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## Urban Coasts as Sustainable Transformative Opportunities for Urban Well-being:

Contemporary urban-coastal areas increasingly convey complex social and environmental features. At the same time, they are influenced by economic and productive stakes. These spaces are characterised by a high population density that raises expectations of the local community towards coastal development, due to its high appeal for users, as well as its great landscape and functional value (Small & Nicholls, 2003).

The spatial and morphological characteristics of urban shores have generated intertwined and increasingly complex land (and sea) uses, leading to the most disparate functional configurations: urban beaches, port areas, piers, sea promenades, but also *wastelands* and semi-natural spaces compose an articulated yet interesting urban mosaic, even though the strong functional competition can drastically reduce the possibilities of equal accessibility to the coasts, compromising their identity value (Green, 2010). From an ecological-environmental point of view, urban coastlines are particularly vulnerable to worsening *climate change*, which inexorably complicates the feasibility of plans and interventions, reducing the space available for human activities along the shore (Giannakidou et al., 2019). The massive densification of the urban fabric can damage the littoral environment, ~~constituting~~ constituted by its very conformation, an element of disconnection of the coastal ecological networks (Pineschi, 2013). To this, ~~sum~~ add the presence of defence works against the hydraulic risk that ~~are~~ are not always adequate to protect the urban-coastal ecosystem (Pilkey & Cooper, 2014). These critical issues tend to increase much more rapidly in large cities, due to ~~the~~ multiple and broader interests involved.

The study of urban-coastal areas is a well-known research topic, especially from the perspective of sustainability, urban regeneration, recovery of brownfields, port and harbour areas and the evolution of the urban waterfront in general. In any case, city shorelines are characterised by a very high landscape value, consistent with an intrinsic social and recreational character that can still inspire differentiated uses. Its ecological role is fundamental, especially since most of the surrounding area is entirely urbanised. Thanks to marine biodiversity, coasts can provide a privileged contact point with nature for the inhabitants of large coastal cities (Edward, 2017). Moreover, they are places where the ecological transition of the city can be experienced through environmental restoration strategies, the use of renewable energy from the sea or programmes to improve the quality of bathing water. In this context, urban-coastal areas represent a unique opportunity for the community in terms of urban planning. They are spaces where a new type of urban transformation can be implemented together with citizens. From this perspective, urban planning and coastal management are closely interconnected within contemporary coastal evolutionary processes: actions included within coastal programmes must be increasingly enriched by techniques, methods and approaches from other disciplines, in relationship with the transformation of the urban

coastline, transcending the limits of scale and including communities in the contemporary coastal project (Kay & Alder, 2017). This seems particularly interesting, as land-based planning is rooted within the traditional urban planning theory, despite the fact that there are still gaps within which planners and decision-makers must intervene. On the contrary, the management of the maritime space is a field yet to be explored, an opportunity that should be integrated within the urban littoral project, from a social, cultural, functional and environmental point of view. Planning the city's stretch of water may indeed provide significant insights into the management of competing coastal uses. With regard to these reflections, the research introduces the concept of the *city-sea interface*, that is, the coastal connection area between the land and the sea within dense urban agglomerations, in which the relations between the two systems appear to be particularly intense. The importance of this concept can be read in relation to the search for a point of contact, for a *trait d'union* between the consolidated terrestrial planning and the emerging maritime spatial planning.

### The New Coastal Question, Socio-Environmental Crisis for an Ever-Changing Society

Over the last century, interventions for coastal transformation have mainly concerned the modelling of urban waterfronts, the enhancement of logistical and economic needs, and the recovery of coastal aesthetic value. However, the current condition of the urban littoral brings out the need to focus planning actions more on the theme of coastal social needs.

Between the 1970s and the beginning of the 1990s, the development of urban-coastal areas was not only oriented towards tourism, and recreation, but also towards economic progress. Numerous investments were promoted in favour of the renovation of harbours and coastal areas, realising spaces for entertainment, reusing existing areas, especially former industrial sites, and implementing commercial and socio-cultural buildings; this led to significant economic growth and the enhancement of the visual quality of coastal areas (Porfyriou & Sepe, 2017). Between the end of the twentieth century and the dawn of the new millennium, a redirection of planning efforts to balance the results of the previous projects' trends in urban-coastal areas can be seen: if initially, the economic profit and aesthetic improvement were pursued, studies and projects for the development of more accessible and inclusive public spaces were subsequently produced. There was a growing interest in social issues, even if the main objective was limiting gentrification (Morena, 2011). On the other hand, the last decade is characterised by an ideal break from the past, as social demands tend to become more and more complex: the economic component of the coasts contrasts with the evolving needs of citizens, also altered by the effects of

climate change, distorting the modalities of social interaction and influencing the perception of spaces and attachment to the place of the users (McElduff & Ritchie, 2018).

The community evolves in relation to littoral changes. Increasingly, the ~~urban-coastal~~urban-coastal society is involved in wide-ranging issues, such as environmental and ecological risks. ~~Added~~ to these are ~~added~~ the criticalities related to the consumption of land, ~~that-which today~~ is a rare but necessary resource today to ensure a fair use of leisure and social places along urban coasts. ~~A~~an inevitable consequence of this is a growing spatial and environmental injustice inversely proportional to the community demand for high-quality coastal public spaces (Mega, 2016). ~~This is~~ also in relation to the need for social distancing in this particular historical moment of a pandemic. Added to this is the issue of limited accessibility that worsens a progressive social fragmentation: despite being a right of citizens and a relevant responsibility for public authorities, ~~I~~the enjoyment of coastal benefits appears limited by socioeconomic inequalities. ~~M~~moreover, the uneven distribution of ~~accesses~~ to coastal public spaces fuels the polarisation of social functions in limited points of the coast, often in conjunction with privatised or otherwise unequally usable areas (Kim et al., 2019). The issue of equalitarian access to public places such as urban beaches falls within the field of environmental justice, since the enjoyment of coastal public space, as a common asset of society, turns out to be an important civil right for coastal users. ~~Moreover~~In addition to that, the availability of such urban areas is one of the responsibilities of the local government, as they have a great influence on the physical and psychological well-being of citizens, regardless of their social status (Kim, 2015).

The urban coast must, therefore, assume features of adaptability and flexibility to satisfy changing community needs, facing external impacts in an effective way. This is particularly significant in relation to how the new post-Covid coastal community experiences sociality in its everyday life, absorbing the social impact of the evolved condition of urban life through new ways of using coastal public places, as well as the ecosystem resources they can provide: it is important for urban planners to analyse in detail the spatial composition of the city-sea interface with particular attention to the places of sociality that could become a new city network at the service of coastal society.

### **The Euro-Mediterranean Context**

The particular geographical area analysed by the research is the Mediterranean basin, with a specific focus on the European urban coastline. For the citizens of the cities that rise in this zone, water areas represent spaces that are essential to their existence, economically, but also culturally and socially. ~~It~~ it is no coincidence that,

for centuries, human settlements on three continents have been concentrated along the coastlines facing this sea, due to the richness of resources and advantageous position, expanding the historical and cultural heritage that characterises this geographical area, but also the strong anthropic and environmental pressure. In fact, it is along these shores that most Europeans live today, and the trend is increasing: the presence of important cultural, landscape and economic values has led to the occupation of about 40% of the available coastal land by urban centres and infrastructures of various kinds (Zacharias & Zamparas, 2016).

The Mediterranean sea is directed towards ~~a~~the rapid development of new economic activities. The European Union's Blue Growth strategy<sup>1</sup> foresees further development of sectors that have the potential to create sustainable jobs and generate positive evolution, related to renewable energy sources, aquaculture, maritime-coastal tourism and more. However, the development of such activities implies an increasing competition for space with currently existing traditional marine uses, such as shipping or fishing, which already occupy large portions of ~~the~~ sea. Hence, ~~it emerges an interest~~an interest emerges in deepening the planning studies of these areas. However, it has to be noted that actual protective policies and plans for Mediterranean coastal areas started a relatively short time ago, since the attention of institutions ~~s~~ was previously focused mainly on inland areas, where pressures related to tourism or other similar functions are not as strong (UNEP/MAP, 2006)<sup>2</sup>. Today, about 80 % of European areas bordering the Mediterranean basin ~~are~~is degraded in an ecological sense and compromised due to human activities over the centuries, particularly the uses that ~~were~~have been held since the 1950s.

From a social point of view, the cultural-historical and economic factors that made the Mediterranean so prosperous also led to ~~an~~unequal development of ~~the~~different communities settled along its shores (King et al., 1997). The larger cities have become poles that have attracted more and more wealth and have increasingly enlarged their demographic basin. On the one hand, the smaller towns have suffered from progressive depopulation, while on the other hand, the large coastal cities have remained swamped by the growing volume of users that has fuelled a strong social demand for community spaces over time. It is, therefore, a priority to provide the citizens of such places with free and fair access to coastal resources, according to the principles of spatial justice. Similarly, climate change and increased urbanisation have generated ~~a~~n growing environmental risk from the sea, altering the safety of these spaces that are so crucial for urban well-being.

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<sup>1</sup> This strategy is based on the concept that European maritime activities should be streamlined in a holistic manner, in order to achieve sustainable growth objectives (<https://s3platform.jrc.ec.europa.eu/blue-growth>).

<sup>2</sup> The Mediterranean Action Plan of the United Nations Environment Programme (UNEP/MAP) is a cooperation consortium established in 1975 with the aim of implementing the well-being and ecological-environmental status of the Mediterranean basin (<https://www.unep.org/unepmap/index.php>).

## Objectives and Structure of the Research

The reasoning presented as an introduction to the doctoral study has gradually defined the main objectives of the research to follow, seeking to investigate whether current coastal planning and governance operate efficiently on coastal open spaces and public areas and whether the social and recreational functions of the shores of large contemporary cities are equally usable by citizens, considering their positive impact on human psycho-physical well-being and their relevant environmental value in deeply urbanised areas. It is, therefore, essential to address the issue of social needs in relation to the provision of the proximity of public spaces along urban coastlines. At the same time, the research is confronted with regulatory-legal aspects, as well as the theme of services provided by urban-coastal areas, in relation to the health, environmental and socio-cultural factorsoffer; linked to this is the environmental risk, since phenomena such as coastal erosion, flooding, and sea-level rise influence the way of living in the contemporary coast. These issues clearly fall within the macro-category of use and landscape management, a key topic for urban studies and planning.

It is possible to break down this broad question into more focused and targeted questions, to-with which a specific research approach is associated. The question of whether coastal community users actually express a growing social demand for coastal recreational spaces will be addressed, using the in-depth study and comparison of case studies of large coastal cities as a basis for investigation. It will be studied whether the ecological approach of contemporary planning can rehabilitate coastal social spaces, preventing climate change effects, through a literature review and the analysis of methods of ecological design applied to urban coasts. Finally, it will be analysed if a new integrated management-planning approach can respond to the changing socio-environmental demands of urban coastlines, through the study of local and international policies, directives and regulations, the collection of physical-spatial data and field interaction with stakeholders.

The articulation of the research work envisages the division of this text into three main macro-sections. The first deals with the theme of the urban coast as a complex interface: in particular, it analyses the notion of the city-sea interface as a design development potential for the sociality of urban coasts, and then describes the concept of the urban-coastalurban-coastal society in relation to its connection with the *urban amphibious*, that is the flexible and adaptive declination of city coasts in a socio-environmental key, for the purposes of the integrated management of land spaces but also of maritime planning; finally, the socio-environmental crisis of contemporary coastlines in large cities is explored in relation to the ecological planning approach, and the theme of coastal governance within

the Euro-Mediterranean basin. In the second macro-section, a review of the current planning approach of large European cities bordering the Mediterranean is presented, with the aim of identifying the main existing projects along urban coasts. The programmatic and planning approach to coastal interface territories is also introduced, proposing a methodological framework to support ~~urban-coastal~~urban-coastal planning and management: existing national and international directives and regulations on the topic of urban coasts and social uses of the sea in cities are analysed; after that, the methodological construction of ~~a~~-geographical support to systematise the spatial, functional and geophysical data of urban coasts is described; moreover, the tools necessary to interpret the community perception of the city coastline, through social listening and field survey, are introduced. In this regard, an initial field application of the socio-environmental survey tool is presented on the case study of Lake Fusaro and the adjacent maritime coast of Bacoli, nearby Naples, as part of the ongoing Erasmus+ WAVE project. The third and last macro-section aims at comparing the urban coasts of Marseille and Naples, Mediterranean cities similar in size and population density, although different in their approach to coastal planning: the physical, legal, geographical and psycho-social characteristics of the two coastal interfaces will be investigated, applying the elaborated *methodological framework*, in order to provide, in conclusion, an analytical basis to support planners and policy-makers who regulate the transformation of the urban coast.

### Academic ~~P~~partnerships and ~~C~~ollaborations

The opportunity to explore these issues arose through participation in the international research called Galileo 2021<sup>3</sup>, a scientific cooperation programme between Italy and France organised by the Université Franco-Italienne. The project, ~~entitled~~ 'Re-SEA-ourcing CITY: City-Sea Interface as a Resource for People: Urban Regeneration in the Context of Ecological Transition~~City-sea interface as a resource for people: urban regeneration in the context of ecological transition~~', was named the winner of the call for proposals and ~~involves~~involved the collaboration of the Department of Architecture of the University of Naples Federico II and the CNR-IRISS, on the Italian side, with the CNRS (*Centre National De La Recherche Scientifique*) and the University of Aix-Marseille, on the French side. It is proposed to deepen the *theme of the city-sea interface as a resource for the regeneration of urban coasts*, characterised by the community and economic interests, mitigating coastal risks in the context of the ecological transition (Timmerman & White, 1997) and reinterpreting the coasts of large cities in a socio-recreational

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<sup>3</sup> The Galileo programme for scientific cooperation between France and Italy is available online at: <https://www.universite-franco-italienne.org/menu-principal/bandi/programma-galileo/>

and landscape-environmental surrounding which is key for sustainable management and efficient planning. This proposal also intends to explore and compare the urban shores of Naples and Marseille, coastal cities facing the challenge of urban sustainability, investigating the social dynamics and regenerative potential and connecting the most significant natural and semi-natural elements for the littoral and society. The aim of the project is, therefore, to develop socio-ecological analyses on the city-sea interfaces of the two Euro-Mediterranean cities, analysing social needs and physical-functional features of vulnerable ~~urban-coastal~~urban-coastal territories, through a strongly multidisciplinary research team, composed of urban planners, geographers, environmental and community psychologists, architects and cartographic engineers.

This study opportunity led to the stipulation of a co-tutelle agreement for the doctoral research of the author, intertwining the academic course of Urban Planning with the course of study in Geography at the Aix-Marseille Université. Through research stays in Marseille, theoretical issues were explored in depth, helping ~~into~~ better define the research question over time and providing the methodological tools for the fieldwork that explored the coastal areas of the Marseille urban in comparison to the Neapolitan coastline. In addition, it was possible to know some leading figures of the local coastal society and to benefit from multidisciplinary knowledge at the CNRS ESPACE laboratory UMR 7200<sup>4</sup>, collaborating with different branches of scientific knowledge, with which geography establishes important relationships. The ESPACE centre is a multi-thematic laboratory whose main fields of research are, on the one hand, the interactions between space, nature and society, in relation to critical environmental issues and their effects on urban systems, and, on the other hand, theories, models and methodologies of spatial analysis. Coastal regions and, specifically, Mediterranean urban areas, represent one of the research centre's privileged areas of investigation: the laboratory is also in charge of managing and coordinating the *Observatoire hommes-milieus* of the Mediterranean coasts, within a national multidisciplinary network of CNRS study centres, with the aim of analysing anthropic pressure and urbanisation in coastal environments. As a result, this doctoral research work has been influenced by the geographical approach to the study of coastal public space from a socio-environmental perspective, allowing for in-depth analytical and database creation methods: this flows into a solid theoretical and operational base that, in the light of the thesis' urban planning matrix, represents a supporting element for the elaboration of innovative plans and policies for the city-sea interface as a linking element between coastal and maritime spatial planning.

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<sup>4</sup> Further information on the research and scientific activities promoted by the CNRS ESPACE laboratory can be found at: <https://www.umrespace.org/>



Finally, the PhD course is linked to a further international experience, namely the Erasmus+ project 'WAVE: Water Areas Vision for Europe. Integrated Knowledge and Visions for Sustainable Water Landscapes in Europe~~Integrated knowledge and visions for sustainable water landscapes in Europe~~<sup>5</sup>: the strategic partnership, coordinated by the Ovidius University of Constanta in Romania, is composed of the University of Naples Federico II, the Universitatea Ovidius din Constanta, the Ion Mincu University for Architecture and Urbanism in Bucharest, the HfWU Nürtingen-Geislingen University of Applied Sciences (Germany), the Weihenstephan-Triesdorf University of Applied Sciences (Germany), the Estonian University of Life Sciences and the Université Libre de Bruxelles, with the collaboration of ISOCARP (International Society of City and Regional Planners) and LE: NOTRE Institute (European landscape architecture network). The project focuses on the study and planning of water spaces along Europe's urban and peri-urban coastlines: the aim is to address the urgent issue of ~~the~~ sustainable development of these areas, from a planning, management and environmental point of view. This clearly represents one of the most difficult challenges of today's settlements: the WAVE project ~~therefore, therefore,~~ promotes a synthesis of interdisciplinary knowledge on the subject, actively involving local communities through the living lab approach. In particular, the methodological application investigated in the author's doctoral research includes the experience of the living lab in Bacoli, in the Phlegraean Fields, through which the issues of participatory planning and collaborative governance were explored in depth, applying methods of social listening and social investigation to foster spatial planning proposals for water landscapes at risk.

## Elements of innovation

The innovation of the research lies within the framework of coastal planning studies from both the land and maritime sides. Indeed, the theoretical efforts seek to define a coherent link between land planning, rooted in traditional and contemporary urban studies, and the more recent maritime spatial planning, which cannot be considered separate from the former.

In fact, the exploration of the city-sea interface theory aims for this objective, bringing the territorial perspective back to a more human and local scale. The city-sea interface, is understood as a peculiar declination of the urban littoral in which the interactions between the urbanised system and the naturalistic-environmental system are extremely strong, ~~also and above all~~ by virtue of the stakes and needs projected therein by the urban coastal~~coastal~~urban-coastal society, may in fact, constitute a fertile context for advances in the field of coastal-sea spatial

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<sup>5</sup> Please refer to the official Erasmus+ WAVE project page: [https://wave.hfwu.de/index.php?title=Main\\_Page](https://wave.hfwu.de/index.php?title=Main_Page)

planning. Indeed, its salient features concern open spaces and ecological areas of land and water that, appropriately linked through ecological approaches, can help planners and policy-makers to adaptively and sustainably reorganise contemporary urban shores, especially in the more densely populated cities. The flexibility of this theoretical construct recalls its dual, amphibious nature, but also its ability to constantly readjust both to morphological and environmental changes, depending on the effects of climate change, and to the social demands of the constantly evolving and, therefore, complex coastal community. The city-sea interface, as an urban amphibious, can be considered a platform of socio-ecological connection within which users' expectations and interests can be truly integrated into a careful and conscious planning, aimed at restoring high-quality urban places and public spaces.

In this regard, a further new element that the research introduces is a *methodological framework* designed to systemise the normative-legal, geographical and psycho-social criticalities inevitably connected to coastal planning. The intention is to help the urban-coastal planner to include the socio-environmental and perceptive component as much as possible within the littoral transformation processes, especially with a view to ~~the~~ implementation of public spaces along the littoral interface. From this point of view, it is also relevant to include, within the conceived *framework*, the main morphological and functional characteristics of the urban amphibious, in order to analyse its composition and to understand the specific relevance of each existing use, in relation to the needs of coastal society but also to the impacts that exogenous factors (such as risks coming from the sea or related to climate change) may have on the usability of ~~urban-coastal~~ urban-coastal areas and on their aesthetic, landscape and social value. The approach proposed in this study also considers the main strategic, planning and design directions existing along the city-sea interface, in order to propose a complete picture of the current state of the art of these areas that are so relevant to the development and growth of contemporary cities. The methodological framework has been elaborated as a tool for comparing case studies and applied for benchmarking in the Euro-Mediterranean context. In this research, it will be applied to the urban coasts of Marseille and Naples. However, its articulation suggests the concrete possibility of integrating it efficiently with planning and decision-making processes, constituting a solid analytical and informative basis to support coastal-sea spatial planning in downscaling to the local and social dimension of the coastal interface: in this sense, the methodological approach can fit into the field of coastal studies in relation to the connection between coastal and sea project ~~and~~ management.

## Recipients of the Research

The research presented here is addressed to policy-makers who are increasingly called upon to operate in contexts of both environmental and social criticality along urban coastlines. In fact, the development of urban settlements along the coast cannot ignore community dynamics and the growing social demand for spaces dedicated to recreational uses. The quality of the coastal areas affects the well-being of the numerous users who daily frequent the city spaces along the sea daily, for the most diverse reasons. In this sense, a key role is played by the understanding of the city-sea interface as an area of maximum intensity of the relations existing between the urban and the maritime spheres, as well as an area in which environmental risks from the sea tend to have the greatest impact, because of the numerous interests and the conflicts within society that decision-makers must efficiently resolve.

At the same time, the results of the doctoral study are also intended to be used by urban planners and designers who are facing the complexity of coastal land projects and are developing maritime spatial planning tools that consider current criticalities. One of the difficulties that can be encountered is, in fact, the time issue existing between a planning system that is fundamentally rooted in the urban planning tradition (coastal-land planning) and another one that has only recently appeared on the planning scene (maritime-spatial planning). The efforts made here attempt to provide a base of information adequate to develop an understanding of the elements of functional overlap between the city and the sea: in the context of research that has long existed on urban coasts, the theory of the *city-sea interface* tries precisely to fit as a point of contact between two systems that are similar and at the same time different (the city and the sea), precisely, confronting contemporary themes such as the demand for space to be allocated to coastal society and the growing ecological risks.

The definition of a methodological framework for the legal, geographic and psycho-social analysis of this area of the urban coast focuses on the social and recreational component towards which the research question is directed; however, its flexibility opens up possible scenarios of integration with further aspects of maritime-coastal planning, in relation to commercial, economic, productive and logistic development, always respecting the socio-environmental criteria of the coastal context. If, therefore, from an operational point of view, this approach constitutes a possible scaffolding to build an integrated coastal-maritime planning that is attentive to both its spatial-functional components, from a theoretical point of view, then it aims to fit within the current multidisciplinary research field aimed at combining the management of coastal spaces oriented towards social development and environmental protection with the potential of maritime-spatial planning.



Part One | **T**HE URBAN COAST AS A  
COMPLEX INTERFACE

## 1. The Ceity-Ssea Interface and the Ssocio-Eenvironmental Value of Uurban Sshores

### 1.1. The Ceoncept of Interface as a Multifaceted Spatial Entity

Every place is characterised by specific physical, morphological and socio-cultural features that makes it, in fact, a unique and non-generalisable spatial reality, the result of the reciprocal relationship between material elements, personal and collective representations and the actions that its inhabitants perform to shape it. Indeed, it is determined by a co-evolutionary process between the natural context and the communities that have experienced it over time (Becattini, 2015). Regarding coastal areas, this is particularly true since this type of place is exceptionally peculiar, and since it responds to heterogeneous identity traits in relationship with various kinds of spaces, uses and socio-environmental conditions. In order to study the processes at the base of the coastal socio-spatial and functional interactions, the concept of interface<sup>6</sup> is introduced: it can be described as a linear or superficial geographical entity where two different systems come into contact; in general, original phenomena occur there, including exchanges of various kinds between the two parties, a reciprocal modification of the two original systems or even the exploitation of their differences and peculiarities by business societies, cities or entire social communities (Brunet et al., 2005). It is thus a privileged zone of interaction between man and the environment, where human activities and functions are combined with the surrounding space. The interface is based on the relationships and juxtaposition of elements: interactions can take place within variable boundaries, as in the case of the contact between land and sea, and can sometimes be in strong competition ~~between~~ with each other, as it happens for compact urban systems and adjacent natural environments (Lévy & Lussault, 2019).

Since urban shores do not only refer to land areas, but also to water areas, it is possible to consider the coastal interface in relation to the reciprocal influence between the marine and land systems, exerted on both sides of the coast (Pittman & Armitage, 2016). The concept of coastal interface is an important research topic for numerous disciplinary fields: it is, in fact, declined in various scientific contexts that have as a common denominator ~~an~~ the interest in defining the peculiarities of the interactions between land and sea and ~~to measure~~ measuring their intensity, with the aim of supporting a responsible government of the territories that are most connected to the dynamics of urban water. This interest is clearly linked to the complexity of the interactions established between the different interpenetrating systems composing the littoral zones. Within the European context, it is estimated that ~~the~~ approximately 90,000 kilometres of continental coastline are home to a good half of the entire EU population, while

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<sup>6</sup> **Interface**, n. - A surface lying between two portions of matter or space and forming their common boundary. From Oxford English Dictionary (www.oed.com)

producing most of the European Union's wealth (European Commission, 2001). It is clear that this generates a constant pressure that limits the quality of life, especially in the most urbanised areas, and that requires adequate integrated management for a sustainable use of the immense economic, environmental and social potential of the coastal space. From a geographical point of view, the interface is akin to a flexible area that facilitates spatial concentration and, consequently, greater human density. This space can be recognised from within and outside its variable boundaries, even unconsciously, through the social networks that are established there and on the basis of the social capital<sup>7</sup> that develops and distinguishes it. Thus, the social value shapes and defines physical space: its form and extent are characterised by a high degree of liability, changing over time according to the evolution of socio-functional relations. It can be compared to a geometric abstraction and studied according to the network of its inhabitants; in relation to the spatial distribution of its socio-environmental elements, the coastal interface may be analysed in a more physical sense, in order to understand social needs and the innovations they require (Nuvolati, 2011).

Along the coastal strips, settlements present complex articulations: urban areas with variable density can be concentrated in accordance with a polar pattern to answer to the demand for resources, or they can be placed along the main road infrastructures parallel to the coastline. All this clearly entails more or less localised pressures on the socio-environmental ecosystem, generating spatial and urban morphologies that are often difficult to codify and manage (Abbate et al., 2009). The *land-sea interface* seems to be easy to define in the mind of researchers, but it has an uncertain spatial delimitation, since it is the subject of broad urban studies, involving economic, geological, historical, cultural, ecological and engineering aspects. It is an area of correlation: its definition is, in fact, linked, on the one hand, to the surface area between high and low tide regions, and, on the other hand, to the complex economical, functional and legal evolution of the coastal and water spaces (Zunica, 1986). This interface takes into account the macro-territorial scale to analyse maritime space, increasingly fractioned by different stakes, tends to be analysed, and the micro-local scale towards which the land governance must tend in order to better manage the social demand.

From a physical and ecological point of view, the *coastal interface* is configured as a point of contact between land, sea and air, within a context of mutual environmental influence between the body of water and the land; it is a peculiar place in that it hosts most of the biological cycle of the coastal ecosystem species (Della Croce et al.,

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<sup>7</sup> The concept of social capital generally refers to the wealth of relationships, experiences and values that an individual builds up in a lifetime in function of a specific place and society in which he or she fits (Andreotti, 2009).

1997). The resulting interactions that characterise this type of interface define specific areas, among which zones with residential, economic, productive, tourist-recreational and port-logistics vocations take place.

In particular, the *city-port interface* is characterised by its multidimensional landscape and its strong imprint on the surrounding territory. On the other hand, if this interface is the result of the mutual relationship between two entities (the city and the port), the intensity of this link depends on the degree of proximity of the two elements, which has evolved over the years, according to urban and spatial changes. The port-city interface is also characterised by the presence of a distinctive architectural artefact that has undergone international influences, as a result of economic and commercial traffic, and could be integrated into the urban system as a public space, enjoyable by the community regardless of its primitive logistical function (Moretti, 2020). In this sense, the urban-port context offers the possibility of experimenting with resilient planning in order to overcome past design criticalities offering new solutions that allow for more efficient and inclusive *governance* models to connect to the edges of the interface. This is important because the coastal interface, in general, has a limited land as a resource. Consequently, port design should provide for coexistence with urban-coastal values rather than their spatial relocation (Bruttomesso & Alemany, 2011).

However, the commercial evolution of urban shores and the progressive decommission and transformation of former logistic areas since the end of the last century have generated a chaotic condition in which the aforementioned interface currently finds itself, progressively moving away from its role as the main gateway to the sea: the basic idea is that the port is a separate element from the interface, whereby the qualitative improvement of urban life is independent of the adequate planning of the city in relation to its harbour component (Ducruet & Notteboom, 2022). In any case, it should be noted that there is a certain degree of port independence, as the harbour is, in fact, an economic system open mainly towards the sea from which sources of economic and cultural enhancement can be received.

The littoral interface is thus characterised by a multidimensional definition, difficult to categorise because it incorporates several definitions and numerous interpretations, depending on its specific uses and morphological conformation.



## 1.2. The City-Sea Interface: The Relationship Between Sea, City and Community

Among the different meanings of the littoral interface, the research aims to explore the concept of the *city-sea interface*, that is, the area of physical, ecological, social and functional contact between the socio-ecologically structured city fringe and the water fringe, connected to the urban system close to the shore: this interface extends along highly urbanised land areas and along heavily used marine areas, constituting a relevant spatial and functional continuity. At the basis of this concept, there is the hypothesis that the portion of the city closest to the coastal water is the urban area most influenced by the maritime element: "The two subsystems", namely the littoral urban fringe and the coastal marine space in close proximity to the shore, "are closely connected and constitute a single spatial, social and ecological system that must be considered as a whole when reflecting on its future"<sup>8</sup>.

In fact, its structure is not fixed, but it changes over time, in accordance with the social and environmental variations that the urban shore undergoes: What fuels the transformations are the human, logistical, functional and environmental flows that characterise the margins of the two coastal systems and that allow for the effective articulation of the interface: the latter thus assumes a unique geographic and socio-spatial identity that is distinct from the basic terrestrial and aquatic domain. It is understood that the city-sea interface is characterised by relatively reduced spatial dimensions on both sides of the coast. Depending on the reference city and its urban configuration, the dimensions of the city-sea interface may, of course, vary, but, in any case, they will not include the entire width of the coastal area: for this reason, this concept can be mainly appreciated in large urban centres (Ollivro, 2016). Within this particular urban area, three interrelated theoretical subsystems can be distinguished, namely the marine ecosystem, the urban ecosystem and the socio-system, based on the conceptualisation of the coastal system proposed by geographer Jean-Pierre Corlay (1995). The marine ecosystem is characterised by more pronounced anthropogenic activities than coastal areas further from the urban core; it is also more affected by the effects of urbanisation. The urban ecosystem, or geosystem<sup>9</sup>, has more sealed soils and greater demographic

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<sup>8</sup> "Les deux sous-ensembles [...] sont très liés et constituent un système spatial, social et écologique qui doit être appréhendé comme un tout dès lors que l'on souhaite réfléchir à son devenir", Robert S. (2019), *L'urbanisation du littoral: espaces, paysages et représentations. Des territoires à l'interface ville-mer*, p. 144, Université de Bretagne Occidentale (UBO), Brest. Translated by I. Pistone.

<sup>9</sup> In geography, the geosystem includes the interrelationships between physical and human elements that are studied in a dynamic way, applying the general theory of systems also in an economic sense and in a broader territorial perspective. The term is often used in antithesis to ecosystem, in order to emphasise the prevalence of anthropic processes over the natural ones, even if the latter are fundamental to the geosystem itself (Lévy & Lussault, 2019).

pressures. Finally, the socio-system is characterised by the prevalence of the social component that influences the entire coastal system ~~also~~ in an economic and perceptive sense.

The socio-ecological relations between the three subsystems are more intense in the territory of the city-sea interface than anywhere else along the coast. Indeed, the interface is particularly sensitive to transformative phenomena such as *sea-level rise* or globalisation: for this reason, climate change and ecological transition, intended as responses to large-scale changes, are particularly important for understanding and planning the city-sea interface. It is now well known that the reach and frequency of adverse weather events, from rising temperatures to disasters such as flooding, are increasing along the coasts of cities; this obviously has a tangible impact on the lifestyle and quality of life of the communities that inhabit the littoral areas, as their location is as privileged in relation to maritime benefits as it is critical with respect to risks from the sea (Siegel, 2020). ~~By~~ Under any circumstances, this criticality should be underestimated in urban planning and design, especially while setting up public uses and spaces, considering ~~gg, moreover,~~ the strong attractiveness of the coasts for numerous categories of *stakeholders*.

The importance of the social dimension of sustainable coastal development must be emphasised, especially for efficient planning. Although in large cities, many uses of the shore can inspire transformative actions, the recreational and social perspective can be effectively integrated with ecological considerations, deepening specific points of the city-sea interface, such as urban beaches or piers, which are important components of the urban coast as spaces intended for sociality. As a matter of fact, from a socio-recreational point of view, the city-sea interface represents an area of high frequentation and considerable interest, especially in recent years when the flow of coastal users has increased ~~considerably to quite an extent~~ (Evrard, 2014). Given its relevant naturalistic and environmental component within highly urbanised contexts, it can attract citizens even far from the urban sea. ~~I~~ the city-sea interface thus becomes a social platform for recreational uses of the coast, generating undeniable positive effects on human health and well-being. Since it is defined by the perimeter ~~reef~~ of the waters washing the city, the coastal interface is strongly linked to the theme of recreational access to the blue space: even if the area of contact with the sea ~~are is~~ narrow, users are equally willing to travel considerable distances to enjoy the maritime resource, despite the fact that the availability of littoral public space is not always sufficient (Elliott et al., 2020).

It is a place where it is possible to make use of important landscape, cultural and environmental services, through social practices that can serve as an indicator of interactions between society and the coastal territory (Albert et al., 2019), considering specific land uses and the perception of place. However, the city-sea interface raises questions about socio-environmental equity and spatial justice, perfectly framed in the perspective of

sustainable development: although the social and recreational function is only one of the many dimensions of integrated coastal zone management, at the present time, social uses can be considered ~~as~~ a key to ~~reconsider~~ review the way to analyse and design the shore in large cities, ensuring social balance, traffic reduction, innovative solutions and, in general, a stronger urban identity. ~~Urban-coastal~~ Urban-coastal zones are, in fact, places of great expectations: they are perfect spaces to conceive actions aimed at raising the quality of urban life and coherently organising traditional and recent uses. The development of coastal settlements often follows a morphological model intended to maximise the landscape enjoyment of unique places and produce physical transformations along the coastline in order to exploit its direct and indirect accessibility. ~~I~~ thanks to its position, the city-sea interface fuels, in fact, the desire to be as close as possible to the sea. Obviously, in terms of economic growth, in this particular urban zone, the real estate value tends to increase proportionally to the proximity to the sea, often sacrificing free areas ~~designed~~ dedicated ~~for~~ the community in favour of building development: this pattern of growth tends to have a significant impact on the more natural parts of the urban shore, as well as on the cultural heritage and social fabric of the communities that inhabit it (Green, 2010).

In ~~the~~ light of these reflections, ~~it can be justified~~ the choice to further explore the notion of the city-sea interface as a resource for citizens can be justified, from both a social and necessarily ecological and environmental perspective, focusing the field of research on the spaces intended for public use along the coasts of large cities. In order to study the social function of the coast, one of the main objectives is to understand the practices and desires of coastal communities: the hypothesis is that nowadays, the expectations of inhabitants tend to increase in terms of quality of life and accessibility to environmental services. It is, therefore, crucial to investigate the dynamics linking the coastal evolution of settlements and their potential for citizens, which should be the basis for interventions and decisions concerning socio-cultural aspects, environmental factors and anthropic elements of the city-sea interface.

### 1.3. The Width of the City-Sea Interface: Land, Water, Islands

Flexibility is one of the main characteristics of the *city-sea interface*, as its conformation is directly dependent on the morphology of the coastline and the specific uses that users carry out there. On the terrestrial margin, the space is urbanised and follows the organisational structure of the city model, influenced by peculiar social and ecological features. On the marine margin, the ecosystem is, in turn, profoundly conditioned by the presence of the city, which influences its physiology, its functionality and, obviously, its evolution. The research attempts to

conceptualise these mutual influences from a dimensional point of view: it is therefore proposed to schematise the *city-sea interface* in three bands, or edges, which are consequential to each other and possess a variable width: the *sea edge*, the *maritime city edge* and the *extended city edge*.

— The *sea edge* indicates the area of the stretch of water closest to the shore. Its extension is linked to the geomorphological structure of the coast, to the presence of reefs, depressions, and sandy seabeds. The inner limit of this strip corresponds to the place where the waves break, moreover generating currents and turbulence: for this reason, its surface is extremely variable in time and space and is bound to the depth of the seabed (Short, 1999). Indeed, for the purposes of a socio-recreational use of the interface, it is mandatory to consider the limits imposed by bathing safety or the technical characteristics of floating installations (such as platforms or similar elements)<sup>10</sup>. In this sense, the uses of the sea are linked to the possible risks that evolve over time in relation to the environmental component. Consequently, the definition of the sea edge must take into account the availability of data about the spatial planning of the body of water, the innovative methods of meteorological-marine meteorological forecasting and the probability that adverse climate events may modify the ways to exploit urban waters: a meta-dimensional perimeter of the analysed edge thus emerges (Simonetti, 2019). Clearly, other activities are also concentrated in this sea space: suffice it to think about the water corridors for boats and ships to enter into the sea; some maritime areas are intended for various kinds of fishing, consequently dealing with rules for environmental and wildlife protection; seabeds can be the subject for guided tours, and it can welcome underwater art installations. Therefore, the sea edge is strongly influenced by local regulations and directives that expand or reduce its width depending on various factors, such as safety criteria, environmental characteristics or administrative and management delimitations. It is also important to consider how much the urban littoral conditions the island systems within the range of influence of the mainland: indeed, islands constitute a fundamental element in the careful management of the interface. In particular, the connection between the sea edge and the islands is inversely proportional to the distance of the latter from the urban coastline: the shorter the distance, the greater the dependence the island will have on the reference city on the mainland, as the urban system of the island will plausibly be configured as a satellite element of the urban pole beyond the body of water (Calado et al., 2007). Since the twentieth century, the progressive urbanisation of the littorals has rapidly altered the spatial configuration of islands nearby large coastal cities, resulting in a loss of biodiversity and socio-ecological modifications. To be precise, tourism represents one of the most serious threats to island sustainability, along with environmental criticalities: it is plausible that a smaller urban system is less efficient in tolerating these issues (Leatherman et al., 1997). However, the tourist industry itself can be considered as a source of wealth and an impulse for the socio-cultural growth of smaller islands, as it constitutes a strong connection with the city-sea interface, expanding the perimeter of the sea edge to the point that these places become an integral part of it, addressing urban planning towards choices that emphasise the anti-fragile character of these maritime spaces (Nurse et al., 2014).

— The *maritime city edge* lies between the sea and the first road infrastructure parallel to the coast, called the *transit road*. Being the central area of the city-sea interface, it acts as an inner hinge in the urban-coastal system. It is the strip of coastal land closest to the water system and, for this reason, particularly important from an environmental and ecological perspective. The main *Nature's Contributions to People* are concentrated there (Díaz et al., 2018); for example, the effects that the local ecosystem, biodiversity, and ecological processes have not only on the quality of life of users, in the form of coastal ecosystem services but also have

<sup>10</sup> At the Community level, the European Union has drafted the UNI 11745:2019, which delimits the area designated for bathing within a radius of 1 kilometre, confirming the area of so-called 'safe waters', with a depth of 1.60 metres and signalled by special boats.

negative outputs (consider the effects of climate change that are amplified in this zone so close to the water). If the coastal interface is, in fact, the area of reciprocal influence between the land and the sea, the *maritime city edge* stands as the stretch of the coastline where the main biological cycles of species inhabiting this spatial environment take place (Tanacredi, 2018). In this area, it is assumed that there is a more linear ecological continuity, due to the close proximity to the water element, which also has important implications for the development of social activities: since water itself is a physical factor that defines peculiar organisational and landscape patterns within coastal settlements, it is connected to specific littoral morphotypes at the base of the analysed portion of the city-sea interface. In particular, we consider trajectories orthogonal to the coast, determined by rainwater outflow paths that generate convexities and concavities. Along these paths, it is possible to identify roads passing through the maritime city edge to connect the inner land to the coastline without abruptly interrupting its environmental continuity. At the same time, we consider morphogenetic trajectories parallel to the border between the sea edge and maritime city edge: this category includes firstly, the coastline itself, with its more or less sinuous course, depending on the conditions of the context, and secondly, the roads parallel to the coast (such as the transit road). The last ones not only act as a gateway to the coastal environment but also constitute the first effective strong limitation to the littoral ecosystem, interrupting its continuity (Mininni, 2006). Since the extent of the maritime city edge is determined by the actual distance between the coastline and the transit road, it is possible to state that its width is extremely variable: for this reason, there are city-sea interfaces endowed with a very wide maritime city edge (for example, settlements that rise really close to the water), as well as other interfaces where the maritime city edge is reduced until it completely disappears, as in cases where transport infrastructure runs along the coastline. Although the presence of built areas in this zone may be of crucial importance from the research perspective, the maritime city edge is, therefore, particularly interesting for the potential presence of public or semi-public open spaces in a very close spatial and visual relationship with the body of water (Zhu, 2020). Whether we refer to artificial shorelines, shaped by docks and piers that are not dedicated to logistic or productive functions and exclude free access, or to natural shorelines (for instance, those stretches of accessible coastline that are mainly characterised by beaches or reefs), the maritime city edge appears to be strongly defined by a morphological and socio-environmental point of view, hosting, at least in principle, a considerable amount of public areas in coastal urban centres that have become increasingly denser towards the sea.

— Finally, the *extended city edge* is the most extreme part of the city-sea interface. It lies beyond the transit road and may extend more or less widely towards the innermost part of the urban coast. It is a zone of the interface with a fluctuant geometry and variable size, since its interest for the urban planning and design of socio-recreational public spaces on the urban coast depends on the presence of relevant green areas or open spaces connected to the coast, as well as on the housing density of the area, which should be extremely low. Its conformation is linked to the phenomenon of urbanisation that has gradually led communities to concentrate along the coastal strip and in the land in the immediate proximity, starting in the Seventies; in the last decade of the twentieth century, the shore already appeared almost completely built-up. It is only at the beginning of the new millennium that urban growth has progressively slowed down, although littoral zones are now compromised or at least rigidly characterised by major infrastructures influencing local ecosystems and a dense urban fabric invading much of the coastal territory (Salvati, 2012). These phenomena are amplified by the need to accommodate new users, to satisfy socioeconomic needs, but above all by the impulse of tourism, a powerful factor in the artificialisation of the coastal landscape. However, the importance of open spaces on the extended city edge is measured in socio-environmental terms. Firstly, these areas play a crucial role in protecting the spaces closest to the shore from environmental risk phenomena that could cause huge human and economic losses: for example, the presence of vegetated areas in perfect condition can protect transport infrastructure and coastal spaces from landslides, floods and other hydrogeological impacts. They; they can also shield open spaces from extreme heat waves or torrential rains, increasing the liveability of the coasts to the communities that are settled there (Munang et al., 2013). Secondly, the open spaces of this zone can

provide a design continuation for the public areas of the contiguous maritime city edge: in this sense, it is possible to give value to the large sites that are still vacant, albeit their number is quite limited in large contemporary cities, and to the small fragments of natural space between the buildings or in degraded areas. According to this vision, the extended city edge can be a suitable place for the enhancement of all the complex human-nature interactions that characterise the maritime city edge. The actual ~~implemented-implementation~~ could be operated through interventions that strengthen the sociality and ecological character of the open spaces in the innermost parts of the city-sea interface (Misiune et al., 2021). ~~;-T~~the planning and management of these areas can indeed modernise their receptive, social and environmental capacity, offering communities new coastal services and generating new inclusive landscapes.

Therefore, the description of the three edges composing the city-sea interface suggests that its structure can vary greatly, not only from city to city, but also within the same coastal urban area: its wider or narrower dimension depends not only on the littoral morphology that defines its spatial character, but also on the presence of very important social uses and open spaces of various kinds, to which users aspire for their uniqueness within the urban system.

#### 1.4. ~~Proximity~~ The Proximity of Coastal Public Spaces for Green-Blue Infrastructure Project

The study of urban evolution allows us to recognise the dependent and independent variables of the littoral landscape. In dimensional terms, coastal space is fundamentally indeterminate, an area where productive, economic and social functions and systems are free from material constraints and urban fragments gain value in the perspective of a continuous process of morphological modelling, expansion and retraction. The city-sea interface represents a resource from many points of view, although it presents an articulated and not always homogeneous structure. In fact, its complexity also depends on the variegated elements that compose it: they can be categorised into a range of juxtaposed spaces, characterised by their greater or lesser aptitude ~~to~~ for urban transformation.

Littoral areas characterised by ~~a~~ denser and more stratified urbanisation are certainly less flexible from a planning point of view, since the functionality of spaces is now consolidated, and the existing building has often saturated the available land: the result is a peculiar spatial configuration with respect to the adjacent maritime system. In this category, it is possible to include not only dense urban areas (for instance, residential areas or ancient core areass of ~~the~~ settlements along the urban coastline, with deep historical, cultural and landscape values) but also industrial and port areas, in which the productive and logistical function often limits the free use of



the coastal interface, as the economic weight of these places is greater than the social desire that communities can manifest towards the urban sea.

On the other hand, the areas of the coastal interface most prone to transformation are those that show either a higher degree of naturalness or a weakly defined, or even fading, functionality. These include unequipped or lightly equipped natural spaces (such as urban beaches), urban parks of various sizes along the coastline (in this case, it is important to consider the landscape constraints that may influence the design process for these areas), socio-recreational areas at a local and micro-local scale (for example, small residual spaces in the urban fabric that are often used as meeting places for market functions, or for the spontaneous installation of street furniture), up to abandoned, degraded or disused areas, as well as public places perceived as unsafe by users. ~~E~~ven if these places do not present a high ecological value, they may have a discrete functional flexibility from a planning and operational perspective. The elements of the latter category, in particular, can be read as ~~an~~ opportunities for sustainable social development, and as potential components of a multifunctional green-blue infrastructure, in relation to ecological and landscape approaches (Di Venosa & Manigrasso, 2022).

The third objective of the *Sustainable Development Goals*<sup>11</sup> states that it is necessary to promote community well-being to ensure sustainable development: coastal planning should focus on the physical and mental health of users, on their satisfaction and on guaranteeing a feeling of positive control over their surroundings. Moreover, several studies show that the triggers for cancer, heart and cerebrovascular problems and respiratory disorders can get worse because of an overly oppressive and unhealthy built environment and sedentary lifestyles. In addition to this, public health is increasingly threatened by external causes such as climate change, which is seen as one of the most compelling challenges ~~of~~ for urban communities in the new millennium (Andreucci et al., 2019).

*Green-blue infrastructure* is an urban planning approach related to nature-based strategies and design solutions and to the reticular development of space: in fact, it can be defined as a strategically planned network of natural and semi-natural areas, whose environmental characteristics can provide a wide range of ecosystem services (Ghofrani et al., 2017). It is also related to the concept of natural capital that every urban area possesses: its founding elements are integrated with the built environment, through different design systems, such as permeable pavements and rain gardens, fostering environmental protection, citizens' well-being, social equity and inclusion: it is ~~therefore, therefore,~~ a hybrid infrastructure composed not only by green and blue public spaces (in case water-coastal ecosystems are included) and more urbanised areas, comprehending both extensive zones, like parks, urban forests, wetlands and coastal creeks, but also punctual and spatially delimited elements, such as

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<sup>11</sup> <https://www.un.org/sustainabledevelopment/health/>

public gardens, narrow community open spaces, depaved areas, ponds and small lakes, urban beaches (Andreucci, 2017). Due to its inherent complexity, littoral green-blue infrastructure involves multi-scalar and multi-actor decision-making processes in order to preserve urban-coastal ecosystems from degradation by increasing their adaptive capacity to global changes. This kind of approach can be included in the field of ecological planning: its rehabilitative action focuses on those areas that are particularly critical and neuralgic in the urban-environmental system in order to regenerate vital ecosystem connections and services for local communities, translating planning interventions into more or less strict policy measures, on a case-by-case basis (Chavez et al., 2021). *Nature-based Solutions* (NbS) absorb this philosophy; in order to manage contemporary challenges in a sustainable manner, even at the small scale along the city-sea interface, and ~~restoring~~ restore the ecosystem nature with an adaptive approach. Simultaneously, they provide benefits for human well-being and biodiversity; in a flexible combination with other environmental, technological or engineering solutions aimed at solving socio-environmental issues: great attention is given to the specificity of intervention sites, even at the local scale, considering their community and cultural characteristics. They are tools designed to grant users ~~an~~ equal accessibility to coastal resources, promoting transparent and participatory planning and recognising trade-offs between the immediate production of economic benefits and the development of various ecosystem services over the long term (Cohen-Shacham et al., 2016).

It is evident how important it is to take these specific characteristics into account in the reorganisation of the public spaces of the city-sea interface; as a platform for the socio-recreational connection of its community, rethinking their functional meaning and facilitating their management and fruition; in accordance with the current social and recreational need that is less oriented towards large public spaces dedicated to tourists and occasional visitors: instead, the actual social demand asks to emphasise ~~high~~ high-quality proximity public spaces in order to allow citizens to experience and come into contact with the sea and the coasts of their city (Pittaluga, 2018). It ~~therefore~~, therefore, seems fundamental to study the coastal interface ~~as a~~ function of the opportunities it offers to its main users who experience it on a daily basis and express a desire for sociality. ~~I~~; in this regard, the concept of the *15-minute city* fits in. This theory proposes an urban model based on ~~a~~ small-scale and extremely localised planning, rooted in the hypothesis that the primary functions that society needs, from a productive but above all social point of view, can be located within a limited radius of action, rounded down to approximately 1.5 kilometres, representing the average distance that can be covered by foot in precisely fifteen minutes. The approach addresses issues related to recreation and sociality, proposing the realisation of ~~high~~ high-quality neighbourhood public spaces that are not only equally accessible to the different segments of littoral society; but also prone to sustainable urban development. The reduction of the influence range of functions related to sociality could ensure higher quality



standards at the neighbourhood level and become part of the ecological transition process (Moreno, 2020a), limiting travel outside dense urban centres to enjoy the benefits of the sea.

Proximity thus becomes not only a systemic character of the network of coastal open spaces, composed ~~by~~ of places ~~but also~~ interactions between individuals, functions and the environment, according to which users tend to form social relationships on the basis of ~~a closenessthe~~ criteria of closeness (Manzini, 2021). This concept can be not only a spur for mending the fragmentation inside communities living along the coast, but also for recalibrating the relationship with the physical-environmental atmosphereenvironment of the city-sea interface. In fact, the coastal city, and consequently the urban shore, can be described as a macro-ecosystem on a territorial scale within which local micro-ecosystems are articulated: the latter are connected to each other as minimal ecological units that can achieve ~~a~~ certain functional independence while maintaining links with adjacent units. Recomposing these micro-ecosystems can push city-sea interface planning towards ~~a~~ more rational management of resources and public spaces, also with regard to protection from environmental criticalities.

In summary, contemporary city-sea interfaces ~~must~~ prove not only to be safe, and efficient, but also accessible, providing better services and increasing the quality of life of local society, through a careful design of the public spaces along the coastline, especially in the areas of the city that are deeply connected to the urban sea. Today, these spaces are often largely congested and scarcely enjoyable, as is well-known. In this sense, resilience is a primary characteristic for coastal areas, in order to respond adaptively to the adverse circumstances that could conceivably affect their most sensitive spatial spheres: the ability to face environmental, sociological and functional changes for the purposes of regaining a balanced status is necessary for the littoral interface when it comes to delivering efficient services and development opportunities for the coastal community. Therefore, one of the main objectives of coastal ecological planning should be healing the damage suffered by the urban-littoral fabric, so that a reorganisation of the fragmented structure of the city-sea interface can take place, restoring a sustainable spatial wholeness for its inevitably anthropic context. The systemic nature of the green-blue infrastructure aims to ~~coherently respond~~ respond coherently to multiple demands expressed both by the city with its inhabitants and by the coastal environment itself. As mentioned above, this approach aims, in fact, at increasing the quality of life of citizens through social and economic actions based on the correct multifunctional use of environmental resources. This makes it a potentially valid policy tool since multifunctionality could positively contribute to the satisfaction of the needs of various stakeholder segments, promoting social growth, dealing with the equal use of coastal public spaces and supporting the development of an efficient green economy for ~~an~~ effective management of the coastal territory (Veerkamp et al., 2021).

### 1.5. The Territory of the City-Sea Interface for a Potential Socio-Environmental Innovation

Within the context of the city-sea interface, it can be stated that land and sea are intrinsically connected through multiple and complex socio-ecological interactions of paramount importance in not only the economic subsistence of coastal communities, but also in terms of the social well-being to which these communities aspire. The relationships between the terrestrial and water systems could be divided into three categories (Álvarez-Romero et al., 2011). In the first one, there are the flows that underlie the unfolding of socio-ecological processes, for example, the watercourses running into the sea, the migration of certain species depending on the time of year, and but also the progressive groupings of communities around polar elements, such as coastal areas that undeniably provide resources and strong social cues. On the other hand, the second category groups elements that disturb and threaten the systemic equilibrium, such as the alteration of habitats or the change in the morphology of places: these critical issues are differentiated into exogenous risks, like climate change and coastal erosion linked to sea-level rise (Giannakidou et al., 2019), and into endogenous risks, like the disconnection of ecological networks due to the urban fabric (Pineschi, 2013). Finally, the third category includes aspects related to management and operational actions regarding the positive and sustainable development of interactions within the coastal interface; in relation to ~~the~~ areas to be protected, ~~the~~ functions to be assigned to coastal spaces or the adoption of restrictions on land (and water) use: such choices must pursue beneficial effects on human lives and return positive outcomes to the coastal environment, thus falling within the scope of territorial-environmental governance (Antonioli, 2017), ~~that is the~~ that allows the decision-making processes that society and its representative institutions undertake, affecting the status, functionality and accessibility of the city-sea interface.

