

Abstract

Seaside resorts, which appeared at the end of the 18th century, first for medical reasons and then for purely idle reasons, were English inventions that first spread over the European coasts and then worldwide. Today, they represent a particularly important tourism issue. However, European coastlines, from the English Channel, the Atlantic to the Mediterranean Sea, are currently in a situation of great vulnerability to environmental change. The rise in sea level and the accelerating rate of coastal erosion and submersion are tangible signs of global warming, which in turn is leading to an increase in certain types of pollution that have been contained until now. There is now talk of the disappearance of some of these stations and the relocation of others, where possible. Submersion, erosion, pollution, stronger storms: a whole model of tourism seems to be under threat of extinction. The study cases developed will be limited to Europe, with a few exceptions, and are taken mainly in France.

Keywords: seaside resorts, sea level rise, coastal erosion, global warming, pollution

Introduction

As creators of landscapes, image systems and touristic clichés, Europe's seaside resorts, like all human activities, are confronted with the climate change and various other risks that threaten their very existence. From this point of view, seaside resorts and their natural setting perfectly fit the definition of landscape as given by the European Landscape Convention (Florence, 2000): "Landscape is a part of territory, as perceived by local inhabitants or visitors, which changes over time as a result of natural forces and human action". Today, an entire economy, dynamic and essential, the tourism economy, could collapse with the disappearance of the resource: the beach.

Historically, the aristocratic practice of therapeutic sea bathing and its first developments in England [1] was followed on the continent by a constellation of seaside resorts whose medical original function [2] quickly gave way to purely hedonistic activity [3]. Thus, seaside resorts, cities of pleasure, spread along the European coastlines, and then worldwide [4]. Since the 1960s, the growth in tourism has contributed to the construction of these new places of relaxation [5], while often forgetting their natural environment. These new tourism landscapes,

which have been strongly anthropized, are now revealing their fragility. As a historian, a specialist in the history of the seaside resorts of Western France and involved in the Mediterranean Association of Sociology of Tourism, this subject is interesting for it reveals a real paradox. Indeed, as a researcher, it is my object of study itself that could tend to disappear, and this, on the scale of a human life. And the phenomena that will be described below are formidable. One can see the consequences on the coasts every year more and more. This study tends to demonstrate the relative fragility of seaside resorts and their underlying economy in the face of various risk factors which will be detailed in this article, the main ones being of an environmental nature. The selection of case studies detailed in this text is taken from the different seaside resorts known to the author, and from the experiences reported by his professional network. These reflections propose lines of research and results that open the debate on the very existence of seaside resorts and their future. Volcanic, seismic and tsunami hazards are excluded from this research, although they may be associated to some of the hazards studied here. The choice was made to focus on four major risks facing the coastlines, each of which is the subject of case studies, limited to Europe, with a few exceptions, and are located in France, main field of research.

Study cases

Sea level rise

Coastal erosion

The French coasts, from the highest cliffs of Normandy to the lowest sandy expanses of Aquitaine, are today confronted with increasingly significant movements of their coastline [6] [7]. Historically, seaside resorts have always had to fight, for the most exposed, storm damage on their coastline. In the Norman or the Breton departments for example, this involves the usual, almost annual, work to consolidate their dikes and riprap. However, in recent years, things have got much worse, with an over-frequency of serious "exceptional" phenomena, which worries local decision-makers a great deal.

Soulac-sur-Mer (Gironde) is a seaside resort that is extremely popular with tourists and has become, in spite of itself, the sad symbol of coastal erosion. Situated in the Médoc, on the Atlantic seaside, in a region with a low, sandy coast, the seaside resort is currently threatened with disappearance due to sand movements, which has caused its coastline to recede by about 200 meters [8] [9]. A building, completed in 1967 150 m from the shore, the "Signal", is today emptied of its inhabitants, by municipal decree (Fig. 1.).



Fig. 1. "Le Signal", building in Soulac-sur-Mer (Gironde): evolution of coastal erosion (source: Région Aquitaine-La Dépêche-Philippe Clairay).

