services, further deepening social inequalities (Véron, 2006).

3. Relationship between Habitat and Population

3.1. Impact of Population on Habitat

- **Population Growth and Urbanization**
  The rapid growth of the human population, especially in urban areas, leads to increased demand for housing and infrastructure. Urbanization, the process by which rural populations move to cities in search of better economic opportunities, often results in the expansion of urban areas. As a consequence, new forms of housing are developed, including apartment complexes, vertical housing, and informal settlements. Urban sprawl, driven by both population growth and migration, leads to changes in land use and urban infrastructure (Morris, 1988; Bocquier & Traoré, 2000).
- **Expansion of Urban Zones and New Forms of Habitat**
  The growth of cities such as Algiers, Oran, and Constantine, among others, has been marked by the expansion of urban zones. This includes the construction of new neighborhoods, industrial areas, and commercial zones. New types of housing, such as high-rise buildings and planned communities, are designed to accommodate the increasing population. However, this expansion also raises challenges regarding infrastructure, resource management, and social equity (Benabbas-Kaghouche & Moyate, 2015; SAADI, 2015).

3.2. Impact of Habitat on Population

- **Living Conditions and Quality of Habitat**
  The quality of housing and the living environment can significantly affect the well-being of the population. In urban areas, poor living conditions, such as overcrowded neighborhoods and inadequate sanitation, can contribute to poor health outcomes. On the other hand, well-planned neighborhoods with access to essential services, such as clean water, healthcare, and education, can enhance the quality of life and contribute to a more productive and healthy population (Moinet, 2020).
- **Influence of Habitat on Health, Safety, and Well-being**
  Housing conditions have direct implications for the health and safety of individuals. For example, substandard housing, such as slums or informal settlements, may expose residents to health hazards, including poor air quality, waterborne diseases, and inadequate waste disposal. Additionally, housing insecurity and lack of safety in certain areas can affect residents' psychological well-being and social stability (Sahnoune & Messaoudi, n.d.).
- **Population Distribution Across Different Types of Habitats**
  The way populations are distributed across different types of habitats influences social and economic outcomes. In cities, wealthier populations may reside in well-serviced areas with better infrastructure, while low-income groups may live in informal settlements or peri-urban zones. Understanding this distribution helps policymakers address inequalities and plan for inclusive urban development (Jarrige, 2004).

4. Evolution of Habitat Based on Population

4.1. Urbanization and City Development

- **Urbanization Processes and Urban Planning**
  Urbanization refers to the movement of people from rural areas to cities. This process involves the development of infrastructure, housing, and public services to accommodate the growing urban population. Urban planning plays a crucial role in managing this growth by ensuring that cities develop in a sustainable and

organized way. Planners aim to create livable cities with green spaces, efficient public transportation, and access to essential services (Véron, 2006; Antoine & Savané, 1990).

- **Examples of Major Cities (Algiers, Oran, Constantine) and Their Evolution**
  The cities of Algiers, Oran, and Constantine have experienced significant urbanization over the past few decades. Algiers, for instance, has transformed from a colonial city into a modern urban center. This transformation has involved the development of new neighborhoods, commercial districts, and cultural centers. Similarly, Oran and Constantine have seen rapid population growth and urban expansion, with new infrastructure projects aimed at accommodating the growing demands of the population (Bocquier & Traoré, 2000; Sahnoune & Messaoudi, n.d.).

4.2. Migrations and Habitat Transformations

- **Internal and External Migrations (Rural to Urban, Border Towns)**
  Migration, both internal (rural to urban) and external (immigration from neighboring countries), plays a significant role in shaping the habitat. In Algeria, internal migration from rural areas to urban centers has been driven by the search for better economic opportunities, education, and healthcare. Border towns often experience external migration due to their proximity to neighboring countries, influencing local habitat conditions (Bocquier & Traoré, 2000; Jarrige, 2004).
- **Consequences on Habitat Types**
  Migrations result in the formation of new types of habitats, including informal settlements in cities, as well as changes in rural housing structures. For instance, many rural migrants settle in peri-urban areas or on the outskirts of cities, where they often construct informal homes due to limited access to formal housing markets. This migration creates challenges in terms of housing quality, infrastructure development, and social integration (SAADI, 2015; Benabbas-Kaghouche & Moyate, 2015).

5. Habitat as a Factor of Development

5.1. Habitat and Economic Growth

- **Links Between Habitat Quality and Economic Development**
  High-quality habitats are essential for economic development. Proper housing, good infrastructure, and access to essential services contribute to a productive workforce and attract investments. Cities with well-developed habitats offer better opportunities for businesses, industries, and entrepreneurs to thrive, which in turn stimulates economic growth (Véron, 2006).
- **Role of Habitat in Productivity and Job Creation**
  The type of habitat can influence the economic activities that take place within a region. Industrial zones, for example, provide employment opportunities for local populations. Housing development also creates jobs in construction, architecture, and urban planning, which are crucial for the overall economic development of the country (Morris, 1988).