In this sense, the phenomenon of coastal urbanisation can be observed as much on land as on the sea: the effects can be not only be measured in terms of ecological and environmental impacts; due to various forms of pollution, but also to urban expansion on the water, in relation to interventions to increase the walkable surface area of the city (Crossland et al., 2006). It is possible to find a condition of heterogeneity in urban shorelines that are characterised as liminal landscapes between sea and city, the sites of physical, biological and anthropic interactions that produce original environmental contexts in which different kinds of elements share mutual relationships (Phillips, 2005). It can be said that city shorelines simultaneously assume the role of interruption and connection between the land and water margins, representing both a potential for development and a physical-social obstacle to the evolution of the city (Pavia & Di Venosa, 2012).

From a functional point of view, the city-sea interface is thus configured as the habitat peculiar ~~of to the~~ coastal community in which each user carries not only economic, but also residential, social and recreational demands, shaping the coastal ecosystem, or in any case, setting forth precise expectations regarding its transformation, and attributing a particular perceptive character to the shore (Turri, 2002). It is a part of the city that could be considered ~~as~~ a territorial entity rather than a mere place, as a consequence of ~~the~~ specific social practices generated by the reticular relations involving both human societies and environmental and functional elements in the transformation of physical space (Magnaghi, 2020; Painter, 2010). This reconnects the coastal interface to the bio-cultural character of the landscape: the area of the territory, as perceived by local communities, is the outcome of the interaction between human and natural factors, including both valuable spaces and ordinary or degraded places, in the natural and urban spheres. Hence, great importance is given to ~~the~~ identity and perceptive value. It allows people to understand and interpret the structure of the territory, in the light of its strengths, its weaknesses and, above all, its antithetic features breaking down its conceptual order and static organisational homogeneity (Minca & Colombino, 2012). The city (especially in its most critical and complex areas, such as the urban shore) tends to fragment and reassemble itself in a continuous and dynamic spatial reorganisation that must be thoroughly understood. The city-sea interface is, in fact, characterised by a mutual interdependence with functional programmes: because of this, it is appropriate to talk about a fluid spatiality ~~that~~ that constantly reshapes its own structure, although this articulation is not always grasped in the relationships between sea and coast, especially in policy-making and planning (Morri, 2012; Soriani 2002).

The city, regardless of its size and number of inhabitants, is an aggregation in which diversified and complex dynamics take place. On the other hand, the territory is considered an element with its own identity that binds itself to the city reality with linear and punctual elements, through tangible and intangible signs, going beyond the generic definition of enclosure for the urban organism. The relationship of continuity between the urban and territorial entities converges in the notion of landscape. For this reason, the urban system crystallises characteristics of the territory linked to history, memory or even future development, but it cannot be considered ~~as~~ a random spatial representation of human settlements. Instead, it can be described as an 'allotropic state of the territory'<sup>12</sup> that manifests with greater density the continuity of the territorial structure, transcending the dimensional aspect. This concept can be extended to the littoral context of this research. In short, the notion of territory is configured as a process of socio-environmental definition of places, in this case, along the city-sea interface, in which the relations between coastal and urban systems transcend dimensional boundaries and change over time: in the same way,

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<sup>12</sup> De Carlo G. (2019), *La città e il territorio - Quattro lezioni (edited by Tuscano C.)*, p. 34, Quodlibet, Macerata.

also the local society changes while enjoying coastal territory through affective-identity representations, specific uses and practices and peculiar resources (Banini & Ilovan, 2021). Indeed, the city-sea interface provides a context within which the direct or indirect actions of users and the knowledge produced by experts in coastal studies must be delimited geographically, functionally and in terms of governance, effectively defining the urban-coastal space (Brun-Picard, 2020). The territorial identity thus assumes an important value in the study of the city-sea interface because it condenses private and collective interests underlying the principle of belonging to place and the specific needs and expectations of users, towards which thoughtful planning should tend in order to guarantee adequate community use of ~~urban-coastal~~urban-coastal areas (Panzerà, 2022).

#### 1.6. Sustainable ~~D~~development ~~A~~along the ~~C~~city-~~S~~sea ~~I~~interface ~~B~~etween ~~U~~urban and ~~M~~maritime ~~P~~planning

While studying the city-sea interface concept, it must be emphasised that land and sea uses, environmental and ecological characteristics and social demands are closely interconnected: despite this, interactions between land and sea areas are often ignored in local urban planning. The development of coastal areas is directly related to the sustainable use of ~~the~~-maritime space. A large number of activities take place at sea and, at the same time, are related to the coastal zone. These functions can be categorised into three main macro-categories, which are listed below: *maritime connections* indicate the movement of goods and passengers, ~~andbut also~~ operations for military purposes; the *exploitation of the sea resources* includes mining, renewable energy production, fishing and aquaculture; finally, among the *uses related to the natural environment fruition*, it is possible to group research and scientific dissemination and recreational and cultural uses (Smith et al., 2011). Since the coast is made up of land and water spaces on which functions often take place simultaneously, it is clear that conflicts can arise in the uses of the city-sea interface: this is particularly true for a context such as the Euro-Mediterranean basin in which economic-tourist sectors are increasingly developing, despite the existing functional frictions (Van den Burg et al., 2016).

The coastal interface can be defined as an open system; in relation to the continuous interactions between the littoral land and the adjacent body of water: however, it must be considered that marine ecosystem tends to show greater openness than its terrestrial counterparts, as it is more malleable from a functional point of view. Indeed, there are no physical boundaries in the sea, just as functional zones are less clearly defined, at least in appearance, and give rise to easier, albeit damaging, overlap od uses. There is a need for efficient and coherent planning integration between the two systems within the ~~urban-coastal~~urban-coastal structure, overcoming any

political and management barriers in favour of environmental well-being and equal usability. Moreover, relationships between the land and the maritime spheres occur on a wide range of spatial and temporal scales that vary according to coastal morphology and social context: the anthropic contribution usually alters these interactions, and its effects must necessarily be interpreted in the long term (Stoms et al., 2005).

In the contemporary urban planning debate, it emerges that maritime spatial planning, which is historically more recent, tends to be conducted separately from land use, which is instead more rooted within traditional planning and management processes (Walsh & Kannen, 2019). Responsibility for terrestrial and marine planning often falls on administrative bodies at different levels of governance, complicating coordination and integration between the two areas that are nevertheless two sides of the same coin (Morf et al., 2022). From this perspective, the notion of the city-sea interface can be proposed as a key to understanding coastal and sea planning, as a connecting element between two inseparable and interdependent ecosystems: their delicate socio-spatial balance appears to be threatened by significant pressures from competing anthropogenic activities that lead to the environmental and functional degradation of coastal spaces (Tsilimigkas & Rempis, 2017). The notion of the city-sea interface brings the urban planning field back to a reasonably local scale, interweaving spatial plans with community needs and ecological features, defining an operational link between two types of space (the land and the sea) separated only by the ephemeral boundary of the coastline.

## 2. Urban ~~C~~oastal ~~S~~society and ~~I~~ts ~~R~~elationship ~~W~~ith the ~~S~~sea

### 2.1. Definition and ~~M~~ain ~~C~~haracteristics of ~~U~~rban ~~C~~oastal ~~S~~society

The development of urban settlements along the coast has been influenced, over time, by numerous factors. Although spatial and socio-functional processes are highly articulated, it is nevertheless possible to briefly divide the elements underlying this development into three macro-categories: the geophysical aspects include features such as advantaged location and easy access to maritime resources; the economic aspects concern not only the richness of organic and inorganic natural resources present along the coastlines, the possibility of establishing successful import and export trades and producing energy from the sea and water, but also, in more recent times, the growing tourism industry; finally, among the landscape-environmental aspects, it is possible to mention the atmospheric benefits for the health and well-being of users, the immense cultural and natural beauty that characterises the coasts, and the not secondary aspect of the social and recreational value of the coasts. Based on these elements, communities settled along the coastal interface tend to grow exponentially, especially where coastal cities are denser. The global population, estimated at 7.6 billion citizens in 2018, is expected to rise to a staggering 9.9 billion by 2050: in the cities, there are currently 4.1 billion of the world population, and this number will grow to 6.9 billion, mostly distributed along coastal areas<sup>13</sup>.

In relation to the theme of shores in large contemporary cities and the relationship established with the citizens who inhabit them and experience their changes, it is possible to define an ~~urban-coastal~~urban-coastal *society* as a community intimately connected to two specific elements. The first is the coast itself, intended as the urban area in direct contact with the body of water (Timur, 2014). The second element is the coastal water, which is essential in the process of ecological transition and environmental regeneration interventions: in fact, water cannot be considered as an element separated from the land; ~~but~~ ~~but~~ rather as a component fluidly linked to the urban system whose coasts are shaped by everyday uses of people who formally or informally enjoy them (Hannigan, 2017). The changing nature of ~~the~~ the city-sea interface ~~therefore,~~ therefore, reflects the diverse needs and experiences of the community, requiring a high degree of socio-spatial flexibility. Indeed, the elements underlying coastal identity change over time ~~and~~ ~~but~~ ~~also~~ in space, influencing the great symbolic power that coastlines possess: this makes it difficult to univocally classify the components of littoral communities (Gillis, 2012). The concept of *place identity* turns out to be fundamental in the study of the city-sea interface territory, conceived as a

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<sup>13</sup> Data available from the *World Population Data Sheet* (2018) of the Population Reference Bureau in Washington, DC. More information can be found at: [https://www.prb.org/wp-content/uploads/2018/08/2018\\_World-Population-data-sheet.pdf](https://www.prb.org/wp-content/uploads/2018/08/2018_World-Population-data-sheet.pdf)

dynamic, open, porous place available for functional implementation: on the basis of these notions, the territorial identity of the ~~urban-coastal~~urban-coastal society is comparable to a process of social construction, which can be analysed through quantitative methods and analytical-planning tools involving various stakeholders and which is essential for the community to settle in a given place for its distinctive features, develop shared values, solutions, actions and future trends (Banini, 2019; Banini, 2011).

The maritime city, and therefore its city-sea interface, can be considered as an expression of the identity of the coastal society that, in different ways, shapes it, generating a fusion of cultures, habits, uses and functions of the coast and the sea: it is possible to study it as a community habitat closely connected to the sea, within which different users from different social classes live and interact, sharing a collective coastal memory that is specific to each littoral interface (Clemente, 2013). Historically, the evolution of ~~urban-coastal~~urban-coastal societies began with the identification of the logistical value of the coastline; subsequently, economic growth led to a socio-environmental coastal deterioration. Communities then rediscovered an interest in environmental and ecological issues, also due to the loss of identity-functional connection between the city, its society and the coast<sup>14</sup> (Timur, 2014). However, it is not easy to identify precisely and exactly the components of this unique kind of community. The urban shore represents a *unicum* because it is the gateway to naturalness within the contemporary urban fabric, ~~i.~~ It offers health benefits and allows specific uses, ~~i.~~ It can be fertile ground for economic investment and encourages sociality: this is clearly important for a wide range of users that goes far beyond the spatial boundaries of the city-sea interface, described in the previous sections.

Immobility in coastal communities is thus rapidly becoming incompatible with its variable sociological structure: further and further, the urban system is coming into contact with coastal areas closer to the sea. For instance, considering places that are far away from main city centres, the users' and occasional visitors' pressure increases just in certain periods during the year (Smith & Thomsen, 2008), while core areas of the city-sea interface are more evenly frequented over the months. The combination of people living nearby the urban coastline and large numbers of national and international tourists can result in significant population growth, along with frequent changes in community composition and structure. Among the users of the coastal society, it is ~~therefore, therefore,~~

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<sup>14</sup> The development of coastal societies is interrelated with the evolution of urban shores and coastal public and commercial spaces. On these grounds, Timur identifies four consecutive historical periods: during the emergence phase, port infrastructures are founded and the road system begins to branch out; the growth phase is characterised by the gradual establishment of urban coastal society in relation to the economic development; in the deterioration phase, the coast suffers the effect of containerisation and the massive expansion of logistical-productive functions, with consequent pollution criticalities; finally, the rediscovery phase brings social and environmental issues to light, with the gradual decommissioning of productive areas, while urban coastal society faces the new coastal questions.

possible to identify permanent residents of the city-sea interface, users who visit the shore to work or for recreation at different moments of the week, stakeholders involved in the tourist, real estate or commercial business, people from other cities, regions or even nations, ~~but also~~ political representatives, and socially engaged associations, as well as additional figures who can enrich the sociological structure of the littoral interface (Schwermer et al., 2019). ~~In~~ From the perspective of coastal interface management, it is plausible that the ~~urban-coastal~~ urban-coastal society will never reach an absolutely well-defined and fixed status: on the one hand, this might be a critical issue to actively involve a significant number of users in coastal governance, considering that a large part of the individuals impacting the coastal area might reside elsewhere or might only have a short-term interest in the zone (Thomsen et al., 2009); on the other hand, it should be noted that the ~~urban-coastal~~ urban-coastal society would not exist if there were no real involvement of its users in the fruition of the sea and the coast, which have always exerted a great appeal on the urban and peri-urban population.

Especially in larger cities, urban coastlines gather socio-economic values and provide a varied range of 'urban services': housing functions, health benefits for citizens, socio-cultural activities, transportation, and job opportunities combined with the numerous ecosystem services produced in these complex urban environments, such as good water quality and microclimate regulation and control. Nonetheless, the contemporary city, and in particular its coastal areas, is a source of stress and social anxiety, due to the frenetic rhythms that the urban ecosystem undergoes, reacting with ceaseless transformations: the socio-recreational value of the city-sea interface, which influences the liveability, the cultural sphere and the very appearance of coastal cities, plays then an essential role for the littoral community. So, it can be said that contemporary coastal society is constantly searching for authenticity along the urban littoral, in response to a sense of loss of culture and identity due to frequent coastal developments (Osbaldiston, 2018).

However, the evolution of such communities is constrained by global issues such as climate change, sea-level rise and coastal erosion that may alter the way of living on the coast, especially in case of massive urbanization, as emphasised by the *Sustainable Development Goals* of the 2030 Agenda. At the same time, the needs and desires of coastal community members, as well as their rights, have evolved to include issues of spatial and functional equity and environmental justice: for this reason, the resolution of environmental problems cannot be separated from the mitigation of social inequalities, because they undermine the liveability of urban public spaces. In accordance with this line of thought, a healthy and safe environment is a fundamental right for coastal communities. Furthermore, equality should be guaranteed ~~to~~ not only between human beings, but also between citizens and urban biodiversity: it is relevant to recognise the weight that the ecological quality of the shore has for



the functionality of the city; human beings are, therefore, a species to be protected as much as their urban-coastal habitat (Lehtinen, 2009). From this perspective, it may be reasonable to analyse the different ways users perceive the urban littoral and which functions it is planned for: spaces ~~where sociality is now a consolidated habit~~ where sociality is now a consolidated habit ~~is-as~~ opposed to places where citizens aim for the a-redemption of the shoreline for social use; coastal areas properly designed for social and recreational uses stand alongside littoral zones where the community desire to freely enjoy the shore and the sea is evident but not satisfied by urban planning.

## 2.2. Urban Aamphibious, Coastal-Urban Forms. How Coastal Ssociety Aadapts to the City-Ssea Interface

Cities have always risen nearby water bodies: over the centuries, the sea has become an irreplaceable element for communication and the economy. Despite the risks and dangers derived from the sea itself, humans have developed defence systems to keep water away from settlements. On the other hand, the perception of the sea and the coast as a place for accessible and equal sociality and recreation is a more recent feature that required new, more strategic, holistic and long-term approaches so that ~~urban-coastal~~ urban-coastal society could efficiently and resiliently adapt to the environmental, economic and social changes of urban (Lennon et al., 2014). From a spatial point of view, coastlines are rarely configured as a straight line: this objective fact influences the social relationship with the sea and the organisation of cities. In fact, daily life in a constant physical confrontation with the open sea can convey feelings of uneasiness and appear threatening, even in environmental terms. The community has often preferred to gather in compact urban agglomerations that provide a sense of greater protection than the vastness of the body of water and the direct and constant relationship with the open sea.

In this perspective, the notion of *urban amphibious* can fit in: this concept describes the urban contact zone rather than the dividing line between the land and the sea, recalling the capacity of the city and its community to constantly readapting to the two systems, in spatial and functional terms, highlighting how ~~urban-coastal~~ urban-coastal society relates to the benefits (~~but also the~~ and the criticalities) that the coast puts in place (Worthington, 2017). In fact, one of the main peculiarities of the urban amphibious is its location, which is liminal but nevertheless central within the social system of the urban coast. The urban amphibious can be considered as an expression of the city-sea interface: it is a space in which different ways of experiencing the city coast are juxtaposed; not only from a recreational, commercial, and economic perspective but also from the tourist point of view. In the same way,

the flexibility of this area, which recalls the concept of amphibious, ~~have~~ has to deal with the environmental evolution of the coastline and the related urbanised zone. It is interesting to investigate the connection between the modification of the coastal interface and the opportunities that the shore offers in terms of functions, as well as the physical factors that influence ~~urban-coastal~~ urban-coastal society.

Within the theory of the urban amphibious, it is possible to identify three types of *coastal-urban forms*, namely, configurations that coasts of maritime cities assume in relation to the morphology of the place, the environmental characteristics of the marine space and the specific interventions that society develops with respect to the sea system (Land, 2016). The *urban foreshore* represents a limited portion of the coast, related to incoming flows, like tourists and visitors, ~~but also to the~~ it also represents the social use of the interface by its citizens: it aims to orient users towards the city, directing them towards the services they need. This may include shops, restaurants, commercial spaces, and places for refreshment and sociality: historically, the urban foreshore is also a public space that has often played a major political role, similarly to urban spaces like public squares that offer ~~a~~ different landscapes and planning perspectives of the city from the seashore. During the twentieth century, spaces intended for industrial and productive development of coastal areas were, in fact, gradually converted into pedestrian and cultural areas, with the realisation of museums, parks, public areas and other places that exploit the proximity with urban water in various ways: perhaps the most representative form of urban foreshore is nowadays represented by urban beaches, whose environmental value and apparent pristine *facies* is somehow preserved with more or less invasive interventions, such as artificial nourishment and land reclamation<sup>15</sup>, also in relation to coastal erosion and climate impacts. The *urban offshore*, on the other hand, indicates ~~s~~ spaces that are more dislocated and peripheral to the urban coastline but equally related to coastal activity, especially from a working, productive and commercial perspective. The relative distance from the neuralgic core of the urban amphibious has led to ~~a~~ relevant coastal economic growth, in relation to the circulation of goods and to logistical features, creating an area that is separated from places for sociality but is characterised by a circumscribed commercial *enclave* (Tagliacozzo, 2007). Finally, the *urban estuary* identifies particular spots of the urban shore, such as port areas, whose purpose is to guide the outflows of ~~urban-coastal~~ urban-coastal society. This portion of the urban amphibious is often linked to variegated socio-cultural expressions: users who frequent this area usually share different languages and dialects and various folkloric experiences. ~~however~~ However, it is not obvious that the ethnic and cultural syncretism within the urban estuary necessarily turns into a convinced coastal cosmopolitanism: usually, it is more likely that this part

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<sup>15</sup> The process of *land reclamation* refers to the actions aimed at reclaiming walkable land from the sea, by placing soil or sand in place of portions of the sea or the body of water. This practice is complex and often completely transforms the morphology of the city-sea interface, even creating new real islands connected to the mainland, with consequent ecological-environmental issues (AlQahtany et al., 2022).

of the urban amphibious simply coexists with its distinctive social features, even if they can be for sure considered as an enrichment of the coastal interface.

It is evident that each type of urban activity has its own specific spatial dimension that defines the coast, along with an appropriate scale of analysis. As mentioned above for the city-sea interface, the urban amphibious can assume different coastal morphotypes depending on the influences on the natural coastal landscape, the development of the residential fabric and, in general, the urban form: from a geomorphological point of view, the shore can be high and rocky, with cliffs of different heights and eventually beaches at their base, or it can be low with various types of sandy areas, dunes and wetlands (Mininni, 2006). These physical characters influence the width of the three edges of the city-sea interface, especially the maritime-city edge, and relate to the spatial and functional flexibility of the urban amphibious: as it has been shown, it is in fact possible to identify port and non-port littoral zones, peripheral or central areas, commercial spaces and leisure places. However, what emerges from these definitions is the need to delve more deeply into the topic of city-sea interface spaces that are specifically intended for socio-recreational functions, since they have paramount importance for the enjoyment of these areas by the ~~urban-coastal~~urban-coastal society: in particular, *urban blue spaces* demonstrate great complexity, not only in relation to their conformation as a boundary between land and water, but also in relation to the problem of accessibility, which is often limited only to some beaches or coastal paths. Moreover, it is well known that users are willing to travel long distances in order to enjoy the urban sea, which reinforces the hypothesis of the crucial relevance of coastal accessibility and the need for proximity to maritime recreational spaces (Bell et al., 2020). Understanding users' attitudes and behaviour is very important for the efficient design of coastal blue spaces: the perceptive impact towards blue-green landscape elements is also important because they generate interest and attachment to the place. Urban blue spaces provide physical and visual access to water and can be described as therapeutic landscapes, a public health resource that promotes psycho-physical well-being and improves social cohesion; for these reasons, ~~urban-coastal~~urban-coastal society usually tends to prefer these areas of the urban amphibious over other natural and semi-natural green areas in the city (Gascon et al., 2017).

It is not a coincidence that the urban amphibious attracts many investors interested in tourism and the amenities of the coast. However, from an ecological point of view, these values are confronted with contemporary problems of coastal erosion and sea level rise, as well as flooding. Remedying these criticalities is by no means obvious or easy: alternatives such as the strategic retreat of coastal communities are neither practically nor sociologically feasible, as the extent of the aforementioned issues is difficult to assess, available land is very scarce, and the identity values of coastal society are not replicable (Worthington, 2017). Although discussed by

academics, urban planners and policy-makers, ~~this kind~~ these kinds of solutions are not very concrete yet, at least for the moment: to date, there are no relevant policies that implement such approaches in a definitive and organised manner. While they may be considered efficient adaptation practices because they may put distance between coastal society and risks, they are a moral hazard with important economic implications: there are countless buildings and spaces threatened by climate change, while relocating the inhabitants of the urban amphibious requires very large sums of money (Gibbs, 2016). The vulnerability of ~~this~~ these coastal zones is obviously not only measured in terms of housing, but also in terms of infrastructure, environmental contamination, and loss of human lives. It is true that ~~urban-coastal~~ urban-coastal society is composed ~~by~~ of a broad social spectrum, from the richest to the poorest demographic groups, ~~h~~. However, the issue of social equity must be considered, because not everyone has access to the same opportunities, and the wealthiest segments of coastal society undoubtedly have privileged contact with resources, information and services (Siders, 2013).

This means that coastal planning must intervene ~~on~~ in the functionality of the urban amphibious, protecting its peculiar characteristics and developing a range of services that can satisfy the totality of the ~~urban-coastal~~ urban-coastal society, with a view to urban well-being and accessibility to the available coastal resources: in addition to the quality of urban green-blue spaces, the urban design should also take into account, therefore, quantitative aspects, such as the presence of public to rest, the size of pedestrian paths, a satisfying amount of accesses to the urban sea, as these elements are crucial to easily enjoy the city-sea interface, through coastal public spaces that are as inclusive and healthy as possible.

### 2.3. The Theory of Coastal Community: Ecosystem Services for Community-Centred Solutions

It is worth asking how to approach technically and sociologically the transformations of the urban amphibious in favour of a less uncertain future development for ~~urban-coastal~~ urban-coastal society, considering that cities are not infinitely available to change. Contemporary urban development still seems far from achieving a methodological and normative framework to adaptively counteract the environmental and social problems of cities and urban coastlines: in this sense, green-blue infrastructure can play an important role in reducing land consumption by coordinating the evolution of public coastal space into a coherent landscape and functional network (Adolphe, 2022). In particular, the objectives will be the protection and enhancement of the ecological porosity of the urban fabric and the implementation of urban quality and existing open spaces that must coexist with the densification now occurring within the urban system. This could lead to the reutilization of marginal and underused, even degraded, green-blue public areas, through a process of re-naturalization and reintegration into the socio-urban

system, with attention to environmental risks, strengthening the relationship between the city and open spaces and increasing urban quality standards from a socio-recreational point of view, in favour of the coastal community (Arcidiacono & Ronchi, 2021).

In lack of an adequate planning and management response, littoral interfaces nonetheless offer cities the support of *coastal commons*, shared resources at the basis of environmental and ecosystem services on which the city depends and whose importance is crucial for the development of coastal communities (Berkes, 2015): these elements are extremely variable according to location and specific local challenges, resulting in similarly articulated governance structures. In fact, the management of the community and environmental components of urban coastlines can only entail a wide range of questions: the urban amphibious and the coastal society are closely connected by intense human-nature interactions. These interactions themselves are characterised by uncertainty and mutual dependence, needing constant feedbacks from users and stakeholders (Misiune et al., 2021). The challenges underlying the management of coastal commons are thus equally dependent ~~from-on~~ both the littoral environment and the ~~urban-coastal~~urban-coastal society: it is necessary to adopt an integrated socio-ecological perspective that mutually and bilaterally relates the human system (within which the coastal society and its socio-economic features for urban well-being are comprehended) and the biophysical system (in which the functional, spatial and environmental characteristics of the urban amphibious can be found). This can have great value for the planning and management of the interface, as from this systemic link, it is possible to understand and integrate non-expert knowledge and social needs, governance arrangements based on users' expectations for coastal transformative actions and rules mediating the relationship and interactions between society and its environment.

Communities ~~therefore,~~ therefore, not only play a fundamental role in governance, in relation to the desired coastal development but also to the expected egalitarian use of the coastal commons. Furthermore, the concept of scale appears to be a priority for the transformations of the territory of the ~~urban-coastal~~urban-coastal society: however, scale is not limited to the temporal and spatial aspects, but it may also involve the administrative and socio-political spheres. For this reason, a threefold dimensional concept has to be considered: the *geographic dimension* relates to the use of resources on a local or territorial level and to the elements inside or outside the urban-coastal system that influence its use; the *temporal dimension* concerns management development and planning initiatives; finally, the *sociopolitical dimension* is connected to the functional organisation of the coast and its stakeholders (Sowman & Wynberg, 2014). The coastal society and the city-sea interface possess an adaptive capacity that gives ~~to~~ the socio-ecological system the ability to adapt to external impacts, such as climate change or socio-spatial issues: if the impacts are manageable and do not exceed the adaptive capacity, the urban-community

structure will adapt, without changing its identity characteristics; on the other hand, if the impacts are so intense that they exceed the adaptive capacity of the socio-ecological system, the response will no longer be adaptive but transformative, with positive or negative outcomes, depending on the speed of the changes and the overall quality of the relative planning interventions (Armitage et al., 2017).

The concept of the coastal commons *is* linked to the notion of urban ecosystem services (ES) from which coastal society benefits and which represents a sustainable urban design key to the enjoyment of the city-sea interface. In this context, ecosystem services are considered as an expression of the desires of users; in relation to the biophysical characteristics of the urban coastline, the location of functions and the time necessary to benefit from them; in relation to the overall and peculiar needs of ~~urban-coastal~~urban-coastal society (Villamagna et al., 2013). Urban ecosystems influence the quality of the surrounding environment by regulating rainwater runoff, purifying the air and mitigating microclimates, reducing impending ecological risks; they also increase the aesthetic and perceptive value of the urban system through green areas and open spaces designed for recreation and sociality, offering opportunities for cultural enrichment and preserving local identity and attachment to place through the material and immaterial benefits for the well-being of society. This approach is linked to ecological planning and is useful for interpreting the specific needs of contemporary coastal cities, assuming the privileged point of view of citizens, understood as service recipients: the aim is to define a better management of the urban littoral territory, increasing well-being and levelling out social inequalities and orienting urban planning towards environmental, through a more flexible approach in quantitative and qualitative terms (Geneletti et al., 2020).

The demand for coastal ecosystem services and urban benefits is usually estimated on the basis of the needs of the population, focusing urban research on the different levels of accessibility to coastal resources and public spaces. The actual accessibility to public areas that produce coastal benefits is evidently differentiated for the various categories of a coastal society, generating socioeconomic inequalities and impacts on citizens' well-being (Ronchi, 2018). In order to understand the distributive equity of ecosystem services, it is necessary to focus on three main elements: the *supply* locates where services are produced; the *access* indicates by whom and where they are used; the *demand* shows who needs ecosystem services. One of the complexities lies in the fact that the location where ecosystem services are actually provided does not necessarily coincide with the spatial distribution of urban parks or public blue-green areas: in fact, having access to ES is different from having access to the most ecologically efficient areas of the urban system; similarly, the areas where ecosystem services are generated do not always correspond to the places where they can be enjoyed. For this reason, the spatial comparison between ES supply and social demand is crucial to study the actual beneficiaries of ecosystem resources within urban

~~coastal~~urban-coastal society, although a process of simple spatial mapping might miss whether potential beneficiaries actually succeed in accessing the supply of ecosystem services (Burkhard & Maes, 2017). Understanding the dynamic interaction between users' needs and policy-makers' strategies can represent an important element in identifying how urban benefits could be equally distributed along the urban amphibious, assessing the relationship between coastal ecological planning and potential accessibility to urban services while taking into account the composition and vulnerabilities of coastal society.

In order to determine the actual accessibility of ecosystem services, it should be identified the flow of ES and the spatial link between the areas in which they are produced and the spaces that benefit from them. Contextual factors that limit the enjoyment of the ecosystem services from the ~~urban-coastal~~urban-coastal society should be then considered: these can include physical barriers, regulatory constraints, environmental limitations, sociocultural habits or practices (Mohr & Dessers, 2019); also, land ownership can be crucial to assess accessibility to littoral resources, since this factor may prevent some categories of users from enjoying some places along the city-sea interface; there are also other criteria that are more difficult to quantify like, for instance, the perception of safety in public spaces, overcrowding in some places or community cohesion, although they are equally relevant in studying the fruition of the coastal commons provided by the urban amphibious. However, equity does not require that everyone has access to the same types and quantity of ES: on the contrary, the specific needs of each individual or group within the coastal society should be analysed, considering the varied social opportunities and diverse demands in relation to socio-demographic variables (McDermott et al., 2013).

Since each coastal society has its own peculiar relationship with the city-sea interface, the relationships inherent to the socio-ecological system and the coastal commons will vary from place to place: it is therefore not possible to devise fixed solutions for ~~the an~~ efficient fruition of urban maritime resources, but rather a different approach should have to be adopted depending on the case, with enough flexibility to identify common factors, examine variables about the urban amphibious and the relationships with the local coastal society that emerges.

#### 2.4. Marine Citizenship: Engaging Urban Coastal Ssociety in Innovative Governance Models

The inseparable link between the city-sea interface and ~~urban-coastal~~urban-coastal society opens up ~~to~~ the definition of a-marine citizenship, that is, the awareness of the rights and responsibilities that each citizen should have towards the marine environment that they personally experiences, a factor that necessarily influences the ability to manage ~~urban-coastal~~urban-coastal spaces (McKinley & Fletcher, 2010). Marine citizenship has its



theoretical roots in the conventional notion of citizenship, according to which all users of an urban community should actively contribute to the achievement of collective social, economic and environmental goals (Fletcher & Potts, 2007). In general, the definition of citizenship is mainly linked to the public dimension of urban life, considering the value of public commitment that citizens take on through more or less institutional duties and more or less active participation in decision-making processes. At present, this concept also includes the notion of environmental behaviour expected by ~~the~~ society, encouraged at formal and informal levels to reduce ecological impacts: from this point of view, it could be stated that marine citizenship could be an incentive for coastal governance to promote environmental benefits, activating integrated policies (Valencia-Saiz, 2005). This concept considers socio-demographic factors and individual and collective values related to the use of the coast and the urban sea: this clearly leads urban planning to identify frameworks based on the inner composition of ~~urban coastal~~urban-coastal society.

The concept of *marine-ocean literacy* is complementary to the notion of marine citizenship: it aims to encourage a positive behavioural change in the use of the city's s-coastal spaces. In essence, it indicates the understanding that the coastal community has of its influence on the sea and the influence that the sea itself has on the local society (Uyarra & Borja, 2016): users with an adequate level of marine-ocean literacy will be able to grasp the basic principles and concepts of the marine ecosystem, actively contributing to spreading knowledge of problems and peculiarities related to the sea and the coast; furthermore, they will be able to take informed and responsible decisions regarding the urban amphibious and its resources. This means that the notion of marine-ocean literacy is not only an educational supplement, but also a strong incentive to develop true comprehension of the mutual connection between the body of water and the coastal society, for the advantage of the urban-coastal ecosystem. In order to make sure that policy-makers and ~~the~~ littoral community achieve relevant levels of marine-ocean literacy, it is necessary to investigate the mutual influence and impacts between ~~the~~ sea and its users, for example, studying ecosystem resources and services, which can be considered an expression of the coastal commons, as stated before. It should ~~be also~~also be relevant to translate the human-nature interaction into a positive social driving force from which the coastal-maritime system can benefit: for this to happen, the involvement of ~~urban coastal~~urban-coastal society is crucial, and it is important to establish effective processes for community listening and methodologies to disseminate coastal knowledge in order to make users as close as possible to marine-ocean literacy (Koutsopoulos & Stel, 2021).

It is evident how these concepts are rooted in the spatial organization of ~~urban coastal~~urban-coastal uses: their integration into maritime planning processes can facilitate coastal design, generating more aware and



responsible communities, and rethinking open spaces through a diagnostic approach that studies the variables involved in urban coasts and investigating the main features characterising the areas of direct and indirect interaction with the sea, in relation to the progressive littoral urbanisation and the impacts on urban blue spaces (Mishra et al., 2020). On the other hand, the New Urban Agenda promotes the ecological and social functions of public spaces to ensure a progressive improvement of urban quality, focusing on environmental sustainability and ecological design. The functional reorganiszation of the fragments of the urban amphibious can be implemented in order to efficiently coordinate the existing relationships between the coastal water and the land-sea interface, from not only a social point of view but also in terms of protection from environmental and hydraulic risks: for this reason, urban planning should promote the connection between the spaces that generate various kinds of ecosystem services with the relative areas where they are actually needed, relating the urban and micro-urban scale with the interventions for risk defence and soliciting community responses to the socio-environmental vulnerabilities of the urban shore (Esmail & Geneletti, 2020). These aspects recall crucial decision-making issues that can be framed from a spatial justice perspective: as previously mentioned, this is a complex notion as it is linked not only to a geographic-spatial sphere, regarding the distribution of resources and users on the reference territory, but also to a social dimension, according to which the community is not homogeneous but it appears to be internally fragmented into subgroups with specific needs and demands. It is, therefore, relevant that equity becomes a primary objective within decision-making processes, pursuing this value through the active involvement of the population.

Facing these critical issues for the city-sea interface requires designing theoretical insights, and exploring the concept of planning for public space and coastal green-blue areas, in order to provide support to planners and *policy-makers*. The integrated analysis of the geographical, spatial and social context could provide important knowledge for efficient solutions based on adaptive processes that identify priorities and impacts of coastal interventions. Hence, it is possible to adopt a multidimensional approach that studies urban coasts in relationship with the social perception of spaces, analysing which are the most appropriate coastal uses, the importance that citizens attribute to these areas over time and the influence that the environmental system has on direct and indirect fruition. Strategic anticipation becomes a very useful tool to detect the worst effects of human choices, turning urban planning efforts towards the functional recovery of abandoned and degraded coastal spaces, prone to morphological transformations and qualitative and equalitarian improvements (Mega, 2016): the management of the coastal territory should aim for transparent methodologies to reduce the impact of the anthropic component on the city-sea interface, investigating the value of proximity coastal public spaces through sustainable and socially valid functions.

In line with the abovementioned reasoning, the increasing spatial complexity and socio-environmental uncertainty that characterises the contemporary city create an ideal space for participatory innovation and cooperative processes. Such strategies clearly entail a multidisciplinary integration in political-administrative and ecological terms in order to strive for an all-round concept of sustainability: social interactions stimulate the generation of common public visions, and they can provide support in identifying emerging challenges, opportunities and threats in advance, if appropriately channelled within strategic anticipation approaches (Garau, 2016). In combination with appropriate planning actions aimed at the qualitative improvement of green-blue areas and the creation of new open spaces, community-based approaches to managing urban-coastal ecosystems constitute an important opportunity to prevent, control and mitigate the negative impacts of human activities in marine and coastal environments (Beatley, 2014), involving in transparent processes all community stakeholders, from political representatives, entrepreneurs and local associations to the common users that compose urban-coastal society.

### 3. The Effects of Climate Change on Contemporary Urban Coastlines

#### 3.1. Risks and Vulnerabilities of the City-Sea Interface

Urban planning assesses the presence of risk as an element that can negatively affect the quality of life of citizens; in different areas related to the fruition and structure of the territory. It is possible to distinguish some categories of risk: natural risks are linked to disastrous phenomena such as floods, coastal storms, earthquakes or volcanic eruptions; technological-environmental risks are generated as a response to the possible damage that human action can bring to the surrounding ecosystem, such as explosions, fires or the greenhouse effect; finally, social risks involve the more or less realistic perception of public space, in relation to the degree of frequentation and spatial degradation (Pine, 2014). On the basis of these definitions, it is possible to identify climate risk as the probability that a certain critical event will occur in a specific place due to direct or indirect causes, causing more or less loss of lives, and damage to the landscape-cultural heritage and the surrounding environmental ecosystem. Its extent can be determined through the product of hazard, vulnerability and exposed value. Hazard indicates the potential occurrence of a negative event or impact of an anthropic or physical-natural kind that brings damage to users, buildings, facilities and the available ecosystem resources; vulnerability is instead the systemic or territorial capacity to endure the negative effects of climate impacts; finally, exposed value refers to the elements potentially influenced by a certain risk, considering the natural or built environment and the population among these (Field et al., 2014).

Current studies show that the climate is rapidly changing and will continue on this trend, altering both societies and the environment: there is much scientific evidence of weather and water phenomena worsening in the near future (Timmerman, 2021; IPCC, 2018; Blöschl et al. 2017). The environmental crisis becomes more and more relevant in terms of academic research, urban planning practice and contemporary public space management, especially in coastal areas, where most cities are concentrated and thus suffer the effects of climate change<sup>16</sup>, progressively more intense. According to the reports of *the Intergovernmental Panel on Climate Change*<sup>17</sup>, the

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<sup>16</sup> Climate change refers to long-term changes in temperatures and weather models due to natural causes (such as variations in the solar cycle) or anthropogenic causes: in particular, since 1800, human activities have been the main driver of climate change, mainly in relation to fossil fuels such as coal, oil and gas (IPCC, 2014).

<sup>17</sup> The *Intergovernmental Panel on Climate Change* (IPCC) was established in 1988 through the joint efforts of the United Nations Environment Programme (UNEP) and the World Meteorological Organisation (WMO). It is the most important institutional body for the dissemination of scientific data on climate change and its impact on the natural and anthropogenic environment. Through its reports, it

environmental impacts will be increasingly evident and catastrophic, confirming the risk that coastal settlements run more than other anthropisized areas of the planet: on average, there has been a worrying increase in global temperature, fluctuating between minimum peaks of 0.8° C and maximum peaks of 1.2° C, in comparison with the pre-industrial period; this situation will tend to worsen up to an increase of 1.5° C if adequate preventive measures will not be taken between 2030 and 2050. The effects of global warming have had major negative implications on the intensity and frequency of extreme climate events, causing an exacerbation of heat waves, floods and coastal storms, and long-term changes, such as the progressive worsening of sea-level rise (IPCC, 2021). These conditions clearly have tangible consequences on the socio-environmental systems at the base of the communities living in the city-sea interface, imposing sustainable approaches to coastal planning to cope with the rapidly evolving impacts of global warming: its effects are increased by the heavy urbanisation of coastal settlements, the thermo-hydraulic properties of buildings and the scarcity of vegetated areas (Gaglione, 2022). ~~Urban-coastal~~Urban-coastal areas are, in fact, characterised by an intrinsic complexity and dynamic morphology, due to their nature as both border and transition zones between the city and water system, which exposes them to multiple risks associated with the dangers and increasing effects of climate change (European Commission, 2013).

Climate has a profound influence on human well-being and health: meteorological elements can indeed act individually or in combination to produce effects on communities. Assessing the influence of the atmospheric environment on human comfort becomes a topic of great interest in the context of life along the coastal interface, as a function of users' leisure, tourism, energy industry, urban planning and architecture, and quality of coastal waters (Oppenheimer et al., 2014). For these reasons, integrated climate risk management acquires more and more relevance within coastal spatial planning: vulnerability to climate change is interpreted in a proactive way, focusing design and management efforts not only towards preventive actions for a catastrophic event, but also in the stimulation of social awareness of risks and adaptive responses by the site itself; identifying and assessing the aforementioned parameters of hazard, vulnerability and exposure become fundamental for an efficient climate risk management<sup>18</sup>.

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assesses potential risks and indicates possible solutions for climate adaptation and mitigation, which international governments can draw on in their land management. For more information, see <https://www.ipcc.ch/>

<sup>18</sup> The analysis of the relationships between climate change, ecosystem and coastal social system allows appropriate planning strategies aimed at resilient development in order to limit global warming phenomena and to encourage adaptive responses for the healthy transition of human and environmental systems (IPCC, 2022). For more information, see the Sixth Assessment Report at <https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/>

~~Sea~~The sea-level rise represents one of the main critical issues for the city-sea interface, also in its insular areas: in the last century, the sea level has risen by as much as 25 centimetres, increasing exponentially in recent years (IPCC, 2021; Moatti & Thiebault, 2016). Flooding constitutes an additional element of risk for coastal use, as it involves the overflowing of the regular banks of a water body or the accumulation of water in areas where ~~usually~~ it usually should not be found. In ~~urban-coastal~~urban-coastal areas, floods can occur either due to natural causes, such as intense flooding, or due to anthropogenic causes, such as a malfunctioning sewage disposal system. It is possible for coastal floods to occur suddenly (event-based hazards), as in the case of unexpected storm surges, or gradually, as in the case of progressive sea-level rise that increases over a long-term time. It is also not uncommon for event-based hazards and gradual hazards to occur at the same time, increasing their specific effects and intensifying impacts on coastal settlements (Rholi & Li, 2021). In this case, it is possible to refer to the so-called *extreme sea level events*<sup>19</sup>: such phenomena can occur during severe storms and cause heavy floods if protection works are lacking or inadequate. It is evident how this is harmful to public life along the city-sea interface, as the sea level rise can easily reach 10 centimetres, a value that can be increased depending on the strength of the tides, wind-related wave motion and possible cloudbursts, as well as the morphology of the coast itself (Bevasqua et al., 2019): without efficient risk reduction operations, damage in Europe is estimated at almost one trillion euros within the first century of the new millennium (Ciscar et al., 2018).

One of the main consequences of these events is the coastal erosion that affects contemporary coastal cities, namely the natural or induced processes that alter coastal morphology, leading to a gradual loss of emerged land: this is measured in relation to the time duration of the event and to the dynamic variation of the sedimentary littoral, intended as the transition area between the land and the sea<sup>20</sup>. According to the data provided by the EMODnet platform<sup>21</sup>, this phenomenon is quite ~~stable~~, even though some locations present critical peaks in negative morphological variation, especially in Italy, Spain and along the Balkan peninsula<sup>22</sup>; it is, however, possible to state that as much as 28% of European coasts is progressively eroding, in relationship with the data of the European

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<sup>19</sup> For more information, see <https://www.eea.europa.eu/ims/extreme-sea-levels-and-coastal-flooding>

<sup>20</sup> <http://www.erosionecostiera.isprambiente.it/erosione-costiera>

<sup>21</sup> The *European Marine Observation and Data Network* (EMODnet) is a long-term initiative to collect and disseminate data on the marine environment funded by the European Commission. It brings together the joint efforts of over 120 national and supranational organisations and bodies, producing free and fully accessible GIS databases. The sectors analysed cover the following categories: bathymetry, biology, chemistry, geology, human activities, physics and seabed habitats. The database can be viewed at <https://emodnet.ec.europa.eu/en>

<sup>22</sup> The database can be consulted at <https://emodnet.ec.europa.eu/en/map-week-%E2%80%93-climate-change-and-coastal-erosion>

project EUROSION<sup>23</sup>, the only pan-European analysis assessing to date the effects of coastal erosion on a continental scale: about 15.000 kilometres of coastline affected by environmental impacts are actively receding, even where risk defence works are actually located, while only 4,700 kilometres have been effectively stabilised (Doody et al., 2004).

Therefore, all European coastal states are affected by coastal erosion, coastal flooding and climatic risk to some extent, although in the Euro-Mediterranean area, these critical issues appear even more complex: in fact, the historical and cultural heritage has a priceless value that cannot be in any case replicated. The Euro-Mediterranean city-sea interface is characterised by the presence of approximately fifty UNESCO sites: their relevance is connected to the economic, social and identity sphere of ~~urban-coastal~~ urban-coastal society (Reimann et al., 2018). Thus, the close relationship between socio-economic development models and environmental implications emerges: not only the anthropic action produces climatic alterations increasing risks, but the usability of the littoral public space is clearly limited by phenomena such as floods and storm surges. Moreover, there have been numerous climate catastrophic events that have affected coastal cities in recent years; in various parts of the Euro-Mediterranean basin (Benito et al., 2015), while sea-level rise future projections report an impressive increase from 20 to 57 centimetres between 2050 and 2100 (Vecchio et al., 2019).

The consequences of climate change require contemporary planners and ~~decision~~ decision-makers to devote attention and design efforts ~~for to~~ realizing adaptive and resilient public spaces that can withstand environmental impacts from the sea: for this to happen, the spatial distribution of hazards, uncertainties, vulnerabilities and communities at risk along the city-sea interface must be assessed. Indeed, climate risk is not evenly distributed across the territory, just as some branches of ~~urban-coastal~~ urban-coastal society may be more sensitive than others to environmental impacts. ~~A s~~ Spatial mapping of the elements affected by climate risk can therefore be very relevant for planning and management in the present and in the future. Also, ~~the~~ social awareness is linked to this reasoning. Awakening the consciousness of ~~urban-coastal~~ urban-coastal society has crucial relations with environmental planning and design: the communities are called upon to play a more proactive role in governance processes; through open dialogue, social listening and stakeholder collaboration. The ultimate goal is ~~giving to give~~ to the city-sea interface the ability to quickly regain its equilibrium after eventual disastrous events generated by climate change, always guaranteeing a high quality of public space for the coastal society (Tubridy et al., 2021).

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<sup>23</sup> Data from the EUROSION project can be viewed at <http://www.eurosion.org/>

### 3.2. Environmental Planning and Adaptation for Coastal Climate Neutrality

Climate protection comprehends policies and planning actions aimed at progressively reducing the impact of climate change on natural and human systems, while limiting environmental externalities that may favour weather changes in the short and long term: the joint and multi-scale approach of coastal adaptation and climate risk mitigation is proposed as an application of the principles of environmental planning, from both a top-down and bottom-up perspective (Musco & Patassini, 2012).

At the EU and national level, policies and directives for reducing climate-changing gases in the atmosphere and the sustainable transformation of the contemporary city and urban coastline are becoming increasingly widespread. At the root of this long process, it is possible to place the Rio Agreement, signed in 1992 following the United Nations Framework Convention on Climate Change (UNFCCC)<sup>24</sup>, recognising not only the importance of human action in climate change, in terms of damage caused but also in relation ~~to~~ potential future solutions. Goal 13 of the 2030 Agenda, endorsed by the United Nations in 2015, highlights the importance of defining appropriate climate actions, also in relation to the record-breaking temperature increase registered in 2019<sup>25</sup>, considered the second hottest year of all time, in the hottest decade ever (2010-2019); despite the fact that emissions of climate-changing gases have fallen by 6% following the lockdowns imposed in 2020 all over the world due to Covid-19, it is still imperative to take action against climate change, as underlined by Goal 11 of the 2030 Agenda<sup>26</sup> which aims to reduce pollution produced by individuals in the cities, pursuing an integrated and participatory development for settlements, based on the integration of the environmental, social and economic dimensions of sustainable development<sup>27</sup>.

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<sup>24</sup> The UNFCCC has its headquarter in New York (<https://unfccc.int/>) and promoted several major conferences among its approximately 200 member states: one of the most important outcomes of the Conferences of the Parties (COPs) are the Kyoto Protocol (1997), which legally binds the member industrialised countries to reduce greenhouse gas emissions since 2005, and the Paris Agreement (2015), which tries to limit global warming to no more than 2 °C above pre-industrial levels. The last COP was held in November 2022.

<sup>25</sup> <https://www.un.org/sustainabledevelopment/climate-change/>

<sup>26</sup> <https://www.un.org/sustainabledevelopment/cities/>

<sup>27</sup> The definition of sustainability is taken from the 1987 Brundtland Report 'Our common future', drawn up by the World Commission on Environment and Development, introducing the pillars of sustainability: economic sustainability is linked to the financial resources needed to sustain the society; environmental sustainability presides over the protection and reproducibility of natural resources; social sustainability aims at the cohesion among the users of a community. To these another one is added, namely the more recent cultural sustainability, linked to intangible values.

From the perspective of climate adaptation, through the *EU Adaptation Strategy*, the European Union aims to encourage member states to have their own national strategy, integrating a resilient approach within sectoral policies, and to ensure decision-making processes linked to climate adaptation theories (European Commission, 2013); in 2021, the strategy was updated, defining a time horizon up to 2050 and promoting systemic climate risk management at every level of governance, in order to respond adaptively to impacts in a quick and efficient way.

In the context of coastal zones, the European Community has been expressing its views on the protection of shorelines and the settlements along them since 1976 with the Barcelona Convention, later updated in 1995. However, at the beginning of the new millennium, the need for efficient maritime-coastal planning led to the drafting of the *Integrated Coastal Zone Management Directive* (2002), aimed at an integrated, dynamic and continuous management for a conscious and sustainable use of littoral areas. In 2013, *Maritime Spatial Planning* was approved: it is one of the main tools for the implementation of ICZM; due to the strong environmental, social and economic interactions between land and sea along the coastal interface<sup>28</sup>. The *EU Flood Directive* of 2007 is also relevant for studying the management of urban amphibious in critical climate scenarios: it aims to assess and contain flood risks for member states; while integrating adaptive measures against coastal storms. The *Marine Strategy Framework Directive* of 2008 proposes strategic approaches to face human-induced changes to littorals. During this post-pandemic period, it makes sense to mention the financial support of the *NextGenerationEU* Recovery Plan, which the European Commission launched in 2021 to relieve the current critical socio-economic and environmental condition by allocating more than 800 billion in order ~~to pursue~~ to pursue ecological resilience in communities<sup>29</sup>.

On the basis of this community framework, it is possible to define the main characteristics of ecological planning applied to the coastal interface context for climate risk defence, facing coastal climate risk in a preventive manner or afterwards through lighter or heavier solutions, depending on the specific case. The term mitigation identifies interventions and preventive measures that planners can take to reduce climate-changing gas emissions, thus acting on the causes of climate change rather than its effects, limiting land consumption and the impacts caused by sectors that are most responsible for pollution, such as the logistics and productive fields: historically, climate change has been caused mainly by intensive land use, exceeding by 25% the impacts generated from fossil

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<sup>28</sup> For a more detailed analysis of EU directives and national instruments for coastal-maritime planning in the Euro-Mediterranean area, please refer to [Chapter 7](#) of this research.

<sup>29</sup> The *NextGenerationEU* instrument ([https://next-generation-eu.europa.eu/index\\_en](https://next-generation-eu.europa.eu/index_en)) is based on the collection of economic aids and funds by EU member states through national recovery plans.



fuels emissions. This highlights the importance of urban planning and valid ~~policy~~-policy-making to limit the increasing environmental damage<sup>30</sup>. Moreover, adaptation strategies are described as preventive or reactive actions to climate effects that gives ~~to~~ the coastal interface a sufficient degree of resilience to live with climate change in the short and long term, minimising negative impacts and anticipating possible damages (Manigrasso, 2013). Currently, there is a wide range of strategies aimed at climate adaptation of the urban amphibious. It is possible to intervene on the coastal interface in a purely technological manner (as in the case of fixed coastal defences); through management interventions, which modify land uses according to the level of risk, through political decisions that regulate planning criteria for the urban shore; besides, behavioural measures may be adopted in order to reconfigure the fruition of the city-sea interface, also from a recreational point of view: on the basis of these premises, the IPCC has defined three intervention strategies listed below, in relation to the adaptive response of the coastline (1990).