The erosion is such that the building is condemned, it will disappear, the sea is already gnawing at its foundations [10]. The inhabitants consider themselves as climatic refugees. The situation is such that the seaside resort is studying a global solution of withdrawal with a reconstruction of the urban core several hundred meters from the shore.

In Normandy, the communes on the west coast of the Channel are strongly affected by coastal erosion. Entire beaches are tending to disappear, especially between Saint-Jean-le-Thomas and Dragey-plage, in the bay of Mont-Saint-Michel. The withdrawal is very impressive. The coastal road, which was in 1947 about 300 m from the shore and separated by a barrier of dunes, is now a few meters from the waves. The small seaside resort of Saint-Jean-le-Thomas is clearly endangered (Fig. 2).

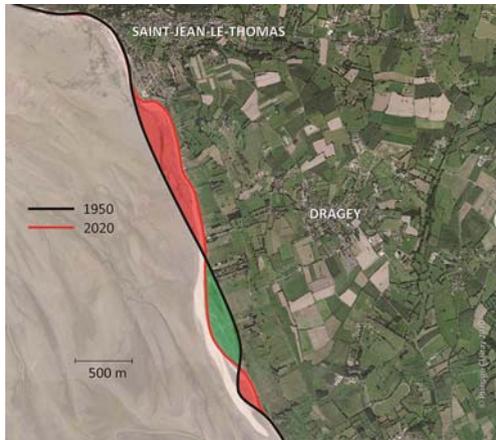


Fig. 2. Evolution of the coastline at Saint-Jean-le-Thomas (Manche) 1950-2020 (source: Philippe Clairay)

To counter this inevitable movement, rockfill is regularly laid and sand is constantly added. But these measures, in the long term, can only slow down this phenomenon, without stopping it. At the beginning of 2020, the prefect of the Manche department warned in the press: "We will have to defend ourselves from the sea, with a global vision. We cannot do just anything. Riprap is not enough, faced with the sea's advance, we'll have to move" [11]. In this department alone, 18,000 buildings are threatened by the rising sea level. Wherever necessary, coastal communities are adopting risk prevention plans and adapting their local urban planning. This phenomenon is of course worldwide, and solutions are being sought everywhere, as is the case in the USA, whose low-lying coastlines are also particularly exposed [12].

On cliff coasts, sea erosion is coupled with wind and water erosion. More and more cliffslides are to be deplored in south England coastline, and in north coasts of France in Normandy and Picardy, with disastrous consequences. The seaside resorts of the Seine-Maritime, of which Etretat is the most famous, see their coastline also receding, and whole sections of cliffs disappear. The landscape is, objectively, in danger. During the summer of 2013, a few meters away from bathers, part of the cliff of Saint-Jouin-Bruneval (Seine-Maritime) collapsed, without causing any casualties [13]. Further north, the small town of Criel-

sur-Mer is experiencing an unprecedented crisis, with the disappearance over the last 50 years, of part of the municipal territory, literally fallen into the water, with the cliff. As the mayor of the town, Alain Trouessin, points out, "The cliff is receding by ten to thirty centimeters a year. It is an average, but it is possible to have very locally a more important retreat: five meters, ten meters. And we don't know where or when..." [14].

Marine submersions

The rise in sea level is causing fearsome submersions, anywhere in the world [15]. In France, the worst of these examples was caused by the storm Xynthia [16]. During the night of February 27th to 28th 2010, by a combination of a high tide and a very strong storm, a catastrophic submersion (a height of almost 2 meters of water in places), led to a tragedy in the communes of La Faute-sur-Mer and l'Aiguillon-sur-Mer in the Vendée. The death toll was extremely heavy: 47 dead throughout the region, and the event traumatized French people. The submerged houses, the vast majority of which were second homes, were built in an area below sea level, protected by a dike that gave way (Fig. 3).



Fig. 3. La Faute-sur-Mer, aerial picture, February 28, 2010 (Ouest-France).

