

# Chapter 15

## Coastal Vulnerability: Sustainable Settlements for Outdoor Tourism



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### 15.1 Italian Coasts in Transition

Today, coastal areas of the Italian peninsula have to deal with the impacts deriving from an intensive anthropization, despite the natural environment and landscape heritage. With a total length of 8300 km, 7500 km of coast remains natural (Isprambiente, 2019). This means that more than 9% of the Italian coast is now artificial<sup>1</sup> (Isprambiente 2019). The very nature of the coastal environment, which is dynamic, generates natural processes that, when added to those of anthropogenic origin, can modify its natural and biological characteristics, making the coasts extremely vulnerable territories. Despite the continuous natural evolution of this type of landscape, anthropic action is today the main cause of coastal erosion phenomena, significantly modifying the Italian coasts over the last 60 years. A significant part of these processes, particularly of the erosive type, is due to the anthropization resulting from the growth of tourism. A relationship between tourism and the landscape that has become increasingly conflicted since the 1950s. This

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<sup>1</sup>This data is given by ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale) that is an Italian public research body supervised by the minister of environment and of the protection of the territory and the sea. The institution carries out a number of tasks of national interest for the protection of the environment.

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is when, in just a few years, the transition from low impact tourism to mass tourism took place, with an invasion of the coasts of the peninsula. The phenomenon led to the birth of the so-called “Med Wall” (EEA, 2006, p. 55): the overbearing urbanization along the Mediterranean in which a large part of the coast is dominated by concrete; mostly low-quality urbanization and mainly of a residential, tourist and seasonal nature that has largely forever changed the Italian coastal landscape. From that moment, not only did the seaside tourism demand have an exponential growth that is still significant today, but tourism in seaside resorts will become the dominant economic sector. In Italy, coastal tourism represents the main driving force of the national tourism economy; between 2016 and 2017 Italian tourists in seaside resorts accounted for 37.3% of the national total, while foreign tourists, 27% (Isprambiente, 2019).

Over the years, the mass phenomenon has led to a process of homogenization of the built landscape (as in the case of Rimini, Bibione, Lignano along the Adriatic coast of the peninsula), as well as its disfigurement. If we consider tourism in its various components of movement, stay and recreation, the vastness of the phenomenon emerges on different levels: landscape, environmental, territorial and socio-economic. The process of overbuilding the coasts in an attempt to respond to the unstoppable demand for seaside tourism has caused a significant exploitation of natural resources and the consumption and modification of coastal landscapes, weakening the coastal ecosystem. If in the years of the mass tourism boom there was a lack of sensitivity towards the coastal heritage, today there is awareness, and the consequences of that “urban tsunami” (Forman 2008, p. 265) are evident: erosion accelerates the mutability of the territory; soils and waters have become polluted and the ecosystem has lost its ecological balance, compromising biodiversity. In addition, coasts have to face the effects of climate change, which are causing a rise in sea levels, the perceived temperature on land and on the surface of the sea, as well as an increase in the frequency of extreme events that cause flooding. Uncontrolled and unconscious urbanization leading to these ongoing dynamics undoubtedly make these portions of the territory extremely vulnerable and unable to manage the “side effects” caused by the process itself. The consequences of this “trend” of uncontrolled landscape tourism are not just limited to the areas overlooking the coasts, but also include, even if in a different way, the innermost areas of these territories, which have experienced some effects of impoverishment. The tourist phenomenon has over the years in fact used a selective development approach that has almost exclusively included the development of the areas closest to the coast. This has led to a substantial fracture in the territorial dynamics in which a series of environmental and socio-economic disadvantages are reflected. Part of the territory that is today characterized by seasonal seaside tourism constitutes portions of territory defined as fragile: far from basic services (education, health and mobility) and from the main inhabited centres, and falling within the national strategy for inland areas subject to depopulation and environmental vulnerability.

### ***15.1.1 Towards Sustainable Tourism: Impact and Potential***

The dynamics taking place along the Italian coast caused by increased seaside tourism is inevitably worrying. Until 2019, forecasts had foretold an increase over the years of tourist arrivals in coastal regions; however, almost two years after the global health crisis due to the spread of the SARS-CoV-2 virus, future predictions are inevitably uncertain. In fact, tourism has been one of the most affected sectors in the current pandemic, with a considerable drop in international tourists. Despite this, data in Italy shows how the open-air tourism sector (i.e. structures that provide accommodation in their own settings, such as bungalows, tents, mobile homes owned by the structure, or camping pitches owned by tourists) has recorded less of a decrease when compared with other types of accommodation facilities. According to ISTAT<sup>2</sup> data, during the first year of the pandemic, hotel facilities (permanent structures) in Italy suffered a significant decrease in arrivals, verifying that between 2019 and 2020 there was a total decrease in tourists equal to 58%. Similar data has been verified for bed and breakfasts, which saw a 53% drop in guests. Despite this decrease, the open-air tourism sector saw a smaller decrease, equal to 40%, between 2019 and 2020. If there were approximately ten million tourists in 2019, in 2020 they were around six million. It also should be noted that before the pandemic, open-air accommodation facilities were largely oriented towards foreign tourism, while in 2020 the percentage of Italian tourists using these facilities has increased, expanding the market to new potential users. This data demonstrates how the pandemic has changed tourists' choices to preferring greener holidays and more contact with nature, which has become a necessity. The long quarantine period that families have had to face has certainly pushed many towards the search for a holiday within nature and has highlighted the need for safety from the spread of the virus even more, resulting in the choice of open-air accommodation. Open-air hospitality has therefore proved to be a valid alternative for living the holiday experience during the pandemic and this trend undoubtedly puts new challenges in front of us for a more sustainable tourism.

