Coastline artificialization

Topic summary:

The Mediterranean coast is a rich environment (biological and mineral natural resources, human, cultural and historical), attractive (landscapes, biodiversity, climatic conditions) and accessible (multi services and multi activities). This space is particularly coveted and highly exposed to risks. It is the seat of many vital issues

Main concepts covered:

* Urbanisation
* Concretization
* Littoralization
* Resiliency
* Integrated coastal zone management (ICZM)

Transversal competencies acquired:

* Communicating orally / writting in mother/foreign language
* Managing information
* Mobilizing reasoning
* Respecting a framework and instructions.
* Knowing how to adapt according to difficulties

Definition of key notions:

Urbanisation:
Phenomenon of mass population concentration in cities.

Artificialization:
Suppression of the natural state of a man-made surface. It results in the loss of natural resources and the waterproofing of soils.

Concretization:
Action to modify a soil to make it artificial. Construction of buildings and residences on the coasts.

Littoralization:
Population growth along coastal regions in fragile environment and limited space.

Resiliency:
Ability of a set to withstand forces that tend to decompose it. In this way, destabilizing, dangerous events can be overcome.

Integrated coastal zone management (ICZM):
A tool for governance of coastal territories for sustainable development.

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Introduction of the topic:

The distribution of the population between Mediterranean countries of the European Union (EU) and the countries of Southern and Eastern Mediterranean has changed considerably since the 1960s and has increased in recent years. Indeed, the overall population growth is associated with a significant increase in the urban population from 48% in 1960 to 67% in 2010. Most of this urbanisation occurred along the coasts (DSDS 2016-2025).

In order to meet economic and tourist demands, coastal cities face excessive land consumption with an irreversible impact on natural areas, groundwater, biodiversity and built cultural heritage. They are subject to artificialization, tourism as well as recreational activities (holiday homes, hotels and campsites multiply, often located near the seaside). Coastal municipalities tend to spread out. Some of the urban activities are dispersed in the neighbouring countryside thus forming artificial peri-urban spaces. Agricultural and natural environments are mostly replaced or fragmented by artificial and concrete surfaces (warehouses, businesses, shops, ports and marinas) leading to an increase in the waterproofing of the soils, faster than the residential use. The same applies to artificial surfaces dedicated to transport infrastructures.

Artificial soils cover all areas that support human activity (except agriculture and forestry): cities, housing, economic activities and transport networks. To this pressure on the natural environment are added the pollution generated by the population density (production of waste, energy dependencies) and new housing constructions. These pollutions cause negative impacts on the health and the environment in general. In addition, the participation of residents in urban planning decision-making remains low in many municipalities.

This increasing linear coastal urbanisation leads to an inadequate protection and management of land areas and urban sprawl (illegal constructions, gentrification of the coasts, unlimited tourist development). The ecological footprint of Mediterranean coastal cities is still too large. They are insufficiently resilient in their ability to deal with natural or human hazards and risks (DSDS 2016-2025).

Sustainable development issues identified in this topic:

What are the pressures caused by the artificialization of Mediterranean coastal municipalities? How do we plan and manage sustainable Mediterranean cities?

Sectorial approaches, conflicts of interest, economic development to the detriment of environmental protection, changing demands of societal demand (modes and quality of life, heliotropism), multiple regulations (business and environmental management).

As urbanisation progresses in Mediterranean and particularly on the South shore, this phenomenon continues the transformation of land with losses and irreversible damage, yet, the coastal municipalities are not managed in a sustainable way and are insufficiently resilient. "Population on Europe's coasts is constantly increasing, sometimes faster than in inland areas. Coasts are converted to manmade artificial surfaces at an even faster pace. There is a need to develop more information to better understand what is happening with built up areas and city planning in Europe and to establish some thresholds and other planning tools to avoid uncontrolled sprawl". (EEA, 2006). Nowadays, this pressure on Mediterranean coastlines continues with many impacts:

Excessive consumption of natural spaces:

There are many conflicts of use and competition for space between tourism and recreation, commercial and industrial activities, and agricultural activities.