The real estate pressure, encouraged by some unwary town councilors, and whose memory of ancient disasters has failed, has had these appalling consequences. After the tragedy, zones of total constructability were established, the black zones, where 915 houses were razed to the ground [17]. Another sad example of this risk is given by the seaside resort of Carnac-plage (Morbihan). During winter 2019-2020, the resort has placed sandbags in front of its beach accesses to avoid submersion, a visible sign that this is indeed a worrying reality. These examples can unfortunately be multiplied and the collective amnesia of older disasters that have occurred over the centuries is also an aggravating factor [18] [19].

Sand recharging: Sisyphus on the beach?

Every spring, beaches whose sand disappears with winter storms, are "recharged". This is the case on beaches in northern Europe with low coastlines (Netherlands, Belgium, England, France). In England, the seaside resorts of the sandy coasts of East Yorkshire: Aldbrough, Withernsea, Hornsea and Spurn Point, are very impressive and well-known examples [20]. In France, on the Normandy coast, the beaches are "renovated" after each sea blow. During the winter 2019-2020, the seaside resort of Jullouville saw part of its concrete seawall destroyed by a strong tide. Riprap and a new sand glacis were built as a matter of urgency:

the most urgent repairs were carried out. The question is how long these structures will last. In Brittany, La Baule-les-Pins (Loire-Atlantique), "the most beautiful beach in Europe" with its 5.4 km long bay of fine sand, sees every winter an incessant ballet of construction machinery bringing tens of tons of blond sand to the very long beach whose coastline is constantly eaten away by strong currents. The resource, the sand, is gone every winter. Thus, for nearly twenty years, enormous quantities of sand have been brought to the beach, about 10 to 15,000 cubic meters per year, with a very large 310,000 cubic meters input in 2005. Indeed, the central part of the beach regularly loses sand the most. This "new" sand is collected offshore, just where it accumulates after storms (at the Banc des Chiens).

Taking Les Sables d'Olonne (Vendée) as an example, La Baule-les-Pins has invested in an Ecoplage during the winter of 2018-2019 to guarantee the stability of its coastline (Fig. 4). Ecoplage, with its flattering name, is a company brand created about ten years ago, which takes up the codes of ecological themes in its communication, arguing that the purpose of this process is to stabilize beach sand, and not to move or replace it, and therefore to provide both an economic and ecological solution to the cities concerned.

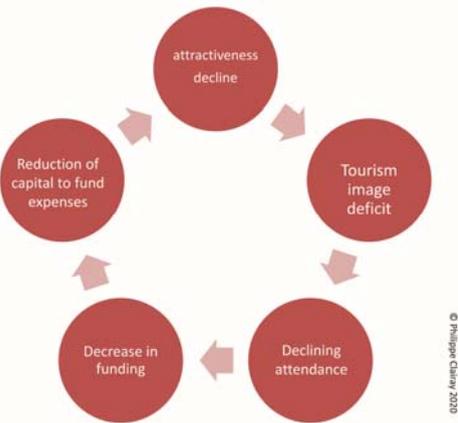
The cost of the operation is around 2.3 million euros, with exceptionally large works. The principle is to drain the beach to stabilize the sand and prevent it from flowing back into the sea. The aim is to preserve the seaside landscape, the image of the resort and, of course, the whole economy. But only large resorts have sufficient financial means to embark on such an adventure.

In Cannes (Alpes-Maritimes), on the French Riviera, 11 million euros were spent during the winter 2017-2018 to widen the beaches and reshape the famous "Croisette" (coastal promenade of the city of Cannes). The city wanted to replace its pebble beach with a new coastline of fine sand... But as soon as the first storms hit, some of this sand was washed back into the sea [21]. This reveals both the power of the waves and the very sudden changes that can naturally occur. The artificialization of the coastline is a dangerous game.

As we have seen, to save the resource that is the sand on their beaches, the most important seaside resorts are investing colossal sums of money. It is a question of maintaining their tourist image and the pleasure that tourists have in visiting their coastline. But they do not, or cannot, so a vicious circle begins, from which it is exceedingly difficult to escape (Fig. 5).