Sustainable tourism is, in fact, a theme that the International Community has been committed to promoting for years and constitutes one of the objectives within the UN's Agenda 2030. SDG 8 "Decent Work and Economic Growth" encourages to implement policies aimed at supporting sustainable tourism by 2030; SDG 12 "Responsible Consumption and Production" affirms that the development and application of tools to monitor the impact of sustainable tourism will translate into better economic, cultural and environmental results; SDG 14 "Life below water" promotes a sustainable use of the sea and oceans. It should also be highlighted that Europe is promoting the Green Deal, a series of policies to encourage a climate-neutral society through an action plan for a sustainable economy by 2050 in which all member states must commit to battle the effects of climate change and

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<sup>2</sup>ISTAT (Italian National Institute of Statistics) is a public research body that produces official statistics, measuring and analysing collective phenomena in Italy.

environmental degradation by acting for a circular economy; these actions are intended to make significant changes also in the tourism industry. The direction of the European policies is clear, and initiatives such as “The European Destination of Excellence (EDEN)”<sup>3</sup> represent an accelerator for the transition towards sustainable tourism. Although the European Community has been promoting alternative tourism models, sensitive to the landscape and environmental impact for years, the pandemic phenomenon is certainly accelerating this type of development. What we are experiencing is a crucial moment for the future of the Italian coasts, for their conservation and undoubtedly for the relaunch of a sector of the economy that is still facing a serious crisis. A new design approach can promote the sustainable development of coastal areas by integrating the tourism-landscape combination as an opportunity to enhance the natural and cultural heritage and counteract land consumption.

Although open-air tourism is more sensitive to issues of sustainability and environmental impact, the open-air accommodation facilities located along the coastal areas of the Italian peninsula are almost always atopic and unable to act as elements capable to build the landscape combining nature and the built environment. The consequence of an approach that has often been purely functional until now led to the creation of low-quality and inaccessible open spaces, the absence of a relationship with the context, and an absence of a specific character for that place. In the awareness that tourism is often the main sector that supports the economy of maritime contexts, the right answer for sustainable open-air tourism consists of defining a new type of landscape that welcomes the demands of contemporaneity and guarantees the long-term care of the territory.

### *15.1.2 Different Issues for Different Italian Coastal Areas*

Given the extent of the coastal area in the Italian peninsula, the research work has identified two different contexts of reference for specific areas characterized by different environmental conditions, in order to verify possible settlement solutions for sustainable outdoor tourism using an innovative approach. It follows the choice of two areas located along the east coast of the Italian peninsula overlooking the Adriatic Sea, in particular in the Veneto region and the Emilia Romagna region (see Fig. 15.1), the two most attractive regions of Italy for outdoor tourism, characterized by different geographical, economic and cultural situations, and particularly exposed to vulnerability.

**The Emilia Romagna Region.** Considerable erosion phenomena on the Emilia-Romagna coast already occurred during the 1960s, a period in which strong tourist development was already underway. The “Commissione De Marchi del 1970” study

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<sup>3</sup>Eden is an initiative of the European Commission aimed at cities between 25,000 and 100,000 inhabitants belonging to EU countries or COSME countries that have adopted strategies to promote sustainable tourism in order to select pioneer destinations.



**Fig. 15.1** Map of Italian Peninsula with Veneto region and Emilia Romagna region highlighted (Credit: AUDe Lab, University of Pavia)

proved that the phenomenon had been in progress for 10 years. The extraction activities of the quarries also contributed to the phenomenon, but the biggest contributor was the construction of “invasive” and rigid defence artefacts that had spread to be 77 km long by the end of the twentieth century (Gruppo Nazionale per la Ricerca sull’Ambiente Costiero 2006a, b). These interventions have altered the natural coastal system by degrading the dynamic nature of the coast. This has contributed to an acceleration of the regressive phenomenon of the coast, which we are trying to remedy today. Regional data referring to the year 2012 shows the presence of 44 km of coastline erosion ( MATTM-Regioni, 2018). Between 2000 and 2012, the loss of sandy shore is estimated to be 540,000 square metres (MATTM-Regioni, 2018). Looking at the data over a longer period of time we can understand the urgency of the crisis: between 1960 and 2012, the Emilia Romagna region lost about 13 million square metres of beach, a loss equal to 37% of the total in the nation (Minambiente, 2017).

**The Veneto Region.** The entire coastal area of the region has undergone a strong development in the seaside tourism sector since the 1960s, which has resulted in a high consumption of land in various coastal portions. The artificialization of the coast has also destroyed many dune alignments of particular naturalistic

importance. As in the Emilia Romagna region, in order to cope with the consequences due to the modification of the ecosystem, rigid systems of defence have been developed over the years. In the last 20 years the coastal situation has worsened, with a constant growth of the erosive phenomenon: in 2006 the erosion affected 25 km of the Veneto coast (Gruppo Nazionale per la Ricerca sull' Ambiente Costiero, 2006a, b); from 2007 to 2012 the presence of 52 km of coastline erosion has been recorded ( MATTM-Regioni, 2018), and a loss of shore equal to 870,000 square metres.

In both regions, the coastal system is no longer in equilibrium and, among the fundamental causes that have triggered various phenomena, including erosion, there is the presence of rigid systems of defence (such as artificial cliffs). The current condition of the coasts necessarily leads us to reflect on interventions that do not compromise a natural system like the coast. The goal of the interventions must be to maintain the natural defence structure inherent in this type of landscape as much as possible.

The search for a new project proposal for the already consolidated sector of outdoor tourism wants, on one hand, to call into question the settlement methods and strategies adopted for the construction of open-air structures along the Italian coast until now, and on the other hand, to enhance the potential of this type of tourism, which, compared to the ordinary type of accommodation (such as hotels), certainly works with nature. Aware of the fact that tourism is necessary, both for the community and the local economy, as well as for the enhancement and management of the territory, the reflection starts from the idea that there is the possibility of intervening on the landscape sensitively and without altering its natural balance. The Global Code of Ethics for Tourism, in fact, recognizes tourism in nature, or ecotourism, as forms of enhancement and also of enrichment when responding to the request for hospitality; they respect the natural heritage and enrich it.