— *Defence strategies* seek to protect vulnerable elements of coastal settlements, such as users, facilities, buildings and socio-economic activities, through appropriate tools. This includes the installation of fixed defensive elements, such as reefs or dykes that act as artificial physical barriers against flooding and coastal erosion, the realignment of coastal defences by circumscribed inland displacements, and the management of coastal morphology to better contain the causes of climate impacts (Evans et al., 2004): among the most innovative measures, there is the possibility of reducing wave intensity by moving the coastline further in the sea from its original location through beach nourishment, building offshore barriers or even installing specific maritime devices useful to generate renewable energy (Pecher & Kofoed, 2017). Within this category, it is possible to also group solutions with a greater degree of flexibility, such as the realization of dunes or urban vegetation works: as a result of the progressive cementification affecting urban settlements, the delicate balance of coastal ecosystems has in fact been altered, complicating the lives of users with phenomena like heat islands (Wu et al., 2019). The drastic reduction of permeable surfaces and urban vegetated areas has limited the natural capacity to absorb exceeding water, critically overloading the sewage systems: the consequence is, therefore, the spillage of wastewater into the sea that contaminates the quality of coastal waters, also in —relationship with bathing activities. Besides, it increases the risk of hydraulic and hydrogeological criticalities that frequently affect coastal areas (Mendonça De Carvalho & Szlafsztein, 2019). So, the presence of resilient open spaces and a valid connection to the green-blue infrastructure at multiple planning levels within the city-sea interface can have positive implications not only from the point of view of environmental protection; but also benefits in terms of the psycho-physical well-being of the ~~urban coastal~~ urban-coastal society, which could enjoy much higher quality coastal public spaces thanks to the influence of urban vegetation nearby the sea (Massoni et al., 2018). In addition to this, various tools can be developed to prevent ~~the~~-maritime water infiltrations, thus reactively reducing the risk ~~from-of~~ climate change. Such expedients aim to defend the urban coastline from environmental risks by limiting land-use changes as

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<sup>30</sup> The European Union has funded the CCTAME (Climate Change - Terrestrial Adaptation & Mitigation in Europe) project, which aims to reduce weaknesses in contemporary land use and policy by devising different scenarios to examine the impact of various climate changes from a preventive perspective. Please refer to the following link for further information and details on this EU project: <https://climate-adapt.eea.europa.eu/en/knowledge/adaptation-information/research-projects/cctame>

much as possible.

- The *adaptation strategies* are intended for the occupation of areas of the coastal interface with high sensitivity to climate risk, modifying their fruition in relation to potential scenarios of strong sea-level rise and consequent flooding in order to amplify the capacity of the urban littoral to respond to negative impacts. This kind of approach is aimed at ~~a~~ more flexible and proactive risk management, adapting spatial functions and human activities to environmental conditions with a view to damage reduction: the possibility of potential sea hazards can be, therefore, acceptable as a function of normative guidelines for climate resilience of new and existing buildings, for creating of shelter points in case of critical events, or for choosing a type coastal vegetation (as well as possible coastal plantations) that better resists the proximity of sea-water and potential flooding (Breil et al., 2007). Adaptative interventions also include sustainable and green solutions: these can be categorised as *Ecosystem-based Approaches*, integrated strategies aimed to increase settlement resilience in order to achieve a wide range of environmental, economic, social and cultural benefits: within these approaches, solutions such as nature-based solutions, green-blue infrastructures, sustainable urban drainage systems and water sensitive urban design can be included (Bergier & Kowalewska, 2019). The increasing environmental focus on sustainability shifted the core of urban design concepts and practices in the planning of natural areas, public spaces and green zones within the urban system. Sea risk defence strategies that rely only on grey infrastructure elements, such as dykes and artificial maritime banks, have ~~been~~ demonstrated to be insufficient in dealing with large-scale climate events, like mega-floods with return intervals of more than one hundred years: there is, therefore a need for ~~an~~ effective integration between the advantages offered by technological solutions and the many benefits that innovative green interventions bring to the protection of the most vulnerable areas along the city-sea interface (Nakamura, 2022). However, in 2021 the European Commission identified ~~not only~~ a general slowdown in the adoption of coastal adaptation strategies due to a lack of knowledge about climate risks, weak decision-making support in the planning stages, but also a weak monitoring and feedback system of the ongoing projects, which require a very long time to be implemented: moreover, at a community level, it is not common to take into account climate impacts also outside the European framework, which could provide management and planning insights, as well as interesting best practices. In addition to these approaches, there are also strategies aimed at enhancing the resilience of the city-sea interface: to achieve this goal, it is possible to intervene ~~on~~ ~~in~~ the systemic vulnerability through ~~not only~~ structural changes to the facilities and buildings that are exposed to impacts, but also through decision-making processes for making the socio-economic component of coastal areas more adaptive. In this sense, the participation of the stakeholders of ~~urban-coastal~~ ~~urban-coastal~~ society becomes fundamental because it may lead to a shared vision of the potential effects of climate change on the urban amphibious and to more efficient plans and actions for adapting the littoral feature to the contemporary climate status (Brooks et al., 2006).
- *Relocation strategies* propose the planned retreat of coastal society from areas of the city-sea interface affected by higher environmental risk to new areas that could be located inland or in other less critical points of the urban coastline, in order to escape potential damage and negative impacts (Evans et al., 2004). This solution does not involve specific planning efforts to protect areas at risk of flooding or coastal erosion, also because of the high costs for realising an effective urban shoreline defence. The extreme scenario foresees the total abandonment of the coastal area: this kind of strategy tries to relocate economic development to other territories, while preserving as far as possible the tourist value of the original coastal area after sea level rise and flooding events. However, as ~~it~~ has already been discussed here<sup>31</sup>, it is not always possible to replicate the peculiar identity values of the city-sea interface, also considering how low is the available land resource today.

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<sup>31</sup> Please refer to chapter 2 section 2.2 of this research for further information.

It should be emphasised that today climate planning is not focused on a genuinely holistic perspective, since it is still considered much more as technical-administrative prerogative of specific mono-disciplinary bodies, generally related to civil protection and energy management: much remains to be studied in this field, especially with regard to the ~~weather-weather~~-sensitive and vulnerable spaces along the city-sea interface. At the local level, it is possible to identify in different global contexts the Climate Plan tool, elaborated in various ways depending on the geographical and environmental context: generally, the plan defines a strategic framing document, which identifies long-term objectives on the basis of socio-economic and environmental characteristics, analysing socio-economic and environmental factors, the operational fields and the involvement of both public bodies and common users with specific participatory methodologies; an emission inventory is then elaborated in order to assess the economic elements and sectors to change for climate mitigation purposes; at the operational level, the appropriate actions are selected, identifying potential impacts for short and medium-long term scenarios and indicating areas affected by hydraulic risk, difficult runoff, urban heat island formation and coastal erosion. However, still, little steps have been made in Europe towards the integration of climate policies within urban planning and decision-making processes for the territorial governance of climate risk, especially in relation to ~~urban-coastal~~urban-coastal spaces (Musco & Fregolent, 2014). In fact, climate protection plans and directives are part of a multi-level framework in terms of not only scientific fields but also application scale, from the territorial dimension to the local government. At the municipal scale, it is not always possible to manage the complexity of coastal ~~climate-climate~~-proof planning, even though it is fundamental to comprehend local public spaces along the coastal interface in this kind of approach. Even if decisions about short-term actions or energy standards for buildings manage to fit into small-scale governance quite easily, there is still a need for an integrated framework to coordinate territorial and national policies with local authorities for long-term interventions regarding coastal land uses and accessibility (Musco & Van Staden, 2009).

### 3.3. Perception and Aawareness of Uurban Coastal Ssociety on Cclimate Change

The consciousness of climate risk along the city-sea interface may differ from user to user for many reasons: first of all, the perception experienced by non-expert stakeholders living in areas at risk will vary from the knowledge possessed by expert individuals, such as planners and decision-makers. For this reason, users who are most affected by maritime risks tend to underestimate the potential impacts of catastrophic environmental events: within participatory approaches to coastal planning, the lack of climate awareness in the communities settled nearby the sea represents a major challenge for ~~an~~-efficient management of maritime risks (Chauvin, 2014).

When climate change started to become a very relevant topic among scholars in the early part of the 1980s, the social perception of this phenomenon was on ~~average-low~~low average levels. Public concern, however, rose rapidly over the next twenty years, especially in heavily industrialised countries, as a consequence of growing scientific evidence, progressive media coverage and frequent political debates. In general terms, ~~the~~-international awareness of the urgency for climate change mitigation has been reached in the first decade of the new millennium: yet, from the perspective of the average users, knowledge about the effects of human activities on the current environmental situation has not increased particularly over time (Baiardi & Morana, 2021). Indeed, there is a general lack of awareness from ~~urban-coastal~~urban-coastal society regarding these issues: this undermines the efficiency of planning in supporting design efforts for littoral adaptation. Moreover, the community usually resists adapting to new practices and uses considered conflicting with common habits, worrying more about coastal risk management policies rather than the environmental risk itself (Krien & Michel-Guillou, 2014).

In this sense, the theory of *social representation*<sup>32</sup> can be useful to understand coastal society users' perceptions of environmental risk; in order to calibrate behaviours to be encouraged or legitimised in ~~policy~~-policy-making and urban planning, overcoming the gap between objective and subjective risk awareness. The social representation indicates the reorganisation of socially constructed opinions on a topic, in this case, coastal risk. The development of ~~a~~-common knowledge enables individuals to cope with its complexity, but it is also a driving force for certain actions on the part of coastal society: the understanding of these elements sheds light on the meaning that potential environmental impacts have for the citizens of the city-sea interface. In the case of floods and coastal erosion, individual opinions of users are not very coherent; because different social groups give different meanings to the main elements associated with climate issues. Besides, the critical situation of coastal hazards for the city-sea interface justifies the psycho-social approach to understand how society ~~identify~~-identifies and reacts to risks from the sea (Lemée et al., 2019).

For urban planners and ~~decision~~-decision-makers, it is, therefore, complex to precisely communicate the imminence and extent of risks because of the differentiated perception of the coastal society about environmental threats, considering influencing factors like the socio-cultural background, social conventions and habits (Lieske et al., 2014). Risk perception is also connected to how long users have lived in the same place: the exchange of

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<sup>32</sup> *Social representation* refers to the transmission of common knowledge within certain social groups through which individuals are able to organise and interpret information from their own context: this theory is useful in operational management of space even if representations may vary from one social group to another (Van Lange et al., 2011). For further information, please refer to cChapter 9, sSection 9.1 of this research.

opinions and experiences between recent and long-time inhabitants can therefore induce shared attitudes towards negative events such as a sea-level rise or coastal floods, consequently influencing social representation at the local level. In this perspective, the concept of urban identity is recalled. In urban studies, identity can be described on the basis of the special characteristics of a place and its value attributed by-to individuals. It is a way of representing the natural, socio-cultural and artificial components of the city; its usefulness lies in defining the actual appearance of a space; in relation to its social representation, recognising the physical, functional and social elements that are common to all users (Luo et al. 2023; Ziyae, 2018). Urban identity can be analysed according to three basic components: the cognitive aspect defines the attachment of an individual to an urban system as its member; the affective aspect emotionally connects the individual to the urban space; the evaluative aspect is linked to the urban quality that the user gives to a place. The social representations of the community influence the relationships between these three domains of urban identity, so expert researchers should relate to the climate risk assessment directly produced by non-expert users in order to clearly communicate the effects of environmental impacts to-on the coastal society (Belanche et al., 2017).

However, the perception of environmental risks related to climate change presupposes a certain degree of awareness of their existence and the potential damage they can generate, although this does not prevent citizens from choosing to enjoy vulnerable spaces such as urban-coastal areas. The littoral community is also influenced by less rational components in the perception of risk, such as the emotional aspect and feelings: public spaces are, in fact, places widely frequented by citizens and can potentially assume an important role in improving urban life, affecting the community's sense of place (Bollini, 2018). The well-being derived from the fruition of the city-sea interface is, in fact, a parameter ere for assessing the quality of coastal settlements and can be linked not only to the evaluative aspect of urban identity; but also to the affective one: this reduces the possibility that the urban-coastal society decides s to move away from the areas that are threatened by environmental criticalities, as they appreciate the proximity to the sea and their social relationships are also based on the peculiarities of the urban-coastal space. It is evident that the place attachment may interfere with the objective perception of risk by coastal communities, limiting the effective application of coastal adaptation solutions; in relation to the lower acceptability by users towards particular planning and management strategies. Moreover, as previously mentioned, ordinary citizens usually trust quite little in public institutions regarding topics like climate change; at the same time, institutional responsibility is not always integrated within actions aimed at improving the environmental situation of the urban amphibious. This is an interesting fact; since a solid trust in public authorities can actually corroborate the existing relationship between climate change awareness and the development of adaptive and positive social behaviour by coastal society (Schleyer-Lindenmann et al., 2022).

It could therefore be stated that the perception of coastal hazards within the ~~urban-coastal~~urban-coastal society constitutes an important element within social practices, although it varies according to the spatial context, environmental characteristics and personal experiences of the users. Understanding the value of social representations proves to be an important cornerstone for analysing individual and community perceptions of environmental hazards: considering that risk management policies are often invasive for the population and generally not well received, the personal involvement of coastal community users appears necessary for ~~an~~-efficient ecological planning of the city-sea interface (Michel-Guillou & Meur-Ferec, 2016). Public opinion should be considered valuable by policy-makers: if they manage to decode the socio-environmental variables at the base of the social representation of climate risk, they may actually strengthen environmental mitigation policies by involving the different stakeholders concerned. On the other hand, if it is true that climate change is a global issue, the management of its most evident effects, such as floods, coastal erosion and sea-level rise, is ~~a~~-the responsibility of local governments, who must interpret the objective and subjective factors of the phenomenon.

#### 4. Governance of Coastal Public Space in the Euro-Mediterranean Context

##### 4.1. The Status of Maritime State Property from the Perspective of Social Uses

In order to understand the theoretical basis of the management for social use of the public spaces of the city-sea interface, it is necessary to define what is the meaning of maritime public domain, a controversial subject in the field of law since it can be assimilated into a *sui generis* sphere of the category of public goods. Generally speaking, the maritime public domain corresponds to those spaces and goods connected with satisfying the needs of navigation and maritime traffic (Querici, 1964). However, this definition appears limiting as it does not take into account the various interests that revolve around the coastal system in the broadest sense: in particular, it is appropriate to refer both to coastal areas usually affected by ordinary wave motion and to spaces that can be used for maritime activities related to navigation, fishing and bathing; therefore, two elements contribute to defining maritime state property, namely the naturalistic-geomorphological aspect of the shore and the functional aspect, connected to the public use of the sea (Ibba, 2016).

In the Additional Protocol to the European Convention on Human Rights, the concept of *public property* is described from a communitarian perspective, indicating all the areas belonging to public state bodies, intended to satisfy certain public interests: this concept includes only state-owned assets and non-disposable assets (Council of Europe, 2019). State-owned assets consist of unmovable or registered movable property belonging to a territorial administration, such as the state, regions or local authorities: depending on the circumstances, such property can be divided into necessary state property and possible state property. The former may be removed from private ownership altogether and pass into the hands of the territorial public administrations, for their intrinsic characteristics: these include military property, water property and, indeed, maritime property. On the other hand, the assets of the incidental public domain can belong to private owners, even though they can be included in the territorial state property in case they are comprehended in the management area of a certain public body: this category can include, among others, various categories of roads, railway lines, aqueducts, buildings of historical, archaeological and artistic value (Palma, 1999).

On the basis of these concepts, it is possible to analyse the delicate issue of maritime governance in Europe, keeping in mind that the existing concession model presents numerous structural variants, not always favourable to an active fruition of the city-sea interface by the urban-coastal society: indeed, the urban shore is not even totally inclusive or prone to easy accessibility and usability in many cases. First of all, the European model has different approaches in relation to concessions for public work contracts, public services and public goods: for



this reason, it is complex to organise the system of public concession in an organic, disciplined and unitary way (Giannelli, 2016). There is a great interest from the European Union in regulating other sectors different from the public concessions: the effects of this line of thought are reflected in the uneven organisation in the management of ~~the~~ maritime state property in the various European states (Caringella & Protto, 2012): in fact, the first definition of concession system in EU law dates back to the *Public Works Contracts Directive* of 1993 (Directive 93/37/EC): in a certain sense, this directive assimilates the public concession to a project contract based on the realization of certain work for a price. Only in the new millennium, ~~the~~ *Directive 2004/18/EC* introduces the concept of public service concession, although it still gives priority to the coordination of public project contracts. The topic of public concessions gained progressive attention as a function of the gradual application of the Community principle of equality: this should be the main aim towards which concession should tend, in order to preserve transparency in the attribution of licences.

Despite the regulatory criticalities at ~~the~~ EU level, the social but ~~also~~ economic value of the maritime public domain clearly emerges, thus deserving ~~an~~ adequate attention in terms of urban and landscape planning. The complexity of this issue has been expressed by the European Directive 2006/123/EC (the so-called *Bolkestein directive*), which aims to enhance the free circulation of public services offered through maritime concessions. In this way, the directive tries to balance the dynamics underlying the concessions' system and the licence allocation process: the purpose is to standardise the coastal management system from an economic point of view and, consequently, in relation to the specific needs of coastal users. In particular, the Bolkestein directive (also known as the *Services Directive*) states that automatic renewals or extensions of maritime concessions for tourist-recreational activities are unconstitutional, even if there is a lack of adequate procedures for licences attribution among aspiring concession holders. This directive tries to examine all the potential situations in which the economic activity involves the use of limited or geographically circumscribed natural resources: in fact, it establishes that member states must organise a public call for potential candidates in order to allocate licenses, especially when the maritime concession is related to the management of limited natural resources, in order to guarantee impartiality and transparency in the procedure; it is necessary to clearly define the specific characteristics and the evaluation methodology of the call.

In any case, with Directive 2014/23/EU, the so-called *Concessions Directive*, the European Union seeks for the first time to regulate the issue of maritime concessions effectively and homogeneously. Concessions for public works, services and goods are a complex instrument: usually, the European Community has penalised concessions for public goods, probably because of an insufficient understanding of the social implications of this tool (Garofoli, 2019). Today, it seems that this aspect of the maritime public domain is still lacking a specific European regulation,



also in light of the indications indirectly provided by the aforementioned Services Directive: as mentioned above, the main objective of Directive 2006/123/EC is in fact to guarantee the principle of freedom of establishment for service providers as well as to protect the free supply of services themselves; this clearly reflects the differences in the concession system in various European states, influencing certain socio-economic functions (Macchia, 2018). However, from the point of view of the social use of the coast, Europe has shown a growing interest, especially in relation to the tourist industry that, starting from the last thirty years of the twentieth century, has enormously influenced the fruition of coastal spaces, changing the mainly logistic-commercial and military function into a more recreational and social use, coherently with the significant business volume that the city-sea interface can generate (Dezio, 2016).

#### 4.2. Governance in Europe: Managing the Mediterranean City-Sea Interface

It is now proposed an analysis of the governance systems within the main states of the Euro-Mediterranean basin, in order to understand the decision-making approaches in the geographical area covered by this research, concerning the management of the social uses of the city-sea interface. The studied countries (France, Spain, Greece, Croatia and Italy) possess a comparable environmental and social background; in particular, the Italian case will be described in an additional paragraph due to its unusual management complexity. From the geomorphologic point of view, these states present long coastal strips that are strongly urbanised and characterised by relevant socio-economic flows because of their landscape-environmental quality and strong tourist appeal; from the organisational and administrative point of view, their governance models for the maritime public domain appears to be articulated among multi-level competencies and actors. Analysing of the main institutional stakeholders involved in the maritime public land property, the distribution of responsibilities in attributing concessions and the main elements at the basis of maritime licences, the research tries to investigate how the Euro-Mediterranean area relates to the contemporary issue of satisfying the social needs of ~~urban-coastal~~ urban-coastal society and the connection between public institutions and the environmental context of the city-sea interface.

— In 2006, the French management system repealed the *Code de domain de l'Etat*, dating back to the 1960s, in order to follow the indications of the *ordonnance 2006-460* establishing the *Code général de la propriété de personnes publiques* (CGPPP). According to the CGPPP, natural maritime public domain intuitively corresponds to the portion of coastline on which natural elements act and which has value for the satisfaction of social needs, considering state property unalienable and imprescriptible: in fact, although the concession of the aforementioned assets to third parties is contemplated, access to beaches and seashore ~~in general,~~ in general, must always be free of charge and openly granted to the community, for recreational, social, and economic purposes (such as fishing and aquaculture), except for reasons of safety, national defence or environmental

protection<sup>33</sup>. In particular, with regard to beaches, the *Code de l'environnement (ordonnance 2000-914)* establishes that the state-owned area affected by such use must be left free of any structure or installation for at least 80% of the length of the reference shoreline. Moreover, permanent facilities on public coastal land are considered unacceptable: it is only allowed to install temporary equipment and structures, with no irreversible anchoring elements to the ground, coherently with the function of the state-owned property. This is linked to the French principle of restoring the original state of the places at the end of each concession, with a strong focus on environmental protection. Regarding the concession grant, the French administration follows ~~the~~ Decree 2006-608: this is a matter of state competence, administered by a specific prefect; the only exceptions are concessions located within the port domain, granted by the competent port authority. The duration of concessions extends to a maximum of twelve years: this short duration, together with the predominantly public management of the maritime state property, is unique within the Euro-Mediterranean governance framework. The concession drafting is subject to an open call procedure, in which the proposals are evaluated by the prefect, in case of both new contracts and renewals. Sub-concessions may be allowed, with regard to specific services that may also be monetised: anyway, their duration will not exceed ~~the~~ one of the main concessions. If the concession holder is a local authority, it is possible to follow a restricted procedure in which candidates are invited to submit proposals on the basis of a draft convention (on which the prefect's opinion is in any case required), in accordance with the *Code général des collectivités territoriales* (1996). It should be added that any occupation or use of the public domain involves the payment of a fee: the amount is established by the state authorities or local departments, depending on the situation, and is based on an assessment of the benefits that the license holder derives from the management of the public domain itself.

— In Spain, the Constitution (1978) includes the legal regime of the maritime public domain. Beaches are defined as free, so they are not subject to concessions: it is the state-owned area prior to the beaches themselves that can be subject to licences to authorise occupation. However, the Spanish legal system suffers from a careless urbanisation policy that, in the last century, has caused an irreversible alteration of the most valuable coastal areas, especially on the Mediterranean side. The gradual cementification of the coast was progressively caused by the lack of an efficient management system that would take into account, on the one hand, the protection of the environmental heritage, which citizens should freely enjoy, and, on the other hand, the demands of economic and recreational development: in fact, Spanish seasonal tourism generates a flow of almost 40 million visitors annually, in comparison with 7 million inhabitants living in a coastal strip only 4.5 kilometres wide<sup>34</sup>. The reference law for the governance of the coastal interface is the *Ley de Costas* (Law 22/1988). When this law was approved, controversies emerged about private buildings on the coast that had been transferred to the public domain: for this reason, the Spanish state granted the interested parties a 30-year public concession in return for an annual fee, without renouncing to the public ownership of the areas. The *Ley de Costas* provides for two types of licences for the use of ~~the~~ maritime public land property, namely authorisations and concessions. The authorisations refer to facilities and activities regulated by the general rules of the legal text, they have a four-year duration, and their request can be subject to public promotion, according to the specific normative: in this category, it is possible to include profit-making activities that can take place on the beaches, also through removable elements, such as renting sunbeds and beach umbrellas; the space for these activities must not exceed half of the reference coastal area. For concessions linked to the use of ~~the~~ coastal public domain, the entrusting process generally (but not exclusively) follows a competitive

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<sup>33</sup> The law of 31 December 1976 already established a buffer zone at least 3 metres wide for users to reach the sea: this element was later incorporated in the *Loi Littoral* of 1986.

<sup>34</sup> For further information, consult the INE (Instituto Nacional de Estadística) database, freely accessible at:

[https://www.ine.es/dyngs/INEbase/en/categoria.htm?c=Estadistica\\_P&cid=1254735576863](https://www.ine.es/dyngs/INEbase/en/categoria.htm?c=Estadistica_P&cid=1254735576863)

procedure, although the call and granting parameters are decided by the reference administration<sup>35</sup>. The duration of the concession-based relationships depends on the specific use of the maritime domain, and it has to be fixed on a case-by-case basis, although it is set at a maximum period of seventy-five years, which can be extended in exceptional circumstances for a further seventy-five years, according to the provisions of *Ley 2 of 2013*. This law also responds to the imminent expiry of the thirty-year concessions of 1988, effectively extending them. With regard to the transferability of maritime concessions, the Spanish regulation allows the transfer of licences between living stakeholders and admits *mortis causa*: in case of the demise of the concession holder, his heirs may take over the management of the portion of maritime public domain that is regulated by the reference concession: for this to happen, they have to submit a special application form within four years from the death of the original concession holder, ; otherwise, , the license itself will expire.

— –The situation in Croatia is characterised by considerable attention to the preservation of natural resources and sustainable development, which is certainly linked to less economic and speculative transformation along the national coastline. Maritime state property is mentioned in Article 52 of the Constitution (1990): the sea, beaches and islands shall be subject to special protection, ; because of their great value ~~for~~ to the Croatian Republic. The sectoral legislation codifies the appropriate exploitation of the maritime public domain by concession holders, as well as the specific functional restrictions. The regulation of the uses of maritime state property refers to the Maritime Domain and Seaports Act No. 11/2002. This act classifies ~~all~~ all-natural elements that fall within the notion of the maritime public domain; it also establishes the different authorities regarding ~~the~~ coastal protection, which is a national responsibility, and the public domain management, which is administered by both regional and state bodies. The Maritime Domain and Seaports Act precisely states the dynamics for granting concessions, clearly expressing a dual category. Concessions aimed at the economic exploitation of the maritime public domain must follow a public tender procedure, as they allow the concession holder to enjoy a potential financial profit through a public asset. On the contrary, concessions for special uses are granted upon the request of the interested parties: special uses are those socio-cultural and sports activities that originate from a private initiative but give benefits to the whole community, which is why in this case, , the license allocation is untied from the competition procedures required by the European Union; in any case, if there are multiple requests, the tender procedure for the granting of the concession follows the decision of a group of experts, selected by the central government, the county concerned or the municipal administration, depending on the relevance of the intervention. Regarding the potential works on the maritime public property under concession, the general principle is to prefer light and detachable structures, ; so that they can be easily removed upon termination of the concession-based relationship, preserving the environmental status of the shore as much as possible; however, if it is required to install permanent facilities, they become part of the maritime public domain on which they stand, , and their ownership is transferred to the public body. The duration of licences varies and ranges between five and ninety-nine years, although there are precise indications to

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<sup>35</sup> The allocation of concessions does not necessarily follow the institution of a public call: it should be noted that if a user has previously expressed its interest in the management of a part or element of the coastal state domain and is not awarded with the relative licence, he may still request the cost coverage for the his proposal, if this is provided for by the call regulation; moreover, the public call may be considered null and void if none of the participants has adequate qualifications to meet the established requirements.

establish, on a case-by-case basis, the right time period of for the various concessions<sup>36</sup>.

— Greece refers to Law 2971/2001 for the regulation of the maritime public domain. This law promotes ideals of transparency and impartiality for authorising recreational and tourist activities along the beaches, allowing the possibility to lease certain areas of the public land property in order to exploit the shore for public utility purposes. On the other hand, as far as accommodation facilities next to beaches are concerned, the management system provides for exceptions to allow hotels to obtain annual authorisations in order to carry out their activities. It also forbids permanent constructions within 100 metres from the shoreline, as well as related purchase deeds and any other changes to the urban territory, unless a special administrative measure has been adopted to delimit the water edge or if there are ongoing environmental recovery interventions on the beach or the coast. It should be noted, however, that Ministerial Decree 5159/586 of 2014 has introduced the direct awarding of beach concessions by municipal authorities: in this way, it has been possible to approve 80 project proposals related to tourist and recreational uses of beaches protected by the NATURA 2000, in accordance with the Prioritised Action Framework For Natura 2000 For The EU Multiannual Financing. At the same time, the law states that accommodation facilities have to apply for special licences in order to install temporary equipment for bathing activities, such as floating wooden docks or beach chairs for customers. Moreover, the duration of licences for tourist ports has been extended. It is thus clear that the Greek maritime domain governance is sometimes heedless of the public character of coastlines and beaches. However, a progressive attention is emerging towards the protection of littoral zones, also limiting the perimeter<sup>reer</sup> of areas to be managed with maritime concessions; in order to avoid overcrowding phenomena within the bathing establishments.

#### 4.3. Coastal Mmaritime Concessions in Italy: Aa Ppeculiar Cease in the Euro-Mediterranean Bbasin

The Italian coastline stretches for about 8,300 linear kilometres, with 3,346 kilometres of beaches. In this area, there are about 61,500 maritime concessions, even if less than half can be linked to social and recreational uses: of this important fraction, about 12,000 concessions are related to bathing establishments, while almost 1,900 concessions concern campsites, sports areas or tourist facilities<sup>37</sup>; the origin of the licences is varied but mainly connected to Regions, Municipalities and Port Authorities. These data anticipate the complexity of the concession topic in the Italian maritime domain within the Euro-Mediterranean panorama; with regard to the allocation of competencies, the time span of licences and the free use of public spaces along the city-sea interface. The concept of maritime state property is defined in the Navigation Code (*Codice della Navigazione*, R.D. 327/1942), which

<sup>36</sup> According to Section 20 of the Maritime Domain and Seaports Act, concessions connected with the economic exploitation of the public domain and the realisation of relevant buildings at a regional level may last up to twenty years: this period may be extended to a maximum of thirty years in relation to any new funding or force majeure. The license holder has to request the concession extension and needs the approval of the central government. Only if the eventual project or plan on the concession area has national resonance, the licence may be valid for up to fifty or sixty years.

<sup>37</sup> Data provided by the Ministry of Infrastructure and Transports through the Maritime Domain Information System (SID). For further information: <https://www.sid.mit.gov.it>

establishes what the public domain actually is<sup>38</sup>: this categorisation also includes territorial sea, in relation to public uses and the satisfaction of collective needs, and port areas, which constitute another form of state property, defined as artificial. Moreover, it ~~is~~ introduced the possibility of drafting concession contracts for the occupation and use of the aforementioned state land property.

In relation to social uses of the city-sea interface intended to meet the needs of an urban-coastal society, it is relevant to note that the first codification of maritime concessions with explicitly tourist-recreational purposes dates back to Law 494/1993: this law indicates the categories of compatible public services, from the management of bathing establishments, accommodation facilities and recreational-sports activities to catering establishments and boat renting. These regulatory indications were then merged into Law 296/2006 (*Legge Finanziaria del 2007*), which defines when licenses could be granted for tourist-recreational uses, with a distinction from concessions for docking points and recreational boating facilities, in relation of fees to pay.

Since the 1970s, however, the need for efficient coordination in the dynamic management of the maritime domain has emerged from not only an economic but also a landscape and environmental point of view. The Presidential Decree 616/1977 started a process of gradual decentralisation of certain administrative functions for the grant of concessions, giving more responsibilities to Regions. In particular, the central government holds control over the dominical aspects, the functions related to national security and maritime navigation and the energy supply. On the other hand, the Regions have the task ~~to manage of~~ managing the tourist and recreational areas of the public domain along the maritime coastline: however, the implementation of this delegation has been considerably delayed, and only in the 1990s the Prime Ministerial Decree 21/12/1995 and Law 59/1997 (*Legge Bassanini*) were drafted to simplify the administrative procedure for granting licences. In the midst of these premises, the Regions then autonomously started to regulate the features of the concession-based relationships: a further decentralisation has become a common practice in order to give municipal authorities the power to assign the actual concession licenses and to eventually modify them, always in a recreational context. In addition to this, municipalities are entrusted with the collection of fees, calculated on the basis of surface extension, the ratio between covered and uncovered areas, and the distance from the sea, in accordance with the aforementioned *Legge Finanziaria del 2007*. Another parametreer to consider is the eventual realisation of facilities insisting on the

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<sup>38</sup> In Article 28 of the *Codice della Navigazione*, the following elements are included in the maritime domain: 'the shore, the beach, the ports, the bays; the lagoons, the mouths of rivers flowing into the sea, the basins of saline or brackish water that freely communicate with the sea at least during part of the year; the channels that can be used for public maritime uses'. In this article, it is specified that the constructions and structures insisting on state-owned areas effectively become part of them.

maritime domain; in order to ensure urban, architectural and landscape-environmental conformity between the interventions on the city-sea interface and the existing plans: indeed, checking this compatibility is usually a municipal responsibility.

From the planning point of view, the Regions have progressively approved several plans for the use of state-owned areas in order to ensure their tourist and social exploitation. They usually provide a guideline for the drafting of beach plans on a local scale, also regulating detailed parameters, such as the dimensional and spatial features of the buildings on the coast. Municipal planning of the shoreline tends to intertwine with the town plans: in fact, the latter manage areas that are not strictly connected to the perimeter of maritime concessions but nevertheless relevant to the social use of the urban amphibious. Local planning usually embodies the distinction into functional belts of the state-owned coastal zone; in order to guarantee spaces for free transit along the shore, areas for resting in the shade and for beach services, as well as a clear area to enjoy the coast without the paying any charges (Carlin, 2019). It should be noted, however, that the integration of state concessions and coastal planning can often cause delays, as specific permissions may be subject to approval delays pending the implementation of the aforementioned Beach Plans.

On the other hand, with regard to tender procedures for licenses assignment, there is a lack of regulations in the Italian case, even though public domain management is a very topical subject because of the considerable profit opportunities it may bring to entrepreneurs. In spite of the fact that the European Union has dedicated significant efforts to regulate the drafting of concession-based relationships since the early 2000s, in Italy, any specific regulation has been approved in Italy to define modalities, times and terms of public calls and the evaluation of tenders. At the national level, the criteria of the Navigation Code are still in force, even if they are extremely generic in relation to the content of calls for tenders and to the consultation for approval: this decades-long gap has prompted the regions to take decisions on their own, devoting greater or lesser attention to the issues of public participation, adequate promotion and identification of evaluation criteria, depending on the sensitivity of the lawmakers. Such uncertainty translates into not always equal treatment among participants in public calls organised by the municipal administrations: the reason lies in the high discretionary power attributed to the judging commissions and in ~~the~~ difficulty for potential concession holders in precisely ~~calibrate~~ calibrating their proposals (Giannaccari, 2021a).

Another critical issue concerning concessions along the Italian coastal interface is the duration of licences: the time parameter initially adopted by the Navigation Code was vague, providing any specific indication ~~on~~ of the maximum time frame to be considered. ~~The~~ Law 88/2001 set the duration of concessions at six years, but then



confirmed automatic renewal upon the expiry of the licence, confirming the right of insistence already defined by the Navigation Code. The right of insistence (which will only be abrogated by Decree-Law 194/2009) is a thorny issue because it legitimises administrations to reconfirm the concessions already granted during the process of license renewal, nullifying fair competition. The motivation for this choice lies in the concessions and stability that Italian legislation has pursued in the field of coastal management, so that entrepreneurs could adequately equip the shores in the long term, increasing private earnings and strengthening the attractiveness of the coastal interface for the tourism industry and for potential new investments (Lami et al., 2010).

Predictably, this criterion was opposed by the European Commission, which initiated infringement procedure 2008/4908 against Italy, closed only in 2012, since the right of insistence is at odds with the principles of the Bolkestein directive, according to which it is not allowed to grant automatic renewals, also due to possible corruption of the administration and illegal agreement with concession holders. During this time, the *Legge Finanziaria del 2007* set a minimum duration of six years and a maximum duration of twenty years for concession-based relationships, which can only be reached in the case of major works or investments, in accordance with regional plans for the use of the public domain and municipal urban planning instruments. In any case, the Italian State faced the issue again, first with the aforementioned Decree-Law 194/2009, granting an indistinct extension to all maritime concessions with recreational tourist purposes until December 31<sup>st</sup>, 2015, and subsequently with Decree-Law 179/2012, granting a new extension until December 31<sup>st</sup>, 2020, and expanding the categories of services to be managed by the licence (including docking points for recreational boating). Law 145/2018, which became effective in January 2019 as the *Legge di Bilancio*, finally declared that the aforementioned maritime concessions would remain active until 2033 (Giannaccari, 2021b). These events were debated in the Plenary Meeting of the Council of State (judgments 17 and 18 of 2021), which put a brake on the extensions of licences as incompatible with Directive 2006/123/EC, limiting the duration of the reference concessions to December 31<sup>st</sup>, 2023.

#### 4.4. Reasoning Aabout the Mediterranean Coastal Management

In spite of these reflections, however, it must be noted that the issue of governing the maritime public domain is far from a Community resolution. There is still an-unresolved discontent regarding the application of the Bolkestein directive from a recreational-bathing point of view, the alleged governance instability and the presence of normative constraints in the license transfer from one concession holder to another; these are not only economic

but also social issues, since the relevance of the coasts, especially in urban areas, is difficult to quantify. There is a need for at least ~~for~~ greater clarity in-on the topic of the management of coastal state property (di Plinio, 2020). This short descriptive framework is therefore intended to highlight the governance complexity of the city-sea interface, since it is necessarily a multi-stakeholder context, but it is also inevitably monopolised by interests that often diverge from the free accessibility and use of public space.

However, a study of the different Mediterranean management frameworks highlights both positive and negative aspects. On the one hand, there is a progressive interest on the part of the competent authorities in the integrated management of the coast, associated with the protection of environmental qualities: in this context, France undoubtedly stands out, efficiently transposing Community directives and making them operational, also by limiting permanent installations on coastal land (imposing, for instance, the removal of bathing facilities at the end of the summer season). Moreover, it has to be noted the gradual introduction of various public tender systems to liberalise the development of economic capital, in order to ensure ~~an~~ adequate fruition of coastal services, in accordance with European indications: however, competitive behaviours may also lead to an excessive monetisation of the maritime public domain and its assets, because enhancing functions specifically dedicate to public sociality could bring economic disadvantages to the concession holders; anyway, if the central authorities keep control of the cultural and landscape quality of the urban amphibious, the management and allocation of licences for coastal exploitation is often delegated to regions and municipalities, entrusting private users with the implementation of projects and facilities (Benetazzo & Gobbato, 2017).

The enjoyment of urban coasts implies the active involvement of all the users of a coastal society, suggesting a reorganisation of the granting procedure of concessions, avoiding ~~to let~~ letting few private individuals in charge of coastal management and directing the process towards integrated governance systems, with the participation of communities, local authorities and associations, or even returning the governance of the coastal territory entirely into the hands of the public, in order to grant the community aspect of the coastal state assets (Lucarelli et al., 2019). If it is true, however, that the services that the coastal landscape offers are linked to recreational and social activities for the public, it should also be considered that they require the realisation of various facilities within the maritime domain and the costs of these interventions are generally sustained by the concession holder. In this sense, the analysis of the Italian case aims to show the existing contrasts between the beach service suppliers and the central government, which has been sanctioned for the continuous delays in implementing the Bolkestein directive. However, the issue appears to be very complex because it is related not only to the difficult landscape and cultural enhancement of the coastal interface, from an economic and tourist point of view, but also to the actual



obstacles in the management of state-owned littoral space for small and medium-sized entrepreneurs often involved, in a national, regional and local context where planning and administrative efficiency is often lacking. A more articulated dialogue with European institutions would therefore be useful in order to find an adequate balance (Gola, 2021); to this sum that ~~urban-coastal~~urban-coastal society should keep a close interaction with the city-sea interface, especially because of the very strong socio-cultural value that users attribute to urban coasts.

Indeed, in almost all of the examined cases, the service provider has to deal with the request for the planning permission and landscape authorisation needed to install the necessary equipment for ensuring coastal use by the littoral community: since he only has the surface right, the built assets can be transferred to the maritime public domain at the end of the concession. This is a matter of concern: on the one hand, it is hoped that the license holders decide ~~for-on~~ light and detachable elements instead of permanent ones, guaranteeing the restoration of the original condition of the coastal areas upon completion of the concession, with obvious advantages for the protection of the coastal landscape value; on the other hand, it should be noted that it is not always feasible to choose temporary installations due to the land composition, atmospheric agents and other causes that impose more resistant and definitive design solutions for safety reasons (Calabrò, 2021). It is ~~therefore,~~ therefore, necessary to think carefully about achieving ~~an~~-integration between management tools for the maritime public domain and the urban plans existing along the city-sea interface: it is compulsory to resolve the conflicts between public property and private property, guaranteeing a careful approach to preserve the environmental features of the shore and to ensure ~~a~~-fair and transparent fruition by the ~~urban-coastal~~urban-coastal society, while managing these ~~characteristics~~-characteristics flexibly and coherently with the changing legal and socio-ecological conditions of the urban amphibious (Provenzano, 2011).

## 5. The **R**esearch **Q**uestion: **S**ocial **U**se of the **C**ity-**S**ea **I**nterface in the Euro-Mediterranean **C**ontext

### 5.1. How to **P**lan and **M**anage the **P**ublic **S**pace of the **C**ity-**S**ea **I**nterface from a **S**ocio-recreational and **E**nvironmental **P**erspective?

The reflections that have defined the field of research indicate the need to investigate the neuralgic elements of the urban coasts by looking at the communities that inhabit them, thus rehabilitating the urban scars fragmenting the city-sea interface, restoring the balance between identity value and functional value of these peculiar areas of the contemporary city. In particular, the interest focuses on those spaces that, most of all, allow the user of the ~~urban-coastal~~urban-coastal society to enjoy the coast and the sea, in a social and recreational way: the public areas along the urban shorelines can, in fact, grant well-being and the possibility to socialise, to relax, in direct contact with the most relevant environmental resource of coastal cities: the sea. The relationship with water in the city is essential for ~~urban-coastal~~urban-coastal society; anyway, the fruition of this natural resource through urban beaches, public parks, blue-green areas and coastal open spaces ~~in general, in general,~~ is not always equal and immediate, also because of a certain management complexity; in the same way, recreational functions are present in the sea too, for instance, sport or non-intensive fishing, diving, cultural activities related to underwater heritage, bathing. In addition to responding to the growing social demand for public spaces for social purposes, these areas, even if they have a limited surface, have the potential to respond adaptively to the effects of climate change and environmental impacts; through adaptive and multifunctional design: an efficient integrated organisation is therefore required for these areas of the city-sea interface, which, as mentioned above, is an amphibious urban entity in terms of both uses and planning tools.

In this sense, it is appropriate to investigate the following research question: how can urban planning and governance processes intervene in existing or potential coastal and maritime public spaces in order to mend the fragmented structure of the city-sea interface, from a socio-recreational and environmental perspective, allowing users equal access to the urban sea and thus increasing the quality of life in large coastal cities?

The research question ~~therefore, therefore,~~ emphasises the need to return quality public spaces to citizens, considering the urban coastline as a connecting platform for ~~urban-coastal~~urban-coastal society. The community can indeed actively participate in the improvement of the city-sea interface, where projects and interventions can be drafted in a flexible but organised manner, channelling planning innovation into a democratic interactive perspective. Inclusion and social cohesion motivate users to participate in the improvement of the interface, in favour of a renewed *sense of place*: this could be a great advantage ~~to overcome~~in overcoming social barriers,

contributing to the definition of a "local mind, composed by interconnected experiences and places in a mutual daily construction of identity"<sup>39</sup>. Restoring urban beaches, the realisation of new natural parks along the coasts (but also the implementation of sustainable socio-recreational uses of urban waters), together with the participative relationship among the users of the ~~urban-coastal~~urban-coastal society, are part of the research perspective: these areas, even if small in size, can ~~in fact~~, in fact, become the socio-environmental engine of the city-sea interface, on condition that they are proficiently planned and connected among themselves, through social and urban design innovation. Hence, a functional reorganisation of coastal public spaces sounds plausible, in accordance with the current socio-recreational demand that is less oriented towards large public spaces dedicated to tourists and visitors and instead emphasises more the importance of proximity public spaces that allow citizens to enjoy their city on a smaller scale (Pittaluga, 2018).

Consequently, the need for an integration of coastal design with water plans, down to the local and micro-local scale, is investigated. The principles of Integrated Coastal Zone Management (2000) suggest a broad, holistic perspective that recognises the interactions among flows and elements in the littoral areas in relation to hydrological, geomorphological, socio-economic, institutional and cultural characteristics, considering participatory planning as a way to put together of local and natural specificities. Maritime Spatial Planning (2014) proposes adaptive management and the implementation of plans for water and coastal use, taking into account land-sea interactions and environmental, social and safety aspects: however, only a limited number of European countries have implemented such tools until today. The 2016 New Urban Agenda promotes the ecological and social functions of public spaces to ensure a progressive improvement of urban quality, focusing on ecological sustainability and design. The functional recomposition of the fragments of the city-sea interface can thus amplify the coastal value, because it may help understand spatial and ideological conflicts through innovative approaches that get to the root of the problem, trying to solve the issues between the urban fabric, the coastal society and its territory (Lindquist et al., 2019). In particular, the mosaic of natural and man-made spaces of urban-coastal areas is also defined be-by an articulated hydrographic network: in this sense, the green-blue infrastructure can ecologically restore the territorial environment, guaranteeing the fruition of ecosystem services and limiting hydraulic risk and coastal erosion, for whose prevention the approach was originally conceived (Acierno, 2019).

Besides the theoretical contribution, the research also aims to provide management and design indications, in response to the criticalities highlighted for the urban amphibious, outlining a methodological framework that can

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<sup>39</sup> "...mente locale, un intrecciarsi di vissuto e di luoghi in una reciproca costruzione quotidiana di identità", La Cecla F. (2015), *Contro l'urbanistica*, p. 13, Einaudi, Turin. Translated by I. Pistone.

support planners and inspire policy-makers regarding the legal, geomorphological and psycho-social characteristics of the city-sea interface for ~~an~~ efficient socio-environmental planning and management. The analysis of the geographical, spatial and social context can, in fact, allow efficient solutions based on adaptive processes, identifying priorities and impacts of coastal interventions. As a result, it is possible to adopt a multidimensional and perceptive approach that studies urban coastlines according to the shared understanding of littoral public space that different social groups manifest, studying which coastal uses are most appropriate, the importance that citizens attribute to these areas and the influence that the environmental system has on the usability of open coastal spaces, in order to enhance physical and visual accessibility to maritime amenities (Robert et al., 2016).

## 5.2. The ~~R~~relevance of the Euro-Mediterranean ~~C~~ease ~~S~~tudy

Today, rethinking how to plan and manage the coastal public space is a common topic in different urban realities: however, it should be noted that each ~~urban-coastal~~urban-coastal society is unique, and it is not possible to approach each city-sea interface in the same way; instead, it is necessary to investigate a diagnostic approach that studies the variables involved in urban coasts in order to discover their common features, from a planning and administrative perspective. It makes sense to analyse what are the main aspects that characterise the spaces of direct and indirect interaction with coastal water, in relation to the progressive coastal urbanisation and the impacts on urban blue spaces.

In particular, the research will focus on the Euro-Mediterranean basin. As described in the introduction of this text, the Mediterranean area represents an absolutely unique geographical, social and functional context in the world. From an environmental point of view, the coasts are under great pressures, due to strong urbanisation and growing climatic risks that threaten both ecological ecosystems and the safety of ~~urban-coastal~~urban-coastal society, effectively limiting the usability of the city-sea interface; furthermore, Mediterranean cities share a strong bond with the natural and built landscape, as a result of an articulated cultural background that somehow unites the settlements along the coasts of different states. It is also an area where, over the centuries and particularly in the last fifty years, several large urban centres with a high population density have started to develop more and more: in these cities, the intensity of the socio-environmental relationships along the *city-sea interface* is particularly high. However, cities such as Valencia, Barcelona, Marseille, Genoa or Naples have adopted different approaches to grant the fruition of the public space along the littoral interface, due to the diversified planning and legal frameworks

of the reference countries: this demonstrates the importance of understanding how to flexibly adapt the methodological approach to the city-sea interface according to the geographical and social context.

Specifically, large cities will be the main objective of this study, since there the criticalities listed so far are amplified, due to the numerous stakes involved, the complex functional articulation of their city-sea interfaces and the demographic variety of the local ~~urban-coastal~~ urban-coastal societies. In the Mediterranean context, the urban coasts of large cities in ~~the~~ European countries generally share a high population density, while the area usually appears connected to large port infrastructures. Despite this, it is possible to find places of social transformation along the urban amphibious, with some attention ~~for~~ to climate change too. In order to study the most varied conditions of littoral urban development in relation to the social demands of an ~~urban-coastal~~ society, the range of investigation will focus on cities with more than half a million inhabitants: among these, Marseille and Naples will be examined as in-depth case studies of the research work.

**Part Two | PROGRAMMATIC AND DESIGN APPROACH TO  
THE CITY-SEA INTERFACE**

## 6. The Sociality of Coastal Public Space in Large Euro-Mediterranean Cities

### 6.1. Studying Large Coastal Cities to Analysze Ceity-Sea Interface Planning and Design

On the basis of the research question, it is analysed how different cities of the Euro-Mediterranean basin deal with the planning of their city-sea interfaces. These areas denote various types of vulnerabilities, as explained above: climate change, complex social demands of an urban-coastal society, and fruition of the edges of the city-sea interface that is not always compatible with the geomorphological characteristics of the urban coasts. These factors have required specific management and planning approaches and methodologies over the last fifty years. Within the chosen spectrum of investigation, which is the European Mediterranean area, we will focus on large coastal cities, considering them urban agglomerations with a population of more than half a million inhabitants, usually linked to important port infrastructures and-but-also endowed with relevant cultural and historical features. The aim is trying-to try to define a synthetic picture of the existing approaches to coastal planning within the context of the study, analysing whether these cities and their coastal interfaces actually respond in planning terms to the growing demand for proximity open spaces intended for social use.

Most of the French coastal surface is touched by the Atlantic Ocean to the west; however, an important Mediterranean littoral stretch connects the country to Spain and Italy. Although it is varied and multifaceted, its Mediterranean coastal strip has only one case of a large coastal city with a population of more than half a million of inhabitants: Marseille, with its 870,731 inhabitants<sup>40</sup>, a thousand-year-old settlement that has undergone numerous transformations and expansions over the centuries. In relation with-to the investigation spectrum of this research, the analysis of the French case is then reduced to the study of Marseille's urban amphibious and its coastal projects. The strong link between the Marseille sea and urban socio-economic development has favoured a large number of functions within the coastal system over time. Historically, its coastal interface has hosted several points devoted to the fishing industry: in the past, this was a particularly flourishing sector, leading to the creation of various fishermen's villages (such as the area of L'Estaque, in the northern part of the city) and small harbours; today, although this activity is still present within the community, it is a secondary function of the urban coast. Another long-standing use along the shore is port and logistics activity, in relation to the transport of goods but mainly of passengers: the leading commercial and productive port has in fact been relocated to Fos-sur-Mer, a small town approximately fifty kilometres away from Marseille, while the tourist function is still held along the littoral

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<sup>40</sup> Data from the 2019 census, available at: <https://www.insee.fr/fr/statistiques/2011101?geo=COM-13055>

of the main urban core. This relocation has thus increased the possibilities for socio-recreational uses of the urban sea.

Similarly to France, also Spain presents a western oceanic side, but has a greater surface area of its coastal strip that is touched by the Mediterranean sea. It is also a denser coastal interface along which there are three urban polarities with more than half a million inhabitants<sup>41</sup>. For this reason, this research will describe the actual city-sea interfaces of Barcelona, Valencia and Malaga, as port cities with important socio-recreational aspects. Barcelona represents the largest and most populated settlement (approximately 1,700,000 inhabitants in 2018) among the Spanish cities: the development of its urban coast has been strongly influenced by some large-scale public events that have directed its transformation towards wide open spaces and places of representation; it is a complex case as the city combines planning approaches for the evolution of its city-sea interface with socio-cultural actions aimed at the well-being of the ~~urban-coastal~~ urban-coastal society. The urban coast of Valencia, with its 791,413 inhabitants, follows a peculiar development, since it was founded away from the sea and it expanded towards the maritime zone only in more recent times: progressively, the urban development has saturated the available coastal areas, even if the integration with earlier littoral villages has not always been homogeneous, because of their a strong local identity; this characteristic clearly determines the direction in which the planning progress of public places along the coastal interface is directed. Malaga is one of the most important tourist destinations in Spain: the city has 571,026 inhabitants and is an appealing destination for a wide variety of users that compose its peculiar coastal community; its evident touristic inclination pushes the development of the coast from a recreational point of view, even if this implies a smaller quantity of proximity public spaces for the local society.

The Italian peninsula appears to be completely immersed within the peculiar context of the research: its coastline presents a considerable extension, but even in this case, only three cities possess the necessary characteristics to be included within the analysis of *city-sea interfaces* with significant demographic size<sup>42</sup>. The main features of the urban coasts of Naples, Palermo and Genoa are, therefore, reported. The urban coast of Naples, inhabited by 921,142 citizens, has ancient origins, and it is very rich in historical, cultural and identity values; anyway, it represents a special case because it has been absolutely static in its evolutionary process for several decades: despite the plans to design new waterfront areas and increase the available public spaces along the shore also for bathing uses, very few actions ~~has~~ have actually been implemented along the complex Neapolitan

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<sup>41</sup> Demographic data refer to census made available by the Instituto Nacional de Estadística (<https://www.ine.es/en/index.htm>).

<sup>42</sup> The number of inhabitants of the three Italian cities examined refers to data published by ISTAT (<https://demo.istat.it/?l=it>).



coastal interface. The urban coast of Palermo (673,439 inhabitants) is configured as a gateway to the Mediterranean and its more exotic areas, considering its proximity to the African continent: this indicates that the urban-maritime interface of this city absorbs diversified influences, giving peculiar value to the cultural characteristics of ~~urban-coastal~~urban-coastal society. Finally, Genoa represents the coastal city with the lowest demographic density among the Italian cases, with 561,203 inhabitants: in spite of this, it is a place particularly tied to its urban coastline, especially in the port and logistic-productive context; however, there are some examples of the transformation of the city-sea interface in a social and environmental perspective.

As far as Croatia and Greece are concerned, the urban coasts of these states do not present cases of coastal cities whose size respects the minimum parameters defined for comparison with other Euro-Mediterranean settlements and their main existing coastal projects. In view of the subject of the study, it is therefore considered appropriate to examine the case of Marseille in France, the cases of Barcelona, Valencia and Malaga in Spain and the cases of Naples, Palermo and Genoa in Italy.