Fig. 4. Work for the creation of the Ecoplage, on the beach of La Baule, January 2019.



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Fig. 5. Consequences of the destruction of the coastal landscape on the tourist economy of seaside resorts (source: Philippe Clairay).

Green algae pollution

The bay of Saint-Brieuc (Côtes d'Armor) had during the summer of 2019 concentrated 70% of the tonnages of green algae removed along the entire Breton coastline, 35.000 tons in total in 2019 (Fig. 6).



Fig. 6. Removal of green algae in the bay of Saint-Brieuc (Côtes d'Armor), 2018.

This shows the scale of this disaster, which began in the 1970s, but whose episodes became more frequent in the 2000s [22]. Here again, the combination of very significant human activity (intensive pig farming, overexploitation of the land) and global warming is causing an inordinate multiplication of green algae (ulvae that run aground by thousands of tons each spring and summer), which strand and make life literally unbearable for the inhabitants of the Brittany coastline. Worse still, these decomposing green algae, caused deaths: the hydrogen sulfide released during putrefaction has already claimed several victims, particularly in the Côtes-d'Armor department. A plan to combat green algae, called "PLAV 2", was set up by the regional authority and the State for the years 2017 to 2021. The aim is to reduce the flow of nitrates in rivers by 30% to avoid the proliferation of green algae in the eight Breton bays most affected by this pollution [23].

Tourists, for their part, are fleeing these coastlines, which nevertheless have very great assets. The beach of Saint-Efflam, on the seaside called "Lieu de Grève" (communes of Saint-Michel-en-Grève and Plestin-les-Grèves, Côtes d'Armor) is only a memory... the hotels are closed and the modest seaside resort is totally deserted: it is literally disappearing. This phenomenon of green tides is also beginning to affect Normandy and the Gironde in recent years.

The only alternative for the municipalities concerned is the removal, by construction

machines, of these tons of green algae which already reek and fill all the storage points along the coast, which in the summer of 2019 very quickly reached saturation point. The recovery of this waste is also a major problem. Ironically, it could be transformed into... fertilizer! In addition to the tragic oil spills, which we will not deal with here, another factor in the pollution of bathing water is becoming increasingly frequent, namely microbiological pollution, due to overflowing sewage treatment plants, which are not adapted to the summer demographic pressure of the coastline. Beaches are regularly closed, sometimes at the height of the season, and fishing on foot is prohibited in order to avoid contamination. Economically, the coastal communities affected by this pollution suffer doubly: their coastline is polluted and unusable for tourism, their image is destroyed and the cost of cleaning up the beaches is extremely high and difficult to bear, despite State aid.

War or armed conflict

Three particularly impressive examples are proposed, to evoke the risk of outright abandonment of seaside resorts and the destruction of their landscape by armed conflict. The first example is that of the Cypriot seaside resort of Famagusta and its beach in the Varosha district. Major investments were made in the fledgling seaside resort from 1972 onwards. But in July 1974, the Turkish army landed in the north of the island and fighting began with the Cypriots. The result of this conflict was the partition of the island, which is still going on today. The city of Famagusta was then abandoned. And since that time, this beautiful waterfront is totally ghostly. The two following examples relate to the war in the former Yugoslavia (1991-2001). In this part of Europe, the tourist economy, which was booming in the 1980s, was brutally shattered by the war which lasted for several years until the independence of the former belligerents. On the Croatian coastline, Kupari Resort came out of the ground in the 1960s and 1970s. This modern seaside resort offers then very impressive hotels, in a small paradise near Dubrovnik.