The presence of places with special characteristics, with singular landscapes between sand and sea, requires particular attention. Furthermore, the tourist propensity of these places, which leads them to be lived in only for certain seasons of the year, requires the search for new functions that can extend the period of stay. The coastal areas of Veneto and Emilia Romagna in fact undergo a high concentration of tourists during a few months of the year, a concentration that becomes a real phenomenon of congestion followed by the effect of “ghost town” for the rest of the year. The objective of the research reflects on possible settlement methods and on a functional programme that can allow coastal areas to be experienced for a prolonged period.

Can outdoor tourism reduce the vulnerability of coastal areas?

The starting point is the outdoor tourism sector; the problem is the high environmental, social and economic vulnerability of coastal areas; the point of arrival is sustainable tourism.

## 15.2 Methodology: Which Method? Which Goal?

At the foundation of the research on such a delicate and complex issue, which includes vastly different territories, there is the thought that to operate with a sustainable approach, it is necessary to know the context of the places and their nature. Although it is still a coastal territory, each portion of this landscape demonstrates its own peculiarities, characteristics and criticalities. A generic approach to the territory would be destructive as well as monotonous and would once again lead to a vulnerable landscape without character, as happened during the 1960s.

The need to contextualize the research is a priority, since only in this way can a contribution be made within a critical context that is sensitive to the characteristics of the specific place.

Therefore, the approach adopted for the search for sustainable tourism along the two coastal areas is that of research by design. The approach is certainly of an experimental type through which the final goal is a project. However it is, above all, in the preliminary phase of investigation and analysis of the territory and of the specific place, where the more theoretical study is addressed and which subsequently leads to the design phase. Research through design works in harmony with architectural practice and with the research process.

The research thus comprised the following phases (see Fig. 15.2):

- Theoretical research: research on the meaning of sustainable tourism and on the role of tourism in coastal areas.
- Investigation: analysis of coastal areas and the generic formulation of the problem in Italy; analysis of outdoor accommodation facilities and the mobile home product.
- Strategic research: identification of two areas of intervention, analysis of the specific places with detection of criticalities and problems, and subsequent definition of the objectives.
- Development of project proposals.

## 15.3 Open-Air Tourism: A Possible Answer

Outdoor tourism was born in England at the end of the nineteenth century (Luisi 2019) but it was after the Second World War, with the proliferation of the automobile, that it became a mass phenomenon. It was a response then, as it is today, to the



Fig. 15.2 Research by design process diagram (Credit: AUDe Lab, University of Pavia)

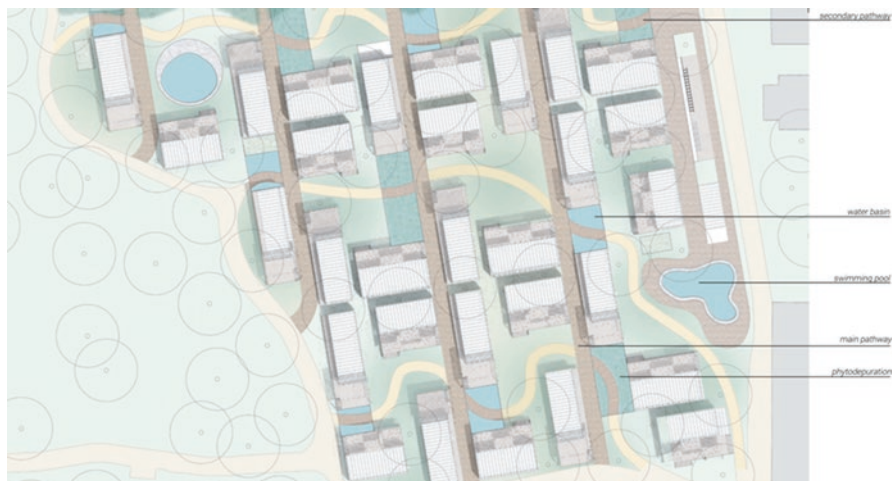
desire to travel at low cost and be immersed in nature, representing a real escape from the city (Battilani, 2001). Over the years, with the growth in the number of tourists, the structures that hosted campers began to organize the camping space by generating two different habitats: that of green pitches dedicated to tents and the more anthropomorphized one defined by pedestrian areas in which temporary housing units (bungalows) were distributed. Unlike the tents, the housing units had the peculiarity of being particularly comfortable and immersing the tourist into an extremely natural context at the same time. The paradox of comfort/luxury/safety and nature/adventure/wildness was expressed even more clearly in the following years and right up to the present day. The first tourist villages were born, and in addition to tent pitches and toilets offer a greater number of services for entertainment and recreational activities that assimilate tourist villages to theme parks and cruises (Luisi, 2019). Hence the desire of the owners of these structures to try to satisfy all the needs of tourists within the enclosure of the campsites transformed them into villages, breaking the relationship with nature. The ultimate goal became the maximization of space in order to place the largest number of housing units. In addition, the distance of the sector from the architectural world, which is an outcome of a regulatory apparatus that in Italy is not interested in any relationship with the landscape, has various consequences: the relationship with the context disappears, settlement models that correspond to the geography of the places are not proposed, the need to create a new model of inhabited landscape does not emerge.

Today, open-air accommodation facilities in Italy include campsites, glamping sites and tourist villages. These structures share the intention of placing the tourist in a natural setting through the arrangement of isolated and comfortable housing units for each family. If during the 70s the prevalent housing units were of a permanent nature (bungalow), in recent years the mobile home is the most popular type of housing unit. The ever-increasing national and regional regulations aimed at coping with the state of environmental and landscape degradation of the coastal territories have certainly influenced the spread of mobile housing units in these contexts. In fact, being equipped with wheels and therefore not permanently connected to the ground, mobile homes do not consume soil, a subject of strong debate today (Berizzi and Trabattoni 2019).