5.2. Habitat and Social Equity

- **Access to Habitat for All Social Categories**
  Social equity in housing means ensuring that all segments of society have access to decent living conditions. Unfortunately, many regions experience disparities in housing access, with marginalized groups living in substandard conditions. Addressing these disparities is vital for ensuring social stability and reducing inequality in urban areas (Bocquier & Traoré, 2000; Sahnoune & Messaoudi, n.d.).
- **Disparities in Access to Adequate Housing**
  The gap between rich and poor populations in terms of housing access is a persistent issue in many cities. Wealthier populations often live in well-planned, secure, and high-quality housing, while poorer populations may be relegated to informal settlements with limited access to services. Tackling these disparities requires effective public policies that focus on affordable housing, slum rehabilitation, and equitable resource distribution (Benabbas-Kaghouche & Moyate, 2015).
- **Public Housing Policies and Slum Resettlement**
  Governments often implement policies to address the housing needs of low-income

populations. In Algeria, programs aimed at reducing slums and providing affordable housing have been initiated, but challenges remain in terms of financing, land availability, and effective implementation. These programs must address both the physical and social dimensions of housing to create sustainable and inclusive communities (Moinet, 2020).

Conclusion

In conclusion, the relationship between habitat and population is complex and multifaceted. Population growth and migration significantly influence the development of housing and urban spaces, while the quality of habitats has a profound impact on the health, safety, and economic outcomes of populations. The evolution of cities and rural areas in response to demographic changes requires careful planning and policy interventions to ensure sustainable urban development.

The role of habitat in economic development and social equity cannot be overstated. Governments and urban planners must focus on creating inclusive, high-quality habitats that promote social mobility and economic growth. Addressing housing inequalities and improving living conditions are essential for building resilient and thriving communities.

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Course N°07: Mechanisms and Processes of the Formation of Built Space

Introduction

The built environment is a term that encompasses the various human-made structures and infrastructures that constitute the spaces we inhabit. It includes not only buildings, but also urban infrastructure, roads, parks, public spaces, and the arrangement and organization of these elements within a given geographic area. The design and development of the built environment are deeply intertwined with various factors such as history, culture, society, economy, and technology. These factors influence how spaces are constructed, organized, and utilized, with lasting effects on the quality of life, social dynamics, and sustainability of urban areas.

In Algeria, the built environment is of particular importance due to the country's rich history, diverse cultural heritage, and rapid urbanization. The country’s architectural and urban landscapes have been shaped by a series of historical influences, from ancient Berber civilizations to Roman, Islamic, and French colonial architectures. These diverse legacies coexist in Algeria's cities and rural areas, creating a unique blend of traditional and modern elements that influence how space is experienced and utilized today. Furthermore, Algeria faces significant challenges related to urban sprawl, population growth, and the need for sustainable development, all of which place additional pressure on the built environment.

This course aims to explore the mechanisms and processes involved in the creation and transformation of the built environment in Algeria. By analyzing the historical evolution of architecture and urbanism, the course will examine how various factors; ranging from technological advancements to societal changes; have shaped the urban landscape over time. Additionally, we will look at the current dynamics that influence urban growth, focusing on contemporary issues such as urbanization, sustainability, and the role of new technologies in shaping future cities. The objective is to provide a comprehensive understanding of how the built environment in Algeria has developed and the ways in which it continues to evolve in response to modern challenges.

1. History of the Built Environment

1.1. Evolution of Architectural Styles

Architecture in Algeria, like in other regions, has evolved over the centuries due to cultural influences, socio-economic needs, and technological innovations. Berber architecture, for example, has always favored the use of local materials (such as adobe), with a strong integration into the environment. According to Bailly (1974), the evolution of architecture is deeply tied to the perception and representation of urban landscapes, influenced by social and cultural transformations.

The influence of Roman and Islamic civilizations has also been pivotal. Timgad and Djemila, for instance, are representative sites of Roman urbanism, with their street grids and public infrastructures (Thomsin, 2001). On the other hand, Islamic architecture introduced elements like riads and inner courtyards, providing both practical and aesthetic solutions to climatic constraints.

1.2. Influence of Ancient Civilizations

The influence of ancient civilizations remains fundamental in Algerian architecture. According to Quéré (1992), Roman constructions, particularly cities built on orthogonal grids, played a crucial role in the structuring of urban spaces. Berber and Andalusian heritage, especially the use of stone and earth, has also been integrated into modern constructions, illustrating a continuity of ancient practices throughout the ages.

2. Key Concepts of Built Space

2.1. Definition of Built Space

Built space is defined as the physical arrangement of all human-created elements designed to organize an environment. It includes buildings, infrastructures, public spaces, and residential areas. Built space reflects societal ideals and human needs at a given moment, influenced by cultural, economic, and political factors (Bailly et al., 1980). In Algeria, this concept is

particularly marked by an interaction between local traditions and modern requirements related to urbanization.

Urban architecture in Algeria, for example, has often been divided between large-scale modern neighborhoods and older historical spaces, creating contrasting dynamics in the management of urban space.