When the war broke out in 1991, everything stopped. The beach was then abandoned, as well as the whole tourist infrastructure. Hotel frontages still carry the bullet impacts. Never resumed or renovated since, despite a project in 2013 [24], the establishments are left in disinheritance, and then looted. Since the end of the war, the inhabitants and tourists have been visiting this beautiful beach again, in an apocalyptic setting (Fig. 7.). The Croatian State plans to take over the site with a purchase of the hotel complex by the end of 2019. Further south, in Montenegro, Sveti Marko has suffered a similar fate, without, however, being directly bombed [25]. On this small island in the Bay of Kotor, a "Club Méditerranée" was established in the 1960s. The first of its kind in a communist country: Yugoslavia. Very well-known and very popular, this holiday center enabled the local population to find jobs and above all contacts with tourists from Western Europe. Boating activities were very popular, and foreign currency was the lifeblood of this then booming region. But, as for the previous example, the war was to make all the actors of the local tourist activity, as well as the summer foreigners, leave in a few days at the beginning of July 1991. The club closed never to reopen. Today on the island, only remains of the buildings are visible, some moving traces of this happy past, in a real time capsule (Fig. 8). There are plans for the future of Sveti Marko, but for the moment, nothing concrete. In these last three cases, we can talk about tourism archaeology.

Economic crisis

Among the elements of fragility of seaside resorts, their economy figures prominently. This invites us to tell a story older than the previous ones, that of a singular resort, Sables d'Or-les-Pins (Côtes d'Armor), built just before the great financial crisis of 1929, which hit France hard in 1930 and 1931. This seaside resort was created ex nihilo, in the dunes bordering a beautiful bay. Its urban planning bears the trace of a technological concern. It is a city designed for the automobile, with, from its creation, a gamble, choices, and perspectives made on the long term.

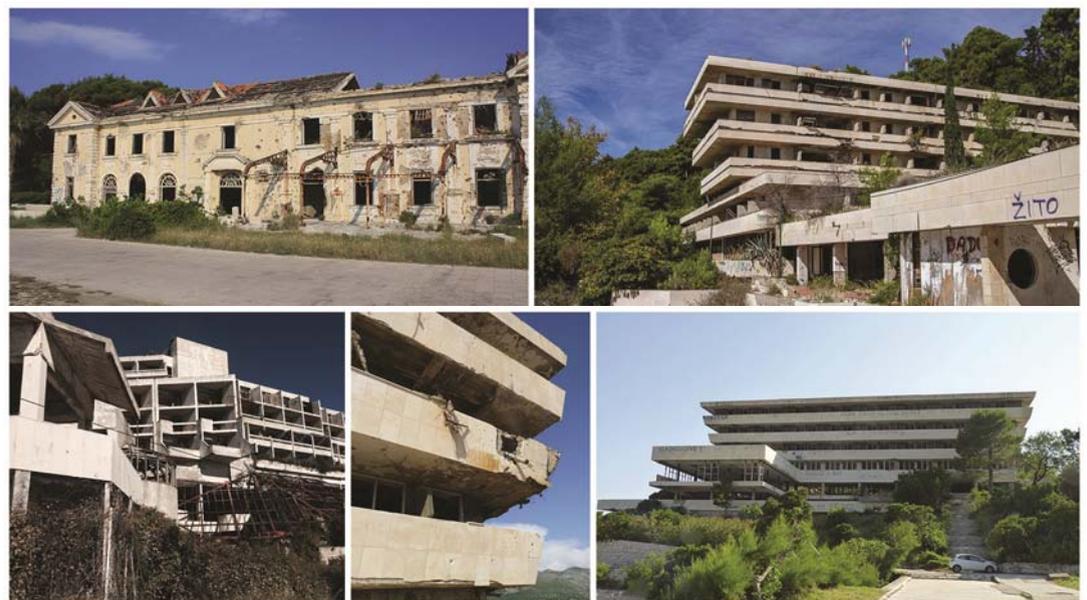


Fig. 7. Kupari resort in 2018 (Dubrovnik Times)