Compared to other countries, such as the United States, the mobile home in Italy is spreading exclusively in the world of outdoor tourism: these are minimal housing units on wheels produced on an industrial level and created specifically for the leisure sector. Precisely because it is a vehicle for leisure time, its use within the accommodation facilities is seasonal, and inside it has all the comforts: kitchen-living room, bedroom / s, toilets, veranda and a predisposition to have water connections, electricity and gas. Once placed inside the facility, it is connected to the various networks (water, gas, sewage, electricity) set up by the facility itself.

The great value of these housing units being removable, is that it gives the ability to give a new interpretation to those coastal areas that are mainly touristic. If until now the coastal settlements have been monotonous, atopic and decontextualized, contributing to the formation of mere enclaves of entertainment, the fragility and the vulnerabilities of these territories, as well as climate change, now gives us new





**Fig. 15.3** Masterplan with mobile homes, water basins, phytodepuration systems and trees (Credit: AUDe Lab, University of Pavia)



**Fig. 15.4** Section highlighting environmental compensation and sustainability: water collection and phytodepuration, natural ventilation, air cooling through water, natural shading, O<sub>2</sub> production (Credit: AUDe Lab, University of Pavia)

challenges. The consequences of a past “cement policy” are already in place, but we can act with compensatory strategies. In this context, the mobile home can represent an opportunity to build an integrated landscape in harmony with nature and with its own character identity. It is necessary to rethink the settlement system of these structures through an approach of integration between nature and the built environment. This means to work on one hand for a connotation of the built landscape capable of generating quality spaces, and on the other hand to work through mitigation strategies by providing shaded areas, rainwater recovery systems, phytodepuration systems and natural ventilation systems (see Figs. 15.3 and 15.4). The outcome must go in the direction of building a new landscape suitable for outdoor tourism but also capable of counteracting the effects of environmental impoverishment (see Figs. 15.5 and 15.6).

Inevitably, each intervention must be defined on the basis of the characteristics and morphology of the place, with its different peculiarities and criticalities.



**Fig. 15.5** Masterplan with mobile homes settlement and natural landscape entering into the campsite (Credit: AUDe Lab, University of Pavia)



**Fig. 15.6** Section highlighting different landscapes: sea, sand, trees (Credit: AUDe Lab, University of Pavia)

Precisely for this reason, the mobile home theme can represent a turning point. Its high versatility, in fact, allows incomparable settlement flexibility. The ability to move or remove the product as needed clearly responds to the urgency of not affecting the natural system, a system that has been suffering for too long and that is no longer able to “breathe”. The soil can contain the climatic catastrophe, and in the case of the mobile home, the absence of permanent structures that anchor it to the soil allows for its high regenerative capacity.

Furthermore, a product such as that of the mobile home can not only avoid the disfigurement of a landscape such as the coastal one that characterizes the Italian peninsula and which constitutes an identity heritage, but can also constitute an ecological choice. The dry assembly system of the constituent elements of the mobile home allows a high recyclability and the ability to reuse its components in the

future. In this way, the life cycle of the mobile home extends far beyond the tourist function, in which the individual components can be reused for new functions.

The reflection that led to the development of two settlement hypotheses in different coastal areas arises from the belief that it is necessary to rethink new forms of tourism through actions aimed at protecting the environment.

## 15.4 Designing Sustainable Tourism in Bibione

*Bibione* is a tourist city established around the 50s as a holiday resort. Located north of the Venice lagoon, it attracts thousands of tourists from all over the world every year, mainly from north-eastern Europe (Germany, Poland, Czechoslovakia). Data from Bibione Tourist information portal show how, despite being a city of only about 2600 inhabitants, it sees about six million people passing through in the summertime.

This incredible numerical difference makes it difficult to read the urban and natural context.

If we try to define Bibione by ecological macrosystems linked to the tourist presence and anthropic use (Banham, 1971), it is possible to identify sets of spaces with a clear identity determined not only by their morphology but also by their use:

**The first ecological system** is undoubtedly that of the beach and the sea. With a stretch of beach more than 9 km long, this system represents the first tourist attraction of Bibione and is, therefore, its most “used” space.

Bibione beach is known to be one of the busiest in Italy. During the ongoing period of the present health emergency, the occupation system of the beach changed. By reducing the maximum number of people who could stay on the beach simultaneously, the occupation strategy has appeared more evident.

An orderly grid of equally spaced umbrellas completely covers the strip of sand next to the shoreline.

Behind the umbrellas, there are services for tourists, which change according to the activity to which they refer. The reflection on the use of public space (this stretch of coast is state-owned, and therefore public, but sold to exclusive private activities) which in part disappears as it is privatized to host exclusive services (because it is reserved only for tourists in the accommodation facility), it must be accompanied by a reflection on the ecological impact (on the natural system, in this case) of this situation.

Tourists use the beach as a massive gathering space. Except for the shoreline being still in public use, every centimetre of sand is subject to systematic use for various activities, from idleness to sporting commitment to orderly and free play.

The high concentration of people, the intensive use of space, and the massification of activities generate a very high environmental impact from CO<sub>2</sub> emissions and waste production.

**The second ecological system** is that of the commercial city, or rather the built agglomeration. Bibione is characterized by buildings between 5 and 10 floors high,

occupied mainly by hotels and holiday homes. The centre of Bibione has a commercial purpose, and even the places of historical identity (this being too short-lived) are almost entirely lacking.

This environment is also massively used by tourists, but mainly in the evening hours.