## 6.2. Real Estate and Social-Derived Planning for Coastal Open Spaces in France: The Cease of Marseille

### 6.2.1. Large-Scale Interventions for Public Recreational Areas: The Parc du Prado and Pointe Rouge

The Marseille city-sea interface plays a fundamental recreational role for the users of ~~urban-coastal~~urban-coastal society: practices such as swimming, sport fishing, scuba diving, and boating take their place along with events for sociality and maritime culture along the coast, both in the most densely populated areas and in the less frequented space of the shore. The urban coast of Marseille is thus configured as a relevant space for effective citizens ~~but also~~and for inland users (Robert & Laffont-Schwob, 2021). The coastal area of the French metropolis has been subjected to different types of interventions aimed at increasing the functional permeability of the coast according to the socio-recreational uses of the littoral interface. These design and management actions have modified the conformation of the maritime public space, through wide-ranging interventions dating back to even decades ago, in the last century, as well as through more localised but equally valid operations to define the places of Marseille sociality.

The southern side of the city-sea interface *is* strongly characterised by the *Parc Balnéaire du Prado*, an important public space in contact with the sea, gradually realised since the mid-1970s: it is a system of open areas

serving the ~~urban-coastal~~ urban-coastal society, with a surface of about 450,000 square metres and an extension of three kilometres along the coast. From the very beginning of the project, the area was studied because it was exposed to strong winds and wave motion, with ~~the~~-related environmental risks, ~~andbut also~~ to water pollution. For this reason, engineers and town planners have transformed the aspect of the Prado zone, expanding its surface area with land reclamation and beach nourishment in order to host community functions ~~andbut also~~ to resist the effects of climate change, such as coastal erosion. ~~The~~-Prado Park consists of large public beaches protected by artificial rocks, vast green spaces intended for sports and recreation, and limited areas in which larger commercial facilities are concentrated, with a few service spots distributed over the total area. This intervention ~~therefore,~~ therefore, proposes a highly artificialized landscape area, whose originality lies in functionally reorganising the different areas of the urban amphibious, creating a place along the maritime city edge that is very appreciated and frequented by the citizens of Marseille from a recreational point of view. The urban beaches are completely integrated into the city's territory, connecting important fragments of the urban-maritime system through good accessibility conditions: the park is located close to the important Marseille promenade, the *Corniche*, linking the Prado Park to the city centre. For the purposes of this research, it is therefore interesting as the available land resource appears to be significantly low today, especially for such a large-scale transformation intended to create open areas for the coastal community (Hérat, 2019).

~~In continuity with the Prado beach park is located~~ the Pointe Rouge area, in the *8th Arrondissement*, is located in continuity to the Prado beach park. This is a public space that presents a tourist harbour, from which ferryboats depart, and another urban beach, one of the largest in the city, where various recreational activities take place and where numerous users are welcomed in the summer season, especially families, due to its shallow sandy seabed. The beach area, with its characteristic half-moon shape, occupies about 7.000 square metres and is the result of a coastal land reclamation dating back to the last two decades of the last century (Robert & Trémélo, 2021). Between 2016 and 2020, the area underwent an intervention for the redevelopment of the bathing space, enhancing the public space surface and demolishing the various illegal constructions from the coastal public domain: Pointe Rouge was, in fact, characterised by many accommodation buildings and restaurants that crowded the sandy portion of the shoreline without permissions; the project aims to regularise the land use and concessions, thus designing easiest accesses to the sea and guaranteeing pedestrian continuity within the bathing system. Moreover, the intervention seeks to realise light buildings intended for refreshment activities with walkways and paths in order to clearly define the public nature of the space facing the sea and allow a broader enjoyment of the

coastal landscape, while endowing the area with adequate services and equipment<sup>43</sup>. In this case, too, it is thus configured as a proximity public space in which citizens can equally benefit from the sea resource.

### 6.2.2. Missed Coastal Permeability in the Euroméditerranée Real Estate Operation

In the central sector of the Marseille coastal interface, it is located another type of transformation of the coastal and nearby port neighbourhood, with different outcomes in terms of social functionality, namely the *Euroméditerranée 1* and *Euroméditerranée 2* projects<sup>44</sup>. The aim of this major urban intervention in two parts is to revitalise the city centre of Marseille, although the operation has not always achieved its objectives.

At the beginning of the 1990s, the national authorities agreed on the creation of an actual driver for territorial and economic development through a multifunctional operational programme, focusing mainly on the tertiary sector and on the culture, tourism and leisure fields, in order to create lively and attractive spaces for both citizens and potential investors. The economic roots of the reference project thus emerged from the outset. In 1995, the planning procedure started, under the guidance of a special public body called *Établissement Public d'Aménagement Euroméditerranée* (EPAEM), composed by of almost sixty experts and a board of directors with national and local representatives. Cooperation with socio-economic facilitators has also been established to negotiate spatial and community strategies in order to involve different stakeholders: urban marketing has great value to channel in channelling investments along the city-sea interface (Bergsli, 2011a).

The project involves the realisation of an urban area of approximately 168,000 square metres: approximately a quarter of the total surface is intended for public use facilities and open spaces. In particular, some recreational and cultural areas in contact with the urban sea have been implemented, exploiting the southern portion of the city port that has been granted to social uses: the result of the transformation of the former *J4 - La Joliette* pier is a water square that acts as a hinge between the port infrastructure and the urban centre, connecting to the pedestrian path that runs along the *Vieux Port* (Parant, 2020). This space, freely usable by citizens, hosts some relevant cultural buildings, such as the MuCEM (*Musée des civilisations de l'Europe et de la Méditerranée*), a national museum created from the former Museum of Popular Arts and Traditions, now dedicated to Mediterranean cultures and connected to the close Fort Saint-Jean, and the multifunctional shopping centre *Les Terrasses du Port*, a significant point of visual contact with the city water, through its large terrace, from which it takes its name and

<sup>43</sup> For further information, please refer to <https://ateliermira.fr/index.php/portfolio-item/pointe-rouge/>

<sup>44</sup> The national scale Euroméditerranée project can be completely viewed on the dedicated webpage: <https://www.euromediterranee.fr/>.

which allows users to experience the aquatic space dedicated to cruise ships, almost as if the building itself were a ship docked on the coast of Marseille. Interestingly, the ~~urban-coastal~~urban-coastal society exploits this public space to enjoy contact with the sea, even in a spontaneous way, for example, through the unplanned bathing activity nearby the MuCEM buildings: the Marseille municipality plans, in fact, to legally regulate this activity. The *Euroméditerranée* plans also include the development of an urban park close to the *Grand Port Maritime de Marseille*, transforming the disused railway line into a green lung that could, among other things, reduce the problems related to the hydraulic risk in the area. In spite of these important planning premises, it is necessary to note that the transformation of this piece of the city so close to the sea does not necessarily mean that the users of its coastal society can actually benefit from the effects of the urban regeneration: in fact, the area appears to be a relevant real estate operation that has led to the construction of large buildings similar to *urban containers*, with a related strong gentrification that undermines the usability of the Marseille urban coastline (Bergsli, 2011b). Furthermore, although the intention of the plan is to reconnect the city to the sea, the presence of strong constraints creates a fracture in the city-sea interface that has not been healed yet: in this sense, it is possible to refer to the port itself, mostly inaccessible and gated, and the motorway viaduct that emerges in this area, severely limiting the visual perception of the maritime resource and lowering the general urban quality.

### 6.2.3. Plage des Catalans and Parc de Corbière: Localised Interventions for Social Contact with the Sea

The Marseille coastal interface is also characterised by more localised actions on coastal public spaces. Nearby the *Vieux Port* the *Plage des Catalans* is located: it is one of the city's oldest urban beaches, with an area of approximately 2,000 square metres that has hosted users of Marseille's ~~urban-coastal~~urban-coastal society for more than two centuries for socio-recreational practices such as bathing and outdoor sports. The ongoing project for this relevant area aims to extend the beach space as much as possible, offering varied and equally usable services while preserving and enhancing the cultural heritage of the site. In fact, the area is defined by ancient porticos signalling the boundary between the beach and the road outside, ~~and -but also-~~ a ~~16th-~~16th-century tower with high architectural value, now abandoned but originally used as a lazaret, from whose function it borrows its name. The transformation of the *Plage des Catalans* ~~therefore,~~ therefore, aims at rehabilitating the historical porticos, so that they can host bathing support services with special attention to users with reduced mobility, and the *Tour Lazaret*, which will host cultural functions. The functional redistribution of spaces includes the relocation of the existing beach volleyball courts from a central position to a more defiladed one, allowing for a spatial increase of

about 1.300 square metres for bathing and sunbathing uses; the project ~~defines also~~ defines two new coastal public squares on either side of the beach, in favour of urban sociality<sup>45</sup>. Besides, the sea edge of the *Plage des Catalans* hosts an innovative underwater museum space, free of charge and accessible to all. In 2021, the *Musee Subaquatique* ~~subaquatic~~ de Marseille was inaugurated: it represents a peculiar and innovative experiment in Europe, allowing social and sustainable fruition of the urban sea, stimulating cultural activities and monitoring the marine biosphere through special sensors integrated into the artworks exhibited below the water level. Ten sculptures are currently submerged at a depth of only five metres and are located one hundred metres away from the shore: they ~~therefore,~~ therefore, fit perfectly within the parameters of safety and easy recreational water enjoyment of the city-sea interface theory<sup>46</sup>.

The Corbière Park in the northern part of the city, near the municipal border, in the *16th arrondissement*, is also part of this social reclamation of the city-sea interface. Centuries ago, the area was urbanised as a fishermen's village: its iconographic fortune is related to artists such as Cézanne, who highlighted its landscape value. The large public space covers an area of about 20,000 square metres and is strongly characterised by the presence of an impressive arch viaduct supporting a railway track, at the base ~~is~~ of which the bathing site is located. It was realised at the end of the 70s ~~Seventies~~, with the aim of granting accessibility to the sea for the local community, since this feature was limited by the presence of the L'Estaque harbour in the most central area of the district: the park is composed by two sandy beaches, surrounded by a terraced garden with a particularly favourable microclimate condition, thanks to the surrounding rocky cliff. The site is intended to be a gateway to the city-sea interface mainly for the local community; it presents a prevalent natural character, which the municipality tries to preserve, and notable architectural and landscape elements; added to this is the presence of a nautical club aimed at promoting maritime sport and culture, especially for sensitive segments of an urban ~~coastal~~ society, like disabled users and children. However, despite its extension, the beach site is still limited because of the human flows it has to deal with: a large part of the shore of the *16th Arrondissement* is, in fact, occupied by port infrastructures and private nautical clubs, limiting the equal usability of the sea; furthermore, the site shows evident infrastructural issues that prevent users to easily reach it<sup>47</sup>.

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<sup>45</sup> The planning interventions followed a participatory process, with the dissemination of questionnaires among the users of the urban coastal society of Marseille. Please refer to the municipality website for more information on this subject: <https://www.marseille.fr/mairie/actualites/les-premiers-resultats-de-l-appel-a-participation-sur-la-renovation-de-la-plage>

<sup>46</sup> The main activities, the artists involved and the objectives of the *Musée subaquatique de Marseille* can be read at <https://www.musee-subaquatique.com/fr/>

<sup>47</sup> <https://www.marseille.fr/environnement/parcs-et-jardins/jardin-de-corbieres>

### 6.3. Major ~~E~~vents and ~~L~~ocal ~~P~~rojects for the ~~D~~evelopment of ~~C~~oastal ~~P~~ublic ~~S~~pace and ~~U~~rban ~~B~~eaches in Spain: Barcelona, Valencia, Malaga

#### 6.3.1. The ~~E~~ffect of ~~L~~arge ~~E~~vents on the ~~O~~pen ~~S~~paces of Barcelona's ~~C~~oastal ~~I~~nterface

The Barcelona coast has undergone urban transformations over the last half-century, becoming an important example for other social and culture-led planning approaches, integrating community activities and inclusive processes with the environmental and economic fields (Degen & Garcia, 2012). The urban coastline is strongly influenced by the beach element, and its use along the city-sea interface has progressively increased since the 1960s, leading to growing pressures between social expectations and public and private interests for economic and productive development. For this reason, until the 1980s, most of the local beaches underwent a rapid process of ecological and environmental degradation that strongly conditioned their usability; in addition to this, there were large stretches of coast that were privatised for different reasons, subtracting useful land for the sociality of citizens. The socialist political transition of 1979 led the planning of the coastal interface towards greater protection of community needs and spatial justice: this is a crucial node in the creation of the future *Barcelona model*. The creation of new public spaces and the qualitative transformation of the existing ones can be considered ~~as~~ tools for the promotion of social cohesion, reflecting the intention to include coastal society within governance processes (Blakeley, 2005).

Linked to this is the 1986 nomination to host the 1992 Olympics: this ~~public-greatgreat public~~ event will shape the development of community areas in Barcelona. In fact, although the city had already taken a virtuous path of urban and coastal transformation, the candidature provided considerable national and regional economic resources to catalyse public ambitions for city growth. The interventions included a general infrastructural improvement of the city, enhancing accessibility to the coastal interface areas, and the creation of areas for sports and leisure: indeed, one of the objectives is opening ~~of~~ the city to the sea, distributing public facilities and services along the urban coastline, according to a holistic approach. The transformation of *Port Vell* has thus generated a multifaceted coastal recreational area. In particular, the *Passeig Maritim* is configured as one of the first interventions, ~~in the~~ Barcelona's recent redevelopment, ~~to giving-give~~ aesthetic ~~andbut-also~~ social consistency to the urban coastline, which was a degraded space in the city, mainly used for productive purposes. The planned pedestrian area thus allows ~~a~~ greater usability of the city-sea interface, also from a landscape point of view: the area is defined by the visual and physical permeability towards the sea, while the presence of open spaces between the buildings favours

sociality and functional flexibility in favour of coastal recreation, allowing different forms of relationships among the users of the ~~urban-coastal~~urban-coastal society in heterogeneous spatial contexts (Degen, 2008). Moreover, the *Passeig Maritim* promenade constitutes a link between the Olympic Village and the popular Barceloneta area. In this area, the homonymous beach is located<sup>48</sup>: it is one of the oldest beaches in the city and measures just over four hundred metres in length; the beach limit is characterised by elements to facilitate accessibility to the sea for users, with an inclusive view to users with reduced mobility, while the bathing space is also equipped for sports activities. However, it must be considered that the planning of this area of the city-sea interface is influenced by private investment that directs its development towards a more entrepreneurial component (especially for the tourism industry) rather than towards purely social purposes: for a long time, this area of the city coastline, together with the nearby Somorrostro beach, has hosted extremely poor urban settlements with around 15.000 inhabitants; the urban quality of the site certainly needed to be restored in favour of greater liveability, but the coastal transformation has evidently altered the community composition of the place (Crespi-Vallbona & Mask-Miró, 2018).

It should be noted that, at the end of the century, the transition to a more conservative management of the city and the coast led to a progressive opening towards coastal transformations guided by private investors: in this light, the intervention ~~on~~in the Diagonal-Mar area and on the related coastal area of Poblenou can be read. Once an urban area dedicated to industrial production, it was thus reconverted into a high-level accommodation and recreational area, hosting different uses, especially in favour of the richest groups of coastal society. Simultaneously, the town planners started to work on the Universal Forum of Cultures, a 2004 four-monthly event of international relevance: the location for this project was a working-class neighbourhood, in order to revalue it. The urban project led to the realisation of a large coastal public space of approximately 200,000 square metres, with related public facilities and buildings. The cultural root of the event was channelled into an economical perspective and once again focused on the development of the waterfront, catalysing the growth of the reference neighbourhood (Casellas & Pallares-Barbera, 2009). If the intervention ~~on~~in the Diagonal-Mar area is linked to a private initiative mainly related to urban marketing that produced exclusive urban models for users of higher classes, the operations related to the Forum of Cultures are ~~of~~-public-led: however, the resulting large empty spaces and generally unused buildings symbolise an unsuccessful strategy (Degen & Garcia, 2012). However, through this ~~urban-coastal~~urban-coastal project, Barcelona's city-sea interface still benefits from ~~an~~-artificial access

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<sup>48</sup> The Barcelona City Council defines facilities and services available along the *Playa de la Barceloneta* at: <https://www.barcelona.cat/es/que-hacer-en-bcn/banos-y-playas/playa-de-la-barceloneta>



to the sea within the Forum area<sup>49</sup>. The bathing establishment with the same name is equipped to carry out the same activities as on the beach, but on a paved surface in continuity with the sea water. Its size is about 11,000 square metres, and it is characterised by its great environmental value, considering the presence of a relevant marine biodiversity: in this bathing area, researchers have identified more than five hundred marine species, including exotic fish, shellfish and seaweed (Pontes et al., 2021).

### 6.3.2. Reconnections **B**etween **C**ity and **S**ea and **C**ommunity **E**xpectations for the Valencia **U**rban **S**hore

Regarding the evolution of the Valencian city-sea interface, it is interesting to note that the city's original location was far away from the sea. For this reason, during the industrial age, the urban evolution of the city led to the gradual dissolution of the urban boundaries dating back to the medieval period and started a process of reunification of the city fabric with the maritime-coastal space, gradually defining the contemporary littoral interface of Valencia. From the second half of the last century, new neighbourhoods saturated the area between the old medieval city and the sea: the original settlements of the local coast, namely the villages of El Cabanyal-El Canyameler and Natzaret, were absorbed by the larger urban core, together with their need for facilities and services; on the other hand, the progressive development of the port led to the deterioration of the living conditions of the inhabitants of the back-port areas, locked in a pincer between the incipient urban advance towards the sea and the growth of the logistical infrastructure, with consequent phenomena of urban segregation, exacerbating social differences (Salom & Fajardo, 2017).

In any case, in 1988, the approval of the *Plan General de Ordenación Urbana* (PGOU) led to new strategies for the qualitative implementation of the city's coastal context: even then, the idea of urban regeneration of the maritime city, including the urban waterfront, came to the fore through the concept of a *Balcón al Mar*, a multi-scalar planning initiative involving various aspects of coastal transformation that took shape in 2004. The project involves the northern area of the port and reaches the area of the Malvarrosa beach: the intervention aims to rebuild the contact between different urban areas marked by the presence of a massive infrastructure such as the harbour, creating a zone dedicated to pedestrians and sociality; in fact, the plan proposes the realisation of services to satisfy cultural and recreational needs, connecting the coastal and back-port districts with a soft mobility system and

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<sup>49</sup> The municipality includes the bathing area of the Forum site in the Barcelona's official beaches. For more information, please visit: <https://www.barcelona.cat/es/que-hacer-en-bcn/banos-y-playas/zona-de-banos-del-forum>



creating open spaces and green areas for social functions along the coast, as well as reconverting degraded buildings and sites. Specifically, the project involves a large urban park of approximately ten hectares, with recreational facilities and leisure areas. In addition to increasing the social value of the coastal interface, ~~t-~~the function of the green area, ~~in addition to increasing the social value of the coastal interface,~~ is to compensate for the anthropic impacts of the port intervention, following the path of a new access channel to the wharf, thus playing an important ecological role in Valencian planning (Lecardane, 2008). This intervention ~~has~~ originated in 2003 from the designation of the city to host the 32nd edition of ~~the~~ America's Cup, an important sailing event whose management led to the creation of the *Consortio Marina de Valencia*: since 2007, its role ~~is~~ has been to coordinate urban planning projects for the ~~urban-coastal~~urban-coastal interface, together with representatives of the central government, the Valencian regional authority and the Council of the City of Valencia. In the same vein, it is possible to consider the subsequent works for the transformation of Valencia seafront, namely the *Juan Carlos I Marina*, dating back to the first decade of the 2000s: in this case, the impact on real estate costs in the involved coastal neighbourhoods was inevitable, as a consequence of urban development. The *Consortio* considered the growth model adopted to be sustainable, as it privileged spaces intended for the community and the free social enjoyment of the coast, eluding as far as possible commercial uses along the city-sea interface, such as hotels and shopping centres; in any case, the development of the *Marina* has had a negative impact on the social structure of the coastal districts, as it has strongly modified the existing urban fabric and community composition, provoking the discontent of the original coastal society and damaging its strong identity value (Caparrós i Gironés, 2019).

From this point of view, the case of the coastal district of El Cabanayal is interesting. As previously mentioned, this settlement corresponds to an ancient fishermen's village that, since the 13th century, had colonised the stretch of coastline currently adjacent to the Valencian port. At the beginning of the 20th century, the district became more and more dependent on Valencia, although it maintained its own distinct spatial and social characteristics. However, with the modern urban development towards the sea, it was incorporated by the larger municipality, through the construction of the Blasco Ibáñez Avenue that connected the city with El Cabanayal (Varea et al., 2016). Despite the fact that the entire district had been preserved since 1993 due to its historical and cultural value, a plan for the development of the area was launched in 1998, with the extension of Avenida Blasco Ibáñez and the consequent demolition of a large number of buildings: on the one hand, the intention was the qualitative improvement of this important coastal area, enhancing its aesthetic value; on the other hand, this would have caused a strong economic pressure on the neighbourhood, compromising its socio-identity characteristics so intimately connected to the city-sea interface. The result was a strong community contestation that obstructed the planning course, through a wide range of community-based activities to raise awareness of the traditional, cultural,

architectural, heritage and social value of the maritime district. In 2015, the public authorities decided to uphold the social complaint, drafting the Integrated Sustainable Urban Development Strategy (ISUDS) for the coastal interface area within El Cabanyal area: the strategy involved an interdisciplinary team and a highly participatory process, in order to incorporate the demands of the coastal community as much as possible (Peris & Bosch, 2020, Ilisei & Salom-Carrasco, 2018). From the recreational point of view, the area is characterised by the presence of the homonymous beach: its length is approximately two hundred linear metres and, although it is a place intended mainly for neighbourhood sociality, there is no lack of tourist services, such as hotels, restaurants and commercial activities. Bathing is facilitated by the installation of specific facilities, and the nearby promenade becomes a meeting and social point for local users<sup>50</sup>.

### 6.3.3. Tourist influence on recreational activities along the Malaga City-Sea interface

Malaga is a city located along the *Costa del Sol*, on the southern side of Mediterranean Spain, and represents one of the main tourist destinations related to bathing in the entire state: it is the second largest Spanish coastal city in terms of the number of foreign tourists, hosting an average of 1.3 million visitors annually, of which around 60 % come from other countries; moreover, it is considered the urban destination with the highest tourist growth in Spain (Chica-Olmo et al., 2020). For these reasons, its tourist industry is very dynamic today. From a morphological point of view, the urban coastline is profoundly characterised by sandy beaches, e. Consequently, this element of the city-sea interface represents one of the main social, functional and landscape cornerstones of Malaga.

According to these features, bathing areas have been developed over time in order to respond to the needs of users. In this sense, the case of the area of Pedregalejo could be interesting: it is an old fishermen's s village located in the eastern part of Malaga, a few kilometres from the main urban centre. Since the Eighties of the last century, the settlement (now an effective urban district) has been progressively transformed, partially losing its traditional character in favour of a more tourist-recreational implementation. The coastline was thus modified with the construction of a complex system of inlets ending in breakwaters in order to protect the narrow coastal strip and, at the same time, recover land necessary for creating a system of pocket-beaches. Although relatively

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<sup>50</sup> The services and facilities available at *Playa del Cabanyal* are described on the official website of Valencia municipality: <https://www.visitvalencia.com/que-ver-valencia/playas-de-valencia/playas-urbanas/playa-de-el-cabanyal-las-arenas>

decentralised, this public space of the city-sea interface is now a destination for citizens and tourists, in relation to access to the sea and the presence of accommodation functions (Hsu et al., 2010).

Westwards from Pedregalejo beach, there is a further element of coastal sociality, namely the *Baños del Carmen*. This is a fairly small green area equipped for bathing, with an extension of approximately 550 metres and an average depth of 5 metres, whose name recalls the old thermal baths built in 1918 as a leisure area for the high society of the time<sup>51</sup>. Since 2010, a process of extension of the current beach area of the *Baños del Carmen* has been officially approved, with the installation of breakwater elements and the coastal connection with the nearby beach of Pedregalejo, as well as the implementation of the vegetated spaces of the site, in order to improve its usability with new facilities for cultural and sports functions and internal pedestrian paths: however, the project is still in progress (Naranjo & Lourdes, 2013).

Malaga's relevance within the Mediterranean basin is also linked to its port and its role as a hub for important goods and passenger traffic. The city has studied a number of solutions to encourage porosity between the port infrastructure and the urban core, where these entities overlap, seeking to balance their values in favour of the community. ~~From-For~~ these reasonings, the recreational area of *Palmeral de las Sorpresas*<sup>52</sup> was developed, a space of about 20,000 square metres located within the harbour area, as a hinge with the city system. Inaugurated in 2011, the site is characterised by a long sun-shading structure designed by Santiago Calatrava and is characterised by the presence of green areas and spaces for recreation in contact with the sea: the boundary with the areas destined for logistical activities is clearly marked by glass barriers that do not, however, interrupt the visual enjoyment of the water resource; on the other hand, mobility by bicycle is limited to certain specific areas, due to the port regulations in force. The *Palmeral de las Sorpresas* is connected to another green space within the local city-sea interface, in particular ~~in-on~~ the extended city edge: the *Parque de Malaga*<sup>53</sup> is a 30,000 square metres vegetated area, composed ~~by-of~~ bicycle and pedestrian paths and public gardens available for the local population. The area also serves as a green filter between the heart of the city and the port area, acting as an important element within the littoral green-blue infrastructure. In both cases, however, the use of green areas near the coast suffers from strong tourism pressure due to their central location, even though they constitute an interesting example of planning integration between urban greenery, the city and the sea (Andrade et al., 2021).

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<sup>51</sup> For further information on this bathing area, visit [https://www.malaga.es/es/turismo/naturaleza/lis\\_cd-4371/banos-carmen](https://www.malaga.es/es/turismo/naturaleza/lis_cd-4371/banos-carmen)

<sup>52</sup> The municipality provides information on the area at the following link: [https://www.malaga.es/es/turismo/informacionyocio/lis\\_cd-4811/palmeral-de-las-sorpresas](https://www.malaga.es/es/turismo/informacionyocio/lis_cd-4811/palmeral-de-las-sorpresas).

<sup>53</sup> Also for the *Parque de Malaga*, information can be found at: [https://www.malaga.es/en/turismo/naturaleza/lis\\_cd-3688/parque-de-malaga](https://www.malaga.es/en/turismo/naturaleza/lis_cd-3688/parque-de-malaga)

## 6.4. Waterfront ~~T~~ransformations and ~~S~~tatic ~~U~~rban ~~S~~hores in Italy: Naples, Palermo and Genoa

### 6.4.1. Large-~~S~~scale ~~V~~ision for ~~U~~rban ~~C~~oastal ~~R~~edesign: ~~T~~he ~~I~~mmobility of the Naples ~~S~~shore

The city-sea interface of Naples is characterised by an incredible richness of historical, cultural and social values, not inferior to the other Euro-Mediterranean case studies analysed in this chapter, but it also denotes a peculiar character of planning and design stagnation, since most of the interventions planned over the last decades have not yet seen the light, remaining essentially on paper. In fact, the Neapolitan metropolis suffers from a slow process of urban evolution, still dealing with issues already faced in European and non-European cities ~~with-of~~ a similar size. Added to this ~~is-are~~ the particular criticalities of the overlapping competences between the municipal authority and the port authority, which holds the management of coastal areas located even outside the harbour perimeter~~reef~~.

In its central area, dominated by the tourist ferry terminal, the transformative intentions of the Neapolitan coastal interface still focus on the waterfront project: attention is paid to repairing the fracture between sea, port and city, taking into account the functional ~~andbut-also~~ landscape values of the zone<sup>54</sup>. Specifically, the existing project proposes to preserve the port's autonomy while establishing a visual and functional continuity between the two areas of the urban amphibian: to do this, a linear infrastructure, defined as a *filtering line*, has been designed along the urban-port boundary perimeter~~reef~~ in order to host, on several levels, green areas, tourist, commercial and service buildings, car parks, and spaces for social aggregation and representation. The road section will be modified, creating a pedestrian route that will act as a visually permeable limit between the uses of the city and the activities of the port, connecting the main points of the central portion of the urban coastline, with the aim of creating a linear public space (Carta & Ronsivalle, 2016). However, it should be emphasised that the intervention area mainly concerns the most representative and tourist part of the Naples city-sea interface: the connection with Piazza Municipio unifies the sea and the urban centre, although the eastern periphery of the port infrastructure basically remains linked to its shipyard and logistical function, without a real urban reconnection (Gargiulo & Cerrone, 2011).

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<sup>54</sup> The main interventions planned for the Neapolitan port waterfront can be found at: <https://adsptirrenocentrale.it/progetto-del-waterfront-dallimmacolatella-al-molo-san-vincenzo/>

Regarding San Giovanni, a Teduccio, a neighbourhood close to the eastern end of the port of Naples, the area falls within the SIN *Napoli Orientale* perimeter<sup>55</sup>, with an extension of approximately 830 hectares, including the maritime area in front of the industrial site located there. The SIN was established through Law 426/98 and can be divided into four main areas, namely the Oil Pole, where petrochemical, mechanical and logistics companies operate; the Gianturco area, with mainly manufacturing and commercial companies; the Pazzigno area, where various small companies are located, and finally the coastal strip. The latter extends from the port to the municipal boundary with Portici: it is a complex area as it includes elements related to the abandoned industrial heritage, such as the thermoelectric power plant and the purifier, as well as areas used by the local community for bathing purposes (even if this activity forbidden due to the severe water pollution). Although operational plans have been promoted for the positive transformation of this coastal urban area, there is a general planning immobility that clashes with the social demand for public space for recreation and contact with the sea resource.

On the opposite side of the Neapolitan shore, another SIN zone has been identified, namely, the *Bagnoli-Coroglio* area, dating back to the mid-19th century. This area was a productive site, although the first significant factory was built at the beginning of the last century, with the construction of the Ilva steel industry. This infrastructure was definitively decommissioned in 1991, but the prolonged productive use of the area has severely damaged the surrounding coastal-maritime ecosystem. For this reason, the SIN extends for about 250 hectares on the mainland and 1,450 hectares in the adjacent sea, according to the new perimetrical area drafted on 8 August 2014. In 2020, an international ideas competition was launched for the functional transformation of this stretch of coastline once used for industrial activities. The urban project selected proposes the creation of a large natural park that includes elements of industrial archaeology: the designed functions involve large vegetated areas, a productive woodland that recalls the original rural use of the area and an urban park that acts as a link between the more naturalistic zone and the existing urban fabric with a predominantly residential function. In a similar way to the existing pedestrian pier, additional floating walkways are proposed, together with an implementation of urban beaches, trying to recover the existing coastal area, in front of the dismissed productive plant, that which is mainly composed by of debris from steel production<sup>56</sup>. The planning action ~~therefore~~, therefore, envisages a large area for recreation and leisure, although it is awaiting actual realisation.

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<sup>55</sup> Sites of National Interest (SIN) are more or less vast areas within the Italian territory that present environmental and socio-cultural values threatened by the presence of ecological risks of various kinds. They are identified by law in order to implement recovery measures (<https://bonifichesiticontaminati.mite.gov.it/>).

<sup>56</sup> Further information on the project and the international ideas competition can be found on the webpage of Agenzia Invitalia S.p.A. (<https://bagnolicontest.invitalia.it/il-concorso>).

#### 6.4.2. Port-City Relations and Social Reclamation of Degraded Coastal Spaces in Palermo

The Sicilian capital has a complex coastal landscape: its general conditions are in a negative condition from an ecological and planning point of view, due to various cases of illegal constructions, the presence of illegitimate discharges into the sea and the failed implementation of adequate socio-environmental recovery projects. From the point of view of bathing, there are no actual points within the city that are used for this function, which is often banned or, in any case, limited: Palermo's urban beaches are located outside the proper city centre and tend to become critically crowded during the summer due to the flows of both citizens and tourists. Nevertheless, it is possible the coast is quite prone to welcome future recreational and sports developments related to the sea, in the presence of appropriate planning processes (Trapani, 2020).

The transformation of the city-sea interface is characterised by the port waterfront evolution project, approved in 2018. The wide-ranging intervention is characterised by the intention to green up a large part of the urban coastline linked to the transport infrastructure, reconnecting it with the innermost urban fabric and creating penetration axes that favour the visual quality of the maritime landscape. It is proposed to realise a space for cultural, tourist and socio-economic activities in the city, creating urban hinges between the tourist harbour and the urban centre, through the redevelopment of areas of historical value, such as the *Molo Trapezoidale*, in functional continuity with the *Castello a Mare* (in whose area an urban lake is defined) and the twentieth-century buildings. In this area, there ~~is the objective~~ the objective is to enhance the public enjoyment of the archaeological elements through the creation of a public park, equipped with cultural and refreshment services to support the definition of a new littoral pole. Attention is therefore paid to the general urban quality, with a view mainly to tourist fruition and architectural enhancement of the existing buildings, in a large-scale vision, although the contact with the sea is mainly visual, for obvious functional reasons related to the logistic use of the area (Carta, 2018).

The Port Authority of Palermo thus plays a major role in local governance: its involvement in urban decision-making processes is linked and quite is crucial in the case of the *Foro Italico*, a green space in the urban heart in close contact with the sea. The area, owned by the port authority, serves as an urban connection between the city and the sea, yet for decades it has been in a state of environmental and functional degradation. Towards the end of the old millennium and the beginning of the 2000s, the ~~urban-coastal~~ urban-coastal society managed to persuade the port authority and the municipality to deal with the presence of illegal activities, in favour of renewed urban safety, limiting the sources of ecological issues. The site was thus transformed into a vegetated esplanade, an urban garden that is now very popular. Its 90,000 square metres host spaces for outdoor recreational and sports

activities, creating an important filter between the chaotic city and the urban sea, whose landscape can be fully enjoyed (Trapani, 2020). Although there has been a lack of further real interventions to transform and fully equip this public space, it remains an emblematic case of community reclamation of an important fragment of the city-sea interface, close to particularly urbanised areas (the city port and the historic centre), activated by social listening of users' demands and needs.

#### 6.4.3. Genoa Littoral Between the Renewal of the Port Area and Ssocio-Economic Transformations

The city of Genoa occupies a prominent place in the North Mediterranean context thanks to its urban coastline shaped by intense logistical activity and cultural and social impulses. In particular, for almost a century, its production processes and economic dynamics have generated substantial demographic growth: however, the industrial crisis that began in the post-war period decreed a negative turning point for Genoa's coastal development. Between the 1970s and the 1990s, the population plummeted from about 800,000 inhabitants to almost 600,000; the low amount of available land, combined with the strong functional competition of the various productive activities along the coast, strongly undermined the accessibility of the city-sea interface, also in relation to the inevitable high costs for the different coastal uses (Lombardini & Rosasco, 2020).

In this context, the intervention in the *Porto Antico* area fits in as an element of renewal of the urban image and a potential spur for the economic recovery of the city. The functional motivation of this project is the realisation of exhibition spaces and public places in contact with the sea, in coincidence with the 1992 International Colombo Exhibition: this area is, in fact, the ideal place for representations and events; furthermore, following the Exposition, the city would gain equipment and spaces for its citizens, creating a new pole of attraction for urban development. The project is also linked to the growing awareness that the urban coastline could be a neuralgic element within the urban system even beyond its productive relevance, representing a real opportunity for socioeconomic redemption through the promotion of leisure areas and activities related to tourism: the need for the organisation of spaces in favour of the evolution of the city-sea interface thus becomes ~~esstantial~~ essential (Gastaldi & Camerin, 2020).

In the same vein is the project of the so-called *Levante Waterfront*, one of the main contemporary operations for the city of Genoa, as it is focused on attracting funding through spatial transformation: the design action is, in fact, linked to the intention of ~~revitalise~~ revitalising the Genoa urban coastline in an economic way, exploiting the various advantages of the area, such as its easily reachable position, its proximity to various urban services and obviously its contact with the maritime system. The planning process seeks to meet the desire to restore the



seafront along the urban littoral interface. The area is occupied by varied uses, both public and productive: the overall design tries to give them coherence and balance. The final aim is the valorisation of a potential coastal pole in order to guarantee urban development and economic profit (Lombardini & Rosasco, 2020).

On the other hand, a different approach is taken for the ongoing plan for the realisation of the *Parco Urbano delle Dune di Genova-Prà*<sup>57</sup>, a green hinge between the port infrastructure and the city behind it. The realisation of this public space implies the participation of several actors operating within the coastal interface, including the Port Authority, the Region and the Municipality. From the design point of view, the intervention proposes a linear park, equipped for recreation and leisure, running along the ~~urban-coastal~~urban-coastal strip and creating a system of dunes from which the operation takes its name (Pirlone et al., 2022): this intervention also acts as an environmental buffer, absorbing the impacts and noise emissions of the machinery in the area and screening the rear urban settlement. The action includes the continuation of the existing promenade and the realisation of four public squares, functionally integrated with each other: attention is paid to the theme of pedestrian accessibility, enhancing the connection between the city and water. From an environmental point of view, the park also benefits from ecological engineering works, grassing and planting of trees, covering a total area of approximately 30,000 square metres. It must also be emphasised that, unlike the other interventions described for the city of Genoa, this project has gone beyond the mere definition of an ecological element in service of urban quality; in order to become, for all intents and purposes, a piece of the city, within the city-sea interface, that can be offered to ~~urban-coastal~~urban-coastal society, listening to its needs.

## 6.5. Different **P**roject **A**pproaches and **O**utputs to **I**mplement **C**oastal **S**ocio-**R**ecreational **V**alues

This synthetic review of projects and interventions implemented or being implemented for the city-sea interfaces of the large cities in the Euro-Mediterranean basin aimed to study the relationship that ~~urban-coastal~~urban-coastal institutions and societies had with the theme of sociality, recreation and ecological benefit along their seashores. It emerged that there are, in fact, very few examples of proximity public spaces explicitly designed for local enjoyment; to ensure constant contact with the urban aquatic resource as a function of psycho-physical well-being and environmental implementation. In the context of the ecological transition of the

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<sup>57</sup> The urban project is part of the European RUMBLE programme, aimed at reducing the noise impacts of port infrastructures (Borelli et al., 2020). The interventions that have been planned for the Prà Dunes Park can be consulted at the following web address: <https://www.portsofgenoa.com/it/strategia-sviluppo/mappa-di-geolocalizzazione-degli-interventi-infrastrutturali/1211-programma-straordinario/2921-p-3067.html>



contemporary urban amphibious, this issue has particular relevance because spatial proximity to community places reduces anthropogenic pressures related to transports and allows for a better social distribution of coastal services along urban littoral.

The French case proves to be one of the most emblematic. In fact, even if it is the only large city analysed, according to the parameters set out above, Marseille offers its citizens several areas destined ~~to~~ for the free enjoyment of the sea and the coast, although the central area of the urban coast is occupied by the GPMM, which drastically reduces littoral accessibility: in this respect, except for the *J4 – La Joliette* zone, the public spaces offered by the *Euroméditerranée* programme guarantee little results in function of the promised permeability, at least visual, towards the sea. It has to be said that the majority of these spaces are strongly influenced by tourism (an element, in any case, very relevant for the economic sustainability of such places): yet some elements of the Marseille city-sea interface really indicate the importance of the community in the definition of recreational places. It is possible to think about the case of the *Plage des Catalans*, which proposes a valid example of an urban beach, nestled between sports facilities and cultural and museum elements within the urban core: it is not a coincidence that it is one of the most popular beaches among Marseille users, a community particularly active in claiming its rights in terms of accessibility to the sea. At the same time, the municipal authorities have shown a certain inclination for social listening over the years.

Spain presents three case studies of large coastal settlements, but among them, it is possible to notice some differences in the design of the coastal interface. Basically, the country shows a particular influence exerted by great events and the masses of tourists that annually visit the Spanish coasts, mainly for medium-short periods related to bathing. The city of Barcelona is very much influenced by the international fair events that have taken place there: in fact, they have been a driving force for the qualitative improvement of the coastal areas, although some of the facilities built to date still do not have a real use, just as the creation of large areas for citizens and tourists has undoubtedly undermined the original identity value. For Valencia, the situation differs considerably, as here, too, the great events linked to sailing competitions have had a relevant impact on coastal planning: however, in relation to the identity value of the local communities, atypical situations can be examined, for example, in the El Cabanyal area, where the ~~urban-coastal~~ urban-coastal society has expressed strong disagreement towards an excessively touristic transformation of the old maritime neighbourhood. Finally, Malaga is characterised by the presence of several urban beaches, albeit slightly detached from the city centre: actually, this could reduce tourist pressure, although these places are still very popular. In any case, the intention to mend the complex relationship between the port infrastructure and the city, through elements of green-blue infrastructure, is also relevant.

The Italian urban coasts are characterised by a different approach to the urban amphibian project as they are still linked to more traditional waterfront regeneration interventions, mainly in ports. Naples and Genoa are strongly influenced by this infrastructure and its implementation, attempting to mediate on an urban level the connection between the harbour and urban fabric. If, however, Genoa has really moved on to the implementation level of some of the operations conceived for its waterfront, the Neapolitan case is characterised by a certain degree of immobility in urban planning, since many projects have been realised on paper, but to date, very few stretches of the city-sea interface have actually been transformed: moreover, serious socio-environmental problems persist in the most peripheral areas of the Naples urban coast. Similarly, the study of Palermo's coastal interface highlights a similar design effort to connect the city and the sea functionally and visually through the filter of the port; however, there is also a strong social component that has achieved lesser but nonetheless important results in the social reclamation of some open spaces intended for public use of the urban water resource.

To conclude, it is emphasised that, in fact, the urban design of proximity spaces with high socio-environmental value has different results in the various countries examined within this doctoral research, usually going towards large interventions with a tourist-cultural root that cannot always meet the real needs of the ~~urban coastal~~urban-coastal community. In most cases, functional permeability characters are pursued, in order to allow the distribution of public functions that can somehow relieve the pressure on the dense city, despite the planning complexity to achieve integration between the urban fabric and the maritime sphere.

## 7. Maritime Spatial Planning: Legal Framework for the Euro-Mediterranean Coastline

### 7.1. EU Directives for the City-Sea Interface

For the normative and legal aspects of this research, it is necessary to clarify that there is not a unique way of interpreting maritime space, since its delimitations derive from different directives and uses, depending on location, governance models and local coastal community. In fact, the boundaries of maritime and coastal areas tend to gradually dissolve: despite this, they generate considerable interest in the study of EU legislative aspects, from a social as well as an economic-environmental perspective, on the basis of the benefits they generate. It is, therefore, correct to say that ~~urban-coastal~~ urban-coastal areas are progressively losing their role as a border, as a demarcation line between different systems (the city and the water) to fall into the category of the interface, as explained above. For these reasons, an examination of the most relevant directives on the subject of coastal waters at a supranational level is proposed, in order to establish the extent to which the socio-environmental development of urban coasts is considered by the European community and, in the specific case of the present research, in the Mediterranean context. This study is essential as the city-sea interface clearly has a dual nature, terrestrial andbut ~~also~~ maritime.

Firstly, the *Recommendation of the European Parliament on Integrated Coastal Zone Management* (ICZM) (2002) recognises the great environmental, socio-economic and cultural importance of the European coasts, while highlighting, already twenty years ago, the threats posed by climate change and the progressive increase of demographic pressure on urban coasts. ~~It~~ it suggests a broad and holistic perspective in order to recognises ~~the~~ interconnection of hydrological, geomorphological, socio-economic, institutional and cultural characteristics in coastal zones: within these elements, participatory planning could be an instrument of synthesis between local and natural specificities (Morales, 2022). Indeed, the ICZM Recommendation identifies that the increasing pressure of human activities, together with the impacts of climate change, can seriously threaten the functional integrity of coastal ecosystems, requiring a multidisciplinary and multi-actor approach to understanding ing the main drivers of change, andbut also the pressures on European coastal areas: hence, there is a need for ~~an~~ effective integration of ecological, social and planning data and expertise in policies and management in order to pursue a balanced and sustainable development of coastal spaces (Moksness et al., 2013). In any case, from a public policy perspective, there is not a single and shared definition of the coastal zone, as it is an area defined according to the peculiar environmental and administrative characters of the different reference countries: the purpose of Integrated Coastal Zone Management plans is therefore to administer activities and uses that directly or indirectly cover the space between land and sea, as coastal interactions are linked to environmental or socio-economic systems that affect

both the terrestrial and the maritime territory (Ahlhorn, 2018). In particular, the document opens up ~~for~~ an ecosystem approach that can protect the coastal environment from ~~the~~ environmental hazards, working towards the strengthening of an efficient socio-cultural system for coastal society; it is interesting that the directive indicates the need to provide adequate accessibility to the public coastal space, according to aesthetic and recreational characteristics, while recognising the interdependence ~~andbut also~~ the discrepancies between the natural coastal system and human activities.

The *Marine Strategy Framework Directive 2008/56/EC of the European Parliament and of the Council*, better known as the *Marine Strategy Framework Directive* (MSFD), introduces an important perspective on the environmental quality of coastlines, focusing on the importance of the ecological assessment of the water conditions in relation to the impacts generated by human activities along the coast, reflecting on the implications for marine biodiversity, habitats and ecosystems. In fact, the directive aims to enhance a better understanding of the anthropogenic pressures on the sea; in order to pursue a valid and sustainable use, also encouraging collaboration between the various European coastal states and between the various smaller-scale maritime regions, working towards shared strategies to face anthropogenic changes in the coastal territory. The MSFD explicitly requires member states to take social and economic aspects into account in the preparation and implementation of their marine strategies; through the evaluation of the sea status and socio-economic analyses of its use, considering the eventual degradation of local environments. Indeed, ecosystem services provide uncountable benefits to ~~urban coastal~~ urban-coastal society, but their protection comes at a price: consequently, the directive calls for estimating the opportunity cost of measures to preserve maritime-coastal ecosystems through a careful cost-benefit analysis of the different potential policies; in order to select the most convenient choice, comparing environmental defence actions with other more damaging investment opportunities (Bertram & Rehdanz, 2013). This led, in May 2020, to the adoption of the *EU Biodiversity Strategy for 2030*: its objective is to increase the protection of the marine system in order to preserve an acceptable environmental status through the management of protected areas and the spatial planning for sustainable social and economic use of the coastline, paying attention to the sources of pollution related to tourism and recreational activities.

In 2014, *Directive 2014/89/EU* of the European Parliament ~~establishes~~ established a framework for *Maritime Spatial Planning* (MSP): it is particularly relevant because it provides a specifically project-based approach ~~for~~ to the issue of coastal management. It is a complex and strategic process for analysing and efficiently allocating the uses of maritime space in order to minimise contrasts between different actors along the coast and maximise the benefits of human activities; while ensuring the resilience of marine ecosystems. Indeed, the directive emphasises the

rapidly increasing demand for maritime space for diverse purposes related to renewable energy production or fossil fuel and natural gas exploitation, maritime transport, fisheries and aquaculture, tourism and archaeological-cultural heritage: these features require an integrated planning and management approach (Zaucha & Gee, 2017).

Maritime Spatial Planning, taking up the indications of the previous EU directives, aims at proposing an interdisciplinary policy tool that offers the possibility to deal with sea-related issues in an ecosystem-based way, promoting sustainability as a development engine for the maritime and coastal economy and as a guiding principle for a responsible fruition of sea and coastal resources in general. The instrument is addressed to a very broad range of users and covers different functional sectors; according to the cumulative impacts they may generate, providing spatial and time measures for the an-efficient fruition of marine areas or resources (Iglesias-Campos et al., 2021). It also mentions the effects that natural disasters and climate change can have on coastal dynamics, influencing littoral human activities: attention is paid to the effect that phenomena such as the erosion of shore and coastal advancement due to sedimentation have on the positive growth of the wider coastal-maritime ecosystem, in terms of damage on the ecological status, loss of biodiversity and degradation of ecosystem services; these elements must be a cornerstone for the elaboration of maritime spatial management plans, as their integration within the planning process can bring considerable benefits in relation to recreational and tourism activities, adaptation to *climate change* and control of coastal zone dynamics and disasters (Douve & Ehler, 2011).

Specifically, it proposes an-adaptive management and coordination of plans for water and coastal use, considering environmental, social and safety aspects; the indications of this directive should provide an adequate framework for the organisation of the maritime space, in combination with existing management models. Attention is also paid to different areas of coastal planning, from a tourist and cultural point of view, in order to limit the strong functional competition that is notoriously typical of the urban amphibious, with positive effects also on the surrounding environment: as mentioned above, in fact, marine ecosystems and resources suffer from strong anthropic pressures and natural hazards with repercussions on the quality of life, economic growth and the efficiency of coastal ecosystem services. The directive—~~therefore, therefore,~~ recommends ~~to carefully include~~including these factors into plans and policies carefully in order to have both environmental benefits and real control over the criticalities of the coastal strip with consequent improvement of socio-recreational and tourism activities. Maritime Spatial Planning can also be a useful tool to highlight crucial areas for ~~the~~-society: it is, in fact, an inclusive process that seeks to meet the needs of the coastal community in a comprehensive manner and in compliance with environmental criteria, merging, where possible, with existing systems for the management of the urban sea. Actually, the MSP tries to comprehend the specific national policies that can become an ideal basis for

further maritime planning provisions, in a complementary way (Calado et al., 2022). At an international level, Directive 2014/89/EU can also be placed in the context of the United Nations 2030 Agenda for Sustainable Development, as Maritime Spatial Planning can become convey the Sustainable Development Goals by involving different spatial scales of maritime-coastal actions, facilitating the achievement of the SDGs at a global, national and local scale (Carpenter et al., 2021). However, to date, only a limited number of European nations have integrated ~~this~~ these guidelines into their local ~~urban-coastal~~ urban-coastal management models.

## 7.2. Land-Sea Interactions in Maritime Spatial Planning

According to the criteria set out in the European directives, planning the city-sea interface must pay special attention to the management and spatial organisation of human activities, involving urban, natural and social sciences. This is due to the progressive dissolution of the boundaries between different littoral spaces, both in the terrestrial and maritime contexts: the coastal character appears discontinuous, which is why the management of the city-sea interface should offer a reticular approach that takes into account, alongside the environmental aspect, economic-productive issues whose benefits originate from the sea but materialise on land (for example, in the case of the fishing industry) as well as identity-cultural issues, influenced by the abovementioned gradual dissolution of traditional ~~urban-coastal~~ urban-coastal boundaries (Zauchá & Gee, 2019). These themes indicate the need for the active involvement of each segment of ~~urban-coastal~~ urban-coastal society. In this vein, it can be stated that Maritime Spatial Planning pursues the theory of ocean governance, that is, the multi-sectoral management of water and coastal space, not only from a legal perspective, but also as a function of the communities that enjoy it, with regard to functional and socio-cultural aspects. So, the concept of *land-sea interactions* is included: this notion amplifies the degree of complexity in urban littoral planning but is closely related ~~with~~ to the study of the public space of the coastal interface (Lainas, 2018).

Land-sea interactions (LSI) refer to a complex phenomenon involving all the natural or anthropic processes that take place along the city-sea interface: they are related to the influences that the littoral environment has on its inhabitants and, at the same time, to the impact of human activities on the reference coastal zone. Land-sea interactions consider both negative and positive or at least acceptable effects on the marine-coastal environment, the resources offered, and the human uses: LSIs can thus be defined as interactions in which land-based natural phenomena or human activities taking place on land have an influence or impact on the marine environment, the sea resources and the activities taking place in the water, and, simultaneously, as interactions in which ~~marine natural~~ marine phenomena or human activities taking place in the water have an influence or impact on the

land-based environment, the coastal resources and the activities taking place on land (Iglesias-Campos et al., 2021).

Land-sea interactions can be further categorised as follows. *Interactions related to natural land-sea processes* have implications for the coastal environment and coastal socio-economic aspects that need to be identified and studied in view of their dynamic nature. The objective is to include them in planning and management processes; at the same time, they can be altered by human activities that interfere with natural processes: for this reason, the analysis of the expected impacts of land and water uses should include the assessment of their effects on natural processes within land-sea interactions and the potential consequences on natural resources and coastal ecosystem services. The *interactions between land and sea uses and activities* include the more anthropogenic component of the overall concept. It should be noted that most maritime functions require supporting installations along the coast (for instance, commercial or tourist ports, docks for recreational boating, and the pipeline system connecting offshore wind farms to the mainland), as well as many functions with a mainly terrestrial basis (such as tourism and cultural uses of the coast, socio-recreational activities or bathing) expand their range of action on the water surface: such interactions can be identified and mapped, from the perspective of environmental, social and economic implications, by estimating their cumulative impacts, benefits and potential functional competition (Shipman et al., 2018). Finally, it is possible to trace a dimension of land-sea interactions that is more focused on the drafting of urban plans and management policies: the *institutional interactions*, existing between different administrative levels, can be identified between the various types of planning instruments and specific competences. The plausible convergence between maritime and land-based planning, together with the relevance of land-sea interactions, highlights the need to act in favour of an integrated system of coastal and maritime spatial planning, facilitating the transfer of knowledge from land-based planning, now consolidated in urban planning practice, to the more recent maritime management (Kidd & Ellis, 2012).

In consideration of the variety of land-sea interactions, it is evident that they involve different types of management and planning processes that necessarily embrace areas and spaces of different extents. One of the main issues related to land-sea interactions is how wide their range of influence is, both towards the terrestrial and the water sphere. Obviously, the specific uses and the ~~reference ecological~~ecological reference system should suggest the dimensional extent of LSIs, in relation to the natural processes involved and the human activities occurring along the urban amphibious: these elements define the functional scope of the analysis (Asprogerakas et al., 2020). However, from the perspective of the planning process, this scope depends primarily on the spatial context of the plan to which the analysis is linked. The extent of the maritime plan, the affected portion of the

coastline and its characteristics and main activities are factors that enrich and define the scope of land-sea interactions study: natural and anthropogenic land-based processes are considered relevant to the extent that their management can have positive consequences for the conditions of water areas and maritime activities, and vice versa (Schlüter et al., 2020).