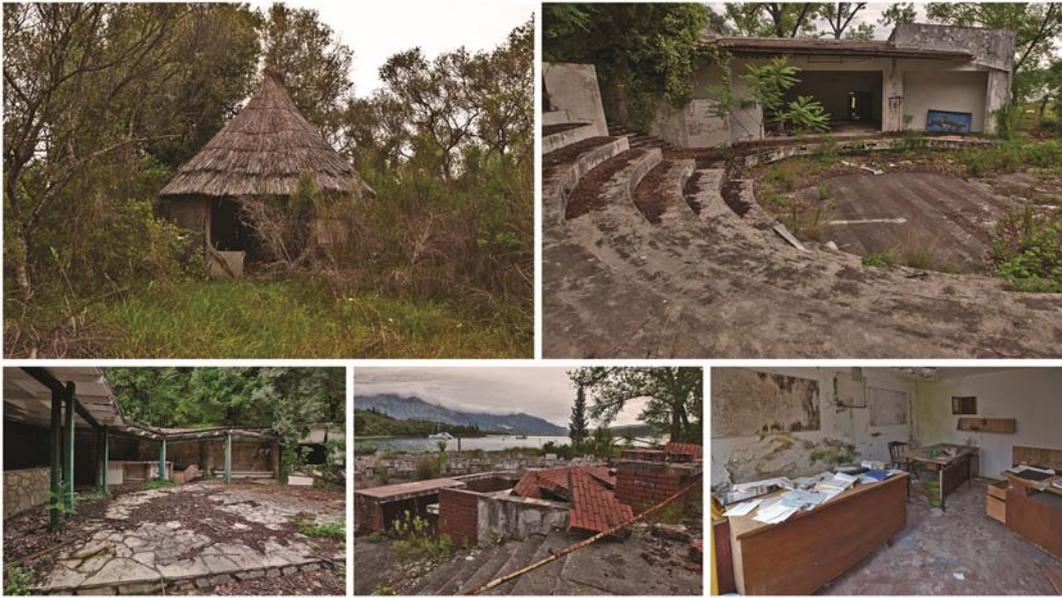


Fig. 8. Abandoned Club Med in Sveti Marko, Montenegro.

The streets are all designed for the automobile, with a width of 35 meters for the main avenue and immense sidewalks. Roland Brouard (1887-1934), the founder, thought, as a visionary, of his seaside resort as a "modern" city with a harmonious landscape: « I wanted to harmonize life and architecture [of the dunes] by making it, through a skillful flattening, the welcoming and definitive base of a city from which the slums would be banished forever. I also wanted to make there a center for meditation, rest and fortifying baths, in places where the wild nature and the picturesque character of the country would be respected, without forgetting the comfort of a civilization which can harmonize with this nature, far from the noise, the disorder of industrial cities and urban agglomerations, sabotaged by the negligence, the greed of the authorities or lawless speculators. [...] » [2].

The story begins in 1921 with the acquisition of the coastal dunes of a small bay near Cape Fréhel. Major works began the following year and, in 1923, the Treyve brothers, landscape designers from Vichy, drew up a general plan of the station. Soon the first six hotels were built. The "Hôtel des Grandes Arcades" in Art Deco style, originally intended to form a large hexagon, is inaugurated in July 1925, but only half of the building is completed (Fig. 9). The resort continues to grow, and soon the "Californian Quarter" rises from the sand. Many villas are built, and the first seasons are promising: between 1925 and 1928, Sables-d'Or-les-Pins radiates. The festival is daily: receptions of all kinds, fireworks, elegance contests, car rallies, tennis or golf tournaments are organized. Beautiful walks are arranged in the pines, set back from the beach, such as that of the "Ronde des Bois d'Amour", or that of the "Vallée de Diane" and its green theatre. A second wave of construction is planned for the years 1928 and 1929, with about a hundred new villas created. It was precisely at that time, amid euphoria, that the seaside resort is going to suffer the full effects of the world financial crisis.

The Great Depression, which hit Europe hard in 1930-1931, is to bankrupt the seaside resort. The ruin was very rapid: the financial structure that had supported the resort since its beginnings collapsed. Loans are no longer guaranteed, and

the main real estate company, owner of the resort's equipment, collapsed too. Roland Brouard dies at the same time as the resort he had created, in 1934. Marked by the abandonment of the investors, the resort will sink into the slump and the Second World War will further worsen the material situation of Sables-d'Or-les-Pins. At the end of the conflict, the seaside resort presents an unrecognizable face: it is partly abandoned. Hotels remain closed and only a few villas are occupied during the season. Today, the resort, which has known years of lethargy, is experiencing a second life after major works in the 2000s.