2.2. Difference Between Public and Private Space

Public and private spaces are of crucial importance in the organization of human societies. Public space includes streets, squares, parks, and all areas accessible to all, serving as places for socialization and circulation. According to Habermas (1992), public space is a sphere where individuals can interact and deliberate, thus facilitating the emergence of citizenship.

In Algeria, this distinction is particularly marked in the medinas, where public spaces such as souks or squares are at the heart of social life. On the other hand, private space is often associated with homes, where the interior configuration, such as inner courtyards in traditional houses, aims to preserve privacy while remaining connected to the outer space.

3. Design Mechanisms

3.1. Urban Planning Process

The urban planning process in Algeria has been shaped by colonial influences and a strong centralization of land management. Contemporary urban plans must address challenges related to rapid population growth and urban sprawl (Angeon et al., 2006). However, in recent years, participatory and sustainable approaches have increasingly been integrated into the design of urban spaces.

Urban planning in Algeria involves the use of tools such as Territorial Coherence Schemes (SCOT) and Urban Planning and Development Plans (PUAT), which aim to organize land use and address issues related to natural resource management and pollution.

3.2. Role of Architects and Urban Planners

Architects and urban planners play a central role in the design of spaces. Their mission is to create structures that are both functional and aesthetic, while also addressing social and environmental imperatives. In Algeria, architects face an additional challenge: reconciling modernity with a rich architectural heritage. As Brunet (1980) emphasizes, contemporary urban planning must integrate the memory of the past while considering the future needs of populations. The rapid evolution of technologies, such as BIM (Building Information Modeling), now allows for better management of architectural projects, integrating both ecological concerns and technical requirements (Pellegrino, 2000).

3.3. Sustainable Urban Planning Practices

This section could focus on the growing trend of sustainable and eco-friendly urban planning in Algeria. It could discuss the integration of green spaces, energy-efficient buildings, and the use of renewable resources in urban design. Special attention could be given to how these practices are being incorporated into urban planning frameworks to address environmental challenges and improve the quality of life.

3.4. Challenges of Rapid Urbanization

This title would delve into the challenges faced by urban planners and architects in dealing with rapid urban expansion in Algeria. It could cover issues like informal settlements, overcrowding, traffic congestion, and the preservation of natural resources in the face of urban growth.

3.5. Technological Innovations in Urban Design

In this section, you could explore how new technologies, such as Geographic Information Systems (GIS), Building Information Modeling (BIM), and smart city technologies, are revolutionizing the way urban spaces are designed and managed. It could also cover how these technologies are being applied in Algeria to address its unique urban challenges.

3.6. Community Engagement in Urban Planning

This section could explore the importance of involving local communities in the urban planning process. It would discuss the benefits of participatory planning and how involving

citizens in the design of their own environments can lead to more sustainable, inclusive, and socially cohesive cities.

3.7. Historical Preservation in Modern Urban Planning

This title would focus on the delicate balance between preserving historical and cultural heritage and meeting the demands of modern urban development. It could discuss the policies and practices in Algeria aimed at protecting its architectural heritage while accommodating the needs of growing urban populations.

3.8. The Role of Government and Policy in Urban Design

This section could focus on the political and regulatory framework for urban planning in Algeria. It would discuss the role of national and local government, policy-making processes, and the implementation of urban planning laws and regulations. This could also include an analysis of how effectively these policies are shaping the built environment and urban development.

4. Materials and Construction Techniques

4.1. Traditional vs. Modern Materials

The evolution of construction materials in Algeria is deeply intertwined with the country's physical and human geography. Historically, the choice of materials, building techniques, and housing forms has been shaped by local environmental constraints (such as climate, topography, and resource availability) and regional cultural practices.

Traditional Materials and Adaptation to the Environment

In traditional Algerian housing, materials were chosen not only for their availability but also for their ability to respond to climatic and geographical conditions:

- In the Sahara Desert (e.g., Ghardaïa, Timimoun), materials like adobe (mudbrick) and limestone were commonly used. Their thermal mass helped regulate indoor

temperatures despite high daytime heat and nighttime cold. Houses were built in compact layouts, with narrow streets to reduce sun exposure and sand infiltration.

- In the mountainous regions of the northeast (e.g., Kabylia), stone and wood were used to construct terraced homes adapted to sloped terrain. These buildings harmonized with the topography and climate, featuring slanted roofs, thick walls, and strategic orientation for ventilation and sunlight.
- In the Tellian and high plateau zones, varied materials such as clay bricks, lime plaster, and terracotta tiles were used. Inner courtyards (patios), small windows, and building orientation were key elements for passive cooling and light control.

Each region developed housing forms uniquely adapted to its environment, making Algeria's traditional architecture an outstanding example of vernacular responses to geography.

Modern Materials and Geographical Disconnection

Post-independence urbanization and population growth led to a widespread shift to modern materials, including:

Reinforced concrete; Glass and Steel

While efficient for rapid construction, these materials have disconnected housing from geographical logic. Standardized apartment blocks and high-rise structures now dominate both northern coastal cities and southern desert towns—often without adapting to:

- Hot and arid climates (resulting in overheating and poor ventilation)
- Mountainous terrain (leading to erosion or instability)
- Cultural and historical context (causing identity loss)

This transition has not only ignored local conditions, but also contributed to the homogenization of urban landscapes, reducing regional architectural diversity..