In the case of coastal socio-recreational activities, this functional aspect of the littoral interface is closely connected to the natural resources offered by the coasts and their quality; at the same time, it can degrade their value: from an environmental point of view, land-sea interactions include ~~an~~-intensive use of coastal space that can lead to poor water and environmental quality, since tourism and recreational activities can be a source of pollution, noise and other disturbances for local species, also through the construction of buildings or infrastructures. Maritime Spatial Planning should pursue innovation in the management of new uses of the sea, so that the social-tourist function of the coastline adapts to the latest environmental standards. From a socio-economic point of view, LSI includes functional competition for coastal space between various fields such as aquaculture, energy production and port development: undeniably, this has positive effects on the economy of coastal communities but may irreversibly alter their character, occupying space necessary for sociality. On the other hand, tourism itself is an important economic incentive, which is why its related activities often take priority with respect to accessibility to coastal and marine areas of great landscape value: the development of tourist poles can also pose a significant threat to ~~the~~-water quality. Finally, from a technical point of view, land-sea interactions entail the establishment of effective solutions to limit environmental pressures and ensure equal usability of the coastline, in relation to access from the sea (for example, with recreational boating boats) and with to accessibility to beaches and other coastal recreation sites (Ramieri et al. 2019a).

In conclusion, MSP processes should take into account land-sea interactions, especially in relation to the most localised areas of coastal spatial planning, by defining the field of analysis according to the scale of intervention (which may be national, regional, sub-regional and even local), the geo-morphological characteristics of the reference coastline, the extent of LSI phenomena and their spatial and time distribution, as well as the location of maritime-coastal ecological resources. In this sense, the concept of the city-sea interface fits in as a peculiar space within which the features of the terrestrial sphere and the characteristics of the maritime space, ~~that~~-which is now the subject of studies for urban planning integration, can be contextually and coherently combined, to the benefit of the entire coastal ecosystem.



### 7.3. Application of Maritime Spatial Planning in the Euro-Mediterranean Context

There are twenty-two Member States along Europe's coastline: these are obliged under the MSP Directive to develop a national maritime spatial plan by 31 March 2021, with a minimum review period of ten years. At present, across Europe, states involved in plan development are at different stages of the process, with plans in preparation, adopted or under review. It is proposed an overview of the main states bordering the Mediterranean basin, in accordance with the target of this research, namely France, Spain, Croatia, Greece and Italy, as mentioned above, national realities that are similar from an environmental and social point of view, but profoundly different in terms of the application of maritime spatial planning.

— In France, the authority responsible for maritime spatial planning is the Ministry of the *Ministère de la Mer*, which has the task of ensuring the coherence of strategic plans at the national level, by consulting with the *Conseil National de la Mer et des Littoraux*: the latter brings together national stakeholder representatives and reports on strategic plans to the European Commission. Moreover, the French state is the country in the Mediterranean basin that is most committed to effective coastal planning. The MSP Directive has been implemented in 2016 with the *Loi 2016-1087 du 8 août 2016 pour la reconquête de la biodiversité, de la nature et des paysages*<sup>58</sup>. In particular, Art. 123 modifies the *Code de l'environnement* by introducing the notion of maritime spatial planning, considered as the process by which the state defines and organises human activities in the sea from an ecological, economic and social perspective, thus outside the spheres of defence and military security. On a national scale, the law leads to the adoption of the *Stratégie Nationale Pour la Mer et le Littoral* (Decree 2017-222 of February 23<sup>rd</sup>, 2017): its aim is supporting to support the coastal ecological transition process, the development of a sustainable blue economy, and the protection of good water quality and an attractive coastline. The decree aims to simplify coastal governance processes by merging several existing regional agencies into just two advisory bodies involved in the management of the French coastline from a social and ecological-environmental perspective. The strategy is implemented on a regional scale with the so-called *Documents stratégiques de façade* (DSF): these are the main tools for applying the indications of the Maritime Spatial Planning, according to the *Loi 2016-1087* and cover the four national maritime sectors along the French coast. These DSFs combine assessment procedures for environmental status and different activities along the coast (including social and bathing functions) with spatial and local planning, in order to meet the criteria of the *Stratégie Nationale Pour la Mer et le Littoral*. These strategies have become definitively operational since March 2022.

— Spain established a framework for Maritime Spatial Planning by adopting *Real Decreto 363/2017*<sup>59</sup> on April 8<sup>th</sup>, 2017, which transposes Directive 2014/89/EC of the European Parliament into Spanish law. Maritime spatial management is delegated to the *Ministerio para la Transición Ecológica y el Reto Demográfico*, involving the Directorate General for Environmental Quality and Assessment during strategic and ecological impact evaluation. However, to date, there are still no plans that incorporate the principles of Maritime Spatial planning.

<sup>58</sup> After the Nature Protection Act of 1976 and the Landscape Protection and Enhancement Act of 1993, the French State drafted a law aimed at restoring biodiversity, nature and landscapes, protecting and enhancing the natural heritage and encouraging green-blue growth. Among the legal principles, there is the establishment of a system of compensation for ecological damage for users who damage the French environment. This legal text can be consulted at: <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000033016237/>

<sup>59</sup> The decree is available at <https://www.boe.es/eli/es/rd/2017/04/08/363>

The planning of Spanish maritime and coastal territories is both a national and regional competence: in particular, the central government is the body responsible for international and European affairs, while regional administrations are entrusted with the management of land and water use, although national guidelines are considered in decision-making processes. Coordination between the different planning scales takes place through interministerial commissions and sector conferences. According to the *Ley de protección del medio marino* (Law 41/2010), which transposes the *Marine Strategy Framework* directive and regulates the public domain in the maritime and terrestrial sphere, each region is in charge of producing coastal protection and monitoring strategies; in relation to the *Real Decreto 715/2012*, a *Comisión Interministerial de Estrategias Marinas* (CIEM), chaired by the Spanish Ministry of Ecological Transition, coordinates the various actions at smaller scales. In any case, the central government is currently working to draft a final maritime planning strategy in line with EU guidelines, defining operational and management tools for each of the five Spanish maritime subdivisions, following a public consultation phase for the subsequent approval of the plans: indeed, the Maritime Spatial Plan (POEM) has been discussed with the population regarding the areas of high potential and the functional priorities, and then submitted to the competent authorities in order to complete the strategic environmental assessment process. The discussion also took place ~~in an~~ internationally, with Spain holding consultations on the matter with France, Portugal and Italy; the first cycle of coastal-maritime management plans, including the action implementation and the monitoring phase, will become operational between 2022 and 2027.

— As far as Croatia is concerned, there is currently no plan for the maritime space, although the entire Croatian territory is governed by various urban planning instruments; in relation to the coastline ~~but and~~ also to ~~the~~ water. The *Physical Planning Act - PPA*<sup>60</sup> (Act 153/13) constitutes the regulatory framework for the functional planning of the Croatian coast. Entered into force in July 2017, the purpose of this Act is to fully transpose the European guidelines for Maritime Spatial Planning. As a result of the requirements of the PPA, work has begun on the creation of a state spatial development plan to manage the entire maritime-coastal sphere, with the boundary of national territorial waters as the spatial limit: in addition, spatial plans have been drawn up for protected areas managed by the national authorities, encompassing ~~again both maritime and land space~~ both maritime and land space again. The Ministry of Physical Planning, Construction and State Assets (MPPCSA) is the national body responsible for the planning and management of coastal land uses. At a lower scale, Croatian counties are in charge of including provisions for their marine areas in the regional level plans; regarding different types of land use: according to the PPA, the functional categories include harbours and docks, submarine cables and pipelines, protected areas, submarine archaeological sites and aquaculture areas. At the local level, municipal governments are clearly required to develop their own general urban plans, which include indications to manage the uses of the marine area, if it falls within their territorial perimeter~~reef~~.

— Similarly, Greece has not developed a maritime spatial management framework yet. However, MSP issues are faced through *Territorial Plans*, ~~included including~~ *Special Frameworks for Spatial Planning* that operate at a regional scale and cover different fields of coastal planning: so far, sectoral plans have been developed for aquaculture, recreational-tourist activities and the productive sector; these tools include guidelines for coastal space and marine areas. Greece also shows some interest in renewable energy, with the 2008 *Special Framework for Renewable Energy Sources* (in the process of being updated), which defines strategic guidelines for offshore wind farms. Law 4546/2018 transposes 2014/89/EU into Greek law, also following the updates made by Law 4759/2020: Maritime Spatial Planning instruments must follow ~~a~~ consultation with ministries, regions representatives and citizens; the competent authority in this field is the Ministry of Environment and Energy, in cooperation with the Ministry of Maritime Affairs and Island Policies. Today, the

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<sup>60</sup> The text of the Physical Planning Act and its guidelines, charges to be paid and planning recommendations are available at: <https://mpgi.gov.hr/access-to-information/regulations-126/regulations-in-the-field-of-physical-planning-8641/8641>

draft of the *National Spatial Planning Strategy for the Marine Space* is in the process of finalisation for public consultation, before its final approval that will be implemented as part of the *National Recovery and Resilience Plan 'Greece 2.0'*.

— To date, Italy has not officially completed or adopted a unified and binding plan for maritime space. However, Italian urban planning has incorporated the European directive through the DPCM of December 1<sup>st</sup>, 2017<sup>61</sup>, concerning the approval of the guidelines for the elaboration of maritime space management plans, according to which the Ministry of Infrastructure and Sustainable Mobility is the competent authority on the matter. The aim is to identify and manage the most relevant areas for land-sea interactions: among these, protected areas are included (in relation to the mutual influence that marine and terrestrial spaces have, also from a rural-productive point of view), hydrographic basins connected to the sea, stretches of coastline with great landscape-visual value in the land-sea relationship, relevant marine-coastal infrastructures and areas comprehended in port plans. Moreover, at a smaller scale, it is possible to identify maritime sub-areas, namely micro-areas of the coastal interface on which particular landscapes, and socio-cultural, andbut also productive values insist. The implementation of management plans must therefore consider present and future activities related to various uses of the sea, in relation to recreation and sociality, but alsoand for -to the protection of material and immaterial heritage, scientific research, transport and the exploitation of renewable energy sources. In this process, a constant inclusive cooperation between public authorities and local stakeholders is promoted<sup>62</sup>; at the same time, the governance of the marine space must not contrast with existing urban plans, but rather fill the gaps that coastal planning has left uncovered. It is also interesting to note that the decree encourages sustainable tourism activities, and thus sociality, along the coastal strips, supporting the adaptation of port areas to preserve historical, environmental and cultural features in the relationship between land and sea, as well as the management of sandy shores against erosion and the protection of the archaeological heritage, including the submerged one, and the traditional uses of the sea, suggesting the use of an ecosystem approach. At the regional level, it should be noted that in June 2021, proposals for future maritime spatial planning tools were submitted to the European Commission for three spatial areas, namely the *Adriatic maritime area*, the *Ionian and Central Mediterranean maritime area* and the *Tyrrhenian and Western Mediterranean maritime area*: the implementation of these plans includes public consultation phases aimed at their approval.

From this analysis, it thus emerges that the French State alone shows consistent progress in implementing Maritime Spatial Planning indications, while the other coastal countries denote a varying degree of attention to the issue, even though they present instruments at different scales that, to some extent attempt to regulate the complex matter of coastal-maritime management. Italy appears to be positively headed towards the final drafting of a framework indicating at several levels the planning modalities of both the water body and its related coastal area, although without having tangible results for the moment; however, there are regional initiatives in this sense.

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<sup>61</sup> This DPCM follows the principles of DL 201/2016 and denotes some attention to interesting issues from the point of view of coastal sociality. The text is freely available at: <https://www.mit.gov.it/normativa/decreto-presidente-consiglio-ministri-del-1deg-dicembre-2017>

<sup>62</sup> The public consultation on the future approval of MSP plans was opened on 15 September 2022 and ended on 31 October 2022. The documents produced there are available on the website of the Ministry of Infrastructures and Sustainable Mobility (<https://www.mit.gov.it/documentazione/pianificazione-dello-spazio-marittimo>).

Similarly, Spain is inclined towards the development of an integrated maritime strategy, especially from an international perspective: this seems interesting, as cooperation between member states is one of the cornerstones of Maritime Spatial Planning. As far as Croatia and Greece are concerned, despite the fact that the EU directive has been transposed into both legislative systems, there is still a certain degree of fragmentation in terms of national sea management and planning.

#### 7.4. Challenges and Potential of Maritime Spatial Planning for Socio-Environmental Transformation at Local Scale

Even outside the European context, Maritime Spatial Planning is increasingly considered ~~as~~ an essential tool for the spatial management of water areas<sup>63</sup>. This instrument is connoted by its potential ~~but also~~ and by challenges that appear to be spread to a more or less equal extent in the countries that have implemented it or are working to develop it, despite being in distinct biophysical, socioeconomic and political contexts: these critical issues need to be adequately addressed to ensure the suitability and long-term sustainability of Maritime Spatial Planning, in relation to the environmental status and the possibility for ~~urban-coastal~~ urban-coastal society to efficiently enjoy the public coastal space and the urban sea (Frazao Santos et al., 2018). Indeed, by definition, the city-sea interface presents a blurred distinction between coastal and marine space: hence the need to think in terms of planning systems that coordinate land and sea policies and give coherence to territorial actions. However, the integration between instruments aimed at regulating the sea and instruments dedicated to the design of the coastal terrestrial sphere is not always so obvious, as these are complex spaces, within which it is difficult to precisely identify administrative competences to satisfy the social demand for accessibility to the littoral interface: as we have seen, to a certain extent, the policies of the Euro-Mediterranean basin seem to register a tendency towards the necessary planning decentralisation at the regional and local scale, although this process is still in its embryonic phase (Ramieri et al., 2019b). Within the context of the issues expressed in the first part of this research work, a synthetic but critical overview of the main problems that affect maritime spatial planning, influencing the usability of the public space of the city-sea interface, has therefore been proposed.

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<sup>63</sup> According to UNESCO's *Intergovernmental Oceanographic Commission*, it is estimated that coastal-maritime planning tools are currently being developed in about 70 countries worldwide, about half of the existing coastal states, covering six continents and four ocean basins (<https://www.mspglobal2030.org/msp-roadmap/msp-around-the-world/>).

From a planning perspective, climate change certainly presents a global and constantly evolving challenge, since factors like global warming, sea-level rise, and coastal erosion alter the distribution of assets and services in the marine-coastal ecosystem (Pörtner et al., 2014). While some maritime uses, such as renewable energy and seabed mining, are less susceptible to environmental impacts, other ones, like fisheries, aquaculture and coastal recreational functions, are generally more vulnerable: it is therefore required to plan for a constantly changing sea through increasingly flexible and adaptive methodological approaches (Frazao Santos et al., 2018). Within the MSP planning philosophy, the application of ecosystem-based approaches may ensure an equal spatial distribution and accessibility to coastal resources: in this sense, strategic environmental assessment proves to be an important tool for ecological implementation within maritime planning, as it estimates the potential impacts of the plan; however, as it is crucial to pursue both environmental and socio-economic objectives, it is also necessary to adequately apply the currently existing policies within the coastal interface (Ehler, 2021). Indeed, the social dimension of sustainability is linked to the economic and ecological dimensions through the multiple dependencies of coastal society's users on maritime resources and coastal space; consequently, the ecological decline of the sea ecosystem and the littoral sphere in general, in general, has serious consequences for coastal communities and human well-being, which underlines the importance of incorporating social justice considerations into Maritime Spatial Planning (Saunders et al., 2020; Bennett et al., 2019). In particular, maritime planning should recognise and respect local arrangements and governance, as well as distinct rights and the diversity of needs expressed by social demands, pursuing equity in the distribution of benefits and defence from risks, as well as in access to resources and public spaces, with particular attention to the most vulnerable groups in coastal society; by promoting inclusion in planning and decision-making processes, MSP could be more adaptive, able to integrate social dynamics and spatial justice (Gilek et al., 2021).

From a social point of view, adequately involving stakeholders in Maritime Spatial Planning is crucial for its acceptance and adoption, because understanding the existing socio-spatial relationships, expectations, and current and future interests of stakeholders allows conflicts to be reduced and economic, social and environmental objectives to be balanced (Pomeroy & Douvère, 2008). Indeed, coastal communities may suffer internal fractures when both established uses and new functions compete for the same area of sea or shore and its resources: in particular, the impact of maritime economic development may lead to conflicts of interest with coastal society users regarding recreational uses of the city-sea interface. Also, for this reason, a participatory approach can improve the quality of decision-making processes, building trust and consensus in the population and leading to more durable solutions over time (Fox et al., 2013; Sayce et al., 2013). However, many factors contribute to the exclusion or lack of involvement of coastal society, including poor communication, low transparency and fragmented governance: it is

not uncommon that stakeholders are integrated into participatory processes only in the final stages of planning and drafting; rather than during the elaboration phase; when their contribution could conceivably be more incisive. Moreover, approaches like simple observations by citizens rather than more proactive approaches may limit the benefits of inclusive planning (Flannery et al., 2018; Gopnik et al., 2012). The issue of coastal community involvement is by no means secondary, as it raises critical issues regarding social equity and spatial justice within the MSP.

According to this perspective, the problem of the scale of action of maritime spatial planning should also be considered. In fact, although the process of implementing water plans is usually related to specific national development objectives, it should not neglect sub-regional and local coastal contexts, taking into account the social demands of the coastal community: the goal would be to gain a systemic understanding of the integrated social and ecological components interacting at urban and micro-urban scales; since it can be argued that it is more efficient to deal with many of the socio-environmental needs at the local level (Iglesias-Campos et al., 2021). This reasoning is particularly interesting because it ties in with a thematic still not deeply investigated in the Maritime Spatial Planning field, namely the integration of coastal public space design within water plans: this is relevant both because these urban areas are crucial in absorbing the impacts of contemporary environmental criticalities, through appropriate ecological planning interventions, and because they constitute a privileged point of enjoyment of the sea resource by users of the littoral interface. Places such as urban beaches, for instance, act as a hinge between the maritime system and the urban-coastal system, giving the possibility to spend leisure time in a healthy way and to exploit the water resource within congested cities: they are an expression of land-sea interactions at the human dimension and, according to their location along the urban amphibious and to their usability, they can represent a litmus test for the actual socio-recreational equity of coastal areas. In order to achieve the effectiveness of Maritime Spatial Planning, it should comprehensively incorporate the complexity of the biophysical and social characteristics of coastal-maritime areas, together with relevant spatial information (Strickland-Munro et al., 2016). However, the integration of socio-environmental data is not always well established within maritime planning processes: this leads to an inadequate representation of the current social demand, which ~~has clearly~~clearly has a micro-urban nature. For this reason, inaccuracies may occur in the analysis of values, perceptions, and user needs, as well as the spatial and time distribution of human interactions with the coastal environment and the factors influencing it (Dalton et al., 2010; St. Martin, 2008). This kind of study in the context of water plans could increase the range of decision-support tools, assist planners in their design actions and facilitate the enjoyment of ecosystem benefits for coastal community users (Le Cornu et al., 2014).

However, it should be noted that to date, the legal force of maritime spatial plans is not always the same, as in some countries, they are more binding, with precise indications to be followed, while in others, they are more similar to guidelines that sectoral plans should follow (Iglesias-Campos et al., 2021). This brings back to the centre the need to create plans that are able to adapt to the legal, social and spatial reference context, constituting a firm support for the sustainable development of the sea and coasts, rather than a limitation to planning, especially at the local scale, within which socio-environmental interactions are more interesting from the point of view of the socio-environmental fruition of the coast.



## 8. Geographical Approach for the Study of City-Sea Interface Characteristics

### 8.1. The Complexity of the Contemporary Coastal Landscape

It is usual to think of coastlines as mere material objects, ignoring the degree of complexity that lies within them. The composition of coastal elements is extremely articulated, as it is possible to identify recreational spaces for sociality, but at the same time, natural amenities, wetlands that are composed of specific vegetation, stratified ecosystems that are home to numerous animal species, as well as vulnerabilities subject to different types of risk. Certainly, this articulation is not static but changes over time. For this reason, it is good to think of coastal areas as processes, which are not static but continuously reinvent themselves or are subject to external transformations. Continuous coastal evolution involves the interaction between solid materials (like sand or rocks), chemical elements (such as salinity or the composition of the seas), energy flows of physical, biological and even anthropic nature, ecological activities and, of course, deep-rooted human activities. It is, therefore, logical to expect accelerated responses from the environment, in relation to the complexity of the coastal site: this is due to the rapid aggravation of climate change, and anthropogenic modifications ~~but also~~ due to an inherent criticality underlying the use of littoral space, especially within the urban system, in relationship with the presence of differentiated interests and needs in a very limited space (Donelson Wright et al., 2019).

The contemporary coastal landscape is thus presented as the result of complex interactions between natural processes and human activities. As previously stated, urban growth and the increase of natural hazards related to the maritime environment create new challenges for coastal management: in order to study the city-sea interface, the quantification, modelling and visualisation of short-term evolution in relation to environmental and anthropogenic impacts may be useful. Identifying sensitive areas and neuralgic points for sustainable transformation, as well as mapping socio-ecological vulnerabilities, are relevant steps for responsible ~~urban-coastal~~ urban-coastal planning and management (Hardin et al., 2014). The coastal strip, especially in the theoretical context of the city-sea interface, is, in fact, a space with relatively reduced width but characterised by considerable length and strong pressures, since it is the site of multiple environmental, social and economic processes and criticalities, particularly in recent years, during which an increasing concentration of uses of the sea and urban shorelines can be registered (Gourmelon & Robin, 2005): this situation translates into functional conflicts and limited access to resources, which are difficult to manage due to mono-disciplinary approaches for critical coastal issues, to an unclear definition of administrative and legal competences and to legal regulations that are juxtaposed but not really integrated with each other. It is, therefore, not surprising that littoral zones represent a vulnerable space where meteorological



events and marine impacts combine with pressures from competing human activities, amplifying risks of natural and anthropogenic origin.

As is now well known, the percentage of inhabitants concentrated along urban coastlines is steadily increasing worldwide, with very high rates of development in the Euro-Mediterranean area: among the numerous other constraints on sustainable development, one of the consequences is a tangible reduction of the amount of natural urban areas. Large cities undeniably trigger socio-economic progress, but the downside is massive urbanisation that leads to air and water pollution, inadequate drainage of rainwater and - limited green spaces and land available for the various activities of communities. The result is the progressive homologation of urban and coastal landscapes and the creation of constraints on the socio-environmental safety, the city ecosystem and the aesthetic and recreational value of urban agglomerations: to ensure urban sustainability, it is ~~therefore~~, therefore, necessary to develop and implement innovative and integrated solutions that address the specific social, economic and environmental issues of these places, before the complexities of the contemporary city (and its coastal areas) become so articulated that the damage caused so far will be irreparable (Bougdah et al., 2020). In the coastal environment, it seems that measuring the impact of human activities constitutes both one of the main challenges of management and planning at different scales and one of the major difficulties encountered by the multidisciplinary study of the coastal zone in recent decades (Caldwell et al., 2013). This critical issue is linked to the complexity of analysing the role of coastal societies within coastal governance processes due to its constantly changing nature, the impossibility of applying rigid and deterministic methods to this type of study and also the difficulty in finding structured information describing the anthropic impact on the environment. In this context, understanding nature-society interactions within the city-sea interface again leads to the need to define multidisciplinary analytical-operational frameworks for the spatialisation of coastal dynamics (Kumar et al., 2019).

The complexity of these spaces can be reinterpreted through the collection and study of data about the physical structure of the city-sea interface and its spatial and functional organisation. The digital reconstruction of the territorial context of the urban amphibious can provide interesting insights in order to better understand the conditions within which the public littoral space is most usable by the users of the coastal society, or on the contrary, which are the physical-functional constraints that prevent its valid and equal fruition. Thus, spatial-geographical analysis is a useful approach to investigate the issues enunciated by the research question in relation to social, environmental and geophysical aspects (Donelson Wright et al., 2019). Increasingly, however, scholars are also relying on research based on non-expert knowledge, actively involving society through different methods. Indeed, it is possible to achieve high-quality results in the decoding of the coastal territorial system through minimal

efforts on the part of users, which, in combination with research work, can produce vast datasets that are extremely useful in the analysis, monitoring and management phases: such approaches could help in better describing the landscape composition as a function of its spatial configuration, understanding which factors influence its interpretation and quantification in analytical terms. The increased availability of spatial data, particularly in the last two decades, has shown new opportunities for landscape development, management and transformation. Coastal research should therefore investigate the interactions between different socio-ecological processes in order to describe how a landscape may change over time, also on the basis of comparisons between related spatial systems (Gergel & Turner, 2017).

~~To shed~~For shedding light on the complexity that hovers over the coastal territory and, in particular, over the city-sea interface, it can be a useful support to evaluate and possibly implement alternative strategies that favour the understanding of the public space: in particular, the geographical and spatial approach to this area can highlight the main characteristics of the coast in metric and quantitative form, as a basis of information for further comparison with other littoral systems. The resulting geographic-spatial model could describe the coastal thematic area analysed in this research, but at the same time, it could foster reflections on its main attributes and criticalities and possible areas of conflict from a functional, environmental and management perspective.

## 8.2. The ~~C~~concept of Spatial ~~D~~data Model

On the basis of this reasoning, it is proposed the realisation of a *spatial data model*, a tool that allows the georeferencing of information related to a geographical space, such as the city-sea interface. Its usefulness lies in its ability to represent the components of space in the form of geometric objects with precise characteristics related to the reference research (Neteler & Mitasova, 2004): georeferenced data, in fact, include a spatial component (geometric or graphic), which describes the position or spatial distribution of a phenomenon or function, and attributes that describe its intrinsic properties. In terms of representation, the spatial component can be expressed through geometric objects, whose characteristics are defined as lines, points and areas in relation to their geographical coordinates, defining a vector data model. Depending on the scale, the representation of geographic-functional features can obviously change: consequently, the ~~urban-coastal~~urban-coastal system can be represented as a point or an area, according to the specific needs (Balram & Boxall, 2019). Such georeferenced data can be translated into layers for the composition of thematic maps. ~~E~~-each feature or attribute at the base of the coastal interface can be combined with other information to carry out new elaborations and produce analyses of ~~the~~ different functional and spatial relationships. ~~I~~n this way, it is possible to decode and visualise the various

processes underlying the communities that inhabit the many zones of the contemporary city, such as accessibility, specific uses, and demographic growth, ~~but also~~and aspects that are more related to the physical-environmental system and the evolution of the ecosystem (Sharma, 2021).

This functionality of the spatial data model can be used to address critical issues in today's spatial planning and management: its application from a socio-economic perspective can be useful to identify solutions to the problem of local accessibility, to locate the most relevant points of the urban coastline within a certain range, to find the optimal position for organising uses and functions in a part of the city, to assist in the design of community services in relation to the demographic composition of the coastal interface, spatially identifying the expectations of society and the peculiar characteristics of the urban system, essentially managing urban growth (Ivan et al., 2017). This geographic approach can also play an important role in natural resource conservation and disaster management: it can be applied for actions such as coastal erosion risk identification and prevention, resource organisation, ecosystem analysis and modelling, environmental planning, flood protection and management, ~~but also~~and ~~to~~mapping human activities that may generate pollution (Bougdah et al., 2020).

It is indeed appropriate to investigate how to manage a complex space such as the urban amphibious, fully understanding its physical-functional composition: its functioning depends on numerous physical, natural and socio-economic variables that interact with each other at different scales and over a more or less broad time range, requiring a multidisciplinary approach. The coastal sphere of large contemporary cities thus appears as a space that is sensitive to a variety of parameters to be interpreted, also in relation to the interests of coastal users, whose frequent conflicts may ~~be resolved~~also be resolved thanks to a geographic-spatial study (Gourmelon, 2003). Geographical information systems are, for the most part, developed to study phenomena according to an approach that tends to be mostly static, although it is possible to integrate spatial analysis with time variables, elaborating comparisons and maps in a given chronological interval. Combining the spatial data model with other types of survey processes or methodological approaches gives access to the dynamics underlying urban development (Bédard et al., 2007). The analysis of spatial data<sup>64</sup> requires a reference framework to systematise the studied phenomena and elements. In this sense, it is possible to identify a twofold approach to geographical representation in research<sup>65</sup>: the discrete method favours the study of discretised elements that fill the space, while the continuous

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<sup>64</sup> Spatial data refer, directly or indirectly, to a specific geographic area (which is why they are sometimes referred to as geospatial data): they may represent a physical object in a geographical coordinate system, but they are also evidently useful in the study of how different variables may affect individuals, communities and the environment (Kumar et al., 2019).

<sup>65</sup> In statistics, a quantitative variable is said to be discrete when it can assume a finite or numerable set of values; conversely, a variable is described as continuous when it can theoretically assume all the values included in a real interval (Bramanti, 1997): consequently, an

method focuses on the study of space, in this case, the coastal space, as covered by surface elements that characterise it, also from a functional perspective (Haining, 2003). The classification of spatial data according to the type of spatial conception (together with the choice of an appropriate scale of analysis) is a necessary step in establishing the appropriate methodologies and techniques to answer the research question.

In this context, it is possible to identify four different types of spatial data, broadly speaking: *point pattern data* indicate a set of information that is organised in a punctual manner within the study area, according to the positions in which interesting events occur (such as specific uses or the incidence of particular phenomena); *field data* refer to variables that are conceptually continuous but are sampled and studied according to fixed criteria that establish an observation interval, like geostatistical data; *area data* associate the analysed information with a certain number of areal entities, forming regular grids (as in the case of remote sensing images) or surfaces with more or less regular shapes (for instance, neighbourhoods, districts or census sections, ~~but also~~ and other functional areas); finally, *spatial interaction data* refer to measurements of phenomena or spatial-functional entities that occur in relation to a precise position or certain areas (Fischer & Wang, 2011). The study of spatial data ~~is~~ is related to the principle that the correlation between variables in geographically or functionally close locations tends to be stronger than the relationships between variables in distant locations: there ~~is~~, thus, an inversely proportional relationship between the spatial-functional distance of the elements of analysis and their similarity<sup>66</sup>. Obviously, this proposition admits exceptions: it is possible for variables that are very close to each other to be contradictory, just as very distant elements may show great affinity; again, there are values of certain variables that are independent of their location (Anselin & Ray, 2010). The usefulness of this geographical approach thus emerges in the study of elements belonging to the same spatial system (such as the city-sea interface), ~~but also~~ and in the comparison of spatial entities that are geographically distant but functionally related.

From a methodological point of view, it is necessary to define the motivation of spatial research and the perspective towards which it tends. The purpose of the study, in fact, constitutes the interface between the dimensional structure of the investigation and the socio-environmental context that motivates it: the aims can obviously be oriented towards theoretical analysis, ~~but also~~ and towards professional and institutional-decisional support. For this reason, it is important to correlate the intentionality of the investigation with the production of

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object of study (such as space and its elements) can be considered continuous if it contains an indefinite number of elements arranged contiguously, or discrete if it is composed by isolated, non-contiguous elements.

<sup>66</sup> Tobler's first law of geography (1970) declares that everything is related to everything else, but things close to each other tend to have more intense relationships than things far away from each other.

expected representations and outputs, which will have to be designed to satisfy the initial purpose. It will also be relevant to distinguish selection criteria for the elements to be analysed, filtering what does not fit into the category of the object of study; ~~but also~~ and categorising the hierarchy of information to be collected. In particular, the hierarchical structure is composed ~~by~~ of layers that allow for the gradual decoding of the coastal interface space: spatial and time aspects are then combined with a variety of attributes that semantically reorder the territory, giving back a comprehensible and coherent picture, suitable for in-depth research (Tambassi, 2019). The elaboration of thematic maps of the coastal areas of contemporary cities allows us to delve into urban forms, management processes and morphological-environmental evolution, providing an important background to different branches of coastal knowledge, starting from natural sciences and ending with legislation, environmental engineering, architecture and all those branches that flow into urban planning practice and theory. The use of these outputs can certainly have different purposes, but they converge in the realisation of a platform that allows the management of data, visualising the various physical and functional information, and interpreting and analysing the current and past conditions with a view to improving the quality of future coastal conditions. Hence, the realisation of a spatial data model may allow to monitor and evaluate changes in the city-sea interface, digitally organising littoral resources for coastal space management and planning (Pérez-Alberti et al., 2021).

### 8.3. Structure of the Spatial Data Model

The main objective of the proposed framework for a spatial data model dedicated to the urban amphibious is the analysis of the social and ecological elements of the city-sea interface, defining its morphological and functional characteristics. This can shed light on the socio-recreational potential of these places: to this end, it appears relevant to study which social uses directly related to the sea are practised along the urban shoreline, as well as the actual presence of coastal ecosystem services, especially related to the psychophysical well-being of citizens and the enjoyment of the coastal cultural, landscape and natural amenities; this is linked to the analysis of the current morphological structure of urban shorelines as well as the formulation of reasoned hypotheses regarding its possible future evolution. During the last 50 years, major transformations s and regeneration of urban coastlines have occurred, as stated above: this makes it interesting to study the littoral interface from a spatial point of view. The model ~~therefore, therefore,~~ involves a diagnosis on a city scale aimed at studying the types of public and semi-public space along the coastal interface, the accessibility to the coast, and the endowment of ecosystem services; at the same time, it gives the possibility of investigating some specific sites of the reference coastal interface, delving into the theme of fruition of the sea, visibility along the coast and socio-recreational coastal uses. The

hypothesised structure can thus be articulated according to groups of layers, schematised as follows (Gourmelon & Robin, 2005).

- ~~Base maps~~ will include aerial photographs, topographic maps, three-dimensional models and georeferenced maps within a given time-frame ~~on~~ in a precise historical moment. This information allows the current coastline to be compared with spatial configurations assumed in the past, ~~but also~~ and allows for the updating and mapping of data in the next categories.
- The *geo-physical structure layer* will collect data on the physical structure of the coast, and the elements that modify its profile, whether they are anthropic or natural: in particular, reference is made to the coastline (understood as the perimeter ~~of~~ of the urban shoreline) and to the anthropic elements designed for preserving the coastal interface from environmental risks or for social and recreational purposes (such as artificial rocks, piers, docks). The objective of this layer is to give shape to the outer border of the maritime city edge, in order to precisely locate land and sea activities, ~~but also~~ and to relate the functional uses and environmental components of the interface with respect to the sea-front; moreover, it allows to know the extent of the defence works against the maritime risk, a crucial element for studying the use of the urban coast for recreational purposes.
- ~~The natural environment layer~~ refers to the green spaces located along the city-sea interface, whose ecological and environmental values counterbalance the negative impacts of the urban fabric: it is possible to identify vegetated areas characterised by different types of urban greenery (including private gardens, urban parks of various sizes, aligned trees, ~~and but also~~ abandoned or degraded natural areas and urban-rural spaces, as well as generic urban forestation) and protected areas, both in the marine and terrestrial spheres. The study of this layer allows ~~to analysis of the~~ available surface for green-blue implementation of various types, also studying the ~~amount-number~~ of free areas: this data can be related to the percentage of sealed soil within the city-sea interface but can also provide information about the presence of more or less extensive elements to be included in the network of coastal green-blue infrastructure.
- Within the *built environment layer*, artificial and anthropic elements characterising the city-sea interface fall into two macro-categories, namely buildings and port areas. The former will be classified according to their function, in particular with reference to residential and tourist uses, nautical clubs, public facilities, production plants, and possible military bases, ~~but also~~ as well as buildings with historical-cultural value belonging to the terrestrial or submerged heritage and disused or abandoned buildings. The second macro-category will investigate all types of port infrastructure, considering harbours, private piers, and commercial, tourist or military ports. Although the primary purpose of the present spatial model is to study the socio-recreational uses and environmental aspects of the city-sea interface, it is nevertheless important to understand the composition of all parts of the urban coastline.
- The *recreational uses layer* identifies areas of the urban amphibious intended for bathing, both public and private, ~~and but also~~ artificial platforms used as solariums; public and private spaces dedicated to outdoor sporting activities, such as playgrounds or gymnastics areas, sports fields or outdoor swimming pools are identified. The purpose of this layer is to identify punctually social and recreational activities related to the urban sea: indeed, the amount of public spaces along the littoral zone is at the core of the social demand expressed by the urban-coastal society, regarding the possibility of fruition to these places, in terms of direct accessibility (free access, access with a ticket, private access, access physically or legally denied) ~~and but also~~ of indirect accessibility, in relationship with potential constraints to visibility (Nikkoli, 2018).
- The last layer analysed in this framework is related to *soft mobility and accessibility* and includes everything that concerns the possibility of reaching the coast by road and rail or by sustainable means of transportation. In fact, it traces driveways, private routes, railway or tram lines along the coast and areas intended for parking cars or motorbikes (considering public, paid or private parking areas); furthermore, this layer measures

pedestrian areas, understood as road sections where vehicular traffic is forbidden, public squares, promenades and all those spaces legally dedicated to pedestrians and cyclists in a clearly designed manner. Access to the public space within the city-sea interface is clearly connected to the transport infrastructure, and measuring its extent can provide useful insights ~~about~~into how much of the urban shore is actually usable by its citizens.

This framework is certainly flexible, offering the possibility of being implemented or readapted according to the study objective, while focusing strongly on the aspects of sociality and the environmental aspects along the city-sea interface at a local level, in order to provide a database for developing policy decisions and coastal plans at a smaller scale. Specifically, the expected outputs concern the production of maps and measurements of the different coastal elements that compose the littoral interface, gaining an in-depth understanding of its composition by mapping the main current recreational uses that take place there, the amount of vegetated coastal spaces, the morphological composition of the present-day urban coastline and the percentage of equally accessible areas along the city shoreline; to this, information concerning the environmental status of the urban amphibious and the elements intended for protection from climate risks can be integrated.



## 9. Psycho-social Approach to Analyse Coastal Social Perception

### 9.1. The Social Perception of the City-Sea Interface

The contemporary territory is characterised by a singular complexity of signs that anthropic actions imprint on the forms of nature: even in the case of territories that are still scarcely urbanised, a place remains uncontaminated only until it is not subject to the perception of an observer, who organises forms and spaces in a semiotic mental model filtered through previous experiences. Indeed, the concept of landscape is, in any case, a mental operation of man (Luginbühl, 2017). According to the European Landscape Convention (2000), the term landscape refers to people's perception of a certain part of a territory whose character derives from the interrelations between environmental and human factors that the observer is able to recognise, incorporating visual, emotional, socio-cultural and psychological components. It is possible to connect the social perception of the landscape, including the coastal landscape, to different scales: today, the participation and involvement of users in the planning and management of their territory emphasises the social perception on a local scale, which considers the *attachment to place*, social relations and the individual experience of citizens. The perceptive dimension is a key element of landscape in relation to territory. However, it is a concept that is difficult to quantify: investigating social perception means, first of all, exploring the different values of the landscape, which include naturalness and recreational enjoyment. Such a study also refers to the sources of social perception, linked to expert and non-expert users, to psychological and mental constructs of perception (in psychophysical and cognitive terms), to quantitative or qualitative analytical approaches and to possible concepts for measuring perception, such as the physical qualities of a certain place, the preference declared by users or the landscape beauty (Cassatella, 2011): it is clear that visual perception alone does not determine users' preferences, yet it plays an important role in defining a community's need for sociality and well-being, also through hypotheses of planning and design intervention

With regard to the study of urban shorelines, it has been stated that open spaces undeniably bring benefits to human health, positively influencing the psycho-physical well-being of users: many studies report that frequenting such areas can restore psychological status by replenishing users' cognitive resources, induce a positive emotional balance and even have an influence on the hormonal physiology related to the nervous system, reducing the average stress level (Bratman et al., 2021). According to psycho-evolutionary theory, humans have, in fact, evolved to recover more quickly from psychologically, physiologically and socially traumatic situations in valuable environments, free of threats and rich in resources and services, rather than in oppressive, highly urbanised contexts. Furthermore, the regenerative capacity of open spaces and blue-green areas increases when the perception of these places is reassuring and appealing for users, compatible with their lifestyles and needs. It has



been demonstrated that components that increase or decrease the naturalness of public space, such as urban vegetation or the characteristics of urban parks, can actually influence how society perceives places, expanding the potential for environmental and psychological restoration (Georgiou et al., 2021).

Alongside the natural and urban components that define the public space of the coastal interface, the presence of other people can be an additional element that may alter the perception of places and the potential for psychological restoration: the presence of users considered non-threatening or overcrowded places can in fact, in fact, impact the degree of perceived safety and well-being (Collado et al., 2017). Along the city-sea interface, however, there are public spaces of different sizes and degrees of fruition: it is well established that the urban shore is perceived by coastal society as an important opportunity for socio-ecological transformation. In particular, spaces such as urban beaches consistently promote the psychological restoration of the coastal community, just as the juxtaposition of different types of green-blue areas along the city shoreline can have different impacts on social perception, also from a planning and management perspective. The excessive fragmentation of naturalistic areas of the urban coast due to anthropic elements, such as port areas or piers, may incredibly reduce or even completely erase the users' perception of well-being; just as spending leisure time in spaces with great social value like urban beaches can have positive effects on the psycho-physical status of the users, in the same way, the presence or lack of services can alter at the micro-urban scale the potential for psychological restoration of these places along the city-sea interface. There are environmental variations in the way the public and open space of the urban coastline is perceived and in the well-being that these places provide for the citizens; moreover, the different individual experiences can modify the social perception of the urban amphibious (Subiza-Pérez et al., 2020). An example may be the change in the fruition of public places following the COVID-19 epidemic, a phenomenon that has expanded the need for the proximity of open areas, focusing markedly on social distancing, health protection and availability of personal space (Severin et al., 2021; Moreno, 2020b).

Regarding the perception of comfort and well-being<sup>67</sup> that users may have in different parts of contemporary coastal areas, this aspect can be influenced by several factors. Specifically, the social perception of the coast may vary according to the naturalness of the place: generally, users prefer urban beaches and dune areas to markedly anthropic places such as jetties or piers, while urban parks and areas with a historical-cultural character possess an average value between urban naturalness and urbanised spaces. In essence, the perception of psycho-social well-

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<sup>67</sup> It is possible to refer to *perceived restorativeness scales*, which indicate the attempt to quantify the perceptive value that society shows towards open spaces with a certain degree of naturalness: a recent Belgian study applied these criteria by measuring the perception of coastal places showing images in comparison to citizens (Hooyberg et al., 2022).

being is less pronounced in areas evidently defined by human action and strongly artificialised, although the presence of coastal services favours the use of more ecologically valuable spaces (Hooyberg et al., 2022). This clearly highlights the importance of the socio-environmental component for the well-being of ~~urban-coastal~~urban-coastal society: considering this element as an aim for littoral planning and policy could lead to interventions that maximise the benefits provided by the city-sea interface to its users.

Understanding the impact of coastal open spaces on social perception is a fundamental prerequisite for sustainable spatial design and the development of new socio-recreational practices and functions along the city-sea interface in accordance with the protection of the coastal environment, with positive impacts on the psycho-physical well-being of citizens (UNEP, 2019). However, there it is compulsory to analyse how the multi-sensory and functional experiences of ~~urban-coastal~~urban-coastal society influence the psycho-social effects of the urban coast and how these effects may differ between segments of coastal communities with different demographic and socio-economic backgrounds: this could be influenced by climate risks, as discussed above, ~~but-also~~and the overcrowding of coastal public places and the possible lack of accessibility, as well as the physical and aesthetic conditions of these areas (Hipp & Ogunseitan, 2011). The short-term and long-term psycho-social benefits of using the littoral areas in the city could also be quantified from an economic point of view, linking the planning of the public space in the city-sea interface to different functional fields, in which the socio-recreational component plays a relevant role, generating positive chain effects on the different segments of ~~urban-coastal~~urban-coastal society (Sandifer et al., 2021).

## 9.2. A Quantitative Approach for Studying the Urban Amphibious

~~Urban-coastal~~Urban-coastal society has high expectations of planning intervention in coastal public spaces aimed at expanding the possibilities of sociality and recreation in large maritime cities, as set out in the reflections that defined the research question. In this vein, the investigated methodological approach tends towards the development of psycho-social and perceptive reading techniques. For this type of analysis, it is ~~needed~~necessary to delve into social listening methodologies and techniques rooted in sociological theory. The aim is to understand the opinions of citizens about the issues of accessibility and fruition of the public spaces along the urban coastline, through an in-depth study of the typical socio-recreational uses of the average user, while at the same time interpreting the possible suggestions regarding the possible or desired transformations of the urban amphibious, in both a planning and environmental perspective.

Both the qualitative and quantitative approaches aim to gather information. However, ~~while~~ the former method relies mainly on observation to directly study the behaviour and manifest characteristics of a place or community, the latter allows for a better understanding of the motivations for certain habits and ~~to explore~~ explores the expectations and perceptions of the individuals involved regarding particular conditions (Cardano, 2003). This is related to the lines of research defined above. In order to generalise the ideas of a section of the population that frequents urban shores, it is necessary to select a type of quantitative approach, suitable for processing a large number of data that are as objective as possible. Quantitative research relates the basic theory and its application in logical, methodological procedures aimed at verifying the theoretical assumptions through the collection of empirical information from field surveys (Corbetta, 2014). On this basis, it is possible to translate concepts into empirical variables, which can be measured and studied, even before disseminating the survey tool. In a similar way, for the purposes of the quantitative study, the relationship between users and the reference context is preliminarily taken into consideration for its influence on the reactions of the analysed individuals, since it can be overlooked or manipulated in a controlled manner within a certain limit; it follows that even the physical and psychological interaction between the scholar and the interviewed users may be considered scientifically neutral and as limited as possible (Cardano & Ortalda, 2016).

Through the sample survey, the quantitative method thus allows ~~the to gather~~ gathering of information by interviewing users of a coastal society, who represent a ~~peculiar-particular~~ segment of the urban community, through a standardised procedure that aims to highlight the relationships between the hypothesised variables. One of the most popular quantitative survey methods in sociological studies is the questionnaire, which has been selected as the survey instrument for this aspect of the research (Beatty et al., 2019). The first phase of building the survey instrument involved an in-depth theoretical investigation from which the abovementioned research questions emerged. If the questionnaire is structured in an efficient and detailed manner, it can, in fact, serve as an efficient information base for technicians dedicated to spatial development and as a guide for policy-makers ~~for to make~~ making informed and targeted decisions: this kind of methodology allows for the collection of information in a standardised way on the basis of well-defined demographic samples from which results can be deduced and related to broader social groups. The theoretical study has thus organically connected a coherent set of ~~hypothesis~~ hypotheses regarding the underlying study questions, with a certain level of abstraction that can be generalised with respect to the wider context of the city-sea interface, in order to draw valid and coherent reasonings (Bailey, 2006). Indeed, if the base theory may assume a broader point of view on a certain topic, the related operational hypotheses must be specific and consistent with the selected case study. This is followed by the design of the methodological structure of the psycho-social research, with the definition of the questionnaire itself: its dissemination is necessary to collect

data that will then be organised and analysed with the target of providing an inductive interpretation of the obtained results (Saris & Gallhofer, 2014).

With regard to the formulation of the possible answers, it has been chosen an additive scale, specifically a *Likert scale*. This is a measurement scale that assesses the level of agreement ~~of or~~ disagreement of the user about a statement: the opinion about a fact can range from being completely in agreement on one side to being completely in disagreement on the other side; in the middle, there is indifference or a lack of opinion on the subject. One of the highlights of the Likert scale is that it succeeds in capturing the nuances of the ideas of users, since it usually consists of three, five or seven points (Memoli, 2004). This instrument has probably become the most popular format among scaling methods aimed at quantifying public opinion on any given issue: it is possible to measure how much someone agrees with an assertion, as mentioned above, ~~but also and~~ to quantify the frequency<sup>68</sup> with regard to certain activities, establishing a time range from 'often' to 'never' (Nemoto & Beglar, 2014). However, it should be noted that this method, while having the ability to measure the degree of agreement with an opinion or the frequency of a certain action, can be negatively influenced by the tendency of the interviewees to agree with any proposed statement, without giving too much weight to the answers they give but trying to appear in line with the interviewer's thinking: it is ~~therefore, therefore,~~ necessary to present the questions in an aseptic and balanced manner, in order to avoid to express personal opinions or feelings within the data collection process<sup>69</sup> (Robinson, 2014). Keeping these concepts in mind, for the purposes of the present research, the usefulness of this method is, therefore, the possibility of achieving simple results, such as numbers and graphs, which enables to generate a hierarchy of values for the individual questions, coherently with the simple structure of the questionnaire model within this research. In the hypothesised questionnaire frame, five-point scales are proposed, in order to have the following possibilities: 1. *Not at all* - 2. *A little* - 3. *Indifferent* - 4. *Very much* - 5. *Very much*. This allows for a more specific expression of opinions by the users; at the same time, it is easy to organise the gathered data for the subsequent processing phase (Joshi et al., 2015).

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<sup>68</sup> With regard to scaling methods, it is possible to distinguish between attitude scales and frequency scales: the former consists of a set of items (statements, objects, facts), to be evaluated more or less favourably through a scale; the latter study actions, situations or events in relation to their frequency of occurrence over a specific period of time. Both types of scales can be connected to Likert scale measurements (Palumbo & Gambarino, 2006).

<sup>69</sup> In order to minimise misunderstandings and to extrapolate coherent information, it is necessary to use appropriate language, avoiding technical terms as well as adversative conjunctions that presuppose the presence of two ideas within the same question: these are referred to as *double-barrelled questions* (Wolfe & Smith, 2007).

In order to better understand the modalities and needs of the city-sea interface, with regard to social demand and perception, it emerges the ~~methodological-critical~~ ~~methodological~~ issue of precisely identifying coastal users, also on the basis of their place of provenance: in fact, it is not easy to assess whether all users of the coastal society come from neighbourhoods along the coast, from the reference city or even from other cities. The sampling error depends on the size of the analysed sample: if it is too small, there is the risk that the analysis could be biased. However, it is not only the size of the sample that determines its validity, and this parameter can still be in conflict with the accuracy of the sampling procedure (Corbetta, 2014). It is ~~therefore, therefore,~~ necessary to seek a balance between the two elements, bearing in mind that accuracy is the main quality for quantitative research: it is possible, in fact, to reach an extremely large number of users to interview, yet it will be almost impossible to identify every single component of the reference community, in this case, the ~~urban-coastal~~ ~~urban-coastal~~ society; on the contrary, it is plausible to identify and thoroughly analyse a small but nevertheless ~~well-varied~~ ~~varied~~ sample that will be sufficiently wide to provide appreciable data (Sharma, 2017).

It is now introduced a peculiarity of the questionnaire and the quantitative approach, namely the concept of representativeness, in relation to the sampling of studied subjects. A sample can be defined as a representative if it provides a small but unbiased picture of the population (Grafström & Schelin, 2013). It is thus stated that the distribution of a certain number of variables within a community does not have to be necessarily related to the whole population: it is sufficient to select a limited sample, based on certain criteria, in order to obtain empirically valid and generalisable results for the city-sea interface. It is clear that the representativeness of the sample will not be absolute but will depend on the variables initially chosen: the sample will be representative with respect to the selected parameters in relation to a given social phenomenon, admitting the existence of other variables. However, since it is impossible to codify all of them and apply them to the entire demographic spectrum, applying the survey methodology in this way will still produce valid results: although it will not have a statistical correspondence with the demographic composition of the entire coastal society, the reliability of the research method will be achieved anyway, allowing to generalise the results obtained from the questionnaires (De Singly, 2020). On the basis of this reasoning, it is therefore proposed to analyse a reduced sample: its composition is defined according to gender and age groups (under 20 years, between 20 and 40 years, between 40 and 60 years, and over 60 years); in addition to this, there are additional characteristics such as level of education, current employment, place of residence and the time period in which users have lived there (Moro, 2011).

### 9.3. Structure of the ~~S~~survey ~~I~~instrument: ~~T~~the ~~Q~~questionnaire

With regard to the hypotheses underlying the analysis, it is stated that, although it is clear that cultural level and personal wealth influence the way people experience the coast (Hein, 2014), it is less obvious whether these factors bind users to particular places on the coastal interface, for example, in relation to *attachment to place*. In this sense, it is possible to hypothesise that the distance of residence from certain points of the urban sea may exert a different influence on members of ~~urban-coastal~~urban-coastal society: plausibly, places that are not well-known or attractive from a tourist point of view might be frequented and appreciated mainly by users living nearby, regardless of social classes (Pasanen et al., 2019; Green, 2010). Therefore, a structured questionnaire is proposed, divided into three main sections (*A. Accessibility of urban blue spaces, B. Land and water uses in the city-sea interface, C. Perception and future scenarios of the urban coast*), with a total of 12 questions to be submitted to the local users.

Section "A. Accessibility of urban blue spaces" aims to analyse the theme of the city-sea interface, according to the importance that users attribute to direct contact with the maritime resource (Cortinovis et al., 2018), defining a scale of frequency in which citizens visit urban shores, in order to establish whether the latter can really be considered a gateway to the city sea. The proposed questions are the following ~~ones~~:

1. In the city, how important is it for you to have physical contact with water (*e.g. swimming, bathing, fishing, diving*)?
2. In the city, how often do you go to the coast for recreation?
3. From where you live, how easy is it to reach the shore in the city?
4. In the city, what ~~is~~are your preferred means of transport to ~~the~~reach the shore?
5. In the city, do you think that access to the coast is limited by physical barriers (gates, barbed wire, fences), pollution or poor water quality, and legal constraints (*e.g. regulations, ~~p~~forbidden areas*)?