The holiday dimension, with the search for fun, is the basis of a reading of the urban space as a large holiday village which “dies” in the winter season.

In fact, during the so-called “out of season” months, the urban space remains empty, deprived of the presence of tourists. Many businesses remain closed for more than six months a year, making the urban space of Bibione a metaphysical space, as it has no interest and function, in addition to being a town also inhabited by the city’s residents.

On the other hand, the urban commercial space represents the evening counterpart to the sea space in the summer months. The massive use of open space transports the “human tourist sector” from day to night. Together with the human mass and the opening of businesses, the environmental impact also remains constant, extending beyond the daytime hours.

**The third ecological system** is that of the wooded landscape. This system can be codified as the “Pineta” landscape, where the landscape of outdoor tourism is also located. The tree-lined area of Bibione represents a potential resource which can be used in two ways: one coded and one free.

The free space of the pine forest is a space overlooking the beach that generates a shady context for people’s free use. The natural system of tall vegetation, characteristic of the maritime pines, which are the dominant vegetation of this context, suggests an interesting climatic variation to the warmth of the beach. For this reason, it is recognized as a resource by tourists and inhabitants.

The open-air tourism system represents the artificial image of the landscape, codified to generate living comfort. In fact, in the accommodation spaces, the pine forest is used or “built” to define a quality context that, although subsidiary to the “Bibione” system, represents a valid alternative.

The rational approach to managing the reception space, determined by commercial needs, means that the spaces within the enclosure are identified with a very orderly system of mobile homes or bungalows or open spaces. These are usually organized on orthogonal grids superimposed on the vegetation system, which is also ordered according to the same structure.

The campsite, therefore, wants to represent a housing ideal, which defines a hybrid between the other two ecologies mentioned so far: the natural element is integrated in a homogenous way with the anthropic one, but all are defined by an anthropized system linked to the management and their need to be used.

The subsidiarity of the enclosed space is linked both to a commercial and functional aspect, not representing a duplication of the urban space, neither for morphology nor for present activities. Concerning the ecological environment of the sea/sand, the space of the “pine forest” is not a substitute, presenting a potential for alternative and often supplementary use.

Finally, the high identity value of this ecological area must be recognized. The “pine forest” landscape is an iconic theme, representative of the Italian maritime tourism space. Therefore, this ecological environment is also supported by a marketable aspect that can suggest its rethinking according to its potential emphasis.

The expansion project of the Bibione International Campsite proposes a strategic intervention system in these areas.

The goal is to propose a vision of the landscape which takes into account various aspects:

1. Definition of a strategic anthropic landscape, using the mobile home system, which enhances the private space using the cluster theme.
2. Definition of a strategy to enhance the natural system, shade-trees-air, using water as an environmental mitigation system.

1. The project’s starting point is the construction of an organized landscape with the accommodation system of mobile homes.

As already explained, this accommodation system is characterized by an excellent sustainability value, being easily removable and therefore not affecting soil consumption.

The first design choice is to define a housing system that integrates the private dimension with the collective one, using an ordered cluster system that maintains a possibility of “organic” perceptual use.

The clusters that define the fundamental settlement matrix of the sector are developed with a double system of four units that are closed to the outside and meet in shared natural spaces.

The clusters are organized with a linear flow system that distributes them homogeneously, guaranteeing easy technical and users’ accessibility.

A transversal flow system is then defined, which moves smoothly through the clusters and generates a transversal landscape perception determined by natural elements and visual variation.

In this way, we want to generate a differentiated living environment, where the private dimension is never forced to interact but never loses the possibility.

2. The natural system present in the project area has already been mentioned, that of the Pineta. The project enhances existing trees (where it is compatible with the other design choices), integrating them with the proposed landscape idea.

We choose to work with two elements for the construction of the landscape: the first is the plant elements, which can be rearranged according to better management of the light and shadow of the spaces. In this way, in fact, by alternating covered and open spaces, it is conceivable to generate pressure differences that favour convective air movements, which generates environmental comfort; the second element is water. In this context, the water topic is present in the lagoon and sea as characterizing elements of the landscape.

However, we choose to face the water from a double point of view, aesthetically and technically. The technical point of view concerns the use of humid space as an air mitigation system. Combining the density strategy on the trees

(shadow/light) using water tubs makes it possible to mitigate the air temperature, thus generating natural cooling ventilation.

We also work with the theme of water purification, integrating the landscape with a double system of phytodepuration tanks (dry and wet) positioned in the threshold spaces between the clusters to emphasize the organic movement of the transverse passages.

Furthermore, the landscape defined by the phytodepuration tanks also works on the visual density: the dry tanks are recognizable by the tall shrubs. The wet ones are water tanks with low essences, thus emphasizing the need for visual variation functionality to obviate the monotony of the landscape.

### **15.4.1 Outcomes**

The project outcome identifies a strategic system that wants to work on the landscape, emphasizing its sustainable aspect. The approach to sustainability, already determined by the use of mobile homes as a living system, addresses the issue of water and natural ventilation in relation to the use of tree species.

The objective is the environmental compensation in the context of the “Bibione system”, made vulnerable by the system of the three mentioned ecologies. With this in mind, the pilot project presented represents a plausible alternative in the redefinition of an extended system: that of outdoor tourism.

Open-air tourism, therefore, redefined according to the sustainability parameters defined in the project, could represent an effective compensation system in contexts, such as that of Bibione, which is characterized by a high anthropic impact.

The existing landscape, redefined according to the parameters of sustainability with particular attention given to water and air, becomes a recognizable element as a manifesto of a specific region and a strategy for safeguarding ecological vulnerabilities.

## **15.5 Designing a New Landscape in Cervia**

Cervia is a tourist city in Emilia-Romagna and is part of the entire tourist sector of the Romagna Riviera. A long urban agglomeration, crossing various municipalities, defines the Adriatic coast for almost 50 km at this point that, starting from Cervia and reaching Cattolica without interruption.