Toward a Reconnection Between Habitat and Geography

Recently, architects and urban planners have emphasized the importance of re-integrating traditional knowledge with modern innovations, aiming to:

- Promote local and sustainable materials (e.g., stabilized earth, hempcrete, geo-sourced bricks)
- Apply bioclimatic and passive design principles
- Preserve and rehabilitate traditional buildings within the framework of sustainable development

These efforts aim to reestablish harmony between housing and its geographic setting, enhancing environmental performance while preserving cultural identity.

4.2. Techniques de construction durable

Sustainable construction techniques are increasingly becoming a cornerstone of contemporary architecture and urban planning. These methods aim not only to reduce the environmental impact of buildings but also to enhance the comfort, health, and well-being of occupants. They are rooted in a holistic approach that considers the entire lifecycle of a building—from the sourcing of materials to energy consumption and end-of-life recycling.

- One of the most prominent methods is passive construction, which involves designing buildings in a way that maximizes natural ventilation, daylight, and thermal insulation. This significantly reduces the need for artificial heating or cooling systems, making it particularly suitable for Algeria's diverse climate, especially in hot arid zones such as the Sahara.
- Rainwater harvesting and stormwater management systems are also essential, especially in regions prone to water scarcity or flooding. These systems allow buildings and urban infrastructures to capture, store, and reuse rainwater for non-potable uses such as irrigation or sanitation, thus easing the pressure on municipal water supplies.
- The use of renewable energy sources, such as solar panels, is gaining traction. Algeria, with its high solar potential, is ideally positioned to benefit from photovoltaic systems for both individual homes and community-scale projects. Integrating solar energy into construction plans can drastically reduce reliance on fossil fuels and lower greenhouse gas emissions.

- Moreover, green roofing, thermal insulation with natural materials, and earth architecture revival (especially in southern Algeria) are strategies that blend traditional know-how with modern sustainable practices. These techniques improve energy efficiency while respecting cultural heritage and local building traditions.

Urban planners in Algeria are now beginning to integrate these sustainable practices into new housing developments and urban regeneration projects. The goal is to create resilient and adaptive urban environments that can withstand climate change impacts, reduce ecological footprints, and promote healthier, more livable cities for future generations (Gay, 2014).

5. Technology and Innovation

5.1. BIM and Digital Modeling

Building Information Modeling (BIM) has transformed the way architects and urban planners design buildings and infrastructure. This technology enables the creation of three-dimensional digital models that integrate all relevant project data, such as materials, dimensions, and costs. In Algeria, the adoption of BIM remains limited, but initiatives are emerging to incorporate this technology into urban projects, particularly as part of city modernization efforts (Feildel, 2010).

BIM also allows for better resource management during the construction phase and promotes a more sustainable approach to urban planning.

5.2. Smart Cities and Emerging Technologies

The concept of the 'Smart City' is rapidly expanding worldwide, and Algeria is beginning to adopt some of these ideas. Emerging technologies such as smart sensors, the Internet of Things (IoT), and Artificial Intelligence (AI) are being used to improve the efficiency of urban services, including traffic management, water supply, and energy. These technologies aim to make cities smarter, more sustainable, and more responsive to citizens' needs. According to Pellegrino (2000), integrating digital technologies into city design can radically transform urban dynamics.

6. Sustainability and Resilience

6.1. Sustainability Strategies

Sustainability strategies in architecture and urban planning aim to minimize the environmental impact of buildings while maximizing their energy efficiency and adaptability to future challenges. In Algeria, sustainability is especially important due to extreme climatic conditions and rapid population growth. Strategies include the construction of low-energy buildings, the use of eco-friendly materials, and the recycling of existing materials (Brunet, 1980).

Sustainability strategies must also include resilient approaches to natural disasters such as floods and sandstorms.

6.2. Adaptation to Climate Change

Climate change is an increasing threat to urban spaces, particularly in regions like Algeria, where climatic conditions can be extreme. Adapting to climate change in architecture and urbanism involves designing buildings and infrastructure capable of withstanding extreme weather events, such as heatwaves and prolonged droughts. Solutions include the use of technologies to regulate indoor temperature, water management, and improved building insulation (Angeon et al., 2006).

Conclusion

The study of the built environment, from its historical roots to modern innovations, reveals the profound impact of geography, culture, and technology on human settlements. Through an exploration of architectural evolution, urban planning mechanisms, construction materials, and sustainable strategies, we gain a comprehensive understanding of how habitat is shaped by both natural and socio-political forces.

Today, urban planning and architectural design must respond to the pressing challenges of rapid urbanization, climate change, and resource scarcity. The integration of sustainable construction techniques, smart technologies, and participatory approaches reflects a growing awareness of the need for more resilient, inclusive, and environmentally responsible habitats.

Algeria, like many countries, stands at a crossroads—balancing its rich architectural heritage with the demands of modern urban development. By combining traditional knowledge with innovative practices, and by embracing both technological advancement and cultural preservation, it is possible to envision a future where the built environment enhances quality of life while respecting ecological and social contexts.