The influence that light or heavy transport systems have on the relationship that users establish with the coast is assessed, ~~but also~~and whether the presence of physical or legal barriers can actually prevent citizens from reaching these very important recreational spaces; moreover, it is studied if the problem of environmental pollution destabilises the social uses of the urban sea (Biernacka & Kronenberg, 2019). As described above, the issue of accessibility and enjoyment of the city-sea interface, in relation to the multiplicity of its uses, is closely connected to the social criticalities that affect contemporary urban coasts: it is important to rethink the functions of these places in relation to the most relevant social components, in order to favour their use by citizens (Carta & Ronsivalle, 2016). Land connections, the presence of soft mobility systems and eventual accesses to the sea influence the activities

and fruition of urban shores: studying how city flows converge towards the city's coasts can help planners and policy-makers to interpret the desires of users in relation to local public spaces, within which the coastal community can actually satisfy its social and recreational needs through the services provided by the city-sea interface (Vandewalle et al., 2008). Indeed, citizens benefit from the proximity to green and blue areas that allow for daily social activities, such as bathing or walking along the coast: it would be useful to examine the possibility of access to such coastal public spaces that allow the ~~urban-coastal~~urban-coastal society to get in touch with the city's maritime sphere (Cortinovis et al. 2018). For this reason, it is interesting to understand the extent to which users frequent the coastal areas of the city-sea interface: it seems relevant to study whether the presence of physical or legal obstacles may actually prevent them from reaching these very important recreational spaces and whether the issue of environmental pollution may constitute a destabilising element in the social uses of the coast and the urban sea. In this sense, analysing how coastal benefits relate to social demand may support ~~a~~-more inclusive and equal urban planning, aimed at a better distribution of services along the urban amphibious (Geneletti et al., 2020).

The functional competition existing between the uses related to the socio-recreational demand of the coastal community and the development of residential, economic and logistic functions along the city-sea interface addresses the questions of section "B. *Land and sea uses in the city-sea interface*" in order to understand whether the urban coastline offers a sufficient amount of public natural and open spaces dedicated to sociality and an adequate ecological quality of the coastal green-blue infrastructure: for this reason, it is interesting to analyse whether citizens consider these areas to be effectively well-~~equipped~~ and how they would implement their effectiveness in the short term, stimulating their reasonings regarding the fruition of the urban littoral ~~andbut also~~ of the sea in their city (Badami & Ronsivalle, 2008). In particular, the following questions have been posed to the users:

6. Here in the city, are there enough of the following public areas, in your opinion?
7. Here in the city, what facilities would you like to develop or improve along the seashore in the future?
8. Today, to your knowledge, what social or recreational activities exist or take place here along the seashore?
9. In the future, what activities would you like to see promoted or allowed here along the seashore?

The second section of the questionnaire ~~therefore, therefore,~~ aims to study the functional conformation of the public areas located along the urban coastline, in relation to the granted services and social uses: it aims to stimulate the citizens' imagination on the theme of the current use of the urban amphibious and how it could evolve from a functional point of view, evaluating the existing and desired offer of socio-recreational activities that the city-



sea interface actually provides for the ~~urban-coastal~~urban-coastal society. There is, in fact, a considerable influence on the activities and needs of users that must be oriented towards the quality of life and reduction of social stress, especially at the local scale within the proximity of public space. Mainly at the micro-urban level, there is a clear need for open areas and natural and semi-natural places that allow the citizen to get in touch with the coastal-maritime environment, despite critical building and spatial issues, urban barriers, increasing contemporary population density and environmental problems. The land and water spaces of the interface offer the possibility of functionally ~~regenerate~~regenerating the social and recreational network of the urban coastline, providing theoretical and operational insights for ~~a~~ real functional sustainability at urban and neighbourhood scales, guaranteeing important transformative opportunities in favour of the ~~urban-coastal~~urban-coastal society (Tan & Jim, 2017): the questions ~~therefore,~~ therefore, aim to translate the demand for recreational uses and the need for contact with the coast into efficient services and planning indications, following the suggestions that users can provide if properly guided and addressed.

Finally, if the public space offers a privileged meeting point within which the various social groups can interact, especially along ~~urban-coastal~~urban-coastal areas, historically a place of great sociability, it is also true that the condition of the urban coastline can influence the way it is perceived by the user, in relation to the fragmented and uneven conformation of the current urban amphibious (Nicholls et al., 2015): because of this, the questionnaire section "*C. Perception and future scenarios of the urban coastline*" investigates how much the landscape and environmental aspect of the shore (considering both its terrestrial and maritime spheres) influences the community's common understanding of littoral issues and evolution. The questions proposed in this section of the questionnaire are listed below:

10. Here, what is the landscape value of the coast for the built-urban~~ized~~ environment and for the natural environment, according to you?
11. In your opinion, how could this area evolve in five years ~~in~~from an environmental perspective?
12. How would you like this coastal area to evolve over the next five years to increase socio-recreational possibilities?

As described above, coastal urban blue spaces are places that provide direct and indirect access to urban water, similar to therapeutic landscapes, because they improve social cohesion, offering psychophysical benefits to the coastal community, which tends to prefer littoral areas to other urban green spaces (Bell et al., 2015). It is, therefore, interesting to understand citizens' attitudes towards urban blue spaces, in relation to the possible recreational activities, the landscape value of the place and the sensory stimulation by the coastal environment: the



perceptive effect of maritime amenities, channelled by urban shorelines, brings positive feelings and a general well-being, creating interest and attachment to place in ~~urban-coastal~~ urban-coastal society (Hawthorne et al., 2022). It is ~~therefore, therefore,~~ necessary to define which are the most relevant factors to influence the development of the city-sea interface, with a focus on the implications for well-being and sociality: the coastal environment stimulates users, who in turn interact with each other and their surroundings through functions that need to be sustainably organised within ~~urban-coastal~~ urban-coastal planning (Mishra et al., 2020); ~~the~~ littoral design must also take into account quantitative and qualitative parameters to improve coastal public spaces, according to flexible frameworks to face contemporary environmental issues as well as social demand for urban services. In addition, the evolution of the urban coastline is a particularly relevant issue, within which the perspective of its direct user is essential. From a spatial and functional point of view, the connection with the concept of the urban amphibious is evident, because of its nature of contact area between land and sea of the city that is constantly reshaped and reorganised according to the two systems. Its adaptability is linked to the possibility of strengthening the existing socio-recreational functions, ~~but-also~~ and of establishing new ones, in a closer relationship with the maritime element<sup>70</sup>. In this sense, the questions in this section aim to highlight the transformation that users consider most plausible and desirable, analysing their knowledge and involvement in the social issues ~~but-also~~ and in the economic and environmental constraints that characterise the city-sea interface. This questionnaire was applied to the case studies of Marseille and Naples, in particular along the city-sea interfaces of the two cities, in order to develop a comparison on a psycho-social basis<sup>71</sup>.

#### 9.4. Application of the Ppsycho-Ssocial Approach to the Bacoli Maritime and Lake Coast in the Context of the Erasmus+ WAVE Project

The psycho-social approach described in the previous paragraphs has been adapted to be applied ~~on-to~~ a further case of urban coastline, as part of the international Erasmus+ project 'WAVE: Water Areas Vision for Europe - Integrated knowledge and visions for sustainable water landscapes in Europe'. The project involves professors, researchers and students from various European universities, in particular from the University of Naples Federico II, Ion Mincu University in Bucharest, Nürtingen-Geislingen University of Applied Sciences, Weihenstephan-Triesdorf

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<sup>70</sup> The urban amphibious, as a spatial and functional concept linked to the notion of city-sea interface investigated by this research, has been described in chapter 2 section 2.2 of this text.

<sup>71</sup> The comparison between the Marseille and Neapolitan city-sea interfaces is described in the third part of this research work.

University of Applied Sciences, EMU University in Tartu and ULB University in Brussels; in addition, international urban and landscape planning associations such as ISOCARP and LE:NOTRE Institute collaborate in the project. The academic background is, therefore, extremely diverse, with scholars and experts in ~~of~~ urban planning, geography, architecture, and natural and social sciences.

The main goal of the WAVE project is to contribute to the common environmental and climate objectives of the different coastal countries in the European Union through systemic innovation. It is well known that most existing socio-urban models are not in line with climate adaptation and mitigation strategies, especially in highly competitive functional contexts such as areas close to water basins, which are burdened by critical issues like land consumption, lack of sufficient green-blue areas, spatial fragmentation of the grey infrastructure and impacts generated by the transport system. For this reason, the responsibility of communities and individual users should be emphasised to re-establish a long-lasting socio-ecological balance in water spaces.

In order to achieve this objective, innovative and integrated learning environments have therefore been developed, in relation with to the theory of living labs: this methodology indicates a physical or virtual space in which community problems can be addressed and solutions proposed at the local level, involving the main actors of the reference context and linking proposals and indications based on direct experience and users' needs (Hossain et al., 2019).

#### 9.4.1. The Living Lab Concept for Qualitative Improvement of Urban Life

There are various interpretations of the concept of living labs, which are, however, related to some common targets and characteristics: the international organisation European Network of Living Labs (ENoLL) defines them as open, innovation-based and user-centred ecosystems aimed at co-creation, integrating research processes and community-based approaches<sup>72</sup>.

In general, it can be stated that the main objective of this methodological approach is to achieve significant improvements in the quality of life for the users involved, in relation to social desires and needs. Fundamentally, living labs are based on various basic principles, including the research context, which can be declined at several

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<sup>72</sup> The European Network of Living Labs (ENoLL) is a non-profit organisation with the aim of connecting organisers and participants of living labs from different countries and disciplines through international calls. Founded in 2006, it includes users and associations from more than 31 countries. For further information, please visit <https://enoll.org/>

scales, the role of stakeholders as effective co-creators and a set of operational and evaluation activities (Mulder, 2012). The pursuit of satisfying and innovative results entails an in-depth analysis in the selection of the tools to be employed: since living labs usually aim at solving problems related to society, it is essential to define an application platform within which it is possible to draw on experiences, knowledge, methods and approaches that, can bring benefits to the geographical reference area, in relation to the identified topic of investigation. The reticular nature of the living labs has the merit of inspiring a variety of proposals and solutions, also in function of collateral criticalities that are gradually revealed in the course of research in a given area: it is ~~therefore, therefore,~~ clear that further social and urban implementation initiatives can arise, benefitting from an increasingly consolidated network of aware users and technicians who support them (Steen & van Bueren, 2017).

Indeed, the active involvement of citizens generates cohesion and enables the development of new skills that can be spent in other fields: the challenge to improve and the progressive discovery are, in fact, common elements in the various declinations of the living lab. Participation in these initiatives tends to be public and open to interested users. However, depending on the topics covered and the prior knowledge required, it may prove useful to structure the team of involved participants in more detail. If free participation has the advantage of being progressively implemented and enhanced thanks to ~~feedbacks~~ from non-expert users, dealing with complex problems may require the participation of citizens with a broader cultural background or with specific skills: this clearly does not limit the inclusive nature of the methodology, rather it amplifies the positive effect that will spread over the spatial reference context. It is also common practice to delineate a mixed composition of participants, benefitting from both the specialised technical knowledge and the personal experience ~~of~~ of local inhabitants (Dell'Era and Landoni, 2014). It is, therefore, a strongly multidisciplinary approach connected to various branches of knowledge, applying technical and social research tools that are also very different from each other: for this reason, it is necessary to apply a wide range of management models, investigation methods and representative tools to channel the heterogeneity of the community involved (García Guzmán et al., 2013). The multiscale nature of the approach and the principle of multilevel participation are cornerstones for the true innovation that the living lab should seek to produce ideas and solutions, sheltered from harmful economic competition: in this sense, the social, ecological, ~~but also~~ and technological transition processes that characterise the contemporary era can be actively incorporated within these spaces for shared and specialised reflections aimed at solving local scale issues (Canzler et al., 2017).

Open innovation and user innovation are paradigms that are often cited and reported as key-words in these kinds of ~~studies~~ studies. These two notions are often intertwined with the analysis operated by living labs. Open innovation focuses mainly on bipolar business-to-business relationships, whereas living labs take on multiple

stakeholders and consider the importance of the real-life environment. User innovation, in turn, assumes that users or communities are valuable elements in overcoming challenges (Von Hippel, 2007). Living labs' theory considers that innovative activities take place among a wide variety of stakeholders, especially in the frame of co-creation processes, rather than focusing exclusively on the interactions within the community in general or between a community and a company.

#### 9.4.2. Definition of the Cease Study and Tool for Ppsycho-Ssocial Aanalysis

In the case of the WAVE Living Labs, users living in urban areas in direct contact with maritime, lake or river basins were involved, providing for constant interactions with experts in the field of ecological planning of public spaces, environmental and cultural heritage protection, risk management and water-related issues, in order to link the development of sociality, tourism and sustainable recreation. In particular, the Italian case study has been identified in the maritime-lake city of Bacoli, in the Phlegraean Fields, a few kilometres away from ~~the~~-Naples. The area of investigation is circumscribed to the Fusaro lakefront, an element of particular importance for local society in terms of culture, sociality, recreation and economy, and to the adjacent stretch of maritime coastline, from the municipal limit of Torregaveta to the boundary of the *Quarantena* Park, thus incorporating bathing areas and large parks and green spaces.

Although Bacoli cannot be considered a large autonomous coastal city, it is nevertheless part of the larger and more complex system of the metropolitan area of Naples: the elements studied may therefore be considered, by extension, in the perspective of the theory of the city-sea interface, including Lake Fusaro in the extended city edge. The living lab in Bacoli, organised by the Department of Architecture of the University of Naples Federico II in collaboration with the project's international partners and the main local stakeholders, took place in September 2022 and involved an application of the psycho-social approach developed within the framework of this doctoral research. Specifically, the field study involved an adaptation of the structured questionnaire previously described, in order to meet the peculiar characteristics of the Bacoli case study. Its structure consisted of 11 questions divided into sections, as shown below.

##### *A. Accessibility to water areas*

1. How important is it for you to have physical contact with water (e.g. swimming, bathing, fishing, diving)?
2. How often do you go to the coast and to the lake for recreation?
3. From where you live, how easy is it to reach the coast and the lake?

4. Do you think access to the coast is limited by physical barriers (gates, barbed wires, fences), pollution or poor water quality, and legal constraints (regulations, prohibited areas)?

*B. Public uses and spaces of the coast and lake*

5. Along the coast and the lake, are there the following public areas, in your opinion?
6. Along the coast and lake, what facilities would you like to develop or improve in the future?
7. What activities would you like to promote along the seashore?
8. What activities would you like to promote along the lake?

*C. Perception of the sea and lake coast and future scenarios*

9. What is the landscape value of the coast and lake, according to you?
10. In your opinion, how ~~this area is~~ this area likely to evolve in the next five years from an environmental point of view?
11. How would you like this area to evolve over the next five years to improve its social and recreational value?

The aforementioned questionnaire has been disseminated both on the field, by interviewing users visiting the study areas, and in an indirect form, by placing totems at specific points of the site: these elements are, in fact, equipped with QR codes, referring to the questionnaire form translated into a digital model. The totems have been designed to remain in place even after the end of the workshop activities, establishing a permanent living lab for the city of Bacoli. The data analysed in this research refer to the period of September and October 2022: 133 users (65 female and 68 male) have been interviewed. According to the data collected, most of the social sample analysed came from the more or less immediate vicinity, specifically 37% from Bacoli and 34% from Naples, while only 4% came from Pozzuoli, the largest urban pole of the Phlegraean system.

#### **9.4.3. The Ssocial Representation of the Coastal and Lake Area of the Bacoli Coastal Community**

The first parameter analysed by the psycho-social survey of the living lab concerns the usability of water spaces in the lake-sea area. It emerged that more than half of the users (about 51%) consider physical contact with the water, for recreational activities, very important, followed by a substantial 30.1% who consider it even fundamental: however, ~~two~~ two-thirds of the social sample declare that they go to the lake or along the urban coast

very rarely or at any rate not often. This is connected to the actual criticality of the mobility system highlighted by the users of the area: it emerges that 65.4% of those interviewed believe that it is very difficult to reach the shore of Lake Fusaro and the nearby stretch of beach by foot, while 53.4% hold this opinion regarding bicycle travel; the easiest way to reach the coast for recreational purposes are motorbikes and scooters, with about 64% of the votes in favour. There is a strong lack of accessibility to the water areas by soft mobility: this is a paradox because most users come from nearby places.

With regard to the possible existence of constraints to coastal usability, the majority of the sample involved in the survey is particularly affected by the poor state of the lake and sea waters, which are indeed subject to pollution: the value ~~in this case, in this case~~, stands at 66.9%. On the contrary, it seems that the presence of physical barriers and legal constraints forbidding access to lake or sea areas does not create particular difficulties for users; since, in both cases, 48% of the interviewees show little concern in this regard; it should be noted, however, that with regard to the presence of physical obstacles, a value of 22.6% of the entire social sample was recorded, a percentage that is not possible to overlook.

Concerning open spaces and social uses of the coast and lake, according to the interviewees, the research area ~~is lacking~~ lacks most of the main types of public areas. In particular, the most relevant data concern promenades, bicycle and pedestrian areas or paths, assessed as strongly lacking by 61.5% of the users, ~~but also~~ well as park areas, natural areas and gardens: in this case, social disappointment reaches 60%; the presence of sports areas is considered strongly lacking by 74.4% of the sample. However, there is general satisfaction with the current amount of jetties (49% of users) and bathing areas (41% of users). Citizens also showed a real interest in facilities related to the tourist development of the area: in particular, there is a strong propensity to develop accommodation facilities (46.6%), tourist harbour (52.6%) and visitor information services (66.9%), while there is an equal number of users who consider themselves little or very interested in the development of restaurants and bars (in both cases, 43.6% of the votes). The commercial development of the area meets an aloof approval, as 45.9% denote little interest in this option. On the contrary, the social sample attributes great value to the development of facilities linked to cultural activities (the strong desire to increase museum or cultural centre spaces reaches almost 62%) and to uses involving direct contact s with the water, such as the installation of rental points for rowing or diving equipment (60% of respondents are extremely interested) or the increase in the surface dedicated to underwater museums, with 71.4% of responses in favour: this information is relevant since the city of Bacoli already has the Underwater Archaeological Park of Baia, located nearby the case study of the living lab, corroborating the

hypothesis that the great cultural and recreational potential of the city-sea interface needs to be increased and planned in the best possible way.

With regard to the uses that should be most promoted along the reference stretch of maritime coastline, the data show a general propensity for many of the proposed options, recalling the actual need of the local coastal society for places destined for sociality and recreation; the same situation is found in relation to the promotion of socio-recreational functions along the shores of Lake Fusaro. Generally speaking, it can be said that the activities most desired by users are walking, jogging and cycling: this is linked to the perceived lack of an adequate system of soft mobility that would facilitate these uses; bathing and sports activities are also very popular. The only use of the city-sea interface that registers slightly lower approval ratings is fishing, probably due to the fact that this is one of the activities already practised without particular difficulty in the study area.

The users involved in the psycho-social survey activities also declared the value they give to certain areas of the coastal and lake landscape in the Fusaro area. Although environmental pollution represents the greatest constraint to the usability of the lake and the sea, as previously demonstrated, the questionnaire showed that the natural environment is considered the main asset of the local landscape: 67% of the users expressed this opinion, while a significantly lower value is recorded for the architectural and archaeological heritage present, whose landscape weight is estimated to be high by 51.9% of the respondents. Ordinary buildings, on the other hand, are rated negatively by the social sample, with 45.8% attributing them as a low-quality within the local landscape.

From the environmental point of view, users showed a general mistrust regarding the qualitative improvement of the area in the next five years. In particular, 51.9% of the citizens involved in the study do not think it plausible that water quality will undergo any amelioration, just as 43.6% do not believe in a future enrichment of marine biodiversity; however, interviewees were cautiously more confident in relation to the possibility that the lakefront and the maritime coastline of the research area could be improved with newly vegetated areas in the short term, with approximately 44% answering in favour of this. At the same time, there is a fairly marked awareness of the possible effects of climate change in the near future. Specifically, about 55% of users believe it is probable that sea-level rise will worsen over the next five years and that coastal erosion will seriously affect the currently available land resource; a further cause for concern is the increase in the frequency of flooding, considered plausible by almost half of the social sample.

With reference to desired functional scenarios over the next five years, users showed a preference for the increase of public areas for recreational and sports purposes and for bathing: in the first case, there is a substantial 82% of people who would very much like such a coastal-lake development, while in the second case, the data show

a still solid 53%. On the other hand, fewer participants showed interest in the commercial development of the study area, with 37.6% of responses expressing a tepid agreement. Another interesting fact is that 69% of the social sample would appreciate the installation of floating structures such as walkways and solariums, while possible land reclamation operations were coolly received by almost a third of the users.

#### 9.4.4. Permanent Living Lab and Social Involvement for Integrated Project Indications

The research experience within the WAVE project and the Living Lab in Bacoli allowed us to test, on a smaller scale and in a geographically reduced context, the potential of the psycho-social approach developed within this doctoral programme. A peculiarity of this application was the possibility of comparing the model with other fields of scientific knowledge, adaptively managing the approach to be confronted with different kinds of investigation, while pursuing the same objective for the analysis model, namely the sustainable transformation of public coastal spaces from a socio-environmental perspective, in line with the research question.

The first phase of data collection has produced considerations on how the local city-sea interface is perceived. In particular, the elaboration of the results of the questionnaire has demonstrated that, within the examined portion of the coastal society of Bacoli, the city's maritime and lakefront spheres are perceived as extremely important elements due to their recreational and social potential for the community. However, there is a real difficulty in accessing the public spaces along the two water bodies: soft mobility is underdeveloped, while the water quality is very low. Nevertheless, users believe that these places contain, in essence, the fundamental characteristics for planning valuable blue spaces intended for the social enjoyment of the environmental resource. In particular, interest is directed at the possible future development of public areas related to bathing and open-air sporting activities, both in sea and lake waters. There is also a particularly high value attributed to the natural landscape, despite the presence of various problems related to environmental pollution, as highlighted by the users interviewed. Another relevant fact is a fairly deep-rooted awareness of the possible negative effects of climate change, especially in relation to sea-level rise and coastal erosion.

Subsequently, in the second phase, the social survey operations converged in meetings with the local population, in which there was an interaction between the academic world, composed of professors, researchers and university students, with representatives of various categories of the local ~~urban-coastal~~urban-coastal society, including politicians, shopkeepers, local associations, fishermen, teachers and breeders. Through the installation of totems for establishing a permanent living lab, it was possible to translate the results of the discussions into project



proposals drawn up within the WAVE project in agreement with local users, who were able to express their appreciation for the various interventions proposed for the study area (the *Casina Vanvitelliana* area, the *Grotte dell'Acqua* area, the *lakefront* area, the *Spiaggia Romana* area, the *Torregaveta* area and the *Parco della Quarantena* area). In fact, the social listening sessions allowed for a better understanding of the needs and expectations within the social demand, linked to the reconnection of open spaces through ecological approaches, in the context of climate dynamics and socio-cultural, tourist and recreational valorisation of the lake and maritime area.

A-The third phase saw the presentation of the results of the evaluation expressed by the users of the Bacoli society on the design proposals. The social assessment was possible through the activation of a second QR code positioned once again on the abovementioned totems. The sense of this operation was firstly to provide planning hypotheses that incorporated the indications provided by the community, through the psycho-social approach, which thus becomes an analytical basis useful to local planners and decision-makers in order to implement the city's development according to precise community indications; secondly, it demonstrated that the psycho-social approach adopted in the research shows itself to be flexible and capable of adhering to different types of coastal case studies. The change of scale from the large Euro-Mediterranean city to the smaller coastal-lake settlement was also possible thanks to the possibility of integrating the data collection phases with moments of confrontation with the community, which provided important guidelines for the design and planning outcome of the living lab.

## 10. ~~Methodological~~ The Methodological Framework for ~~S~~ocio-~~E~~nvironmental ~~B~~enchmarking of ~~C~~ity-~~S~~ea ~~I~~nterfaces

### 10.1. Understanding the ~~C~~omplexity of ~~U~~rban-~~C~~oastal ~~S~~pace through ~~C~~omparison

As previously discussed, the coastal space of the contemporary city appears to be a complex field within which numerous features can be studied with a dedicated approach: in fact, the spatial and functional fragmentation and dispersion recorded in such areas ~~is~~-are evident, especially over the last few decades; the structure of compact cities has been gradually dilated into widespread settlements due to the progressive growth of modern urban fabric and increasingly articulated and mystifying urban dynamics. The demographic increase is linked to social needs that are not always satisfied by appropriate public spaces and community services, as the city and its shore are often shaped by economic stakes aimed at earning a profit rather than the well-being of users. Added to this is the issue of climate change: environmental adaptation requires an assessment of future scenarios of urban evolution and the development of strategies and plans to allow human coexistence with ongoing ecological transformations. Therefore, proactive urban planning is necessary in order to face environmental risks and develop preventive actions and interventions (Cooper & Lamckert, 2012). In the Euro-Mediterranean context, it has also been pointed out that urban planning within the city-sea interface tends to be uneven, both from the point of view of socio-recreational uses and environmental protection. It is evident that the proximity of settlements to the sea and the availability of areas suitable for bathing represent strong tourist attractors, modelling the evolution of the urban amphibious, which tends to transform and adapt to contingent and spatial needs, due to its dynamic nature. The increase of the social demand for coastal space correlated to the change of the littoral territory represents one of the main problems linking planning activities and environmental sustainability for maritime areas, while factors such as urbanisation, economics, transport, tourism and recreational use of the interface can alter the balance of land-sea interactions (Colannino & Roca Cladera, 2008).

It seems appropriate to enrich the research process through a methodological framework that considers the different factors of an urban-coastal society, their interrelationships, needs and perceptions as relevant inputs to comparatively assess urban-coastal dynamics. Benchmarking is a process that allows entities, institutions, and spatial and functional organisations to improve themselves through the comparison of existing characters, ideas and solutions: in short, it basically allows them to learn from each other from similar situations, using the experience gained in other places. The purpose of the comparison is to identify ideas and directions for improvements, on the basis of managerial and planning adaptation to existing situations in order to implement the public space along the city-sea interface: in this sense, it can represent an added value for coastal strategies, highlighting criticalities and

processes that can be revised or reconfirmed. The analysis of data found in different points of the Euro-Mediterranean basin can therefore open up scenarios of technical and scientific cooperation and collaboration, linking critical knowledge from various fields (Lanzetta, 2020).

The study of existing governance processes and regulations intends to provide a picture of the evolution of policies and decision-making tools within the coastal cities analysed, in order to understand how littoral interface planning is carried out and what lines of implementation and social integration are envisaged: this can provide important information regarding the institutional relationships between the actors involved in urban littoral development, highlighting possible similarities and discrepancies in the case studies, assessing the degree of participation of the urban-coastal society and the actual interest of the municipality in environmental and socio-recreational as well as economic and logistical terms. The relationship between the sea, the coast and the existing spaces and infrastructures, whether civil, port or public, must be analysed, taking into consideration not only the most relevant neighbourhoods along the urban coast and the areas adjacent to harbours, but also the peripheral sites far from the city centre, areas with an ancient productive vocation now in a state of decay, and spaces of the city-sea interface where strong community and environmental stakes insist. Finally, benchmarking must consider the parameter of social expectation and perception, interpreting the different needs of the coastal community and pointing out how the desire for landscape visibility and functional accessibility to the sea resource affects the way different city-sea interfaces are understood, within the same Euro-Mediterranean basin (Cattedra, 2011). In addition to this, the method presented can be inserted within a broader process of urban planning and design of the city-sea interface space, in relation to the social demand for coastal public space: the multidisciplinary context of the present research has allowed to elaborate a detailed approach, which becomes an important basis for future planning and management development by urban planners and local policy-makers, from an integrated perspective.

## 10.2. Methodological Notes

In order to provide adequate guidance for possible comparative operations between different city-sea interfaces, it is necessary to clarify some principles underlying the application of the tools and approaches illustrated in the previous chapters.

Once the urban form of the chosen cities has been analysed, it is possible to proceed in studying the existing *legal framework* that characterises them. The direction of the approach will clearly follow the indications of the

research question, regarding the socio-ecological planning of coastal public space within the city-sea interface. The methodological criteria were chosen according to the aspects considered most suitable for the legal investigation. The regulatory analysis ~~therefore, therefore,~~ envisages the collection and study of existing legislative frameworks in the urban coasts to compare, from a social, cultural, environmental and management point of view: in particular, the study of the city-sea interface must focus on directives relating to environmental and landscape value, water quality in terms of bathing, ~~but also~~ as well as the risks of erosion, flooding and other critical aspects of climate change; it is also important to search for regulations and urban planning tools that regulate ~~accessibility~~ to the urban coast, in relation to socio-recreational practices, fruition and social safety of places. Furthermore, the documents analysed should focus mainly on the local scale, in order to verify the presence of ~~an~~ adequate governance of the city-sea interface, from the point of view of existing instruments and from a participatory and community perspective.

Concerning the *geographical approach*, the realisation of the spatial data model must consider the spatial accuracy of the collected information. Within the proposed framework, most of the data concern land uses that are difficult to find from existing databases, or, in any case, available only at a very large scale: for this reason, digitisation is necessary for redrawing elements by means of source images in raster format. These files must therefore possess the highest possible degree of resolution to guarantee efficient decoding of the coastal interface in the various case studies to be compared. For this, it is appropriate to introduce the concept of the minimum mapping unit (MMU), which is the specific size of the smallest element that is reliably identified within a map (Buckley, 2008). This is a very important parameter in both data collection and actual map production. Indeed, it allows a skimming process among the data to be analysed and produced, also in relation to the scale of the final output (Peterson, 2021). Depending on the scale considered, spatial data may offer different information on the characteristics studied and the interrelationships that are established: consequently, since scale influences any analysis of geographic data, spatial analysis needs to evaluate the scale components through minimum mapping units (Álvarez, 2017). In the specific case of the spatial data model proposed by this research, the reference base will generally consist of aerial photographs of the study area: the main research object concerns the socio-recreational use of coastal resources in the city-sea interface. ~~e.~~ Consequently, the aim is to investigate the reduced space in which the ~~urban-coastal~~ urban-coastal society acts and comes into contact with the urban sea. For this reason, it is desirable to refer to very low values of MMUs: the small public spaces and the reduced natural area along the urban coast constitute the founding elements of the urban green-blue infrastructure at the basis of the socio-ecological planning of the city-sea interface.

The *psycho-social approach* introduced in this research is realised through the realisation of a questionnaire, as described above. The dissemination of this survey instrument takes place in the form of a structured interview, working directly with the field and interacting with the users within the reference social sample. The individual interview thus allows the creation of a dialogical relationship between the researcher and the interviewee: this has several positive aspects because it gives the possibility to explore in depth the questionnaire's themes together with the user, dispelling doubts relating to a misinterpretation of the questions and possible answers (Corrao, 2005). In fact, the cultural gap between expert and non-expert users is a common problem: although the structure of the questionnaire does not foresee correct or incorrect answers, it is still important that the requested information is adequately interpreted for ~~the~~ studying the social perception of the city-sea interface. In addition, an attempt is made to prevent possible biases of the studied social sample: since it is a numerically small social piece, it is indispensable that the information collected meets the socio-demographic criteria underlying the analysis. By dividing the reference urban coastline into spatial areas within which collecting data proportionally and equally with the fieldwork, it is possible to prevent this criticality. Massively disseminating the questionnaires through digital platforms may mean that the interviewee may be a different person than the one chosen in accordance with the social representativeness theory, with other unnecessary characteristics: in the case of a wide dissemination that is not precisely controlled, there is no way of knowing the exact extent of the error; furthermore, it may also happen that the questionnaire is filled in by a user included in the sociological survey spectrum, but with the help of a third party. The dissemination of the sample survey on the field can provide the necessary expert help to the users, without altering their answers.

According to the proposed analytical hypothesis, the consequentiality of these approaches can provide ~~a~~ support for the planning and management of the reference case studies by comparing the peculiar features of their city-sea interfaces, in relation to some specific areas in line with the research question. In particular, this study will present the benchmarking between two large Euro-Mediterranean cities, which will be discussed in the following chapters: Marseille and Naples.

Part Three | ANALYSING **I**THE CITY-SEA INTERFACE:

**I**THE **C**ASES OF MARSEILLE AND NAPLES

## 11. Marseille, Naples: European Uurban Ccoasts in Ccomparison

### 11.1. Motivation and Aacademic Ccontext of Ccomparison

The scope of the doctoral research and the reflections so far expressed suggest the need to define specific case studies. In this sense, it is proposed a parallelism between two cities of great relevance in the social, economic and cultural context of the Mediterranean basin, namely Marseille and Naples, coastal urban settlements that show similarities from a functional, demographic and spatial point of view, even though they present significant differences<sup>73</sup>. The urban coast of Marseille is characterised by the conflict between port and productive areas, where social tensions amplify the interpretative complexity, and spaces that are more prone to satisfy the needs of users, in the southern part of the shore. Similarly, the urban coast of Naples is an emblematic case ~~for~~of the presence of criticalities linked to ~~a~~weak littoral planning ~~in~~from a social perspective, even if the local coastal community is increasingly making its voice heard, especially in more peripheral areas of the Neapolitan city. The aim is to therefore to understand whether the city-sea interfaces of Marseille and Naples are actually designed and managed to meet the socio-recreational expectations of citizens. For this reason, the research will delve into specific areas of the two cities, on the basis of similar characteristics that allow comparison. To answer this question, the research will analyse the urban dynamics and planning of these spaces, examining if public policies and documents guarantee the accessibility to coastal functions for all users and ensure permeability between the shore and the rest of the city, applying the abovementioned methodological framework.

Both are important Mediterranean cities with a similar size and an equally complex articulation of the city-sea interface: in fact, their urban shores present comparable areas, from a physical-morphological and functional point of view; in both cities, it can be noted a juxtaposition of industrial and port areas, urban areas with a naturalistic-residential value, urban beaches and dense urban areas in the heart of the city-sea interface. Even from a socioeconomic point of view, the two cities have similar difficulties, sharing the same problems of equal accessibility to the sea, although Naples has remained fundamentally static during the last fifty years, while Marseille has tried to respond to the demands of coastal society with targeted interventions and policies, proposing innovative solutions to regenerate its urban amphibious from a recreational, cultural and environmental point of view. For instance, the French city has developed the *Musée Subaquatique de Marseille*, in the *Anse des Catalans* area, the first underwater museum in Europe, and a system for the production of thalasso-thermal energy in the middle area of

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<sup>73</sup> Marseille and Naples have been previously described in relation to some of the main projects and interventions along their city-sea interface, in chapter 6 of this research.



the coast, exploiting the natural warmth of the water for a clean and sustainable power source. However, both cities have considerable influence on their metropolitan area and can be considered as main Euro-Mediterranean poles (Bertoncello & Rodrigues-Malta, 2003).

A spatial comparison between the two cities is then proposed, analysing the main features and functional conformation of their urban coastlines, as well as the regulatory-legal framework in Naples and Marseille; physical-morphological and functional data will be collected in order to apply the theory of the spatial data model, highlighting the main points for comparing the two coastal interfaces and their spaces of sociality; this will be followed by the application of the social analysis method, with the distribution of questionnaires at specific points along the Marseille and Naples coasts. The objective is to describe the influence exerted by morphological aspects of the ~~urban-coastal~~urban-coastal structure, economic-social elements and the actual presence of services and public spaces on the use that citizens make of their own city-sea interface, identifying the relationship between these factors and the socio-environmental development of urban shores. Since the perception of space is conditioned by social fruition and habits, based on the presence of functional activities and anthropic and natural elements shaping the contemporary urban coastline, the comparison aims to define the social representation that the minds of the users attribute to the city-sea interface in relation to their needs, an expression of the functional expectations of the ~~urban-coastal~~urban-coastal community.

This study can be framed within the participation on a competitive basis in a larger international research project, entitled "Re-SEA-ourcing CITY. City-sea interface as a resource for people: urban regeneration in the context of ecological transition", funded by the Université Franco-Italienne for the Galileo 2021 programme. The aim of the programme is the production of integrated and multidisciplinary knowledge, favouring relations between Italian and French researchers. In particular, the project has the objective ~~to study~~of studying the value of the urban coastline for cities in relation to its role as a public space and its beneficial effects ~~for~~on citizens. As we have seen, recreational activities related to water and the coast have, in fact, various positive effects on human health and well-being: there is, therefore, a need for large coastal cities to exploit their coastline as a landscape, social and recreational resource, by appropriately designing coastal public spaces. In this sense, the city-sea interface is a resource from many points of view, although the socio-functional conformation of today's coasts may question both socio-environmental equity and spatial justice: this is by no means a secondary problem because it affects sustainable development, and to date, urban shores seem to be still far from these principles. It is true that the socio-recreational coastal function is only one of the dimensions of the integrated management of the city-sea interface, but social uses may be considered as drivers to better manage the coastal public space. ~~In~~From this

perspective, it is possible to reconsider how the coastline is analysed and designed in large cities, in order to ensure social balance, traffic reduction, innovative solutions for the city and a stronger urban identity. The city-sea interfaces are, in fact, places of high expectations: they are perfect spaces to conceive new projects in order to raise the quality of urban life and coherently organise traditional uses and new functionalities. Specifically, the research pursued the objective of understanding the current situation of the ~~urban-coastal~~urban-coastal areas of Marseille and Naples, in relation to their spatial and social evolution, in order to provide a methodological model useful to achieve a better integration between social functions in the future management of the coastal interface of the two cities. First of all, the socio-recreational functions of the two urban shores were studied, highlighting the main issues of proximity to coastal public spaces and blue-green areas, as well as the social representations and expectations of the urban littoral community. Subsequently, the approach became more operational, analysing in depth the socio-environmental criticalities of the city-sea interfaces and defining a framework to assist the planning and management of coastal and socio-spatial resources.

The international research activity presented started in January 2021 and ended in December 2022, producing publications, numerous seminars and integrated activities with stakeholders and users from the ~~urban-coastal~~urban-coastal society of Naples and Marseille. ~~Multidisciplinary~~A multidisciplinary approach is one of the main features of the research team. The French group is composed by of researchers from ESPACE (UMR 7300), a joint research laboratory comprehending scholars from CNRS (*Centre national de la recherche scientifique*), Aix-Marseille Université, Avignon Université and Université Côte d'Azur. In particular, the French group's contribution involved various disciplinary fields, including geography, community psychology, sociology and geomatics. The Italian research group, on the other hand, involved members of the Department of Architecture of the University of Naples Federico II and members of the CNR (National Research Council), IRISS section: the reference study fields were urban planning, architecture representation techniques, evaluation methodologies and psychology. The presence of researchers and doctoral students belonging to such a wide range of disciplines allowed us to define a diversified method of analysis and to produce integrated results for future opportunities and developments, broadening the scope and range of final outputs of the present doctoral research.

## 11.2. Conformation and ~~S~~Ssocial ~~C~~Ccharacteristics of the ~~U~~Uurban ~~C~~Ccoast of Marseille

Marseille is the second largest city in France in terms of urban size and population density. These features make it the main coastal socio-economic pole of the country, placing it among the most influential urban entities in the Mediterranean sea. The city's coastline is articulated around a central core dedicated to port-logistics functions,

mostly inaccessible ~~for to~~ the population. Northward ~~is located~~ there is a residential-recreational area, while the southern area of the coast is directly related to the historic centre and the *Vieux Port*, the ancient access from the sea, now a residential and tourist area. These coastal areas are characterised by a fragmented and varied demographic composition in social, cultural and economic terms (Bertrand, 2012). Marseille is an interesting study case from the perspective of coastal regeneration, as it has experienced, in various stages, the different coastal transformation phases common to most large coastal cities over the last fifty years, with planning and operational innovation at various scales and in different fields. The transformative impulse started as early as the 1960s, when in 1963, the plan for the development of Marseille's metropolitan area displaced expansion in the peripheral municipality of Fos-sur-Mer, separating productive and commercial port activities in liminal settlements from tertiary and tourist uses in the main urban pole of the territorial shore: this addressed the problem of the city's role in a vast urban region, but at the same time freed the Marseille urban structure from a cumbersome element such as the main port infrastructure (Zalio, 1996). The 1990s then marked an important moment for the Marseille coast, with the launch of the national interest operation *Euroméditerranée*, which envisaged the spatial and functional recomposition of the southern side of the urban coastline, for socioeconomic, cultural and environmental purposes, aiming to reconcile the port vocation, in order to strengthen the role of the city within the Mediterranean basin, with urban regeneration and community demands, despite the overall turn towards economic profit and globalisation of (Bertoncello & Dubois, 2010). From an environmental point of view, Marseille relates to the sea differently depending on the geographical area. In the southern part, the urban fabric fades into a progressive gradient of naturalness; the port-productive area in the north is functionally confronted with the sea mainly through an artificialised coastline; in the urban core, the shore denotes a greater complexity, with a radial green structure articulated from the centre towards the periphery with different densities (Consalès et al., 2012).

It is conventional to divide the Marseille coastal basin, or *Rade*, into two juxtaposed sections, the wealthier *Rade Sud*, where the majority of social spaces are located, and the *Rade Nord*, with a more productive and logistic character. The *Rade Sud* extends from the *Parc National des Calanques*, established in 2012 and considered the first park in Europe to be both a land and sea-protected area within an urban settlement, and the *Vieux Port*, in the heart of Marseille city-sea interface. It includes the long and wide *Corniche* promenade, through which it is possible to reach the main coastal public spaces such as the *Plage des Catalans*, the *Plage des Prophètes*, and the *Parc Balnéaire du Prado*: as mentioned above, the latter was realised in the 1960s and serves as a true urban terrace overlooking the sea, giving access to relevant urban beaches and extensive coastal green spaces. It is important to emphasise that these natural and semi-natural urban areas, harmoniously integrated into the urban fabric, have a public nature: it is evident the recreational-tourist and bathing character of the *Rade Sud*, along which

it is possible to find high-end housing services and a high social status. In general, the urban beaches and coastal open spaces are easily accessible and constitute an essential element of the cityscape of Marseille: anyway, even this zone is frequented by users from different social backgrounds, the effects of its gradual regeneration, which began at the end of the last century, have favoured high-end commercial and restaurant activities, with consequent social fragmentation in the spaces of the Rade Sud. The public authorities are dealing with this issue through targeted actions and regulations that allow social *mixité* and efficient recreational management of the coast (Deboudt, 2010).

The Rade Nord, on the other hand, is composed by of the littoral areas between the historic fabric of the *Vieux Port*, where there are numerous cultural activities for the population as well as both planned and spontaneous leisure spaces, and the *16th arrondissement*, the northernmost district of the city; in the middle, it is located the famous regeneration area of the *Euroméditerranée*. These areas demonstrate greater functional and social heterogeneity: it is easy to see that most of the available land and sea is occupied by functions related to the *Grand Port Maritime de Marseille* (GPMM) (Agam, 2015). Over time, the coast has been completely redesigned by the port infrastructure, although several projects are trying to mend the relationship between the harbour, shore and city: within the *Euroméditerranée* programme, it is possible to recall the abovementioned transformation of the former logistic J4 areas and buildings, near the neuralgic *Place de la Joliette*, with the realisation of important public works such as the MuCEM, a museum building connected to important elements of cultural heritage and vast public spaces along the coast, as well as *Les Terrasses du Port*, a shopping centre whose roof is conceived as a public square on the sea in perspective relation with the historical docks (Bertoncello & Rodrigues-Malta, 2003). In any case, the neighbourhoods facing the harbour are strongly affected by inevitable functional constraints on the fruition of the urban sea, in relationship with this massive infrastructure, as well as by gentrification and the presence of economically weak social segments in degraded urban areas.

The case of the aforementioned *16th arrondissement* is emblematic: it is a former industrial area which, despite its recreational value, is extremely difficult to enjoy equally by locals: the Saumaty port and shipyard area and the numerous elite nautical clubs occupy almost the entire coastline, depriving the shore of almost any physical access to the sea and undermining socio-environmental justice, while the *Cale de la Lave* is the only public entrance for private boats not registered with clubs in the entire Marseille area; long stretches of the city-sea interface are designated for vehicular traffic only, lacking adequate space for social fruition of the water resource; the *Plages de Corbière* complex is the only officially planned bathing spot in the area (Bertoncello & Hagel, 2016). It is clear, therefore, that the feeling of social redemption in these places is as strong as the interest in urban

transformation in the short term. The heterogeneity of the Marseille urban amphibious not only demonstrates the interest of this case study but also how difficult it is to adopt a univocal planning and management approach; in relation to the juxtaposition between port and productive areas, where social tensions amplify the complexity of interpretation, and spaces more inclined to host community functions, especially in the southern part of the littoral.

### 11.3. Conformation and Ssocial Ccharacteristics of the Uurban Ccoast of Naples

The coast of Naples, like all large and ancient European cities, is characterised by a millenary stratification of uses and transformations that results in a densely populated territory, with approximately one million inhabitants, with many natural and cultural resources but also as well as degraded areas and competing uses. From the Pietrarsa museum on the eastern boundary with Portici to the Bagnoli area in the Gulf of Pozzuoli, the Neapolitan coastline is variously articulated and occupied for a large part by the port with its incessant activities, from the transport of goods to the mobilisation of passengers. According to ISTAT data, in 2020, the port of Naples has been the third in Italy for tourist transport<sup>74</sup>; the Port Authority of the Central Tyrrhenian Sea has studied passenger traffic in 2021 with approximately over 4,000,000 passengers transported, while container traffic has exceeded one million units: this testifies the relevance of the Neapolitan port, despite the negative effects of the pandemic period. Along the coastal interface, however, there is extremely poor accessibility to the urban sea for socio-recreational purposes; due to the low water quality caused by heavy logistical and productive activity, as well as to the privatisation of the coastline, which is detrimental to socio-environmental justice. Despite the progressive decommissioning of industrial and port facilities located along neuralgic areas of the urban coastline, there is still a lack of a-virtuous interventions to positively exploit this-these planning opportunities: on the contrary, very often, the extensive production of plans and projects has remained on paper, leaving any tangible sign of coastal transformation except in minor moments in the recent history of the local city-sea interface. This leads to a marked social tension, exacerbated on the one hand by the presence of important stakeholders along the city coastline; and on the other by society's desire to enjoy its urban sea on a neighbourhood scale (Papa, 2010). The progressive growth of the harbour infrastructure; started in the second half of the 19th century, has occupied mainly the eastern area (from the Beverello pier to San Giovanni a Teduccio), while the western part of the shore has been less influenced by this specific functional evolution over time, developing consistent values in terms of nature and landscape (Posillipo and Chiaia), with the exception of the Bagnoli plain, which since the early 20th century has

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<sup>74</sup> Data available at <http://dati.istat.it/index.aspx?queryid=25765>

been occupied by the Ilva steel factory, which was definitively abandoned in the 1990s. Similarly, the eastern zone of San Giovanni was also, for years, the site of industrial settlements that are now completely abandoned and only partly reconverted.

It is possible to ideally divide the Neapolitan coastline into various segments. The eastern end is occupied by the area of San Giovanni a Teduccio, which for a long time hosted industrial plants and shows community conflicts from a socio-environmental point of view, in relation to the desire of the local user to exploit more their littoral zone, even if the poor ecological condition of the water and the urban beach constitute an inevitable constraint (Palmentieri, 2016). In sequence, there is the city port, which is composed by of three subsections, namely the tourist port under construction, followed by the productive-commercial area and finally by the historical port of Naples, characterised by a large tourist flow: permeability towards the water mirror is clearly limited to a minimum due to the harbour infrastructure. The third section of the coastline includes the historic fabric of Santa Lucia and the Riviera di Chiaia, up to the Mergellina area: the wide stretch of coastline possesses a predominantly social and residential character; the coastal area presents buildings with high architectural value, cultural features and historical gardens, such as the *Villa Comunale* and the Molosiglio gardens, which act as a hinge with the historic harbour and have a marked socio-recreational potential for the population, despite the the conflicting interests with port and military institutions present nearby. Ithe area is not well equipped for bathing activities or direct enjoyment of the sea, although some parts of the water body would allow this type of function. I:-this has led the population to exploit the existing localised beach areas and the artificial rocks to independently reclaim maritime social-recreational uses.

From Mergellina, it is possible to reach the Posillipo hill, characterised by a high-high-quality of landscape. This is the most evocative stretch of coastline of the Naples urban amphibious due to the positive relationship established between urban naturalness, considering the vegetation on the side of the hill facing the sea, and the significant historical elements, from the Virgiliano Park to the Pausilypon Park, the Seiano Cave and the Gaiola underwater park; however, here the accessibility to the city-sea interface is extremely limited, due to both the complex orography and the coastal privatisation by private users who have incorporated accesses to the sea into their residential or tourist properties, not always in a legal way. This opens the discussion to the issue of maritime concessions and management of the coastal maritime domain. The shore is high and often rocky except for a few small inlets that, unfortunately, only allow access to residents. Mobility is strongly compromised by an infrastructural system composed of narrow roads with no parking areas. Thus, although Posillipo constitutes the portion of shore with the greatest landscape value and with the better water quality for bathing of in the city, it can be said that it is

not equally accessible for the littoral community. It can be considered a space with a marked environmental character that is mainly reserved for owners, usually belonging to the wealthier classes of the population. Indeed, this stretch of coast is characterised by the presence of private residences, some of them possessing historical and exceptional landscape value, and restaurants or accommodation facilities that prevent easy access from both land and sea. In addition, many areas are poorly maintained and present high risks of landslides, combined with a widespread of illegal buildings.

Finally, in continuity with Posillipo, there is the last stretch of the Neapolitan urban coastline, namely Bagnoli: this is a former industrial area where social conflicts are linked to the desire for recreational and bathing uses of local sandy shores, ~~but also~~ and for new public spaces and tertiary and sports poles in a peripheral area that has often left at the mercy of itself by public institutions. Particularly important is the issue of recovery for land and sea areas, since this place is deeply affected by heavy metal pollution due to the former productive activities, as well as the question of public land ownership: ~~this~~ these elements should be well considered by scholars and technicians for the purposes of a careful and accurate planning process (Coppola, 2020). Moreover, as mentioned earlier, the last ideas competition for the Bagnoli coast, managed by Invitalia, was concluded in June 2021, proposing the realisation of recreational and social facilities, as well as the definition of beaches and bathing spots, next to a large natural park: however, there is still scepticism about the actual implementation of this proposal.



## 12. Framework The Framework of Eexisting Urban Plans and Policies for the Ceity-Sea Interface

### 12.1. Coastal Planning in Marseille as an Interpretation of Current Social Needs

Current legislation in Marseille takes great care of the socio-recreational value of the coastline. As stated above, the last thirty years of the 20th century have seen an enhancement of the urban shore in favour of sociality, with the realisation of the Pointe Rouge tourist harbour, the city purification plant and the *Parc Balnéaire du Prado* in the Rade Sud, and the Corbière beach, in the Rade Nord, alongside an overall improvement of bathing water quality. From 2000 to 2010, the municipality increasingly included users in its coastal policy, promoting the *Plan de Gestion de la Rade de Marseille* (2009). This instrument proposes approximately seventy actions in favour of the sea and the coast of Marseille, providing for the implementation of a better and more equal accessibility to the urban littoral, with a focus also on the removal of architectural barriers for users with reduced mobility. To this is added the enhancement of leisure docks, an in-depth analysis of the criticalities of the twenty-one urban beaches along the Marseille city-sea interface and a redevelopment of coastal pedestrian paths. Nevertheless, the growing weight of issues related to social uses, coastal pollution, and environmental hazards led to further urban planning and normative elaboration in the 2010-2020 decade: five additional documents regulating the use of the Marseille city-sea interface, from different points of view, were thus launched.

The *Plan Plages et Littoral* (2010) has a strong socio-environmental character and is part of the municipal strategy to protect and develop Marseille's coastal areas. First of all, this instrument aims to improve the quality of urban waters for recreational and bathing purposes; it also plans to protect areas available for social and bathing activities from coastal erosion, reinforcing the existing defence structures against risks from the sea and building new ones where necessary. The policy aims to improve the general conditions of urban beaches, not only from the point of view of cleanliness and hygiene, but also to increase the perception of the safety of coastal areas through measures to safeguard bathers; it provides better services and diversifying the range of functions connected to urban beaches, also through the integration of appropriate and responsible commercial activities. Finally, special attention is paid to the use and accessibility of these public places, in relation to users with reduced mobility, and to the efficient connection between the city and its maritime-recreational area, also through cycle paths and public transport services. The *Plan Plages et Littoral* shows interest in the recreational aspect of the city-sea interface, proposing the realisation of spaces intended for open-air sports and service facilities (such as bathing\_huts and toilets); besides, it supports the creation of new beaches and redevelopment and enlargement of the existing ones, especially along the Rade Sud, in order to meet the social needs of citizens, who must become aware of the sustainable use, protection and risks of the coastal space.



The subsequent *Plan Nautisme et Plongée* (2011) implements the nautical character of the city through tourism initiatives, improving the quality of leisure docks, proposing a rational and sustainable use of water spaces, and involving the population in activities related to recreational boating and amateur diving. The Marseille government is showing its intention not to repeat for sea planning the same mistakes made over the years on land, where the available public space has been eroded by heavy roads and parking lots, often in a way that is difficult to reverse. Similarly, increasing the capacity of port infrastructures excessively, as well as building new berths without an accurate assessment of the inevitable impacts, can be incredibly damaging to the landscape, in relation to the image that the city offers from the sea and the vulnerability of the surrounding natural coastal environments. The actions envisaged in the document ~~therefore, therefore,~~ respond to several issues, aiming firstly at the sustainable development of leisure harbours, rationally increasing their capacity and developing related services, and adapting the coastal interface and maritime logistical nodes to underwater recreational and cultural activities. Efforts are also made to stimulate nautical and diving-related tourism by supporting major national and international sea-related events, ~~but also~~ and by involving ~~urban-coastal~~ urban-coastal society in these initiatives and promoting synergy with sports federations, associations, research centres and universities. For these reasons, the ports of Saumaty and L'Estaque, in the Rade Nord, and the port of Frioul have been developed; besides, it has been created a centre of excellence dedicated to boating and diving, also in the Rade Nord.