The Pineta Family Village campsite is a typical example of the accommodation facilities in this region. It is spread over a longitudinal lot, with two short views, one facing directly onto the sea and the other onto the internal vehicular distribution ridge, via Matteotti, which defines the leading road network of the urban reference context.

The two adjacent lots on the long sides are also intended for hospitality activities, specifically for exceptional ones. To the north, the Montecatini colony represents a clear example of rationalist architecture, abandoned for years and therefore uninhabitable today.

On the south side is the logistic training base of the Italian army. It is followed by another abandoned maritime colony, the colony Varese or Costanzo Ciano.

In fact, the two colonies exemplify a drastic settlement attitude, which began in the 1930s but continued to the present day, determined by an exclusive relationship with the coastal landscape.

This sequence of accommodation activities is an example, in fact, of a settlement system that is repeated several times along the Adriatic coast of Romagna, which sees the accommodation business develop in the strip of land facing the beach up to the internal road.

In fact, the private structures, outside the historical centres, where the city/sea relationship is always balanced by the public space (seafront), are positioned in an exclusive way towards overlooking the portion of the beach, denying its relationship with the built context and also with the internal natural context.

This land occupation system generates a double effect concerning the use of the marine landscape: public access to the coastal area is solved with a system of secondary roads that develop alongside the accommodation activities (the same approach is repeated when the residential portion is before the historic core); the use of the beach is broken down according to activity, presenting itself as a sequence of private spaces.

The denial of the seafront as a public space is obviously also linked to the absence of a consolidated urban sector. The built-up space in which Camping Pineta is located, like most of the built-up area of the Adriatic coast of Romagna, is based on tourist activity.

The colonies are a historical reference example, almost all are abandoned because they are not used and are too inefficient to cater for the new tourist needs. Alongside the colonies, hotels and campsites have developed, and obviously holiday homes. The ensemble of these buildings defines an urban context of “transit”, conveyed by the access to the sea (leading landscape) or historical centres (primary functions).

In summary, the relationship between the landscape and the coastal marine space (public for private use) is the qualifying element (near/far) of the accommodation activities of this anthropogenic macro-region. The qualification act that is proximity through an exclusive attitude binds the use and accessibility to the beach, implying a denial of the public promenade, and therefore denying the public dimension linked to the landscape to the urban context of reference.

Today the landscape system of the Italian coasts is put in crisis by general principles of erosion due to different causes (Archetti, 2019).

The risk of the disappearance of the beach, representing an actual ecological emergency, undermines the role of these spaces concerning the built and urban space. Both public contexts (when they exist) and private ones, fully defined in their relationship with the coastal space, undergo a significant crisis.

**Camping Pineta Village** is an example of a situation familiar to some accommodation sectors.

First of all, the uneven construction over time of dissimilar lots has generated a landscape discontinuity of the open space linked to the linguistic discontinuity of the build. The campsite alternates between several types of accommodation: mobile homes of different typology, shapes and heights; two-storey houses; hexagonal bungalows; rectangular bungalows; and collective services.

Alongside the construction discontinuity, there is also a very strong landscape discontinuity in the campsite, determined by the contingent natural conditions of the area: the proximity to the coastal landscape implies greater exposure to winds and the erosive effect of the sea on vegetation. It is still possible to distinguish two macro-landscapes inside the campsite:

- The first landscape, linked to the internal context, is defined by the arboreal presence of maritime pines along the Viale Matteotti road. The tall trees, typical of the Italian open-air tourism landscape, define a shaded and protected area.
- The second landscape begins at about three-quarters along the area. After a level change, a semi-desert landscape appears, influenced by the beach and the sea. The sandy soil and the strong winds mean that the vegetation in these areas struggles to grow, leaving large sunny areas.

Finally, the Camping Pineta Village is located, as mentioned, overlooking the sea. Access to the beach is exclusive and there is a portion for private use in the coastal space. However, the beach has been subjected to critical erosion that has led to its significant reduction, thus undermining the relationship with the accommodation space.

Therefore, the design reflection on the Pineta campsite starts from the need to find a coherent settlement solution that starts on the characteristics of the landscape. Taken in its objectivity, the landscape of the campsite is also now divided in its quality: the space of the pine forest is flourishing and in good condition; the space on the beach is clearly spoiled, where the plants fail to grow so close to the sea on sandy soil.

The settlement project, therefore, provides for a redefinition of the entire campsite, proposing a solution for two fundamental issues:

1. The confrontation with the sea, through the management of collective areas, in order to enhance the relationship with the landscape.
2. The definition of a landscape integrated with the existing ecological situation, taking into account the environmental difficulties mentioned.

Therefore, the complete redefinition of the organization of the campsite starts from the enhancement of the potential, trying to keep all the healthy vegetation intact and converting the damaged space into a sandy and sunny space.

The seafront, which starts tired from the winds, is converted into a coastal landscape, supported by the use of suitable mobile homes. We choose to propose a system of mobile homes facing the sea (first line) made of lodge tents, easy to place on the sand and slightly more spartan than traditional houses.



The second front, always on sandy soil, is proposed, with a system of houses with a terrace roof. This type of house allows the veranda to be developed partly above the house, thus enjoying a panoramic sea view (primary landscape).

The third front develops inside the pine forest and lives in an independent environment concerning the primary landscape, set up with “usual” mobile homes.

**The design strategy** proposes to define a landscape system starting from the concept of the seafront or of an urban space linked to the landscape, which instead of developing along the coastline (too short) becomes an internal ridge.

The campsite is interpreted as a longitudinal bridge space, which reaches the sea from via Matteotti. Despite its private status (exclusive for guests), this connective system wants to redefine the reading of the macro settlement context (Romagna Riviera) by explaining the change of landscape. The change of landscape, pine forest/sandy, emphasized by the landscape and settlement choices, is, therefore, a clear example of a critical situation converted into potential.