This course aims to equip students with the conceptual tools and critical perspectives necessary to understand and contribute to the ongoing transformation of our living spaces. The geography of habitat is not only a reflection of where we live, but of how we live—and how we choose to shape the world around us.

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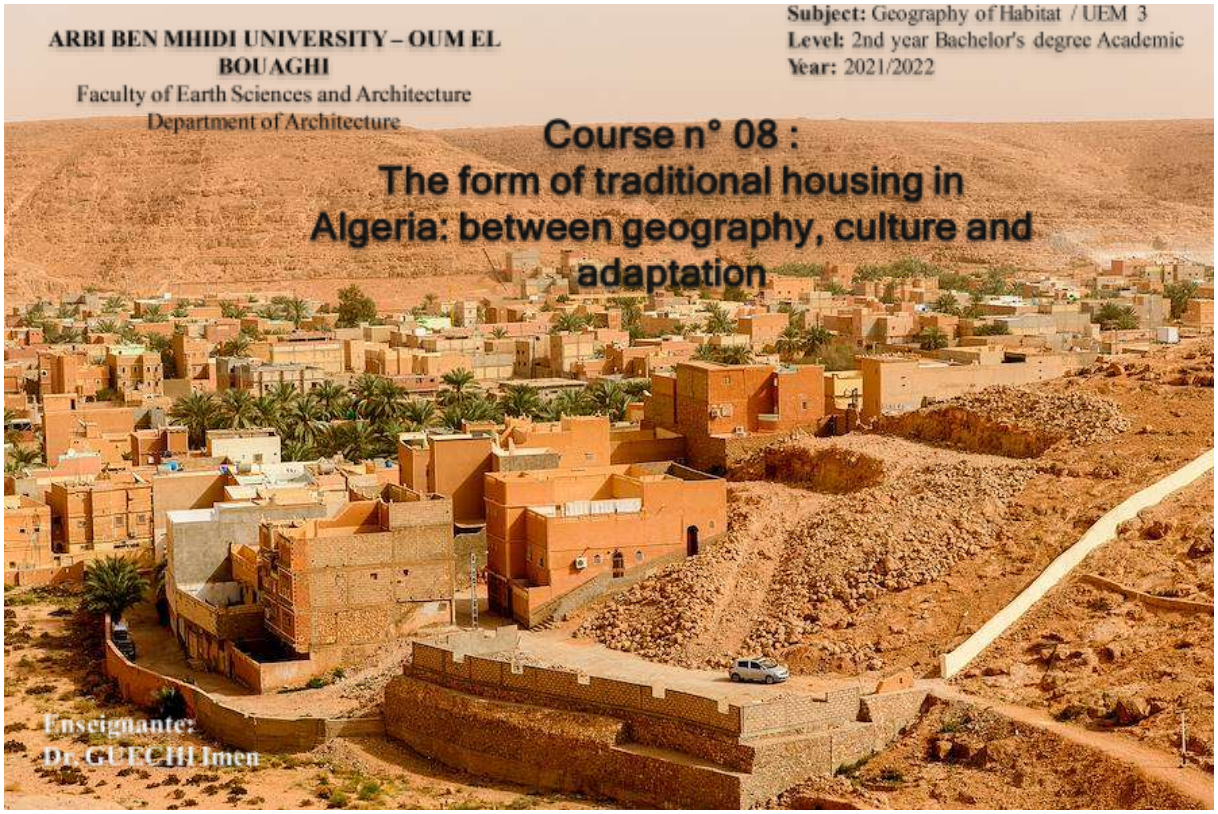
Course N°08: The form of traditional housing in Algeria: between geography, culture and adaptation



Introduction

Traditional housing in Algeria, shaped by centuries of history and adaptations to the country's geographical and climatic specificities, is a fundamental element of the nation's cultural and architectural identity. Algeria, with its diverse geography ranging from Mediterranean coasts to the Atlas Mountains and the vast desert expanses of the Sahara, presents a wide variety of housing forms that have evolved based on local resources, climatic conditions, and social influences. Traditional houses, constructed with local materials such as adobe, stone, wood, and sometimes pies, were designed to provide comfort and security while meeting the specific needs of communities. Traditional housing also reflects social and cultural values, incorporating concepts of privacy, functionality, and environmental respect. However, with rapid modernization and the growth of urban centers, these traditional forms have been profoundly affected by the introduction of modern materials such as concrete, steel, and glass, altering the urban landscape and lifestyles. The aim of this course is to explore these traditional housing forms, analyzing their evolution, the principles underlying them, and their impact on contemporary urbanism, while emphasizing the importance of preserving certain elements in the context of sustainability and urban modernization in Algerian cities.

1. Geographical and Climatic Context of Traditional Housing in Algeria

the geography and climate of Algeria have played a fundamental role in shaping the traditional housing forms found throughout the country. Each region has developed its own unique solutions to the environmental challenges it faces, demonstrating a deep connection between the built environment and the natural surroundings

1.1. Geography of Algeria

Algeria, located in North Africa, boasts a remarkable geographical diversity, encompassing mountainous regions (Tellian Atlas, Aurès Mountains), the vast Sahara Desert, and Mediterranean coastal areas. This geographical variety directly influences the design and materials used in traditional housing across the country.