The drafting of the *Plan de valorisation du milieu marin et de ses ressources* (2011) is linked to a more environmental and ecological aspect, consolidating cooperation between public and research institutions with associations and ordinary users of ~~urban-coastal~~ urban-coastal society to limit maritime degradation. Among its primary objectives is the identification of critical economic, social and ecological issues related to the city's marine resources. To make this happen, the document supports scientific research in coastal areas, promoting projects for restoring degraded marine areas and the construction of artificial rocks for defence against environmental risks and coastal ecosystem development. It aims to develop social education and awareness-raising actions in order to operate an integrated, community-based and sustainable management of the natural system at the base of the coastal interface, involving expert and non-expert users in the ecological planning of the coastline.

Similarly, the *Plan de Gestion et de Valorisation des Espaces Naturels Littoraux et Insulaires* (2013) seeks to valorise the natural spaces of the Marseille coast as well as its islands, with a view to ecological transition, by stimulating awareness of maritime issues among users. This policy is articulated in a differentiated manner according to the site of interest along the Marseille shore, through specific management schemes, ~~and~~ operational projects, ~~but also~~ and the creation of protected natural areas where necessary. Generally speaking, however, it is

possible to identify common objectives for each action in the document. First of all, it is stated that an in-depth knowledge of the coastline, islands and maritime resources of Marseille is essential for sustainable development and efficient management of the different uses of the city-sea interface: a special policy is therefore proposed in order to prevent damages that may alter the ecosystem status, in relation to urban waters ~~but also~~ and to the urban greenery along the coastline (preventing fires, for example), taking into account the ecological transition of human activities at sea and on the land. Once again, emphasis is placed on adequate social education on the environmental aspects of the city-sea interface and on good practices to be developed in this sensitive area of the city.

The *Contrat de Baie* is another document with great value for the Marseille shore development: it proposes a strategic vision for the coastal territory, both from an ecological perspective and with a view to the management of social uses. This document has been drafted through the joint efforts of the municipality, the province and research and urban planning bodies. It stems from the will of local actors to improve the quality of bathing water and the littoral *milieu*, proposing solutions mainly on a small scale. Among its objectives, there is the reduction of marine pollution levels also for recreational purposes, the protection of the ecological quality of the coast, as well as the organisation of a more efficient coastal governance in relation to local uses and stakeholders: the *Contrat de Baie* aims, in fact, to systematise all coastal plans, programmes and actions with the same purposes. Moreover, since the coastal area analysed by the document often presents conflicting economic, tourist, cultural and recreational stakes, community awareness and involvement are sought, with the establishment of partnerships with competent authorities regarding bathing activity and beaches and the creation of a permanent observatory with the purpose of providing information support and developing databases dedicated to the coastal interface. In addition, it is proposed to regulate bathing for sandy or rocky beaches serving the majority of the coastal society, as well as for small beaches used mainly by residents. It is noted that accessibility to these places is not always easy, especially by land: the risks that afflict these crucial points of the coast are therefore studied, with the possibility of creating new coves for access to the sea by boats<sup>75</sup>. From an ecological point of view, the *Contrat de Baie* identifies coastal areas subject to the greatest environmental criticalities, such as erosion and flooding, in relation to criteria such as the resident population, the surrounding habitat, the presence of buildings and working activities: these points along the shore are called *Territoire à Risques important d'Inundation* (TRI). From an operational point of view, the priority project actions are identified, in agreement with the population and the authorities in charge, assessing their

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<sup>75</sup> This reasoning about accessibility is very relevant for the management of the sea in Marseille, since there is currently only one cove for access to the sea for boats not affiliated to nautical clubs. The so-called *Cale de la Lave* is located in the Rade Nord and is a very congested gateway to the urban water.

feasibility and urgency, also on the basis of their location on the Marseilles territory; the plan then provides for the finalisation of the interventions perfecting the specific objectives and the necessary economic budget. In essence, the document has a strong socio-environmental value, seeking to restore the ecological quality of the interface, facing the issue of land consumption and managing ecosystem services, studying the use of public coastal areas and limiting the impact of port infrastructures on beaches and coastal spaces dedicated to users, through ecological planning techniques and ~~an~~-accurate management of the functions of the coastal strip that ~~are~~-is most closely connected to the sea.

At the metropolitan scale, the *Plan Local d'Urbanisme Intercommunal* (PLUi), finally approved in 2021, focuses on the well-being of coastal areas and their recreational and environmental potential. Compatible with the *Loi Littoral*<sup>76</sup>, it highlights different types of coastal spaces to be organised and protected, enhancing the ecological and functional quality of green areas along the city's coastline through an ecosystem approach. In particular, *spaces close to the shore* are highlighted, imposing strong limitations ~~to~~-on buildings: these areas include urban spaces between the city and the sea, where there are clearly conflicts linked to the contrast of the two systems; they are influenced by the surrounding urbanisation, and their delimitation may also be indicated by the presence of road infrastructures (in accordance with the maritime city edge notion<sup>77</sup>). Instead, *valuable natural spaces* are areas that require special care to preserve their landscape and environmental features, while *urbanisation fracture spaces* call for even more scrupulous protection of the ecological functions and ecosystem services within the littoral zone: a coastal buffer zone of one hundred metres from the shore is applied to these spaces. At the same time, the PLUi proposes a recomposition of the functional and spatial elements of the Rade Nord, reconfirming the social and bathing characteristics of the Rade Sud, through interventions aimed at not only reconnecting the city, port and sea systems, but also at dedicating urban spaces to satisfy the current social demand. The objective is the enhancement of the city-sea interface by favouring soft mobility and intervening ~~on~~-in the transition areas between the urban and maritime systems with the integration of urban parks and green-blue public areas: public space is considered ~~as~~-an extension of the urban beaches, ensuring greater visual permeability towards the sea. The Marseille *Rade* is thus planned to host new socio-recreational spaces with high ecological quality in the northern part, functions linked to the productive and logistical context in the middle area, and actions for spatial and

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<sup>76</sup> The *Loi relative à l'aménagement, la protection et la mise en valeur du littoral*, known simply as the *Loi Littoral*, was approved on January 3<sup>rd</sup>, 1986: it has the task of regulating and protecting French coastal development, also managing free and equal accessibility to the sea resource.

<sup>77</sup> Please refer to cChapter 1 paragraph 1.3 of this text.

functional reconnection of coastal fragments in the southern zone, which is already devoted to community uses of the sea.

These indications recall the addresses defined within Marseille's municipal urban planning by the *Plan Local d'Urbanisme* (PLU), approved in 2013 and subsequently integrated in 2015. According to this plan, the valorisation of coastal areas can be achieved through the integrated management of public places, ensuring a better spatial, social and environmental quality and enhancing both direct and indirect accessibility. It proposes the realisation of recreational and cultural poles in relation to the sea, especially in the northern part of the city, through the reconversion of former productive sites and interventions on road connections and soft mobility, in a logic of preservation of environmental values: the Rade Nord has deep-rooted economic stakes, due to the presence of the port infrastructure and several large productive-commercial activities, but it still offers diversified spaces that can be developed towards a recreational value, respecting the social demands of local users. At the same time, the plan is directed towards a better management of the public coastal spaces and urban beaches along the entire city-sea interface, indicating actions aimed at improving social fruition and the existing facilities, expanding the functional offer for community and recreational uses and thus favouring the opening of the city towards the sea. Reference is also made to the improvement of the network of coastal green-blue spaces, in order to maintain a high level of protection for natural spaces while adapting to environmental challenges and the social uses they can host, also in relation to water quality.

With regard to the planning of the city-sea interface of Marseille, reference must finally be made to the *Charte Ville-Port* (2013), drawn up by the Port Authority of the *Grand Port Maritime de Marseille* (GPMM): in particular, the port characterises the entire northern part of the city, even though it influences prominently and not always positively the relations with the surrounding spaces; for this reason, this strategic document has been realised, with a time horizon of fifteen years, trying to revisit the city-port interactions in relation to the dynamism of the harbour spaces and the development of the urban territory, integrating economic-financial ~~but also~~ and social balances. The main intentions of the *Charte Ville-Port* are certainly related to the development of port activities that should be included in urban projects<sup>78</sup>, reaffirming the productive and logistical vocation of coastal water basins: however, it recognises that the emergence of a strong city-sea relationship, in which the port infrastructure is a major element, requires to have a mixed functional planning between the harbour function and social uses. For this reason, it declares the intention to partly redirect the ship traffic in order to favour ~~civil-coastal~~ coastal civil use. From a spatial

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<sup>78</sup> According to Law 2008-660, coastal basins, their land areas and docks are the property of the port, which takes care of their development and is in charge of enhancing them (<https://www.legifrance.gouv.fr/loda/id/JORFTEXT000019122891/>).

point of view, the strategic document divides the coastal interface into three macro-environments, in relation to the presence of the port. The *southern zone* hosts the passenger port and is in close contact with the urban centre, becoming a potential urban hinge and a public space of great social quality: in fact, ~~there their~~ buildings ~~for public and socio-cultural~~ have been realised ~~for public and socio-cultural~~, use, such as the MuCEM, the CEREM and the ~~multifunctional centre Les Terrasses du Port~~; ~~use such as the MuCEM, the CEREM and the multifunctional centre Les Terrasses du Port~~, around these elements, maritime squares and *boulevards* have been developed. The *middle zone* stretches from the Arenc area to the border with the *16th arrondissement*: here, the port function is confirmed, while referring to the need to diversify the functional offer, cautiously considering recreational uses of the coast inside the harbour perimeter, such as recreational boating, and even the possibility to partially allow free passage of pedestrians. Finally, the northern area is indicated as suitable for the creation of recreational areas and public proximity spaces, reaffirming the social-tourist qualities of the area: new economic activities are proposed for the Saumaty area (the northern portion of the Marseille port), the redevelopment of existing harbour structures to reduce the visual and environmental impact and the functional reconversion of some areas, improving the offer of services to the community; the need to extend the surface dedicated to urban beaches is also identified to favour equal accessibility to the sea. The *Charte Ville-Port* ~~not only~~ mentions factors mainly from the logistics, commercial and financial sectors, but also identifies ways to include community participation in coastal planning. However, while promoting a planning synergy with society, the interventions proposed and implemented have been predominantly managed by institutional consultation, dedicating the central area of the coast, several kilometres long, to logistics and port activity.

For this reason, the *Dialogue Ville-Port*<sup>79</sup> have been set up: they are cycles of meetings and participatory activities with public bodies, technicians and representatives of the population that, starting in 2019, channelled the request of stakeholders to be informed and involved in the planning of the coast and port areas, which have such an impact on the lives of citizens: through thematic workshops, the participants produce transformation hypotheses for the city. Interesting, for example, is the work carried out for the opening to the public of the *digue du large*, a walkway facing the GPMM approximately seven kilometres long that protects the urban coastline from environmental risks, but which is proposed as a maritime promenade that would strongly define the social and

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<sup>79</sup> The *Dialogue Ville-Port* initiative, established in 2019 and renewed in 2021, seeks for the integration of residents' expectations within urban governance processes, the promotion of sustainable relations between port activity, related coastal urban areas and social uses of the coast, and finally the design and implementation of integrated urban maritime projects. Workshop activities can be viewed at: <https://www.dialoguevilleportmarseille.fr/>

recreational relationship between the ~~urban-coastal~~ urban-coastal society and the sea of their city. The propensity of the Marseille case study to the socio-environmental transformation of the urban amphibious is thus apparent.

## 12.2. Governance Conflicts and Wweak Social Planning Along the Coast of Naples

The coast of Naples is an interesting case, as the quality of the water, the strong logistic-port activity and the privatisation of accesses to the sea preclude adequate social uses, also due to the lack of virtuous effects of the industrial decommissioning, exacerbating the social tension regarding the use of the maritime landscape on a neighbourhood scale. This is witnessed by the inhabitants of the eastern area of San Giovanni a Teduccio, where there is a strong desire to enjoy the local shore, despite the poor ecological condition of the water and the urban beach (Palmentieri, 2016), and the community of Bagnoli, at the western end of the city, which is divided between the desire to establish social and recreational uses along the shoreline and the difficulties of a peripheral area affected by the criticality of coastal recovery and land ownership, but often forgotten by institutions (Coppola, 2020). Both areas have been classified as *Siti di Interesse Nazionale* (SIN) due to their complex environmental condition: despite this, they are still unresolved issues within the Neapolitan coastal landscape.

Neapolitan planning does not offer many particular solutions to increase the landscape and social value of the urban coastline. At the municipal level, the *Preliminare di Piano Urbanistico Comunale* (PUC), approved in 2020, proposes limited interventions for non-port areas along the shore. It reflects on the issue of accessibility, emphasising the relationship between the port and the city, especially in the eastern part of the littoral zone. It hasis proposed the implementation of a-specific regulations<sub>7</sub> for the coastline, in order to guarantee community accessibility to the sea and protect the coastal landscape, redefining the relationship between the waterfront and the historic city in a qualitative manner: the objective is the functional and environmental improvement of the city-port transition zones, in competition with the Port Authority; however, there is a lack of in-depth consideration of the theme of coastal recreation and sociality, as well as the localised planning of proximity public spaces that can constitute a coastal green-blue network. Reference is also made to the importance of social participation in the design of public space and socio-environmental regeneration, although no particular strategic guidelines are identified. From the environmental point of view, the document identifies some areas of the Neapolitan city-sea interface subject to the risk of coastal erosion, in particular, the Posillipo stretch of coastline: it indicates the need to propose interventions, even localised ones, to defend the shore from the dangers of the sea, defining implementation methods and legal limits. This critical issue is, in fact, linked to the community's enjoyment of the water resource. The *Preliminare di Piano* ~~therefore,~~ therefore, identifies the need to regulate the access points to

the sea, providing the necessary indications for bathing establishments along the coast: for this reason, it proposes to identify the territorial areas whose transformation is subordinate to the drafting of specific implementation plans, with the indication of the appropriate urban planning parameters, as well as the types of light and non-impacting actions that may be allowed within the process of socio-functional reconnection between the city and the sea. The intention is to give the possibility of setting up temporary facilities for bathing or other recreational uses, even outside the summer season, postponing to a public selection process the choice of the related managers who will have to sign a special agreement, although the specific procedure is still undefined: among these hypothetical installations, light boardwalks and mobile jetties for the temporary mooring of boats are included. Despite some positive intentions, there is still a lack of a clear definition of the implementation modalities for these uses of the coast, albeit the *Preliminare di PUC* is merely a strategic document.

Instead, the current *Variante del Piano Regolatore Generale* (PRG) (2004) shows greater attention to social aspects, environmental sustainability and landscape protection. The *Variante* emphasises that the urban coastline of Naples is characterised by a vast extension, but less than one-one-third of its length has a real direct relationship between the city and the sea: this is due to the fact that almost five kilometres of the coastal interface are in fact occupied by the massive port infrastructure; another critical element, in the eastern area of the urban settlement, is the presence of the railway, which acts as a fracture between the urban system and the maritime system. Although the harbour historically constitutes a cornerstone of the economic structure of the city, it must nevertheless be taken into consideration that it currently represents an obstacle rather than a point of access to the sea, operating a socio-cultural fracture rift the urban amphibious: the document defines the port system as a territorial sphere that is independent from-of the rest of the city, with a varied range of productive, logistical, commercial and tourist functions, but little social permeability. In this sense, the issue of existing docks and berths for leisure boating is also discussed. About twenty years ago, the demand for boat moorings was already strongly unsatisfied and steadily increasing: the plan therefore, therefore, seeks to increase the infrastructure for pleasure sailing, enhancing the sector's potential, even though the strong constraint of lacking space along the city-sea interface still persists. The relevance of this issue is reflected in the need to limit the environmental degradation generated by the irrational and irresponsible location of berthing places, which are often illegal. The intention expressed by the *Variante* is, therefore, to regulate the shore in order to favour an efficient integration between the city and the sea, reducing socio-ecological impacts to a minimum. strategicallyStrategically, reference is made to the easternmost area of the urban-coastalurban-coastal strip, bordering the Neapolitan port, namely the area between Vigliena and Pietrarsa, where it would be possible to enhance the natural aspect of the city-sea interface, improving littoral usability and accessibility for local users, by locating high-quality social functions: hence, it is proposed to create a large linear



green-blue park following the coastline starting from San Giovanni a Teduccio, overcoming municipal boundaries and connecting together the various coastal public spaces of the Neapolitan metropolitan area, favouring pedestrian and bicycle mobility and the strong landscape values of the territorial littoral at a larger scale; however, it remains an unrealised project until today. From the environmental and ecological point of view, the plan seeks to actively protect the Neapolitan environment, fostering its valorisation in a dynamic and non-binding manner; with regard to coastal risks, it identifies the criticality of landslides affecting the parts of the city-sea interface characterised by high vertical fronts, which are now fragile due to past mining activity.

Currently, the municipality identifies twenty-four urban beaches<sup>80</sup> (according to the *Mayoral Ordinance no. 248 of April 22<sup>nd</sup>, 2021*) located in three areas of the Neapolitan interface: the bathing area of the City Centre extends from the Molosiglio cliff to the foot of the Posillipo hill, crossing the promenade of Via Caracciolo and Mergellina; the bathing area of Posillipo-Marechiaro stretches from Mergellina to the Trentaremi Bay, including important elements of the city's architectural, archaeological and natural heritage; finally, the bathing area of Bagnoli-Coroglio includes the western part of the urban coast of Naples as far as the border with the municipality of Pozzuoli. In this classification, it is not mentioned the San Giovanni a Teduccio area, where the ecological quality of the water is extremely critical, even if social demand for direct contact with the sea resource still persists. Moreover, fifteen of the twenty-four urban beaches identified are private: only three of the remaining nine free beaches, are identified as equipped with bathing services, but they are not always easily accessible. One example is the beach of the Underwater Park of Gaiola. This area is regulated by the *Interministerial Decree of August 7<sup>th</sup>, 2002*: according to the legal framework, the site is divided into one, a-Zzone A, of integral protection, in which any measure can be adopted or renewed for the use of the maritime and coastal domain unless for safety, service or research reasons, and two, a-zZone B, in which it is possible to implement indications for social and cultural activities, in agreement with the competent authorities, but always with respect to the protection of the Park. The area may be subject to restrictions for the access to bathing areas, in relation to the naturalness of some areas, ~~but also~~ and for other reasons: for example, during the past pandemic period, the fruition of the beach zone was severely restricted due to the health emergency. Despite the fact that it is a free beach, bathing is also forbidden in zone A, except for special reasons of study or research, while in Zzone B, it may be permitted, albeit with limits relating to the prescriptions of the managing authority and the rules of the port captaincy: the same limitations apply to nautical activities in the water of the protected area.

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<sup>80</sup> The municipality of Naples has mapped the urban bathing system in 2021. For further information, please visit <https://www.comune.napoli.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/12668>.



It is thus evident from the municipal mapping that swimming is in various cases forbidden, while most urban beaches are privatised, affected by polluted waters or poorly equipped for bathing activities, intensifying the problem of unequal accessibility to the urban shoreline: for example, in the area comprehending the historic fabric of Santa Lucia, the Riviera di Chiaia and the Mergellina, despite the tourist-recreational matrix, the coast lacks adequate bathing facilities; in the Posillipo area, the complex orography reduces the possibility to have ~~an~~ easy fruition of the sea, while local inhabitants and economic activities monopolise most of the coastal accesses. Besides, Posillipo is regulated by the *Piano Territoriale Paesistico dell'area di Posillipo*. This plan states that, within a buffer zone of three hundred metres from the coastline, interventions for the conservation and redevelopment of the existing natural and vegetal system are allowed, while the compatibility of the facilities related to beaches and authorised bathing establishments with the local landscape, environmental and archaeological values must be verified before any project authorisation: only hygienic-technological adaptation is allowed, without further increases in volume. The same indications apply to commercial and restaurant buildings and existing nautical clubs. It is also emphasised that the landscape-environmental redevelopment of the area is a municipal responsibility, as well as the identification and removal of unauthorised built elements that disturb the enjoyment of the coastal area. However, still remains a general difficulty in accessing the coastal recreational areas of this relevant portion of the city-sea interface.

Moreover, the Posillipo cliff is the area of the urban shore that is most affected by ~~the~~ environmental risk. According to the analysis of the *Piano per la Difesa delle Coste* of the Basin Authority, the area appears to be subject to a very high risk in terms of coastal erosion and flooding, as well as to the risk of landslides: this clearly has a very strong impact on the usability of the coast and the sea, further limiting the possibilities of access to the city's water resources and placing precise safety constraints on any future planning and design intentions for this littoral space. Other areas of the urban amphibious where the document highlights the high risk of flooding and erosion are the urban beaches of the Rotonda Diaz, in the heart of the urban shore in the Riviera di Chiaia, the areas related to the Bagno Elena private bathing establishment, at the base of the Posillipo hill, and the coast of San Giovanni a Teduccio, close to the port infrastructure. According to the aforementioned cartographic sources, the sea defence works, essentially limited to traditional artificial rocks parallel to the coastline, are subject to the risk of overflowing, especially in the area of the Riviera di Chiaia: this indicates an essential lack of efficient defence works against maritime dangers.

It should also be emphasised that coastal management is affected by an unclear demarcation of coastal state property between the municipal administration and the Port Authority: in fact, not only areas related to the

logistics function fall under port management, but also a substantial part of the entire Neapolitan coastline. This governance anomaly weakens the municipality's interest in enhancing coastal public spaces. From a planning point of view, not only the aforementioned *Variante del Piano Regolatore Generale* insists on the port of Naples, but above all, the *Piano Regolatore di Sistema Portuale* (PRSP), now in a phase of drafting in accordance with the new sectoral legislation (Decree Law 169/2016). With the introduction of the new legislative decree, the old *Piano Regolatore Portuale* (PRP) of the Naples harbour, drafted in accordance with ~~the~~ Law No. 84/94, adopted by the Port Committee in 2012 but never officially approved, no longer serves any purpose. Port planning ~~therefore,~~ therefore, follows the indications of a specific strategic document, namely the *Masterplan del Porto di Napoli* (2017). This document analyses the criticalities of the management model for the harbour and the coast of Naples: for this reason, it is considered appropriate to reorganise the system of concessions in the port area, in relation to the different functions that may be present inside the port or in the bordering spaces, also in the perspective of future changes and evolutions. The intention to intervene ~~on~~ in the western area of the port interface (San Vincenzo Pier) from a tourist-social point of view is also highlighted, in order to balance the relationship between the harbour and the city: in fact, the historic port should be a social hinge, not only because of its economic value, but also because of the presence of public and cultural green spaces.

On a broader scale, the *Piano Territoriale di Coordinamento* identifies the ports of the province's main cities as the major nodal elements of the coastal territory, albeit without proposing a strategic cohesion of harbour areas between economic-logistic functions and social potential. Another relevant element of the legal framework in Naples is the *Piano di Utilizzazione delle Aree Demaniali* (PUAD), a ~~regional plan~~ regional plan approved ~~in~~ on December 20<sup>th</sup>, 2022, that, despite its broad range of action, represents a directive specifically designed for recreational-tourist purposes of the coast. Even if it is still in ~~a~~ the drafting phase before its final approval, the PUAD identifies three coastal settlement categories (A. High tourist value, B1. Ordinary tourist value, B2. Low tourist value) in relation to the endowment of recreational services, water quality and cultural-landscape value. In particular, coefficients are applied to assess the recreational quality of the shore, in relation to the ratio of tourists to residents, the available concession areas, the presence of parks and accommodation facilities and bathing functions: the latter ~~parameter~~ parameter is calculated on the basis of environmental quality criteria and water monitoring by ARPAC (*Agenzia Regionale per la Protezione Ambientale in Campania*). However, it is surprising that the Naples coast is placed in the middle category B1, as it does not fully meet the abovementioned parameters. From a management point of view, the PUAD indicates that state-owned areas for tourism and recreational purposes have to be managed by the municipalities in which they are located, with the exclusion of those falling within ports of regional or inter-regional importance, managed by the Region itself, or areas under the control of the Port Authority. In order to plan the

bathing functions along the coastal space, explicit reference is made to the concepts of a free sandy shore, namely a strip at least 5 metres deep, calculated from the foreshore, of shaded stay and of beach services that bathing-related areas must be equipped with. Moreover, it is stated that at least 30% of the total length of sandy shores, as well as 30% of the total surface of other kinds of spaces within the maritime public domain, has to be granted to the coastal community for socio-recreational activities. It is also established that urban centres along the coast should locate at least one area within their municipal perimeter reef with peculiar landscape, environmental and bathing features to be destined as a free beach equipped with facilities and public services for the recreational enjoyment of the sea.

On a local scale, the PUAD is implemented by means of the *Piano Attuativo di Utilizzazione delle Aree del Demanio marittimo* (PAD), identifying intervention areas with design, environmental, ecological and landscape indications, pointing out the soft mobility system and the accesses to the sea, ~~but also~~ and eventual coastal roads, the presence of equipment or specific entrances for users with reduced mobility, as well as technological networks; furthermore, the PAD describes the current use of maritime domain areas, distinguishing free beaches, beach services and bathing establishments (also with other social functions, outside the summer season). The PAD must also guarantee that services connected to bathing and commercial or refreshment activities must not in any way affect the landscape value of the coastal interface, avoiding barriers or obstacles to views towards the sea: it is in fact established that boundary fences must not exceed a height of 1.5 metres and must be built with materials compatible with the surrounding environment and necessarily interrupted at 5 metres from the shoreline. In order to meet the planning indications from the regional PUAD about the minimum surface of free fruition of sandy shores and other coastal state-owned areas for social, recreational and bathing purposes, public accesses to the sea should be built at least every 200 metres, with a view to equal use of the urban coastline. The city of Naples has not drafted this operational plan yet, since the elaboration of the regional PUAD is still ongoing, but it is interesting in relation to the criticality of local governance: the PAD in fact describes the criteria for the allocation of maritime public concessions that should convey a qualitative improvement of the coastal areas for which they are granted, from the environmental, landscape, functional and accessibility points of view, with a focus on possible recreational uses. The assignment of licences must also be compatible with the reference PAD: this factor justifies ~~even more~~ even more, the need to promote this very important urban planning tool for the management of the city-sea interface.

### 12.3. Complexities and Differences in the Planning Frameworks of Marseille and Naples

In line with the objective of interpreting the needs and aspirations of coastal communities regarding coastal leisure and recreational spaces, the first phase of the comparison focused on planning and regulatory analysis, highlighting a clear difference between Marseille and Naples.

The French case study represents the model of a European city that has been able to renew itself in the last decades between the old and the new millennium and to significantly change its image through phases of regeneration of disused coastal areas and urban waterfront, developing a specific knowledge about social activation for planning and co-design activities intended to read social needs and translate them into active projects. Starting from the first decade of the new millennium, however, a progressive attention to the theme of coastal planning emerges on the part of the local community and the competent institutions, perhaps in relation to the growing awareness of the importance of littoral interface management for socio-environmental and economic development. In this sense, Integrated Coastal Zone Management and Maritime Spatial Planning directives can be rightfully considered the main influences among the European regulations, but also and the presence of the *Politique Mer et Littoral* has been a source of planning inspiration. It can be noted a strong concern for the environmental quality of coastal areas dedicated to recreation, such as urban beaches, although the frequency of visits is still not included in the criteria for drafting legal instruments. There is still a breach of duty towards the social demand for recreational fruition of the public coastal space: this is linked to a municipal poor attitude in listening to the population and, specifically, in public participation in coastal transformation projects; the *Charte Ville-Port* is an example where real social involvement was essentially bypassed by the public institutions. Similarly, the study of the transition areas between the coastal-maritime system and the urban system still appears to be poorly investigated.

On the other hand, Naples pays the price of a delay in the implementation of the various plans and projects drawn up for the transformation of coastal areas. Despite the fact that social and co-designing workshops have been activated, in San Giovanni a Teduccio as in Bagnoli, going as far as the feasibility project phase, none of these has been actually implemented, apart from small and limited interventions that are generally still in progress. From the planning point of view, there are considerably fewer documents than in the analysis of the French case. There may be several reasons for this. The apparent low interest on the part of the public institutions towards socio-environmental littoral issues may depend on a possible lack of planning competencies at the local scale: this inevitably has negative effects on the production of adequate policies for the management and planning of the public coastal space. Moreover, Naples denotes a particularly fragmented legal framework (Cantassano et al., 2017): land uses tend to frequently overlap frequently, and governance boundaries are not always well

defined. An example of this is the massive presence of the Port Authority in the management of the maritime domain, even outside the physical and functional harbour perimeter. The result is a gradual fading of public interests in the quality enhancement and design of urban beaches, small community spaces and parks along the shore. The interesting implication is that this management competition has led city planning to delve more deeply into the interactions between the city (especially in the port area) and its coastline. However, there is a general lack of attention to the social uses of the urban amphibious: there is a lack of documents specifically dedicated to the recreational dimension of the urban coastline (differently from what emerged analysing the Marseille shore), while the town plan, namely *Piano Urbanistico Comunale*, still in the drafting stage, seems generally detached from coastal issues, especially in operational terms. Moreover, the dynamics of concession-based relationships ~~is~~ are still vague: indeed, it has to be noted that the planning tools intended to coordinate and regulate the features and quality of the interventions ~~on~~ in the maritime domain are not yet operational, even if they are necessary for the equal social enjoyment of the sea resource. From the point of view of environmental risk, coastal erosion is one of the main criticalities: the *Piano Stralcio per l'Erosione Costiera*, drawn up in 2012 by the competent Basin Authority, locates the areas that are most exposed to the dangers of erosion and proposes possible risk mitigation solutions, even if its scale is wide. Anyway, within ordinary planning, a real awareness of these negative factors, which can affect the ~~life-life~~ of the urban-coastal society, has not been developed yet: there are few references to operational actions for reducing the existing risks at the urban and local scale. It should be noted, in this regard, that both Marseille and Naples have been often burdened by flash floods or coastal storms in recent years: this issue should therefore play a prominent role within the planning and regulatory frameworks of the two cities.

In conclusion, it is possible to state that there is an evident disparity between the two analysed legal frameworks. Naples seems poorly involved in the social and recreational theme of its urban amphibious, while Marseilles denotes a greater propensity towards planning actions dedicated to bathing and leisure along the coast. Anyway, both cities are similarly lacking in implementing the principles of integrated coastal planning at the local level, although in both Italy and France, there have been efforts to transpose the European directives, albeit in different ways and with different results: so, it is still missing a general framework that can effectively regulate the design of small spaces dedicated to ~~urban-coastal~~ urban-coastal society, according to the principles of ecological planning. However, it must be emphasised that even from this point of view, the Marseille system of coastal government is a step forward compared to the Neapolitan one, not only regarding the implementation of green-blue infrastructure: greater attention is also dedicated to environmental risks and to the defence of the city-sea interface from the wide range of dangers coming from the sea. Moreover, in both cities, the main planning operations have been started mainly with top-down initiatives, even if social listening procedures have been activated. As a result,

various interventions have mostly sought the regeneration of urban containers and the redevelopment of public spaces for the purpose of commercial and tertiary real estate enhancement, even if they have not always realised the community expectations for the recreational fruition of beaches and urban parks along the coast. On the basis of the critical analysis of plans and policies drawn up for the littoral interfaces of Marseille and Naples with reference to the implemented transformations, it is stressed the weakness of co-designing activities: even if this kind of approach may give useful planning insights, in the context of the two analysed Euro-Mediterranean cities, the needs and desires of the coastal communities have been often limited within reduced areas by the political-administrative institutions, even though in some cases the latter have started virtuous processes, developing inclusive planning know-how.

### 13. Geographical Approach for the City-Sea Interfaces of Marseille and Naples

#### 13.1. The Maritime City Edge as a Relevant Socio-Environmental Element for Coastal Planning

In the context of the spatial research of the main characters of the city-sea interfaces of Marseille and Naples, the previously described geographical approach is used for the elaboration of a spatial data model that provides a functional description of the two coastal urban entities in comparison. According to the city-sea interface theory, this peculiar space hosts the most intense relationships between the maritime sphere and the city sphere: these coastal ecosystems include human and biophysical components and provide numerous benefits to coastal society, in the fields of tourism, recreation, fishing, commerce and aesthetic-cultural values; moreover, they are connected to numerous essential services such as energy production, environmental conservation and protection from natural hazards (Ranganathan, 2007). It is therefore assumed that the maritime city edge, that is, the coastal strip comprehended in between the shoreline and the transit road parallel to the coast (as stated in the previous chapters), can therefore be the neuralgic core of these relations and impacts, which have both an environmental and social matrix: this part of the city-sea interface becomes a physical and functional hinge between the sea system and the city system, a space in which the ecological continuity is not broken by the main road infrastructure and in which the community comes into contact with the city's water and at the same time enjoys the public coastal space. From a geographic and functional point of view, the maritime city edge thus assumes a great value in understanding the entire city-sea interface; from a planning perspective, it becomes a key element in directing analytical studies towards a design resolution of critical littoral issues.

Indeed, the management of this coastal area must consider a wide range of complex, overlapping and often contradictory stakes. Decisions on regulatory priorities, such as design development initiatives, long-term plans or allocation of uses of coastal spaces, usually intertwine with changing social values and constantly evolving biophysical and functional contexts: balancing the needs of the different voices of ~~urban-coastal~~urban-coastal society among public spaces, private interests, ecological protection and development demands is a contemporary challenge that requires the combination of increasingly careful management plans and design actions (Loomis & Peterson, 2014). For this reason, the geographical approach here presented seeks to map the crucial elements of the maritime city edge, in order to understand which ones can bring enrichment to the urban shore and the littoral community, primarily from a socio-environmental and recreational point of view, in line with the objectives of this research, ~~andbut also~~ the eventual constraints to this kind of development. This methodology clearly recalls the identification of the benefits provided by ecosystem services, which are fundamental within decision-making processes oriented towards ecological planning: their value is linked to the well-being of society and the safeguard



of the environmental status of places, motivated by the participation of the users themselves in the protection of ecosystems (Klain & Chan, 2012).

With regard to the benchmarking context between the two Euro-Mediterranean case studies, the definition of the spatial data model involved the identification of five main layer categories: the *geo-physical structure* of the two cities, the *natural* and *built environments*, the *recreational* uses and the soft mobility and accessibility system. The objective is to understand the composition of the maritime city edge of Marseille and Naples and to measure its different characteristics, in order to collect data necessary for careful planning of socio-recreational values and fair accessibility to the coast and the sea. For the study of the Marseille coastline, the base reference is the *BD Ortho 2020* image, while *Pléiades 2021* satellite images have been selected for Naples: the use of high-resolution and recent base maps has allowed us to obtain the highest possible degree of precision in the digitisation phase of the various functional zones within the benchmarking context.

### 13.2. Extent and Ggeo-physical Sstructure of the Mmaritime Ceity Eedge

Within the geographical analysis, the first difference to be found between the two case studies concerns the overall extent of that the maritime urban edge holds-holds from a dimensional and spatial point of view, despite the fact that the linear length of this element within the two cities is roughly similar.

The municipality of Marseilles covers a total surface area of 238.4 square kilometres; its urban coastline extends from the municipal end of the 16th Arrondissement in the north to the Calanques national park in the south: functionally, it is possible to divide it into a northern portion with a mainly port function, a central portion with an urban and bathing character and a southern portion with an essentially naturalistic value, coinciding with the aforementioned protected park. The latter portion, however, is not included in the perimeter of the analysed maritime city edge because the Calanques area is essentially a space with a very low level of urbanisation in relationship to the other parts of the coastal settlement; besides, it is governed by peculiar regulations that limit design and socio-recreational flexibility for the purpose of protecting the surrounding natural environment. Consequently, the area studied in the geographical approach corresponds to the first two stretches of the city's coastline, comprehending the Rade Nord and the Rade Sud, with a length of approximately 22 linear kilometres. In total, the maritime city edge of Marseille measures 5.20 square kilometres, corresponding to 2.2% of the total urban area. In the case of Naples, the municipal area has a smaller surface, with only 118.9 square kilometres. The studied coastline covers the entire municipal shore, from the western end of Bagnoli, on the border with Pozzuoli, to

the littoral of San Giovanni a Teduccio, on the eastern edge of Naples. On the basis of these premises, the perimeter of the Neapolitan maritime city edge has been defined, and its total size measures 7.54 square kilometres: from a functional point of view, it can be schematised into a western portion with a more industrial character (in relationship with the former industrial area in Bagnoli) and naturalistic-residential character, a central area for mainly residential, tourist and recreational use and finally an eastern port and productive area. In percentage terms, the Neapolitan maritime city edge corresponds to 6.3% of the total urban area.

It is evident that although Marseille has a larger surface area than Naples, the French city devotes less space to the city-sea interface, at least in relation to its maritime city edge component. This is interesting because it strongly conditions the way in which spaces in direct contact with the urban sea are designed and indicates that the transit road, previously defined as the first interruption between the coastal and the urban spheres within the city, is, in fact very close to the maritime ecosystem in the Marseilles case. On the contrary, Naples appears more characterised by its maritime city edge, at least from a dimensional point of view. The shape of this piece of the city along the coast is certainly conditioned by the land reclamation interventions that municipalities may implement, and but also by the presence of elements that spatially modify the urban shore. The database therefore, therefore, investigates the elements underlying the geo-physical structure that define the shape of the maritime city edge, allowing it to expand its surface area but also and to protect spaces and community uses from environmental risks: think, for example, of the installation of artificial rocks or breakwaters, but also and the use of jetties or floating walkways along the urban coastline.

In this sense, the city of Marseille has a fairly substantial number of artificial reefs whose primary function is precisely to prevent risk from the sea. The percentage of such elements within the local geo-physical structure is 0.49%, or approximately 25,615 square metres. Although this number is statistically low, these elements play an important role in defending the social uses of the urban coastline. In the southern area of the city, for example, the Prado urban beaches are characterised by the presence of extensive arms of artificial rocks that seek to preserve the community function of the place, while also giving a characteristic shape to the area; in the middle central portion of the maritime city edge, the rocks present in the area of Malmousque and along the Corniche promenade act as a spontaneous gateway to the sea for local users. On the contrary, in the case of Naples, the geo-physical structure is certainly characterised by the presence of artificial rocks, as well as some jetties, although quantitatively, this functional element covers a smaller surface of the coastal interface than its French counterpart: the overall area is only 2,298 square metres. This means that the Neapolitan geo-physical structure measures about 0.03% of the entire maritime city edge and an even smaller 0.002% of the total area of the city. Despite this, it

is possible to attribute an important social value to these areas of the city-sea interface. In particular, the coastal area of the Riviera di Chiaia is strongly characterised by the presence of long stretches of artificial rocks and breakwaters parallel to the coast: beyond their role of defence against environmental hazards such as coastal erosion and storm surges, it is a common habit for the Neapolitan coastal community to use these functional elements in a social and recreational manner, transforming them into improvised place to sunbath or dive into the sea for bathing; this phenomenon is incredibly common during various periods of the year. Regarding the western area of the city, Bagnoli is famous for its jetties, originally conceived for productive uses related to the area's primary function; however, they are now an integral part of the ~~urban-coastal~~urban-coastal landscape, and one of them is also completely dedicated to pedestrian, reinforcing the social-community matrix of this type of functional asset.

### 13.3. ~~Natural~~The Natural and ~~Bbuilt~~Eenvironments ~~Aalong~~Ddensely ~~Uurbanised~~Ccoastal ~~Aareas~~

The natural environment of the maritime city edge of Naples is characterised by a significant amount of vegetated areas: a surface area of 2.15 square kilometres characterises its coastal zone, corresponding to almost ~~one-one~~one-third (28.46%) of the total size of the maritime city edge, although this value is equivalent to only 1.9% of the municipal surface area. Vegetated areas include urban parks, private gardens, aligned trees and eventual urban-rural areas, ~~but also~~and degraded or abandoned green spaces. The area most closely linked to this aspect of the city-sea interface is undoubtedly Posillipo: the homonymous urban hill is, in fact, particularly important for the Neapolitan urban coastline because of its naturalistic features, being moreover subject to a specific landscape plan. However, it must be considered that the use of these green areas is limited by the privatisation carried out by residents and economic activities managers, as previously discussed. In any case, it remains the area with the highest concentration of urban greenery in the entire maritime city edge: this clarification is necessary, since other spaces comprehended in this edge of the city-sea interface, although they do not present any particular quantity of urban green, are nevertheless close to vegetated areas. One example is the Riviera di Chiaia and Santa Lucia area, which does not possess a significant amount of open or green spaces, with the exception of the Molosiglio Gardens, nearby the port area: however, immediately beyond the transit road, there is the *Villa Comunale* which represents a significant green area.

In contrast to Naples, Marseille does not show a particularly large area devoted to the natural environment. The data shows that this function occupies 587,521 square metres, or 11.29% of the total size of the maritime city edge. The reasons include the fact that the maritime city edge tends to be very small, with the exception of a few

cases and the very large area occupied by the GPMM. The points where urban greenery is most concentrated in the northern area coincide with the *Jardin de Corbière*, an area that also hosts the only real public access to the sea for bathing in the 16th Arrondissement. Proceeding towards the historical city centre, not far from the Vieux Port, the *Jardin du Pharo* emerges, a public park accessible to the littoral community where buildings with historical and cultural value are located: however, unlike the *Jardin de Corbière*, this space does not allow for physical contact with the sea. Finally, the Rade Sud offers probably the most important vegetated area of the city, namely the *Parc du Prado*, which constitutes a public open area equipped for recreation and leisure, as well as for bathing; as in the case of the Riviera di Chiaia, also here it is possible to note that in the immediate proximity, there is a large green sports area, whose environmental continuity with the park is interrupted by the transit road.

On the other hand, as far as the built environment of the maritime city edge is concerned, the analysis identifies a value of 14.03% relative to the buildings along the coast of Naples. The respective 1.06 square kilometres of buildings of various types (residential, productive, historical-cultural) represent a significant surface, indicating that a consistent portion of coastal land is densely urbanised. In particular, the areas that show the highest rate of construction are Posillipo and San Giovanni a Teduccio: in the first case, these are mainly residential and accommodation buildings, for a total of 287,806 square metres corresponding to 27.2% of the total value; in the second case, a large part of the buildings have productive and logistical functions, considering the proximity to the port, and represent more than half of the total constructions present along the maritime city edge. In Marseille, the incidence of the built environment along the maritime city edge is significantly lower in terms of percentage: the 496,460 square metres of buildings represent 9.54% of the total surface area of the coastal area between the sea and the transit road. The Rade Sud appears most dense in terms of civil urbanisation. In particular, the areas surrounding the *Jardin du Pharo* and Malmousque neighbourhood comprehend 153,563 square metres of built surface, equal to 31% of the analysed category: these are mainly residential buildings, with some elements with a productive function. Proceeding towards the southern end of the maritime city edge, the Montredon area hosts a further portion of buildings for predominantly residential use, consisting in of 95,100 square metres, or 18.4% of the total built environment.

Another element of great relevance within the two city-sea interfaces is undoubtedly the port infrastructure: in both cases, it occupies a substantial portion of the coastal territory, with tourist but mainly commercial and logistical functions, a factor that clearly collides with the development of coastal social and recreational activities and with the free use of the urban coastline. In Naples, the surface area dedicated to the port in its various forms corresponds to approximately 2.26 square kilometres: a substantial portion of the maritime city edge equal to 30.1% of the total

area, mainly located in the easternmost area of the case study. With regard to the French city, this value is even higher: in fact, it is 57.29% of the coastal strip between the transit road and the urban sea: the approximately 3.00 square kilometres are mainly concentrated in the central-northern area and correspond to the *Grand Port Maritime de Marseille*, an infrastructure that is as relevant from an economic point of view as it is limiting in terms of accessibility to the water body for the ~~urban-coastal~~urban-coastal society. A peculiar characteristic of Marseille is the presence of numerous nautical clubs, whose prevailing location is the Vieux Port, in the historical heart of the city, within the Pointe Rouge pole in the Rade Sud, and in the area of L'Estaque, in the XVI Arrondissement: in the latter place they often constitute an insurmountable barrier for the city's users. A further element that differentiates Naples and Marseilles from the point of view of the coastal built environment is the presence in ~~the~~-Marseilles city of large spaces dedicated to the storage of private boats: while in the Italian case study, no significant points destined for this function were identified, along the French coast 241,238 square metres of this kind of constructions, some of them very tall, have been mapped. This represents 4.64% of the total area of the maritime city edge, mostly located along the coast of the 16th Arrondissement.

#### 13.4. Main Coastal Rrecreational Uses and Soft Mobility System

The study of the socio-recreational aspects of the maritime city edge involved the mapping of the main bathing spots in the two cities taken as case studies. Along the Neapolitan coastal interface, it is possible to identify a total area of 142,341 square metres dedicated to this activity. This is 1.89% of the total area of the maritime city edge, a value that clearly has little bearing on the vastness of the coastal area of reference. It must be added that the urban beaches in Naples are very diverse, with different degrees of accessibility and water quality: the coast of San Giovanni a Teduccio is forbidden for bathing, due to very high levels of pollution, yet the local community strongly desires to enjoy it; the Riviera di Chiaia has one of the few free Neapolitan beaches, although the provision of bathing-related services is not very efficient, while the available space is quite limited; Posillipo probably offers the widest variety of urban beaches in the city, even if access tends to be private or very expensive, while publicly accessible areas (such as the Gaiola beach) can only be reached by- uneasy routes; finally, the Bagnoli area has urban beaches, ~~but also~~and here contact with the water is forbidden as a consequence of the poor ecological quality.

In the case of Marseille, the urban beach endowment of the maritime city edge is 148,871 square metres. There is a strong similarity with the Neapolitan case, but this figure reflects a significantly higher surface percentage (2.86% of the total coastal area), although even in this case, it is a rather small amount. It should be emphasised,

however, that the offer of bathing areas along the French coastline is much more adequate to meet the needs of ~~urban-coastal~~urban-coastal society than its Italian counterpart: in particular, the Rade Sud appears to be very much oriented towards the recreational use of the urban coasts, thanks to the presence of relevant urban beaches, such as Pointe Rouge and Prado areas: in both cases, the sites are well equipped for bathing, and the fruition of the sea resource is completely free of charge; going up towards the central part of the city-sea interface, the Plage des Catalans represents one of the most frequented places by Marseille users, not only for bathing but also for outdoor activities. It should be noted, however, that the central-northern sector is strongly characterised by the port infrastructure: thus, only in the extreme northern part of the maritime city edge ~~it is~~it possible to find additional urban beaches, although in the Rade Nord, they are much more limited.

Sports activity and the public spaces designed to host it are a further analysis criterion related to coastal sociality. The digitisation of the two coastal interfaces highlights the fact that in both cases, the presence of these elements is relatively low: the share in Naples is 74,715 square metres, equal to just under 1% of the maritime city edge, compared to the 13,780 square metres that Marseille devotes to this function (0.26% of the maritime city edge). With regard to these percentages, it must be considered that, although located outside the maritime city edge in the strict sense, the two city-sea interfaces nevertheless offer sports facilities to their users; it must also be said that the Prado area in Marseille constitutes a large multifunctional space, in which open-air sports activity is only one of the possible uses. In the Neapolitan case, on the other hand, it should be noted that most of the outdoor sports facilities present ~~at~~in the maritime city edge are not freely usable by users as they are included within private nautical clubs.

With regard to the soft mobility offered by the Neapolitan coastal interface, the area dedicated to this function within the maritime city edge is 387,346 square metres, or 5.14% of the total surface area. This percentage includes cycle-pedestrian paths, sidewalks, pedestrianised areas and public squares: in short, this is a parameter ~~that~~reef that attempts to calculate the spaces in which the pedestrian can move freely according to the current design of the urban amphibious. It should be emphasised, however, that this value does not always reflect direct accessibility to the coast, ~~i~~i indeed in most cases, pedestrian routes are quite far from the coast, sometimes even in terms of views, as is the case at Posillipo, for example. The stretches of coast along which users ~~can~~s can easily walk by users while enjoying visual contact with the sea of the city are mainly located in Bagnoli and along the Riviera di Chiaia: the paths tend to follow the coastline and, despite the presence of some obstacles (especially in the former case), it is generally possible to walk following the shoreline. In relation to the allocation of parking areas, it must be pointed out that the 102,410 square metres made available along the city-sea interface (equal to 1.36% of the maritime city

edge) guarantee relatively simple movements to the coastal society's users: in fact, almost all of this surface area indicates simple roadside stalls, with the presence of a few paid parking spaces. However, the overall distribution of this function is not optimal, as it is not evenly distributed among all areas of the urban coast, making some places difficult to reach and enjoy, not only in the more peripheral parts of the littoral interface but also in the more central areas of the coast.

For the Marseille coast, the surface area dedicated to bicycle and pedestrian mobility is slightly larger than the Neapolitan one: the mapping of the maritime city edge shows 396,350 square metres, representing 7.62% of the total size of the study area. This figure is, therefore, even more favourable in the French case study, since Marseille's maritime city edge is considerably smaller than its Neapolitan counterpart. To this must be added that almost the entire Rade Sud allows the urban system to be very close to the sea. The Vieux Port and MuCEM areas also offer the same possibility; however, the whole central portion, occupied by the massive Marseilles port, does not allow physical or at least visual permeability towards the coast and the water. The situation does not improve going northwards, in the XVI Arrondissement, as the nautical clubs and the presence of vast areas destined for boat storage make the sea effectively unreachable, both in terms of physical access and in terms of visual contact. Similarly to the Italian situation, the space intended to park two and four-wheeled vehicles covers a very low percentage of the coastal interface, ~~that which~~ is equivalent to 1.96% of the maritime city edge. The 102,118 square metres of parking spaces for cars and motorbikes are, however, discretely distributed, providing a valuable support to local mobility, especially in the Rade Sud.

### 13.5. Dense Interfaces with Limited Coastal Space for Recreational Use but High Social Potential

Geographical research has provided a clear picture of the functional arrangement of the area, which tends to emphasise coastal socio-environmental relations to the greatest degree and to absorb pressures from the urban and maritime spheres, within the *city-sea interface* theory. The study of the maritime city-edges of Marseille and Naples has thus revealed similar characteristics as well as elements of dissonance in these two Euro-Mediterranean case studies.

As mentioned above, the different overall size of the two city-sea interfaces is indicative of a different geophysical conformation ~~but also~~ of a different layout of the transit road. Partly, this is due to different functional conceptions, since the French city tends to favour a road infrastructure as close as possible to the sea, while this happens more rarely in Naples; however, considering the morphological structure of the two settlements,



it must be considered that the Italian city has a much higher and jagged coast than the French one, which obliges to put a greater distance between the transit road and the shoreline. Hence the different widths of the two coastal interfaces: in Marseille, it tends to widen at a few points, near the port and the limited extrusions of the coast where small settlements arise, such as the village of Malmousque, or in relation to the areas of *land reclamation*, such as the *Parc du Prado*; the Neapolitan *maritime city edge*, on the other hand, assumes a considerable transversal extension, especially in the Posillipo hill, where the highest natural value of the coast can be found.

However, in spite of the flexibility of the middle component of the city-sea interface, it must be pointed out that Marseille and Naples dedicate a small percentage of the total area to social and recreational functions. In France, this type of use, which is crucial for the purposes of this research, covers just 3.13% of the total size; similarly, in the Italian case, this value reaches 2.88%: these percentages are among the lowest within the functional system of the two urban coasts, ~~an~~ information that must certainly be interpreted in relation to the reference context: in Marseilles, for example, there are entire public areas dedicated to open-air recreation and bathing; the Neapolitan coastal interface is less organised, because urban beaches and other socio-recreational facilities are not equally accessible or distributed. Anyway, it should be noted that the Italian case study has a much higher degree of naturalness than the French one: the Neapolitan maritime city edge offers ~~to~~ the local community a considerable amount of urban greenery, in various forms, although not all of it is freely usable; at the same time, in Marseille, most of the coastal open spaces can be easily accessed, although the majority of them are located in the Rade Sud.

With regard to these reflections, it is impossible not to refer to the cumbersome presence of ports within the case studies. Approximately ~~one~~ one-third of the Neapolitan maritime city edge is absorbed by this function, while in Marseille, the port infrastructure exceeds half of the area available within the research area. It is clear that both cities are strongly linked to port activity, since they are among the major logistical, tourist and commercial poles of the Mediterranean basin; in any case, the percentages found are relevant also because the port constitutes a strong limitation to the visual and functional permeability of the city-sea interface. If in Naples it is still possible for a pedestrian to move quite freely around the port terminal even if they don't have to take a ferry (although there aren't particular recreational or social activities), in the Marseille port, usability is completely precluded unless the user has a boarding ticket. This opens up interesting scenarios regarding the difficult relationship between the harbour and the urban realities that often collide with each other; however, in both Naples and Marseilles, the Port Authority has signed important strategic documents for the community transformation of the coastal areas. In particular, the

French case shows a more effective implementation of project operations for the city-sea interface than the Italian case.