Finally, the internal ridge, or transversal seafront, is positioned in line with the current distribution of the campsite services (reception, restaurants, shops, swimming pools) and extended for the full length of the campsite.

Two hierarchically different strips are defined: one broad, mainly determined by accommodation functions (super-campers, mobile homes) and the other almost exclusively occupied by services.

Consistent with this organization, the campsite’s waterfront becomes an opportunity to redevelop the coastal landscape, bringing a part of it into the campsite itself.

In this way, the present situation of the state-owned coast can be weakened and redefined with occasional and perhaps less destructive use.

### **15.5.1 Outcomes**

The design of open-air tourism accommodation areas brings a potential reflection on the conservation and enhancement of the landscape. In the urban context of the Adriatic-Romagna coast, where the prevailing settlement system isolates the coastal landscape from the public context, the open-air receptive environment becomes an essential point of interaction.

Through reflection on the identity of the landscape and its vulnerabilities, the open space design can become an opportunity to redevelop an existing situation (that of the tourist space). Furthermore, the design action on the private space can start to lessen the difficulties of the public space (the coastal one).

Even if not weakened by anthropogenic presence, the massive weight of the industrial presence on the coast can be lightened. The weight of the environmental impact can be shared between the private and public landscape. By rewriting the internal campsite landscape as an extension of the sea landscape, it is possible to think about a redefinition of the human impact on the natural system.

## 15.6 Comparing Outcomes and Strategies

The two proposed design research experiences arise from the need to define a new sustainable landscape and a stable ecosystem in open-air accommodation through the definition of a light and reversible settlement system.

Efforts to counteract the vulnerability of the Italian Adriatic coasts can be activated starting with the tourism sector, which represents the main economic driving force and is responsible for the transformation of the territory. The coastal territory today presents vulnerabilities linked to two distinct conditions: on one hand, the action of man, and on the other, those natural actions which have evolved issues related to climate change. The first action, that of man, has evolved strongly over the last fifty years, transforming natural or man-made territories for agriculture and fishing into areas for the establishment of tourist activities. In the past, the coastal territory, through practices consolidated over time and closely linked to natural conditions, had created an ecological system that was in equilibrium. It was not always an approach of unconditional respect towards natural conditions but of a modification of controlled nature to make the territories habitable and usable for economic purposes. For example, in the area of the Delta del Po, the river was diverted and the geography changed to allow soil and water exploitation as productive elements. These actions, not always without disastrous consequences, for example with the Polesine flood, have often redetermined a balance between anthropization and nature. Man has thus learned to coexist with nature by modifying its landscapes and protecting them to safeguard environmental conditions and, therefore, productivity. The abandonment of these practices simultaneously led to the abandonment of the

<b>OUTCOMES</b>	<b>BIBIONE</b>	<b>CERVIA</b>
<b>SOIL</b>	redefined natural soil	active natural soil
<b>STRATEGY</b>	resilient sustainability	active and compensatory sustainability
<b>GOAL</b>	sustainable landscape, promote biodiversity, give character	sustainable landscape, promote biodiversity, give character, better climatic conditions
<b>DESIGN ANSWER</b>	beach extension	new environment creation

**Fig. 15.7** Outcomes comparison between Bibione and Cervia projects in terms of soil definition, strategy for sustainability, goals and design answer (Credit: AUDe Lab, University of Pavia)

care of the territory, and it is for this reason that tourism, with its economic capacity, can represent a new hope for the protection and care of soils and landscapes. The care of the territory can arise where there is economic initiative and for this reason attention is placed on the accommodation facilities that characterize a substantial part of the Adriatic coast. From this consideration comes the first design response that combines the two projects of Bibione and Cervia; the construction of a new permanent landscape that combines the need to counteract the vulnerability of these places with the need to inhabit them. The soil thus becomes an element of definition and control of nature which takes on permanent aspects for these contexts. However, the two cases show a different attitude (see Fig. 15.7). In Cervia, the soil project works to counteract the effects induced by anthropization and climate change by preserving, as far as possible in a highly urbanized area, some natural features. The project extends the beach inside the open-air accommodation facility, allowing natural behaviour towards the sea by eliminating non-native or spontaneous vegetation, which had compromised the sandy strip. The project intervenes on an existing village that applied the same strategy throughout the area, namely that of camping in the pine forest, operating indiscriminately in the internal portion of the area and on the coastal strip. The beach enters the village not only in its being sandy soil but also in its collective functions which include some typical elements of accommodation facilities such as the swimming pool and the solarium. From the point of view of the construction of the character of the place, the theme of the beach that enters into the village coincides with the definition of a public “seafront” path that penetrates the area, defining hierarchies and references. The settlement system of the mobile units, with a temporary and possible variable character, supports the new landscape and soil system by adapting to it and strengthening it. Instead of counteracting the natural effect of winds and the sea with rigid elements, the strategy designed for Cervia defines the landscape according to specific geographical and climatic conditions. The identity of the landscape becomes an opportunity for the consolidation of a natural state and creates a new stable maritime landscape regardless of the presence or absence of human activity.