- **Mountains**: In the mountainous regions, such as the Aurès and Kabylie, houses are designed to adapt to the terrain's slopes and the colder climate. The homes are predominantly built using stone, with roofs often covered by tiles. The thick stone walls provide insulation against the cold winters, and the architecture often incorporates terraced levels to adjust to the uneven topography. (Yahiaoui, 1987; Mehibel et al., 2014).
- **Saharan Regions**: In the vast desert regions of southern Algeria, traditional houses are constructed using local materials such as adobe (mudbrick) and stone. These materials have excellent thermal properties, allowing them to maintain cool interiors during the scorching heat of the day and retain warmth at night, providing comfort for the residents in extreme temperature fluctuations. The thick walls and compact layouts are designed to reduce heat absorption and mitigate the harsh desert climate. (Khouri et al., 2023; Ammari & Zemmouri, 2018).
- **Coastal Areas**: The coastal regions, influenced by a Mediterranean climate, feature housing made from materials like wood, reed (chaume), and other natural materials found in the area. These homes are better suited for the milder temperatures, with an emphasis on lightness and ventilation. Coastal houses are designed to withstand the humidity and the occasional heavy rainfall, while their roofs are often covered with reed or palm leaves to provide natural insulation against the heat and moisture. (Racha & Kacher, 2020; Bahloul, 1996).

1.2. Climate and its Influence on Traditional Housing

The variations in climate, ranging from Mediterranean conditions to the arid climate of the Sahara, have strongly influenced the adaptation of housing to local environmental conditions. People in Algeria have developed architectural solutions that address challenges like heat, humidity, and sandstorms, particularly in rural and desert areas.

- **Thermal Insulation**: In the southern regions, thick walls made of adobe or stone are a critical feature of traditional homes. These materials are highly effective in insulating against intense heat, keeping the interiors cool during the hot daytime temperatures. The dense construction helps maintain a more stable internal environment, reducing

the need for artificial cooling. In contrast, during the cold desert nights, the walls retain the heat accumulated during the day, offering warmth to the inhabitants. (Dekkiche, 1989; Khouri et al., 2023).

- **Natural Ventilation**: Ventilation is an essential component of traditional Algerian architecture, particularly in the hotter regions. Houses are often designed with strategically placed windows and vents that allow for the free flow of air, facilitating natural cooling. This passive ventilation system helps to alleviate the heat of the summer months and prevents the buildup of moisture, especially in coastal and semi-arid regions. The placement of these openings maximizes airflow, ensuring that the interiors remain comfortable without the need for modern air-conditioning. (Saada & Dekoumi, 2019; Moufida et al., 2024).

2. Characteristics of Traditional Housing in Algeria

2.1. Traditional Construction Materials

- **Adobe and Clay:** In the Saharan and mountainous regions of Algeria, adobe is a common material for building walls. Adobe, made from a mixture of earth, water, and straw, is a locally sourced material known for its excellent thermal insulation properties and ease of use. It is particularly suited for areas where other resources are scarce. Adobe walls help maintain a comfortable indoor temperature by keeping homes cool in the heat of the day and warm at night, a vital feature in the extreme temperature fluctuations typical of the desert and mountainous climates. (Ammari & Zemmouri, 2018; Khouri et al., 2023).
- **Stone and Clay**: In the mountainous and coastal regions, stone is a more prevalent material, often combined with clay to enhance the structural integrity and water resistance of the buildings. Stone provides durability and strength, making it ideal for the harsher weather conditions of the mountainous areas. In coastal areas, the use of stone combined with clay also helps to create solid, waterproof structures that can withstand the region's humid conditions and occasional storms. (Mehibel et al., 2014; Khoukhi & Fezzioui, 2012).
- **Wood and Reed (Chaume):** Wood is typically used in the coastal and northern regions of Algeria. It is mainly employed in the construction of roof structures and doors,

providing the necessary framework for the building. Reed or palm fronds (chaume) are used for roofing in traditional homes, offering natural insulation and protection against the humidity and heat in coastal areas. This combination of materials also reflects the availability of local resources in these regions. (Mouna & Drias, 2024; Saada & Dekoumi, 2019).

2.2. Typology of Dwellings

- **Houses in the Medinas**: The traditional urban houses in Algerian medinas, such as those in Algiers, typically follow a courtyard-style design. These houses are arranged around a central patio or garden, offering a private space away from the outside world. The thick stone walls protect the privacy of the inhabitants and create a cool environment in the hot climate. The interior of these homes is typically composed of a series of rooms, including living areas, kitchens, and storage spaces, which are organized in a way that reflects the social structure of the family. (Hadjri, 1993; BOURAHLA & Chérif).