Human transformation and development:

Loss of biodiversity and landscape transformation, irreversible development, loss of integrity and identity, fragility against natural hazards and climate change.

Intensive resource development:

In response to the influx of people, natural resources are over-exploited, including fish stocks and freshwater.

Anthropogenic waste release:

Increased contamination and poisoning to the detriment of terrestrial and marine biodiversity. Increased volume and lack of infrastructure to manage this waste.

Changes in equilibrium parameters:

Biological imbalances and ecological drift, impacts of climate change on a fragile interface. Ecosystem capacity to deliver goods and services declining (related to declining biodiversity). Remaining natural and semi-natural habitats are fragmented. Increased impacts of climate change on this interface.

Land use and fragmentation is a long-term change that is almost impossible to reverse. Urbanisation is the major cause of the decline of natural and semi-natural habitats in Europe (EEA, 2015). However, European society wants "blue growth", particularly for the maritime sector. The Marine Strategy Framework Directive is the basis for the EU policy for productive, clean and healthy oceans by 2020. This is accomplished by achieving or maintaining good environmental status by 2020 with a commitment to an ecosystem-based approach to managing human activities in the marine environment.

In the latest report of the Intergovernmental Panel on Climate Change (IPCC), mitigation measures are

recommended for the next two decades, including policies integrating the co-location of areas of high residential densities and areas of high employment densities. Proposed solutions include strengthening the development of small coastal cities as focal points, monitoring and controlling coastal urbanisation and sprawl.

They are among the solutions providing urban ecosystem services, contributing to greater resilience to climate change and sustainable development issues in coastal cities:

Increase and strengthen urban resilience:

Implementation of urban adaptation and sustainable management processes (geographic integration, thematic integration, application of institutional instruments, participatory, integrated and sustainable management).

Socio-economic cohesion:

Approximation and participation of all categories of actors for concerted and coordinated management at all levels and for all sectors. Political will and national strategies.

Large-scale modernization of the industrial sector:

Replacement of energy-intensive technologies with the best available, additional innovations. Collaborative activities between companies and between sectors that can reduce their consumption of raw materials and energy. Sharing of infrastructure, information, energy use.

Promote sustainable urbanization:

Construction of green buildings, landscaping of open and green public spaces, blue infrastructure.

Sustainable waste management:

Strengthen and develop waste treatment and recycling sectors. Reduce waste, increase reuse, recycling and energy recovery.

Regulations and planning:

Decision-making with evaluation of long-term developments. Implementation of Integrated Coastal Zone Management (ICZM).

Ecosystem-based management remains the key to secure ecosystem services and their benefits (EEA, 2015). This management method is supposed to combat the combined effects of the many existing pressures. ICZM is precisely one of the tools that decision-makers must seize and implement in their actions. The main challenge is to ensure the long-term resilience of coastal ecosystems and therefore the social resilience of Mediterranean communities.

Integrated Coastal Zone Management (ICZM), a tool for governance of coastal territories for sustainable development.

Integrated coastal zone management is a dynamic process that brings together government and society, science and decision-makers, public and private interests for the protection and development of coastal systems and resources. This process is intended to optimize long-term resource-based choices and their reasoned and reasonable use. It simultaneously takes into account the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, as well as their impacts on both the marine and the terrestrial.

Position of the topic in the school program:

	11	12	13	14	15	16	17
Mother / Foreign language / Litterature	X	X	X	X	X	X	X
History							
Geography	X	X	X	X	X	X	X
Mathematics							
Biology / Geology	X	X	X	X	X	X	X
Physic / Chemistry							
Social Science / Economy / Law							
Art / Musics	X	X	X	X	X	X	X
Technology / Computer science							

Ressources:

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- EEA, 2015. Environment in Europe: Status and Outlook 2015 – Summary. European Environment Agency, Copenhagen.
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