The recent global Covid-19 health crisis has already affected seaside practices, the image of coasts, and of course, seaside resorts tourism economy. Despite the dramatic irruption of Covid-19 in the USA, the beaches of Florida, bathed in sunshine and living in an incredible carefree way, first saw their popularity sustained. Radical prohibition measures had to be taken to confine the public and raise awareness of the virus [26]. The financial recession that is following will probably also hit the seaside resort economy hard throughout Europe and all over the world.

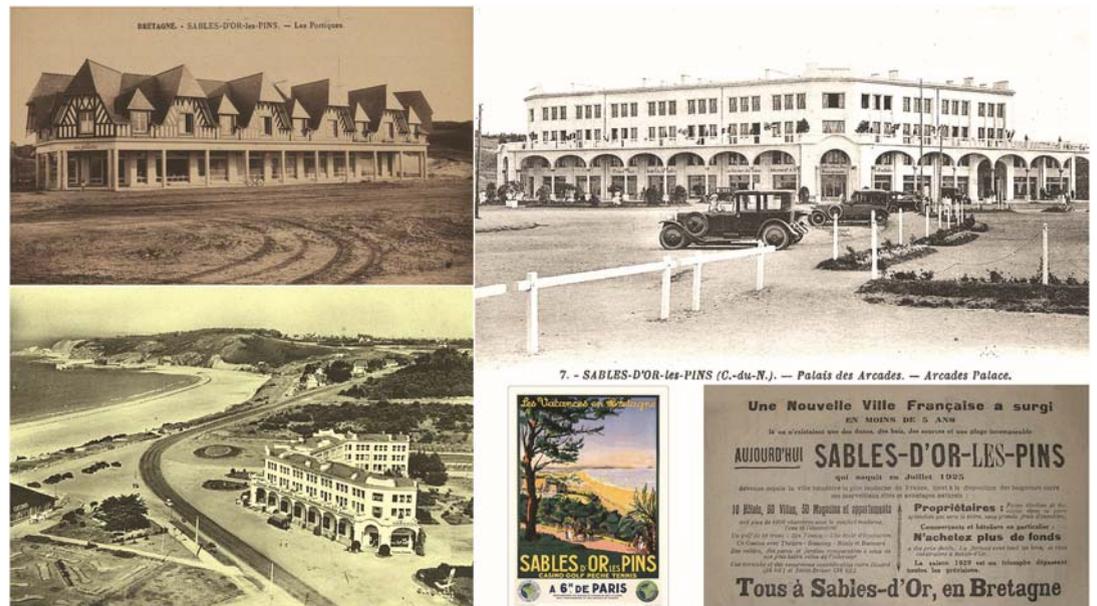


Fig. 9. Sables-d'Or-les-Pins in the 1930s (source: Archives Départementales des Côtes d'Armor, Philippe Clairay).

Results

The table below summarizes the different trajectories that the seaside resorts can follow when confronted with the risks identified in this respect. Of course, this presentation remains schematic and does not consider other local factors such as the resilience of the local population and authorities, economic dynamism before the risk is faced, pre-crisis tourism attendances. Nevertheless, we showed that the changes can be drastic: during crisis, resorts can be immediately devastated or abandoned (e.g. during a flood wave or an armed conflict), or suffer slow degradation, for example during an economic crisis. The destiny of seaside resorts is therefore multifactorial, but we can see that the environmental risks affect them to the highest degree. (Fig. 10).

Conclusions

The perception of the seaside landscape itself is likely to be upset in the coming years. Indeed, the coastline is undergoing profound changes, as we have seen from the case studies developed, and its landscape is going to change profoundly. Going to the beach, having fun and finding a source of well-being, both for tourists and seaside dwellers, are all positive images that are threatened by the various crises that seaside resorts are already facing. The landscape only exists if it is looked at, and from a touristic point of view, only if it is shaped by man. This is particularly the case on the coastal fringe, which is particularly anthropized.