Figure N°01 : Houses in the Medinas

- **Ksour**: In the southern regions, ksour (fortified villages) are an essential part of traditional architecture. These buildings were designed to protect residents from both natural elements and invasions. The ksour typically consist of communal living spaces, with homes built closely together for protection. On the other hand, gourbis are temporary, lightweight structures used by nomadic peoples. Made from materials like reed and palm, these homes are easily assembled and disassembled, making them

suitable for the mobility required by nomadic lifestyles. They are usually simple, with minimal internal division. (Khouri et al., 2023; Saada & Dekoumi, 2019).

Figure N°02 : ksar

2.3. Interior Space Organization

Traditional Algerian homes are typically designed with a focus on internal courtyards, gardens, and enclosed spaces, which offer protection from the elements and ensure privacy. The interior organization often reflects the social structure and the division of labor within the family. Living spaces are usually divided into rooms that serve specific functions:

- Reception Rooms: These are often used for receiving guests and formal social interactions, reflecting the hospitality culture present in Algerian society. (Yahiaoui, 1987).
- Private Bedrooms: These rooms are reserved for family members and provide a private sanctuary, away from the public spaces.
- Storage Areas: Traditional homes typically include areas for storing food, clothing, and tools, as storage was essential for families living in rural areas or those practicing agricultural activities. (Racha & Kacher, 2020).

The design of the interior spaces is tailored to ensure both comfort and practicality, while maintaining a deep connection to the environmental and cultural context (Khouri et al., 2023). This organizational structure allows for a harmonious balance between social interaction, privacy, and protection from the outside world.

Figure N°03: Interior Space Organization of medina house

3. The Relationship Between Habitat and Social Environment

The design of traditional Algerian homes embodies the social and cultural norms of the region, with clear divisions that respect privacy, hierarchy, and community values. These architectural choices not only reflect the social fabric of Algerian society but also provide

insight into the way people interact with each other and their environment. (Mehibel, Pitts, & Gao, 2014).

3.1. Adaptation to the Social and Cultural Environment

Traditional housing in Algeria is deeply influenced by social structures and cultural traditions. The design and organization of traditional homes are shaped by the need to respect local customs, values, and the community's way of life (Mouna & Drias, 2024) . One of the key aspects of this adaptation is the clear division between private and public spaces within the home.

- **Private vs. Public Spaces**: In many traditional Algerian homes, particularly in the medinas, homes are organized around a central courtyard or patio, which serves as a buffer between the public and private areas. The public areas are typically where guests are received and formal social interactions take place, such as salons or guest rooms. These spaces are designed to facilitate the hospitality customs common in Algerian culture, where guests are treated with great respect and importance.
- **Impact of Local Traditions**: The concept of hospitality in Algerian culture is deeply ingrained in the design of the home. The salons or guest rooms are often spacious and welcoming, with seating arrangements that encourage social interaction and the exchange of ideas. The layout of the home also takes into account the need for social gatherings and communal life, making room for shared spaces where people can meet and converse.
- **Interior Courtyards:** The use of interior courtyards or gardens in traditional homes is another reflection of the local cultural practices. These spaces provide a protected, private outdoor area where family members can spend time together away from the public eye, fostering a sense of security and family unity.

3.2. The Role of Family and Social Hierarchy in Spatial Organization

In traditional Algerian homes, the layout and spatial organization are often a direct reflection of the family structure and social hierarchy. The family unit is at the center of the home, but

the spatial organization reflects the roles and relationships within that unit. (Saada & Dekoumi, 2019).

- **Division of Spaces by Gender**: The division of spaces based on gender is a significant aspect of traditional Algerian homes. In many households, women and men have separate living areas. Women's spaces are often more private, with restricted access, while men's spaces are generally more public and accessible. For instance, in many homes, the men may have access to the salon or the exterior areas of the house, while women's areas are often secluded, especially in the more traditional rural or conservative settings. (Ammari & Zemmouri, 2018).
- **Social Hierarchy and Space Allocation**: The hierarchy within the family is also reflected in how spaces are allocated. The head of the household, often the father or eldest male, may have a more prominent space, often in a room with better access to light and air. Younger family members or less senior individuals typically occupy smaller, more private rooms. This organization also extends to the division of labor within the home, where men and women typically have roles that align with the spaces they occupy. (Boutabba et al., 2020)
- **Guest Spaces:** The organization of space within the home also includes special accommodations for guests. In traditional Algerian homes, the hospitality space is particularly important, and rooms dedicated to receiving guests (such as salons) are often separate from private family spaces. This ensures that guests can enjoy comfort and privacy, while the family can maintain its own intimacy and daily routine. (Bahloul, 1996).

4. The Evolution of Traditional Housing in Algeria in the Face of Modernity

the evolution of housing in Algeria reflects the broader shifts in the country's social, political, and economic landscape. While colonization introduced foreign architectural styles that significantly altered traditional Algerian habitats, the post-independence era has seen a return to rethinking how traditional elements can coexist with modern needs. The transition to

modernity, with its focus on rapid urbanization, has also paved the way for a contemporary architectural approach that values sustainability, cultural heritage, and local resources. (Khouri et al., 2023).