In conclusion, it should be noted that the two maritime city edges show ~~a~~-different ways of managing space. Marseille is extremely affected by the presence of the port, which significantly limits the functional permeability towards the sea, but denotes the capacity to organise more delimited spaces and areas; for geomorphologic or functional reasons, exploiting residual areas in a positive way, even if some critical issues related to conflicts of interest between different parts of ~~urban-coastal~~urban-coastal society still remain unsolved, like the tensions between ordinary citizens and users of nautical clubs in the northern area of the coast. On the other hand, the coastal interface in Naples has a wider surface but suffers from a discontinuous distribution of public facilities along the shore; moreover, accessibility to the littoral resources is often compromised by unclear governance models, by the privatisation of spaces nearby the urban sea and by the presence of degraded areas and disused sites in the peripheral zone of the maritime city edge, as a result of ~~a~~-tendentially static planning over the last decades. However, the larger size of the research area may be an advantage in the functional remodelling of the urban amphibious. Such reflections suggest that the elaboration of a spatial data model describing the main characters and functionalities of the city-sea interface may actually serve as a basis for planning reasoning: understanding the spatial dynamics underlying coastal functioning may, in fact, facilitate the identification of sensitive points along the urban coastline and signal the possible presence of conflict zones. This type of approach can certainly be extended and adapted to different contexts, providing an analytical database that is propaedeutic to a coastal-maritime spatial design responsibly oriented towards the social demand; within the theoretical innovation of the city-sea interface as a link between land and sea planning.

## 14. Psycho-Social Approach Applied to the Urban Amphibious in Marseille and Naples

### 14.1. Questionnaire Dissemination and Types of Study Areas

The study of the dynamics underlying the social demand of the coastal communities of Marseille and Naples involved the psycho-social approach, according to the methodological framework described above. The proposed questionnaire model was therefore disseminated<sup>81</sup>. In order to facilitate the comparison between the different urban areas of the two city-sea interfaces, four types of study areas were identified, based on the similar morphological-functional characteristics existing between the two Euro-Mediterranean cities.

The productive and port areas include the 16th Arrondissement of Marseille and, for Naples, the coasts of Bagnoli and San Giovanni a Teduccio. The XVI Arrondissement, specifically the area of L'Estaque, a former fishermen's village, became over time a productive district and was then partially incorporated by the northern part of the GPMM: today, it hosts a disused quarry and one of the city's main bathing spots, as well as a large number of nautical clubs that severely limit accessibility to the sea. The neighbourhoods of Bagnoli and San Giovanni a Teduccio are peculiar sites along the Neapolitan coastal interface because local communities express a strong desire to enjoy the coast and the sea, yet the ecological quality of the coastline is deeply damaged by past productive activities that have defined the identity of these places.

Residential green areas include the Corniche area in Marseille and the coastal area of the Posillipo district in Naples. The Corniche, between the area of Malmousque and the Prado bathing area, is a long scenic promenade along which users can enjoy direct and visual contact with the urban sea, passing through a predominantly residential area inhabited by an upper-middle class. Similarly, the Posillipo area constitutes one of the main environmental areas of the urban Parthenopean coastline, as well as a privileged panoramic view: however, the presence of dwellings and properties of wealthier classes and accommodation activities precludes a fair enjoyment of the shoreline.

As dense urban areas, we consider the historic core of Marseille, specifically the Vieux Port area and the public area of the MuCEM, and the Neapolitan Riviera di Chiaia. The Vieux Port area includes the old harbour of the Marseille city, now transformed into a large pedestrian area in visual contact with the sea, while the MuCEM area is a real space reclaimed by the community, thanks to an agreement with the Port Authority: today it hosts a large square along the shoreline and various cultural functions. The Riviera di Chiaia, on the other hand, is a very

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<sup>81</sup> In particular, reference is made to the model described in Chapter 9 Section 9.3.

popular area along the Neapolitan city-sea interface: here, the residential function is flanked by the tourist and recreational ones, while a wide promenade connects some important elements of the city's historical-cultural heritage; however, bathing is only allowed in some specific points of the area.

Finally, urban beaches indicate the Prado bathing area for the French case study and some circumscribed areas of the Neapolitan coast, namely the Rotonda Diaz beach, the Bagno Elena bathing establishment and the Gaiola beach. As for the Prado, it is a vast area with a recreational function almost entirely reclaimed by the sea: there are numerous bathing spots ~~but also~~ and a large green area dedicated to outdoor sports activities. The bathing spots chosen for the dissemination of questionnaires in Naples are located in different areas of the urban coastline and present different degrees of accessibility: the beach of the Rotonda Diaz is a public beach, although it is generally crowded in summer; the beach of Bagno Elena is located in Posillipo, and its access is subject to the payment of a ticket; the beach of Gaiola is comprehended within the homonymous protected park, is a free beach although it is regulated by strict rules and it is not easy to reach it due to the roughness of the access road.

The questionnaire involved 265 users, 160 in Naples and 105 in Marseille, distributed in the different study areas described above. The dissemination phase took place during ~~the~~ spring 2022: in particular, the questionnaires were disseminated during the daytime, between 8:30 and 14:30, in order to provide a more precise comparison conditions. The composition of the social samples followed the criteria of the representativeness concept, as explained above. Academic collaboration with the ESPACE laboratory of the Aix-Marseille Université enabled the processing of the data collected, integrating a geographical-analytical approach to field research. The information found allows for an in-depth study of the needs of an ~~urban-coastal~~ urban-coastal society sample within the two European case studies; moreover, it can serve as a basis for developing project guidelines for coastal planning that is more aware of the needs of the coastal community and the specific social demand.

## 14.2. Accessibility of Uurban Bblue Sspaces

Access to the city's blue spaces, understood as the ability to utilise and benefit from the available marine resources or areas of the city-sea interface, is fundamental to the well-being and sustainable growth of ~~urban coastal~~ urban-coastal society. The physical access to coastal spaces for diverse uses, including social and recreational activities, requires careful management with regard to user perceptions: it is, therefore, an element within the planning of the city-sea interface that is strongly influenced by the concept of socio-environmental justice (Bennet & Satterfield, 2018; Ribot & Peluso, 2009). In this regard, according to the questionnaire scheme

disseminated along the city-sea interface of Marseille and Naples, interviewees from the two cities were asked how important physical contact with the water was for them with regard to activities such as bathing and recreational fishing. The results are quite similar for both case studies, as most users rated contact with the sea as important (46% of the Marseille users and 42% of the Naples users). This value also remains solid for the 'very much' option, with 44% of the answers on the French side and 26% on the Italian side. If these values indeed appear predictable for two cities so closely linked to the sea, a comparison with the frequency of visits for recreational purposes is interesting.

In Naples, there is a discrepancy between the strong interest shown in coming into contact with the sea resource and the percentage of visits to the coast: 39% of the users states to go to the city's coastal area never or rarely (no more than twice a month), while 33% of the analysed sample spends time there about once a week; only 8% of the coastal society declare that they visit the urban coast for recreational purposes often (at least three times a week). On the other hand, the habits of the citizens of Marseille show a direct proportionality relationship between the desire to visit the coast and the actual frequency of visits: only 7% of the interviewees admit to spending very little or any time at all along the city-sea interface for leisure and social purposes; more consistent are the values of users who frequent the coast about once a week (27%) or about twice a week (26%); finally, the most consistent figure reflects the 41% of the users involved in the research who admit to visiting the coast of Marseille at least three times a week.

The reasons behind the missed satisfaction of the need for contact with the sea can be multiple, related to functional and logistical features. The proposed questionnaire investigates the connection between this criticality and the issue of mobility, both light and heavy, and the constraints to fruition that the coastal interfaces of Naples and Marseilles demonstrate. From the point of view of soft mobility, the two interfaces differ greatly in terms of offered services. More than half of the Neapolitan users ~~has~~have difficulty in reaching the urban coast by foot, while only 14% of the interviewees considers it easy or very easy; as for cycling, 29% finds it hard, and only 11% of users defines it as very easy. In Marseille, the situation is diametrically opposed, as citizens consider that reaching the coast by foot is incredibly easy (38% defines this action as 'very easy', compared with the lowest recorded value of 12% who defines it as 'very hard'). When it comes to the possibility of approaching the sea by bicycle, similar data are found: ~~one~~one-third of citizens say that it is easy compared to 16% who says that it is difficult.

Getting around by public transport such as buses is clearly easier for the users of both city-sea interfaces, who share fairly similar opinions: the responses of Marseille interviewees who think that reaching the sea in this way has a difficulty degree within the norm amount to 28%, while 54% of the sample considers easy or very easy to

access the coast by bus. Similarly, in Naples, the most registered value ~~is~~ of difficulty is 'within the norm', with 39% of the answers given, showing progressively lower figures in the range of other possible answers. A similar situation is recorded with regard to reaching the urban coastline by metro in the two cities: in both Marseille and Naples, the highest number of responses falls on the intermediate difficulty value (respectively, 30% and 31% of the users defined the complexity of using this means of public transport as 'within the norm'); however, Naples also denotes a high percentage of negative responses, since 30% of the users opted for the 'very hard' option provided by the questionnaire.

Reaching the coast by car is incredibly easy for Neapolitan users: 42% of the interviewees chose the 'easy' option, and an additional 33% opted for 'very easy', in contrast to a not very significant 2% of the sample who consider this means of transport to be very uncomfortable. A similar situation can be found when it comes to reaching the coast by motorbike or scooter: in Naples, an overwhelming 51% of the users states that this means of transport allows 'very easy' accessibility to the city-sea interface, while only 4% thinks that two-wheeled vehicles are inadequate to go to the sea in the city (about the question 3. *From where you live, how easy is it to reach the shore in the city by motorbike or scooter?*; 2% selected the option 'very hard' and a further 2% chose 'hard'). The people of Marseille, on the other hand, have a different conception of going to the coast by private means, on two or four wheels. In relation to cars, users show a certain homogeneity in their answers: 22% says that getting to the coast by car is 'hard', while 25% and 23% say it is 'easy' and 'very easy' respectively. With regard to motorbike or scooter, there is a greater propensity to use this means of transport, as 32% of the users emphasises its great convenience of use, against a much smaller 12% of the sample ~~who-which~~ says that reaching the coast by motorbike is 'very hard'. In any case, compared to the Neapolitan case, in Marseille, the gap between those who prefer to reach the shore by private means and those who find it uncomfortable is considerably less pronounced.

On the basis of these data, the questionnaire highlighted which of the proposed transport modalities was the favourite of *city-sea interface* users in Naples and Marseille. The survey showed that the approach to mobility in the two cities is diametrically opposed. In fact, Neapolitan users show a discrete appreciation for walking (21%), while the preference for cycling is much weaker, with 6% of the answers, ~~but also and~~ for public transportation such as buses and the metro (respectively, 9% and 6% of the studied sample). The most popular means of transport is undoubtedly the car, with 38% of the responses in favour, while moving around by motorbike or scooter received only 16% of the preferences, although it was perceived as the easiest way to reach the coast. On the Marseille side, the trend is reversed compared to the Naples case: users show much less interest in using cars (5%) and motorbikes (3%); the use of public buses reaches 14% of the preferences, similarly to subways, which account for

15%; undoubtedly, Marseille users prefer to reach the urban coast by foot, according to 37% of the responses, while going to the shore by bicycle totals 22% of the preferences.

In addition to transport preferences towards the urban coastline, the constraints limiting the use of this resource within the city-sea interface of Naples and Marseille were also explored. From the results of the disseminated questionnaire, it emerges that physical barriers seem to be the limitation that users in both cities perceive as least impacting on the enjoyment of the urban sea. In Naples, 28% of the citizens, in fact, believes that physical barriers along the urban shoreline have little influence on general accessibility, while 15% states that they are not an issue at all; however, it should be emphasised that a substantial 27% considers them to be very limiting to the fruition of the coast. On the other hand, the Marseille inhabitants involved in the survey show an even more low perception of physical constraints to the city's water: 27% and 39% of the users consider them to have respectively little or any impact on the use of the ~~urban-coastal~~urban-coastal resource; anyway, 15% perceives physical barriers as a strong obstacle to maritime recreation. In relation to the conditions of pollution along the coast of the two cities, in Naples, 43% of the interviewees perceives them as having a strong impact on maritime recreation (26% even consider them to be incredibly impactful); similarly, in Marseille, 45% of the users perceives a strong constraint in relation to environmental pollution. The results for this type of constraint on the use of the city-sea interface appear firstly much more incisive than the perception of physical coastal barriers, and secondly quite similar between the littoral interfaces of the two case studies. Finally, the perception of eventual legal constraints to maritime-coastal accessibility is analysed. Again, the results that emerged along the Neapolitan city-sea interface tend to highlight a marked perception of the limitation imposed by this kind of constraint: 34% considers it to be ~~quite~~ much limiting, while 17% considers it to be very much limiting for coastal fruition; in any case, the middle option indicating a general indifference towards legal constraints is a relevant figure because it groups together 21% of the total answers. On the other hand, the opinions of the Marseille coastal society are more evenly distributed over the range of possible options regarding the perceptions of coastal legal constraints, while the incidence of users who consider this type of limitation on littoral accessibility really impactful is very low, with only 6% of the answers.

### 14.3. Land and ~~S~~sea ~~U~~ses in the ~~C~~city-~~S~~sea ~~I~~nterface

The study of the functionality of the city-sea interfaces of Naples and Marseille is articulated through an analysis of how the ~~urban-coastal~~urban-coastal society perceives the endowment of public areas near the city's



coastline. Concerning the presence of pedestrian areas or coastal promenades, users in both cities seem quite satisfied with the current situation: 32% of the interviewed Neapolitans declares that the shore of their city is sufficiently equipped with this kind of public spaces, while an important 29% also states that there are even a conspicuous number of them; in Marseille, 35% of users asserts that there is an adequate number of coastal pedestrian areas, although it is necessary to point out that 23% of the interviewees considers the amount-number of such areas along the urban littoral to be low, while 24% believes that the city's coastline does not meet the minimum functional requirements at all.

Regarding the presence of coastal green areas such as parks or urban gardens, the results from the two case studies generally agree on the lack of this type of socio-recreational element along the coastal interface. Both samples of ~~urban-coastal~~urban-coastal society think that parks and gardens are available to a limited extent along the shore, particularly in Naples 41% and in Marseille 36%; it is also worth noting that 30% of the French users emphasises the absolute insufficiency of this littoral function. In any case, 29% of the Neapolitan citizens and 23% of the Marseille citizens consider themselves, on average satisfied with the current situation, while a much smaller number of users thinks ~~to-of~~ an above-average presence of green areas. A similar situation is found with regard to the presence of spaces for outdoor sports activities. 39% of the Naples users defines such public spaces as quite lacking, similar to 34% of the Marseille survey sample, while 36% of the citizens of the Italian case and 29% of the French ones consider them to be totally insufficient. It should be highlighted, however, that a certain percentage of citizens involved in the analysis considers the sports areas along the urban shoreline to be at least sufficient, especially in Marseille, where 27% of the answers in this sense were recorded; in Naples, a more lukewarm 19% emerged instead.

Urban beaches play an important role in this research, yet the perception of their presence is not so obvious within the coastal communities of the two case studies. Users in Marseille consider urban beaches to be below the minimum standard necessary to meet local socio-recreational needs, with 37% of the answers, while 14% of the users considers them to be totally insufficient. 22% of the French sample thinks that the current number of urban beaches is sufficient, while 17% considers them more than sufficient. On the Italian side, the situation is roughly the same: although 26% considers that the city-sea interface in Naples offers a sufficient amount of beaches, only 8% considers this kind of element more than sufficient, while 41% thinks that it is insufficient.

The questionnaire ~~therefore~~, therefore, investigated the needs of users in Naples and Marseille with regard to facilities along the urban coastline and their potential improvement. Marseille users showed a particular aversion to the development of receptive activities such as restaurants or bars: 47% of the interviewees would not like them to

be developed at all, while only 6% would like them to be greatly expanded. In Naples, opinions were more homogeneous: although not the highest value recorded, a good 20% would like accommodation activities to develop a lot; overall, 52% of the users would prefer little or no development of bars or restaurants along the coast, while 22% is indifferent to such development. The possible future installation of facilities to rent nautical equipment (such as kayaks or diving harnesses) is much more appreciated, particularly in Marseille, where about half of the users surveyed would like such a development for the urban amphibious, while 28% shows indifference; only 11% confesses to being uninterested. In Naples, however, there is a warm welcome for a possible increase in such recreational use of the city-sea interface, with 34% of the users declaring very favourable opinions, compared with 24% of the interviewees who is indifferent to the implementation of this activity; however, just over a fifth of the users (21%) shows low interest.

According to the data collected, the needs of citizens in Marseille and Naples diverge sharply in relation to the development of tourist docks and private harbours: the former are particularly opposed to this function (45% of the users would not like to see any further increase in the areas for recreational port activities), although 14% of the interviewees is indifferent to the issue and 18% would be interested in seeing it develop in the future. On the contrary, the Neapolitan case shows a substantial 35% of the users very favourable to the growth of areas for recreational boating; however, 29% is-are generally indifferent to its development, and 16% is-are not very interested in it. The information provided by the questionnaire shows an overall alignment between the desires of users in both cities about the development of spaces for cultural centres or museums, whether traditional or underwater. In Naples, there is considerable interest in cultural facilities on the mainland, with 46% of the users showing interest and 20% also indicating a strong propensity to develop such activities; on the other hand, 19% is-are indifferent to this coastal development. Similarly, 48% of the Marseille citizens appears interested in the development or improvement of museums and cultural centres along the city-sea interface, while a smaller 20% shows indifference and 13% totally disagrees with a potential transformation of the shore in this sense. Possible developments with a view to underwater museum installations also stimulate the interest of the Neapolitans interviewees (35% of the users would like such peculiar equipment to be implemented along the littoral interface, and 31% would like it very much), while 18% shows no particular interest in this kind of facility; the questionnaires disseminated in Marseille show an incredible 57% of the users in favour of the development of underwater museums, while only 17% remained indifferent to this potential development: this figure is interesting, considering that Marseille is one of the very few examples in the world, and the only one in the Mediterranean, to boast an underwater museum currently existing and active in the Anse des Catalans.

The survey aims at this point to deepen the awareness of the activities currently present along the urban coasts of Naples and Marseilles, according to the social need to promote them or possibly regulate them in the future. The interviewees of two city-sea interfaces show a strong desire for having the possibility to walk along the shore: in Marseille, 47% of the answers is-are in favour of implementation, while in Naples, 36% ~~the-efof the~~ users expresses the same opinion, in addition to a more substantial 42% who states to be extremely inclined to the promotion of such an activity in the future. Both samples analysed show awareness of the use of their respective city-sea interfaces in this sense, however, with regard to the use of bicycles, a significant 21% of the Neapolitan users and a milder but still significant 12% of the Marseille users ~~affirms~~ to be unaware of the use of the urban coastline through this function: only 18% of the French interviewees and 20% of the Italian ones are indifferent to the implementation of bicycle use along the coast, while 36% in Marseille and 41% in Naples respectively would like very much to see an increase of this function in the future.

Activities in the water attract great interest in the two cities, as shown by the outcome of the analysis. Concerning the possibility of swimming or bathing along the urban coastline, 47% of the users in Marseille affirmed interest in developing this function of the urban sea to a greater extent, compared with 53% in Naples, which shows an even greater interest, while much lower are the values related to indifference or aversion to this practice; in both cities, however, according to about a third of the two social samples, this recreational action-activity is not allowed or does not take place along the coastal interface. Regarding the possibility of increasing activities such as rowing or sailing and such as diving or snorkelling, the demands between the two cities diverge significantly. People interviewed in Marseille are very keen on the development of these functions (56% of the users defines itself themselves as very interested in rowing, and 46% says ~~it-they~~ would like to see the development of diving and snorkelling activities, significantly outstripping the values of the other options proposed). Generally, the Marseille users involved in the analysis say they are aware of the use of the urban sea for boating activities (80% of the total sample), just as most of them know that it is possible to snorkel or dive along the urban coastline (62% of the total sample). In Naples, 37% of the users would like very much to see the implementation of sailing and rowing, and 31% is-are very much in favour of greater future growth of snorkelling along the urban coastline: however, there is 24% for the former and 27% for the latter who express a general indifference to the development of these activities. The majority of Neapolitan users also state that they are not aware that these two types of activities are generally carried out along the city-sea interface: in particular, 80% of the interviewees do not show any knowledge about diving spots in the city, while 57% of the users believes that sailing or rowing functions are not present in the range of actions offered by the Neapolitan littoral.

Generally speaking, fishing ~~find~~found similar opinions in the two city-sea interfaces: in both case studies, about ~~one~~one-third of the interviewees were indifferent to the future development of this practice along the urban littoral; 17% of the Italian users and 18% of the French users would instead like fishing in the city to be encouraged, while 16% of the Neapolitan sample and 19% of the Marseille sample would like this activity not to be developed further in the future. However, while almost all of the Marseille users claim to know that fishing is legally allowed or at least practised within the city-sea interface, 41% of the Neapolitans ~~states~~ to be unaware of the practice. The survey also showed that the social sample studied for the Italian coast has a very strong interest in the implementation of activities related to guided and cultural tours along the urban shoreline: 33% of the users considers ~~itself~~themselves interested in such a development, and 29% denotes an extremely high interest; 17% appears to be simply indifferent to such a coastal development while only 5% is totally against socio-cultural initiatives of this kind. For Marseille, the situation is more or less the same, as 42% of the users ~~shows~~ a propensity for the future development of this activity, although about ~~one~~one-third of the interviewees ~~shows~~ indifference to it; also, here, a low percentage of users is totally against the development of guided tours (9% of the total). On average, in both cities, it appears that the majority of the interviewed citizens ~~has~~have little knowledge about the current presence of such a coastal practice: in Naples, 62% of the users ~~is~~are unaware of it, while the Marseille residents record 43% of responses coherent with this opinion.

#### 14.4. Perception and ~~F~~future ~~S~~scenarios of the ~~U~~urban ~~C~~coastline

The investigation of the proposed questionnaire seeks to bring out the perception of coastal space and landscape, studying how the ~~urban-coastal~~urban-coastal society of the two case studies interprets the environmental and urban quality of the local coastal context. Specifically, the aim is to interpret the value that the interviewees give to the various parts of urban amphibious involved in the analysis. In Naples, ~~one~~one-third of the users ~~attributes~~ a high value to the built and urbanised area of the shore, while 14% considers it to have very high value; similarly, 41% of the Marseille users believe that the urban shore has a high landscape value for the built environment, compared to 21% who rate it extremely high. In both cities, about a quarter of the analysed social sample considers the urbanised landscape of the city-sea interface to have a neutral quality; only 8% in Italy and 3% in France rate the value of the area very low.

These responses are interesting according to their frequency in certain areas of the Neapolitan and Marseille city-sea interface. Regarding the Neapolitan case study, the interface areas with the highest landscape value were the Posillipo and Riviera di Chiaia coasts. Urban beaches recorded a solid 47% of the responses regarding a high

landscape value for the urbanised environment: the reason probably lies in the fact that they are generally located in the most well-kept urban zones of the shore of Naples. The productive-port areas of the Neapolitan coastline record a generally neutral or low landscape value for the built environment: however, the landscape value of the Bagnoli littoral is nevertheless assessed as quite high by 25% of the users. In Marseille, the dense urban areas (namely the Vieux Port and MuCEM zones) and the Corniche area achieved the most positive results. The Prado area also registers a very significant 35% of the responses describing the surrounding built landscape as very high: it is interesting since it is a large blue-green lung of the urbanised Marseille coastline, but it is also located nearby important architectural elements such as the Château Borély. In contrast, the area of L'Estaque receives a lukewarm appreciation from citizens, who rate the urbanised landscape as neutral by 35%.

Concerning the landscape value of the natural environment of the city-sea interface, the Neapolitan citizens generally consider it to be excellent, like the Marseille users: respectively, 33% and 40% rate it 'very high', while 26% and 33% rate it as 'high'. The neutral value of the natural component of the coastal landscape is attributed ~~by~~ to only 19% of the Italian social sample and 14% of the French social sample. Significantly fewer users in both cities consider the landscape to have low or very low value: however, it makes sense to point out that 17% of the users in Naples still attributes a low rating to ~~the~~ the natural landscape of the local city-sea interface.

Again, it is useful to analyse the frequency of the answers given by the users involved in the field research. As far as the Neapolitan case is concerned, the environmental and naturalistic value is generally very high, even in urban areas characterised by dense urbanisation: the area of urban beaches reaches the highest values, with 50% of the users considering the surrounding landscape value to be very high, while in the Posillipo coast, this value stands at 47%; 35% attributes great landscape quality to the Riviera di Chiaia coast, while in Bagnoli 41% considers the natural landscape to be high. The lowest figure is reached by San Giovanni a Teduccio, where 41% of the users gives neutral quality to the natural landscape, and 34% considers it to have a low rating. In France, the Corniche is the area with the highest landscape value for the natural environment of the coast, with 61% of the responses in favour. The landscape of the L'Estaque and Prado areas shows a very high value for 50% of the users, while the dense urban areas registers 38% of the users who considers the natural landscape value as high, ~~but also and~~ a substantial 30% who rates it neutral.

From the environmental point of view, we analyse the perception that users of the two ~~urban-coastal~~ urban-coastal societies have about some of the main phenomena related to climate risks and the urban sea. Users in Marseille show a strong awareness of the risk related to the sea-level rise: half of the interviewees declared ~~s~~ that this critical issue has a very high probability of affecting the urban coast in the next five years, while 28% considers

it to be mildly probable and only 6% believes it is impossible for such a situation to occur in the near future. On the contrary, in Naples, users were less aware than their French counterparts, with 51% believing that the probability of sea-level rise occurring within the next five years has an average level and 29% considering it unlikely; only 4% believe that this critical event will certainly occur in the near future. Also, for coastal erosion, Marseille users appear more alert to the incipient difficulties that their littoral interface will address in the near future: just over a third of the citizens firmly believes in the impact of this risk on the urban coast in the next five years, compared to 17% who perceives this probability on average level and a small 1% who instead considers the eventuality to be completely implausible. Half of the Neapolitans who were interviewed believes that the risk of coastal erosion is plausible, but only 4% considers the gradual loss of coastal land a certainty, while 23% of the social sample says to perceive the future threat to be slight.

An increase in the frequency of coastal floods is assessed as probable by half of the social sample analysed in Naples, while 34% believes it is not a very plausible eventuality; only 1% assess this risk as a more than sure threat to the Neapolitan coast over the next five years. On the contrary, the citizens interviewed in Marseille show a more varied range of opinions on the subject: 24% assesses the risk as implausible, while 22% considers that an intensification of this kind of environmental threat is probable during the next five years; 28% assesses the hypothesis as very probable, and 25% of the interviewees believes that the Marseille city-sea interface will certainly face an exacerbation of the problem in the short term. Both cities showed widespread disillusionment with the possibility that the next five years will bring an increase in the ecological quality of urban waters and an improvement in marine biodiversity. In the first case, Naples recorded 17% of users completely certain that such eventualities will not occur and 43% showing feeble confidence in such a change in the short term, while only 6% stated with certainty that the urban water quality ~~will~~would improve in the next five years; Similarly, in Marseille, 37% of citizens rates as quite implausible an eventual increase in water quality in the coastal zone, while 34% are moderately confident about it, compared to 15% of the sample who believes that such development is quite likely to happen. In the second case, about one-fifth of the Neapolitan users thinks that the marine biodiversity will not improve at all in the future, and 40% of the sample believes that there are few possibilities for a-positive development in this regard; however, 26% is moderately optimistic; the Marseille users are for the most part not very confident (47% of the sample believes that it is unlikely that marine biodiversity will improve within five years), but it is also recorded that 38% of the users thinks that a-positive development of the ecological issue is likely to happen.

Finally, the questionnaire analysed the social desires of the interviewees regarding the functional evolution of the coast in the next five years, in relation to its socio-recreational functions. Regarding the possibility of reclaiming new walkable spaces from the sea, French citizens show a strong reticence as more than half of them ~~is~~ are against ~~to~~ this scenario; 18% would like the urban coast to evolve in this sense, and only 6% expresses a strong desire in this regard. Neapolitan users also had a similar opinion, with 36% totally against this possibility of urban development and 17% finding it a viable solution; about a quarter of the interviewees ~~expresses~~ expressed an absolutely neutral opinion. With regard to the future possibility of realising floating structures, such as walkways or platforms on the water and solariums, the littoral society in Naples shows considerable interest, with 50% of the users in favour and 16% showing great enthusiasm for the hypothesis; only 7% expresses complete disagreement. For the citizens of Marseille, on the other hand, the possibility of implementing the city-sea interface in the short term with floating structures is not a widely shared scenario: 36% of the users states ~~to it~~ be totally unfavourable, while 21% shows a feeble interest; this potential urban evolution meets a great desire— among only 10% of the social sample.

The two studied samples of ~~urban-coastal~~ urban-coastal society agree on the hypothesis of increasing public spaces for recreation and socialising in the next five years: data from Marseille show that 54% of users would really like a similar development for the city's coastline, just as in Naples 42% of the interviewees shows great interest in such a hypothesis; values about other opinions on this subject tend to be drastically lower in both cities, reaching only 6% in France and 1% in Italy of users that are totally against it. A similar situation occurs with the proposal to design new facilities for bathing, with 44% of the users in Marseille and 34% of the users in Naples being very much in favour of this option; here, too, there are very low values for interviewees showing indifference to this possible development of the urban coastline or even aversion. On the contrary, the opinions of Naples and Marseille strongly diverge on the possibility of further extending the areas intended for commercial activities along the urban amphibious in the near future: 58% of the Marseille users completely disagrees, while only 2% seems to be ~~be~~ completely in favour of this kind of development; although the Neapolitan users who are totally in favour of this hypothesis are only 8%, there is a portion equal to 19% who states to be quite interested in such a coastal transformation, compared to 30% of users who instead remains neutral. With regard to the future realisation of new leisure docks, French citizens appear to be satisfied with the current situation, as 65% of the studied social sample denotes a strong aversion to implementations of existing harbour infrastructures in the short term; Neapolitan users, on the other hand, appear much more interested, with 33% responding in favour of this scenario for the development of the city-sea interface.



#### 14.5. Analysing Coastal Social Demand to Support Policy-makers and Planners

The results of the psycho-social approach showed that in both case studies, the city-sea interface is perceived by users as a resource for social and recreational functions and activities. However, there are morphological and functional differences that generate a peculiar way of experiencing and using the urban coasts in the two cities. First of all, it is possible to find in both Naples and Marseille the same desire to be in physical contact with the urban sea: however, although both ~~urban-coastal~~ urban-coastal societies state that they consider very relevant ~~the~~ access to the city's waters for social and recreational purposes, in Naples, the interviewees tend to frequent the city-sea interface less than the users in Marseille. Moreover, this reflects a paradox that emerged in the social samples of both case studies: accessibility to the sea is often perceived as denied by the presence of constraints to bathing and to the fruition of the shore in general. In particular, the strongest constraint identified by the psycho-social analysis is maritime pollution and poor ecological water quality in the city. In spite of this, it is possible to find a similarity between the urban coasts of the two cities, namely the generally high landscape value attributed to both urbanised and naturalistic areas of the city-sea interface: it should be noted that the environmental quality is high even in points of the littoral that are densely built, as the population of the two cities strongly perceives the presence of the maritime element as a mitigating factor of the anthropic components existing along the urban coastline.

The urban coasts of the two Euro-Mediterranean cities present different degrees of accessibility to the coast, due to obstacles of a physical nature as well, necessarily influencing the frequency of visits to the sea in the city: according to the data collected, these limitations influence the Italian case more than the French one, as Neapolitan users tend to visit the urban coast less often for recreational purposes also due to these constraints. This element leads to a different perception of the activities that are allowed out along the city-sea interface: Marseille users seem to be more aware of the possibility of carrying out recreational activities along the shore, such as boating ~~but~~ also and fishing, swimming or snorkelling. It is clear, however, that this does not prevent the Neapolitan community from expressing the same socio-recreational needs related to the sea and the coast.

From this, it follows that the Marseille and Naples littoral interfaces also differ in their vision of the public coastal space. The Marseille users were particularly reluctant to accept changes to the urban coastline linked to commercial or accommodation or restaurant sector, unlike their Neapolitan counterparts in the survey: in Italy, it seems that the possibility of a transformation oriented towards profit and an increase in tourism can be combined

with the recreational offer for local users. Similarly, different opinions have been recorded about the possibility of enhancing infrastructures related to pleasure boating and sailing; the meeting point is found in the common interest for the hypothesis of installing more public facilities that allow for community use of the coastal resource. In both case studies, the future possibility of having more spaces for outdoor sports and bathing activities is welcomed, but users from France and Italy disagree about reclaiming walkable land from the sea or realising floating elements for socio-recreational purposes, indicating a different understanding of the evolutionary dynamics of coastal areas. It is interesting to note that although Marseille has experienced several permanent modifications of the coastline in its recent history (think of the transformation of the Prado bathing area), the users of this city do not approve of the possibility of further changes to the shoreline profile, unlike the citizens of interviewed in Naples.

From the environmental point of view, the users interviewed in Naples and Marseille share the same doubts about the future environmental improvement of the city-sea interface: both of the analysed social samples show a certain reticence in believing that in the short term, the environmental quality of the urban coastline can be increased, just as they believe that marine biodiversity is unlikely to be enriched. However, they have a different understanding of the risks linked to climate change and the threats coming from the sea that undermine the development of the urban amphibious: in particular, the answers provided in Naples show a general lack of awareness of the effects of phenomena such as coastal erosion or the progressive sea-level rise, or at most a general indifference; on the contrary, in Marseille, a more solid attention to contemporary environmental criticalities emerged.

The use of the psycho-social approach is thus useful in assessing the social representation of ~~urban coastal~~ urban-coastal society: its needs can be empirically studied through a socially variegated sample, analysing the degree of connection between the city and the sea. This type of investigation allowed the comparison of the coastal interfaces of two large cities within the Euro-Mediterranean basin: as shown above, the flexibility of the approach enables the structure of the analysis method to be specifically shaped for benchmarking activities between other coastal urban realities. Although the two case studies present similarities, it is evident that the social demand is different; however, it emerges a marked propensity to implement public interface space for sociality that should be more integrated within the management and planning of coastal space. In fact, in addition to the comparison of the case studies, which provides relevant analytical insights, the data collected can be included within the design and urban planning processes to diversify the functional offer of the city-sea interface from a community perspective, through social listening and interpretation of the social demand. In this way, the analytical

tool becomes an operational basis that can concretely support the decision-making dynamics and the planning of the coastal public space in an adaptive manner.

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**Conclusions | RESEARCH PERSPECTIVES**

## Research ~~R~~results: ~~O~~vercoming ~~\_~~Large ~~S~~scale ~~C~~oastal ~~P~~lanning for ~~L~~ocal ~~S~~socio-~~E~~environmental ~~W~~well-being

Contemporary coastal cities are characterised by the increasingly complex issues that mainly influence the development of the most densely urbanised and inhabited ones. The research has investigated issues related to the use of social spaces within a complex urban context, such as the city-sea interface, proposing a systemic interpretation of its peculiar characters and deepening technical-operational tools to mediate common dynamics within the innovative maritime spatial planning and the more traditional coastal land planning. Specifically, the Euro-Mediterranean context is particularly interesting due to the presence of a very high demographic concentration and crucial socio-cultural, landscape and environmental values. The originality of the doctoral thesis lies precisely within this branch of the urban planning discipline, which is currently at the centre of the scientific debate on the sustainable evolution of coastlines. The proposed theoretical declination revolves around the hinge of social demand for public space that can be equally enjoyed by the coastal community, in accordance with the current ecological transition, which imposes, on the one hand, the use of nature-based solutions that minimise impacts on coastal areas, and on the other an adequate level of attention to planning adaptation strategies in relationship with the constantly worsening climate context. The main outcomes of the present study are therefore described, in the context of the aforementioned critical issues.

*1. The city-sea interface concept can be read as a synthesis of traditional coastal spatial planning and the more innovative maritime spatial planning, integrating land-sea interactions within management and planning processes.*

The city-sea interface is characterised by the presence of complex social and ecological relationships that influence the local communities on a daily basis and that have determined its peculiar urbanisation. The effects of these phenomena are clearly reflected ~~on~~in the liveability of the urban coastline, ~~but also and~~ ~~on~~in the environmental system, composed equally of the terrestrial and marine sides of the shore. As a matter of fact, the city-sea interface, in the sense of urban amphibious, hosts the community dynamics underlying ~~urban-coastal~~urban-coastal society and, at the same time, the stratification of coastal plans that are not always coherent and homogeneous. The objective of this theoretical concept is, therefore, to bring out the littoral flexibility, exploiting its potential from a planning perspective, but at the same time to define a methodological order for the management of the three edges composing the city-sea interface, described in the chapter 1 of this text: the maritime sphere of the

sea edge should therefore not be considered as disconnected from coastal land use planning, just as the maritime city edge constitutes the functional link between the inner areas of the extended city edge and the water system, from a socio-cultural, touristic, ecological and environmental point of view. In this context, open spaces, urban green areas, proximity public spaces, as well as maritime areas near the shore with cultural and recreational functions or potential represent opportunities for ecological planning, paving the way for the social and sustainable design of coastal areas in highly urbanised areas, transcending the ephemeral spatial limits between land and water: indeed, the context of the urban littoral is becoming increasingly inclusive, encouraging planning actions that provide users with a physical-visual connection to coastal-marine environments through ecologically dynamic and multifunctional spaces (Beatley, 2018). It is also true that in coastal spaces, both terrestrial and maritime, many different uses coexist, often concentrated in a relatively small area, including littoral tourism, cultural functions related to heritage, protected areas, fishing, aquaculture, ~~but also~~ mining and energy collection, military uses and transport of goods and passengers. The importance of ~~a careful but~~, at the same time, flexible regulation that allows the fruition of resources and the protection of the environment becomes evident (Barbanti et al., 2015). In this sense, coastal management can benefit from the adaptive character of the urban amphibious in order to efficiently orient land-sea interactions in the context of maritime and coastal spatial plans. However, as highlighted in chapter 7, ~~little few~~ steps have been taken in most of the Euro-Mediterranean countries considered in this study. France has shown a greater propensity for this type of innovative planning of the maritime and littoral space, through the *Stratégie Nationale Pour la Mer et le Littoral*: this instrument emphasises the issues of ecological transition and water quality, ~~but also~~ the socio-tourist organisation of the shore and the sustainability of sea uses. France can thus be a model for the other analysed states that are moving, at different stages, towards ~~an~~ organic and cohesive management of their coastal maritime domains, approaching international cooperation processes.

*2. At present, maritime spatial planning suffers from a lack of real implementation at the local scale, making downscaling necessary to bring the issue back into the social and community perspective of the urban amphibious.*

The public spaces within the city-sea interface are linked to the interests of different categories of stakeholders, with regard to the land and the water-side. However, one of the critical nodes of the integration between land-based urbanism and modern maritime spatial planning concerns the difficulty for the users of the ~~urban-coastal~~ urban-coastal society to perceive tangible effects on the littoral territory, limiting the interest and motivation of the community that should instead be concretely involved in such processes. In fact, strategic

orientations often appear to be cast from above and tend to be defined at the national or regional level rather than at the local scale (Zaucha & Gee, 2019). This clearly implies different levels of understanding of policies drafted to incorporate land-sea interactions within conventional planning instruments, especially in the present context where traditional land-use planning and maritime spatial management may diverge sharply, undermining the overall functional cohesion of the city-sea interface: it is, therefore necessary to organise in a conscious manner different requirements at various scales within the articulated coastal planning system (Morf et al., 2022). In order to implement maritime-coastal spatial plans, downscaling processes that bring the attention of administrations and planners back to the local interests of communities are crucial. In order to ensure an integrated development of the urban amphibious, it is necessary to produce development scenarios of the desired land and maritime activities, with the aim of directing functional growth towards socio-ecological sustainability, analysing the peculiar environmental characteristics and expected impacts, mediating existing conflicts and enhancing synergies between uses and social groups of the ~~urban-coastal~~ urban-coastal society. In this sense, the tourist-cultural sphere can act as an engine for economic development without compromising the natural resources and coastal commons offered by the city-sea interface. The comparison between similar cases can provide important indications on how to operate in favour of the coastal defence, positive delocalisation of coastal and sea uses and environmental protection: the socio-recreational functions can be coherent with low-impact technologies, such as sustainable energy production (such as thalasso-thermal energy), ~~but also~~ and with activities like fishing or non-intensive fish or mussel farming (this is a traditional activity in the area of Lake Fusaro, discussed in chapter 9.4). All these elements are consistent with the principles of blue growth on a local scale, provided that these functions are logically organised in relation to the most intensive uses of the urban littoral, such as port activity, and that targeted measures are identified to safeguard the coastal environment (Barbanti & Perini, 2018). From an operational point of view, the downscaling process involves the identification of data to describe at the local scale the urban amphibious: the integration of existing datasets with specific elements related to the socio-recreational use and geomorphological characters of the urban coast can define an important analytical starting point for future plans and projects.

*3. Bringing urban amphibious planning back to the human and local scale favours the development of high-quality proximity public spaces, responding to the social demand for urban well-being and to the ongoing ecological transition.*



The emerging social demand for proximity public space goes hand in hand with the gradual scale reduction required by coastal planning: from a community and recreational point of view, it has emerged how the ecological areas of the city-sea interface can satisfy the specific needs of ~~urban-coastal~~urban-coastal society in terms of sociality and urban well-being. The concept of proximity, and therefore of small scale, within the interface project can be a valid element in mending the flaws inherent in ~~urban-coastal~~urban-coastal society, linked to unequal ~~accessibility~~ to the sea and its resources. The possibility to access, within a short distance, areas available for human interaction and enjoyment of coastal naturalness in the context of large cities is part of the 15-minute city theme (Moreno, 2020a) and allows to reduce the need to move outside the main urban cores for the fruition of high-quality littoral assets, in the perspective of the ongoing ecological transition; at the same time, it protects the right to relational proximity, that is, the character that public spaces must necessarily offer in terms of sociality with other individuals, strengthening the shared identity of the community (Manzini, 2021). Such reasoning gains even more value in relation to the post-pandemic period in which we live and which has stimulated reflection on the distributive justice of places, as well as their wholesomeness: the impact of this unusual criticality has transformed even open spaces into a kind of gated communities, urban islands where sociality can be at risk but can also constitute a risk (Kleilein & Meyer, 2021). Health effects are thus one of the cornerstones that the ecological planning of the city-sea interface must promote. In this sense, a responsible design of urban shores can provide efficient solutions, calibrating the amount of access to urban water, fairly sizing social spaces and mending the unstable connections between green zones, dense areas and closely related coastal spaces in order to consolidate them within the broader framework of green-blue infrastructure within the field of ecological planning. As we have seen, it is precisely the open and less urbanised spaces that ~~is~~are more prone to transformations, a potentiality that can easily turn into a weakness in relation to both the interests at the base of coastal functional competition and the growing environmental criticality. On the basis of the reasoning of ~~c~~Chapter 3, it is necessary to emphasise an integrated approach that recognises the existing interdependencies between environmental, social and technical factors, recognising at a multi-scalar level the potential vulnerabilities of the different areas of the coastal interface. Adaptive environmental planning requires ~~to-manage~~managing the coastal resource carefully, considering existing social and institutional arrangements and user awareness in relation to the new environmental condition (Lloyd et al., 2013). The recomposition of maritime-coastal ecosystems through the active involvement of ~~urban-coastal~~urban-coastal society can thus lead to a more equal and rational organisation of public spaces and the related coastal commons, limiting the effects of environmental risks, also by exploiting technologically innovative solutions. This clearly has an important influence on the inclusion of the dynamics of land-sea interactions within the ecosystem approach to maritime-coastal spatial planning, introducing such criteria into the governance processes

that should facilitate their implementation (Bałowski & Nyka, 2022). The results of the study set out in Chapters 4 and 6 show, however, that France once again represents the most advanced model in the field of ~~urban coastal~~ urban-coastal planning and management for social and recreational purposes; in the Euro-Mediterranean context, as it transposes EU directives and at the same time limits negative changes on coastal land as much as possible, establishing specific regulatory systems aimed at liberalising public coastal space and improving the supply of socio-recreational services. The Italian case, on the other hand, appears particularly complex; since the coastal management matter still seems vague and is burdened by Community sanctions.

*4. The proposed methodological framework, applied to the city-sea interfaces of Naples and Marseille, offers indications for planning downscaling, interpreting the needs of ~~urban coastal~~ urban-coastal society in the light of the existing normative system and the spatial-functional features of the urban amphibious.*

From an operational point of view, the definition of the methodological framework, described in ~~c~~Chapter 10, allows ~~to~~ for the simplify-simplification of benchmarking operations between similar urban coasts belonging to the same geographic-functional context. Within the Euro-Mediterranean context for which it was conceived, this approach allows for the analysis of the regulatory and governance processes currently active along the reference city-sea interface; in order to implement the active participation of ~~urban coastal~~ urban-coastal society within current coastal planning, consequently improving the social aspects of urban amphibious. The analysis of the relationships between land and sea, conceptualised by the spatial components of the city-sea interface, can be carried out through the geographic and psycho-social components of the framework, which brings together different types of approaches to verify, on the one hand, the existing social demand in terms of areas usable by the local community, and on the other hand the actual functional, environmental and morphological availability of the urban coasts to host present and future functions of urban sea resources and littoral places. In chapters 12, 13 and 14 of this text, the approach was used, on an experimental basis, to compare the normative, functional, morphological and social characteristics of the coastal interfaces of Marseille and Naples, understood as large coastal cities whose actual similarities and differences in the management and community perception of the coastal public space have been analysed. From the regulatory point of view, the study showed that Marseille presents a range of directives and plans aimed at the qualitative improvement of the city-sea interface, taking care of its different aspects (social, recreational, environmental, and cultural). Naples, on the other hand, tends to be static, with the presence of numerous projects that have remained on paper; moreover, it has to be highlighted the unusual administrative overlap between the municipal authority and the port authority with regard to the management of the maritime

domain: if this leads to a general municipal lack of interest in the development of certain coastal spaces intended for the ~~urban-coastal~~urban-coastal society, it is nonetheless evident that the Port Authority itself outlines, at least at a strategic level, guidelines for the reconnection of land and sea from a social point of view. In both cities, however, coastal transformations mainly result from top-down planning. Geographically, it emerged that, in part, the different management of the city-sea interfaces of the two cities depends on the morphological conformation of the urban coastline, specifically of the maritime city edge, the middle area of the city-sea interface, considered as the connecting element between land and urban sea where the main socio-environmental coastal interactions are concentrated. Marseille presents a particularly reduced maritime city edge in terms of size, as its transit road (the first road infrastructure parallel to the coast that interrupts the ecological and functional continuity within the littoral interface) is very close to the coastline; moreover, the central portion of the study area is occupied by the massive Grand Port Maritime de Marseille. In spite of this, the French city demonstrates a certain ability to organise the reduced spaces for bathing and outdoor sports activities. In Naples, the maritime city edge has a larger surface, especially in the Posillipo area, but accessibility to the coast is often blocked by obstacles of various kinds (linked to the privatisation of coastal spaces or to the aforementioned governance dynamics); besides, it is not uncommon that the spaces destined for social use are lacking in terms of public services and equipment. Both in Italy and in France, however, there is a limited percentage of public spaces destined for ~~urban-coastal~~urban-coastal society: Naples, although less evolved from a planning point of view, nevertheless shows a wider spatial potential than Marseilles, as well as greater coastal naturalness. Finally, from a psycho-social point of view, the survey showed that in both cities, the city-sea interfaces possess great value for sociality and recreation in the eyes of the users involved in the fieldwork. In any case, Neapolitans are less likely to frequent the urban coastline than their counterparts in Marseille, even though in both case studies, there is a shared perception of inaccessibility to the sea, mainly due to poor water quality and environmental pollution: the data show, however, that the landscape quality of the built and natural environment of the urban amphibious is considered of great value by the French and Italian samples. On the basis of the information collected in different areas of the urban coasts of Marseille and Naples, it is possible to state that the methodological framework can also be considered as a possible solution to the abovementioned downscaling problem inherent in the implementation of coastal-maritime spatial planning. Indeed, as mentioned above, maritime spatial planning still has to deal with a very large scale of application and needs to downscale at the local level in order to actively involve stakeholders and efficiently organise community uses by incorporating land-sea interactions into the drafting of plans. The innovation of the methodological proposal lies in the possibility of reading the city-sea interface data as an analytical basis for understanding socio-ecological demand from a planning perspective, serving as an operational support for downscaling future coastal projects,

plans and policies. In fact, the analysis has shown an interesting social and functional cross-section regarding Marseille and Naples, highlighting merits and demerits of the current regulatory framework and how the ~~urban coastal~~ urban-coastal society perceives the actual organisation of uses, the coastal landscape and the environmental conditions: these elements can be read as an information structure at the basis of the future planning development in a socio-ecological perspective for the two cities and for the city-sea interface.

## Future Perspectives. Indications for Implementing the Methodological Framework to Ground of Coastal-Maritime Planning and Management

Within the research process, the methodological framework was designed to study and understand the emerging needs for public space and places of sociality, in relation to the morphological and functional characteristics of the city-sea interface and the regulatory frameworks in force, taking into consideration the increasingly topical climatic issues: this is also linked to the particular pandemic timeframe during which most of the doctoral work was carried out, a period that highlighted the importance of allocating a fair use of ~~the~~ places in the context of the urban amphibious. From a planning point of view, the research offers several possible hooks to further develop the presented themes and broaden the scope of the study, ~~thanks,~~ moreover, to the strongly multidisciplinary context of the co-tutelle research.

In fact, the methodological approach described has a high degree of flexibility and adaptability: this allows the field of research to be extended to further functional areas of the city-sea interface. As described in ~~the~~ Part One of the thesis, the city-sea interface encompasses interactions between the environmental system and the urban-anthropogenic system: these can diversify into numerous branches of ~~urban-coastal~~ urban-coastal uses. Functions such as non-intensive fishing, transport by land or sea, aquaculture and mussel farming can be included in the list of fields that can be analysed with the proposed framework; in a perspective of sustainable and ecological development, these uses of the coast and the sea could provide an important benefit to the wider coastal system. From the psycho-social point of view, the framework can be calibrated to explore the needs and perceptions of different types of users, in different geographical contexts: the variation of the survey model applied to the case study of Bacoli, whose living lab is still active, has demonstrated the method's adaptability to different coastal realities, even smaller ones. From a geographical point of view, it is possible to extend the layers composing the spatial data model in order to create shared databases on the main coastal urban centres within the Euro-Mediterranean basin. It is also conceivable to include environmental aspects of the city-sea interface in a more in-depth manner, such as water quality or climate risk elements. In relation to the latter parameter, ~~reef~~, the analysis of the direct or indirect impacts on the public littoral space caused by the growing environmental crisis may benefit from an information system that relates the different interdependent systems composing the city-sea interface, helping urban planners and policy-makers in estimating the best planning solutions and responses to face direct or indirect damage to the natural, social or even economic spheres of the urban amphibious: the geographical approach of the present research could thus evolve into a proactive support to ecological planning (Raven et al., 2018).

Beyond its use as a benchmarking tool (which, in any case, constitutes an important output of the doctoral study), the methodological framework can be read as an attempt to provide a solution to the issue of downscaling for maritime-coastal spatial planning. The attention paid to the interpretation of the demand for spaces dedicated to sociality and the landscape-environmental perception of the city-sea interface and its criticalities can, in fact, offer an important analytical contribution ~~for~~ to the drafting of future plans aimed at the integrated and ecological implementation of urban coasts. The analysis of the existing legal framework, the geographical approach, and the psycho-social approach can, in fact, be combined in a complementary way in order to elaborate a unified operational method that can elaborate spatial-functional data with social perceptions, integrating this knowledge with the framework of currently existing policies and plans. The integration of ~~the~~ these approaches could allow ~~to identify~~ identifying neuralgic hotspots along the city-sea interface, descending with even greater precision to the urban scale, spatially localising the perceptions and needs recorded by field surveys and cross-referencing them with spatial data, verifying the actual lack of services, interpreting the characteristics of the urban littoral in order to verify the feasibility of interventions on public spaces and maritime domain, in accordance with current regulations and any policy and plan in progress. According to the principles of environmental psychology and landscape research, in fact, the transformation of urban land is related to the attitude that users show towards a given change, a factor that strongly influences the success of a given intervention; but can also direct future planning choices: this is particularly relevant to the blue-green space project, as the combination of quantitative data, obtained from geographical mapping and the elaboration of questionnaires disseminated among citizens, can stimulate the qualitative analysis for the re-functionalisation of ~~urban~~ open urban areas, taking into account the multidimensional variables that each user attributes to them (Stessens et al., 2020). Clearly, these are highly collaborative techniques; which link the various branches of the approach: the characteristics of the existing coastal public spaces can condition the formulation of the psycho-social survey, just as the wishes expressed by the users (and the normative indications) can determine how the data are collected and how the layers of the spatial data model have to be defined (Balram & Dragičević, 2005).

This methodological framework could also be related to the use of other small-scale digital tools and technologies to concretely and operationally implement downscaling processes aimed at maritime-coastal spatial management, from the planning of spaces to the definition of ~~the~~ specific functional elements. The aim is that the proposed approach can become a support basis for local planning; within the framework of already existing coastal tools: referring to the case studies of the research and, in particular, to chapter 12 of the text, in Naples, the framework could stimulate the application of the *Piano Attuativo di Utilizzazione delle Aree del Demanio marittimo* (PAD), providing useful information for the allocation of concessions and the definition of spaces to be designed, in

accordance with the desires of the ~~urban-coastal~~urban-coastal society; in Marseille, ~~an~~ integration with the *Plan Plages et Littoral* can be hypothesised, which could become in this way more efficient in the identification of critical points of the coast and in the location of potential new accesses to the maritime resource and services related to the landscape, environmental and socio-recreational enhancement of the city-sea interface.

Therefore, with the objective of implementing the proposed methodological model, in view of the conceptual outcomes that emerged from the research, the further improvement of an analytical and design approach for the city-sea interface is identified as the main axis of future development. Since the methodological framework offers the possibility of reading the urban amphibious from a legal, environmental, planning and social perspective, it could be useful as a base for sustainable planning of the coast and the urban sea that respects the local scale of littoral uses proper to the ~~urban-coastal~~urban-coastal society, which has an increasingly central role within these complex management processes.