However, a negative image of the coastline, linked to the presence of major risk factors, is exceedingly difficult to change. The abandonment, for whatever reason, of seaside resorts, will by consequence reject the images of lively beaches into a happy but bygone past.

Conclusion

Changes in world tourism, which are already underway, will probably accelerate following the recent crises, particularly the Covid-19 crisis, which stopped all flows and brought the whole of tourism activity to a standstill. The coastal touristic economy is therefore threatened in several respects: by economic factors arising from crises (financial, health), and above all by the climate crisis.

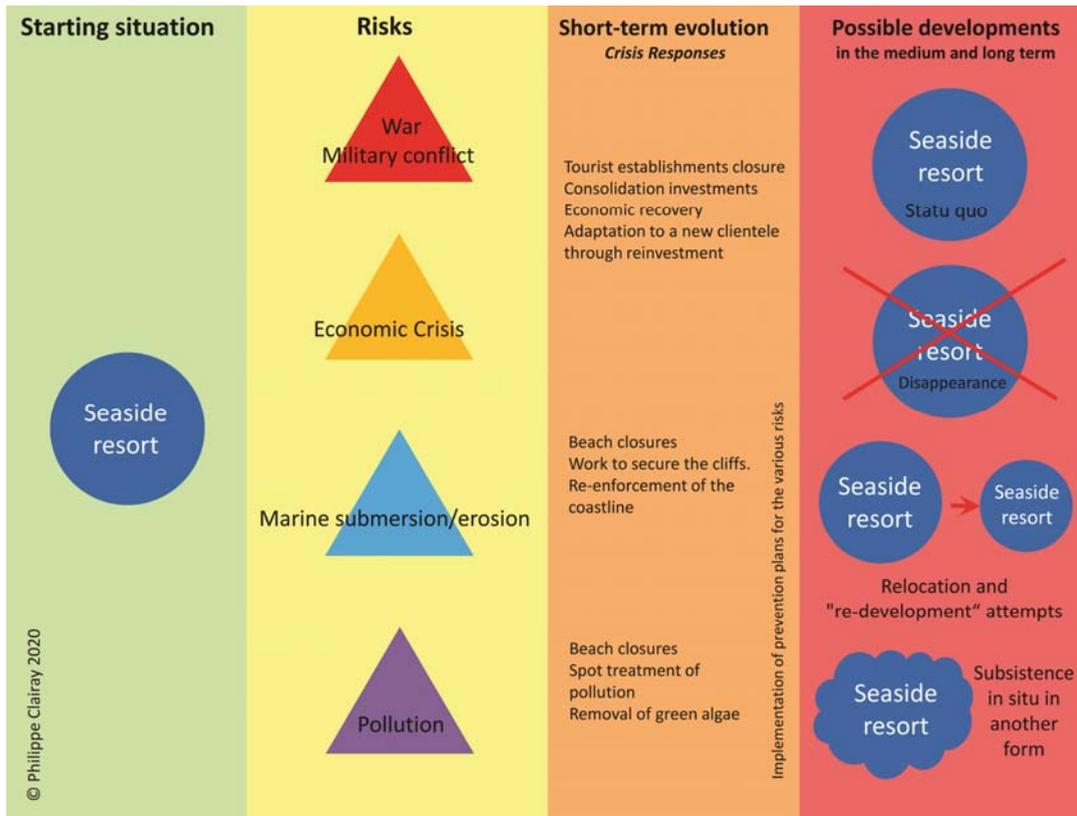


Fig. 10. Synoptic table of the evolution of seaside resorts: risks and responses (source: Philippe Clairay).

For the existence of beach leisure activities is linked to the fact that beaches themselves still exist! And this is how tourism is: it tends to consume what it wants to enhance. Natural paradises become urbanized hells. Moreover, this destruction of an anthropized natural landscape is accelerating with coastal erosion, risks of submersion, green tides. These signs of climate change raise the question of the survival of these seaside resorts. To overcome these decisive challenges, our societies will have to show great resilience. For it is not only an economy, but a way of life that is under threat.

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