4.1. Impact of Colonization on Housing

The colonial period in Algeria had a profound effect on the country's architectural landscape, particularly in urban areas. During the French occupation, European architectural styles were introduced, primarily in cities like Algiers, Constantine, and Oran. These styles, influenced by European modernism, colonial aesthetics, and urban planning, dramatically altered the traditional architectural fabric of Algerian cities.

- **Introduction of European Styles:** The French colonialists built houses in the European style, characterized by high ceilings, large windows, balconies, and straight lines, which were quite different from the traditional Algerian houses made from local materials such as adobe and stone. This style was intended to reflect the dominance and civilization of the French colonial powers, often disregarding the climate-specific needs and cultural preferences of the local population.
- **Urban Transformation**: In cities, especially in the capital Algiers, traditional homes were demolished or modified to make room for colonial-style buildings. This transformation involved the construction of European-style villas, apartment buildings, and public infrastructures that not only displaced the indigenous architectural forms but also contributed to a social and cultural disconnect. The new buildings often lacked the thermal efficiency, privacy, and space organization suited to the local way of life, thus marking a shift away from the traditional forms.
- **Impact on Social and Cultural Structures**: The introduction of European-style homes also reflected a change in the way of life for Algerian families. The urbanization and adoption of Western architectural forms contributed to the social stratification that distinguished the colonizers from the local population, with the former enjoying privileges and a lifestyle that was often inaccessible to the indigenous Algerians.

4.2. Transition to Modernity

After Algeria gained independence in 1962, the country faced the challenge of urbanization and modernization, with rapid population growth leading to the need for more housing and infrastructure. This period saw significant changes in the way Algerian cities were planned and built. (Moufida, Faten, & Djamel, 2024).

- **Rapid Urbanization**: Following independence, Algeria experienced an intense period of urban growth, particularly in major cities. This was driven by the rural-to-urban migration, economic changes, and the desire for modern living conditions. As a result, large-scale residential developments were constructed to accommodate the growing population. However, many of these new constructions neglected the traditional architectural principles that had characterized Algerian homes for centuries. (Khouri et al., 2023).
- **Neglect of Traditional Principles**: The early years of independence focused heavily on modernist architecture, often inspired by Western styles. The design of new neighborhoods and buildings prioritized functionality, speed of construction, and the use of modern building materials such as concrete, steel, and glass. Unfortunately, this rapid urban expansion often ignored important aspects of traditional Algerian architecture, such as local building materials, energy efficiency, and spatial organization that suited local customs and climate conditions. (Mehibel, Pitts, & Gao, 2014).
- **Efforts to Reintegrate Traditional Elements**: In recent years, there has been a growing recognition of the need to balance modern urban development with the preservation of traditional architectural principles. Efforts have been made to reintegrate local building materials, such as adobe, stone, and wood, into new construction projects. Furthermore, some contemporary architectural designs have sought to incorporate elements of traditional Algerian homes, such as interior courtyards, thick walls for insulation, and shaded outdoor spaces. These efforts aim to create more sustainable buildings that align with the local climate and cultural values.
- **Sustainability and Resource Management:** With the increasing emphasis on environmental sustainability, modern architecture in Algeria is beginning to focus on

reducing the ecological footprint of buildings. This includes incorporating passive design strategies such as natural ventilation, solar energy use, and rainwater harvesting systems into new housing projects. The aim is to integrate both traditional and modern techniques to create homes that are not only functional but also environmentally friendly and resource-efficient.

Conclusion

the study of traditional housing in Algeria reveals a profound connection between architecture, geography, climate, and social structures. The diverse geography of the country, from the mountainous regions to the Saharan desert and the coastal areas, has led to a wide variety of construction materials and architectural forms tailored to the specific environmental conditions. The traditional Algerian habitat is deeply influenced by the need to adapt to both the harsh climate and the cultural norms that shape spatial organization, emphasizing privacy, social hierarchy, and communal living.

The architectural choices in Algeria have always been shaped by the natural environment, using local materials such as adobe, stone, and wood, each with its own functional and thermal advantages. The interior spaces of traditional Algerian homes are often organized around courtyards or internal gardens, reflecting the family-centric and community-oriented culture. Furthermore, the relationship between family roles and space division in traditional homes underscores the significance of social hierarchy, with distinct spaces for men, women, and guests.

However, the evolution of housing in Algeria, especially after the colonial period, has been marked by the introduction of European architectural styles and modern building materials. While these changes brought about new urban forms, they also led to the erosion of traditional building techniques and cultural practices. The post-independence period saw rapid urbanization, which further distanced new constructions from traditional architectural principles.

Despite the shift towards modernity, there is now a growing recognition of the need to reintroduce traditional elements into contemporary architecture, especially in the context of sustainability and environmental challenges. Incorporating traditional design principles and materials into modern housing projects is increasingly seen as a way to create buildings that are more in tune with local climates and cultural values while ensuring sustainable development.

Ultimately, the evolution of traditional housing in Algeria is a testament to the resilience of local architecture in the face of external influences. As the country continues to modernize, there is potential for a harmonious integration of traditional and modern architectural practices, ensuring that the rich heritage of Algerian housing is preserved for future generations.

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