From this point of view, the strategy designed for Bibione is different. Also, in this case we have the definition of a new soil which, however, is conceived to be inhabited in a sustainable way and therefore conforms to the condition of an anthropized environment. The theme is that of an active soil sustainability. The open space, integrated with the settlement / housing system, is conceived as a system of resource compensation. The creation of phytodepuration tanks to clean rainwater and recover wastewater from bathrooms by reintroducing them into the water system, and with the possibility to use it for irrigation, as well as the introduction of water and plants to mitigate temperatures during the summer period and to contribute to energy saving, are all functional actions to create an environment suitable for being inhabited as well as inducing environmental and climatic conditions that promote biodiversity. This project assumes the pine forest as a starting condition and tries to make it even more habitable. The pine forest is extremely common along the Adriatic coast and represents a recent landscape built by man to ensure shade and naturalness near the sea. The maritime pine is a tree that is well suited to the coastal

climate, allowing a large, shaded area compared to its trunk, thus leaving the soil little occupied by vegetation and therefore suitable for hosting tents, caravans or small homes, that could be fixed or mobile. It is also a tree that grows on soils that are partially sandy. For this reason, the proposal on Bibione takes on an easily exportable value along the Italian coast, representing a second feasible model. In this case, the natural environment responds to the built one by mitigating the vulnerabilities generated by the anthropogenic mass.

In both case studies, the construction of the touristic landscape of outdoor tourism is an opportunity to reflect on the possibility of building sustainable landscapes.

Bibione expresses an active and compensatory sustainability comparing to the resilient sustainability of Cervia. Reading the accommodation space as a necessary substrate integrated with mobile homes determines further reflection.

The vulnerabilities of the natural context, increased by strong anthropization, can be mitigated by the artificial system of outdoor tourism and can induce further research applied to public and non-accommodation contexts.

## 15.7 Discussion and Research Limitations

Sustainability applied to a more niche form of tourism is certainly more easily feasible than a form of mass tourism, such as the one that involves most of the Italian coastal areas, in which the application of sustainability principles on different levels is an intricate process. The difficulty is even greater when the intervention area is critical and vulnerable. However, it is necessary to understand the deeper meaning of sustainability applied to tourism and how, in a historical era such as the contemporary one, namely that of the Anthropocene, the trend of reversal can no longer be postponed. Designing for sustainability in many parts of the Italian coast is not just a question of protecting the environment and the landscape, but a question of “life or death” for the landscape itself. In the absence of immediate conscious actions, portions of the peninsula’s territory could vanish forever, leading to disastrous consequences for the environment and for the health of its inhabitants. According to the World Tourism Organization, sustainable tourism must consider not only current social, economic and environmental impacts but also future ones. That is to say that today’s actions will inevitably have a reverberation in the future. Unresponsive actions today could deprive future generations of benefiting from coastal areas.

The role of sustainability in the tourism sector inside vulnerable areas is of extreme importance to the point that its application can determine the fate of many coastal areas of the peninsula. The planning of accommodation facilities is one of the key issues, where the settlement strategy to be adopted plays a central role. Open-air tourism is certainly a form of tourism with a high potential to be able to define itself as sustainable. By adding determined measures to this way of using the landscape, it can be possible to preserve and define a new tourism landscape. Excluding the possibility of intervening with permanent structures, such as bungalows, can be the first step. Approaching to landscape with light and mobile

architectures can reduce anthropization, allowing coasts to be more natural territories and less artificial. Leaving the landscape more natural allows natural processes undergo, strengthen coastal landscape. It means relating tourism to nature to create a harmonized landscape instead of a landscape of contrasts. Furthermore the high flexibility, not only of the settlement but also function of mobile homes, can allow for the management of the services of accommodation facilities through mobile units. In fact, there is no lack of examples of mobile units of minimal size and comparable to mobile homes, located in diversified contexts and with different functions. A clear example of the versatility of the product is demonstrated by the pandemic, that is still underway. The urgency of the spread of the virus and the need to allocate more spaces for healthcare in the cities has led to the placement of various mobile installations in many inhabited centres and in the vicinity of existing hospitals. Furthermore, the mobile home, if conceived as a combinable container, can allow articulation of the spaces to be used for the different services within the accommodation facility with different combinations, depending on the needs.

Even though the research outcomes demonstrate the high potential of mobile homes settlements for outdoor tourism, it demonstrates its limitations as well. As it stands, doesn't exist in Italy any strategy of control of these settlements, neither at a national level nor at a regional one. If there are regulations such as the distance of the settlement elements from the coast, there is currently no strategy aimed at encouraging the owners of the structures to adopt settlement measures and approaches that are sensitive to the natural landscape of the coast. In a practical way, this gap leaves strategic decisions to the owners of the structures, who can be free to approach the landscape in a more or less sensitive way. For this reason, the research that results in applied design has not yet reached the next stage, namely that of execution. Research limitations are reflected in the current lack of verification over time and the post-construction results of this type of settlement.

Thinking of a form of tourism that is sustainable in particularly vulnerable areas, leads inevitably to the need to measure the feasibility of the intervention as well as the practical efficiency of the planning intention. It is in fact the clearness in the intention/vision of planning that stands the quality of tourism landscapes. While intervening within purely tourist areas certainly raises issues that go beyond the mere design of the accommodation facility. One of the most common problems in these areas is in fact the social aspect. The lack of a unitary strategy of these places often results in a fragmentation of the man-made landscape: on the one hand, the existence of a pedestrian axis parallel to the coastline and on which the commercial services overlook the ground floor; around the axis a fabric consisting of condominiums mainly rented during the summer season; in the areas often furthest from the centre, the location along the coast and in the innermost areas of open-air accommodation facilities; and in the innermost areas of the territory the residential areas where the local population lives. The lack of homogeneity at the settlement level undoubtedly generates a divided space, and even more a series of spaces, between the low-quality building fabric that are hardly usable. Therefore, the legacy of a functional approach has led to an impracticable cohesion between the different areas of the urban fabric and an overcrowding phenomenon during the high season

of a few specific areas for recreation. The contextual reflection on the landscape of tourism for the protection of the coastal landscape should go beyond the enclosure of individual accommodation facilities to embrace a wider landscape that contaminates the small, inhabited centres and other permanent accommodation facilities, reconfiguring the lost relationship between buildings and nature to find a new sustainable landscape in equilibrium.

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