

11. Aspects of mass coastal tourism in the Black Sea Romanian coast

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A **BSTRACT:** The Romanian seaside of the Black Sea stretches on a length of approx. 240 km, between Ukraine and Bulgaria, from the Danube Delta, in the North, and the seaside resort Vama Veche, located at the border with Bulgaria. This is fitted and exploited for tourist purposes only on a distance of approx. 82 km, from Cape Midia (in the North) and up to the border with Bulgaria (in the South), area where there are 18 seaside localities, among which 13 are tourist resorts of national interest. (Simon *et al.*, 2011)

The use of Causal Loop Diagrams in this study comes first in the combination with an extensive literature review. Based on new studies and references, the team designs a first sketch of the coastal tourism relevant for this Study. This first draft is afterwards discussed and actualized based on other participatory approaches, where the stakeholders together with the scientists can complete the mind mapping process. Starting from the statistics and experience, which is the impact of the Coastal Tourism Development on the Marine habitats and the sea bottom, this analysis presents the factors that intervene in this storyline.

Keywords: coastal development, Black Sea, Romania coastline, causal diagram

INTRODUCTION

The purpose of the study is to present a systemic analysis on the aspects of coastal tourism on the Romanian Coast that can impact the state of the Black Sea.

This region is a complex one, which increases its tourism value. It lies on 245 km in length, with the Danube Delta and the Razim-Sinoe lagoon complex to the North while to the South, on about 70 km, there lies the seashore itself. The seaside resorts, which are well known at international level (Năvodari, Mamaia, Eforie Nord, Eforie Sud, Techirghiol, Costinești, Olimp, Neptun, Jupiter, Aurora, Venus, Saturn and Mangalia), have all modern accommodation, treatment centres and various entertainment opportunities. (NIS,2013)

The entire tourism potential has allowed the development of tourist activities focused on certain types of tourism. In time, the following tourism forms have appeared:

- The tourism for rest and recreation is one of the oldest forms of tourism practiced in this region, which has evolved together with the diversification of the tourism services, especially of those from entertainment.
- The spa tourism for physical recovery, corporal and facial cosmetics, is the tourism form that has known the fastest upgrading. Before 1990, medical types of systems were used, but nowadays very modern techniques and endowments are used for the physical, aesthetic and psychological recovery.
- The social tourism for children and young people is offered in Costinești resort, a place preferred by students and young people without families and children, as a fun place, and Năvodari

resort, focused on the most important camp for pupils. Moreover, the tourism offer from these resorts has started addressing to other tourist segments, but they are very few.

- The active tourism for leisure activities and sports is focused on the practice of light sports, from the need to move and for an active rest.
- The business tourism and the congresses have known an ascending evolution in the last 20 years. Constanța and Mangalia cities have become important hosts for numerous economic reunions, economic contracts conclusions, seminars and conferences on social, medical and scientific themes.

The resorts from the Romanian seaside face more problems, among which the most obvious is the reduction of the number of tourists, in the last decade, the tourist offer managing to rise only partially at the level of tourist expectancy. The Romanian seaside is forced to compete with other new offers of seaside, existing in the entire Black Sea basin (NIS, 2013).

One more negative, but continuous, problem is the marine erosion. This phenomenon has always existed, but during the last five decades it has accentuated very much. We can mention a few aspects occurred because of the human interventions, with a negative effect on the beach areas:

- Pushing the deposits carried by the Sulina Branch further into the sea, in order to maintain the navigational depth;
- The large number of hydro technical buildings on the Danube located on the middle and inferior course, which have reduced the deposits with approx. 50%;
- The extension and the modernisation of the harbour areas, from Midia and Constanța, Mangalia, which have diverted the seaside currents towards the open sea;
- The presence of some industrial activities from the harbour areas with accidental pollution impact on the natural environment;
- The tendency of the marine level to increase with 1.5 -3 mm per year, as a consequence of the high volume of fresh water brought by the direct affluent rivers;
- The increase of the number of storms and their intensity, especially during the cold season, with devastating consequences on the beaches and the natural coasts;
- The illegal extraction of sand by the population from the nearby localities for constructions, fact that affects the thickness and the quality of the sand layer;
- The deterioration of the concrete dams that have the role of directing the deposits towards the shore (Simon *et al.*, 2011).

Another problem is the manner in which the Romanian resorts have appeared and developed along the Black Seacoast. The majority have old accommodation and catering units that partially satisfy the current requirements of the tourists. The deficient aspect is that of the exterior architecture that is not adapted to the natural environment and to the regional specific, the small number of leisure spaces and the insufficient local transportation. During the last two decades, the modernization actions of the numerous hotels and villas have intensified, and other have been built.

Among the tourism forms from Romania, the seaside tourism holds the highest share, because there is the tradition of spending at least a weekend at the seaside, or a part of the holiday. 40% - 120.000 places are located on the seaside from the accommodation capacity of Romania, the majority being the 2 star and 1 star units. The tourist season is short, around 3months a year, with reduced possibilities of extension as a consequence of the small number of recreational and entertainment activities. The tendency to extend the season in the months of May and September started in 2007, by organizing new activities and by involving the economic agents. Moreover, the duration of the stay has been reduced from 7days to 5 days on the Romanian seaside for the internal as well as external tourism. For the internal tourism, the weekend tourism has appeared in the last 2-3 years in almost all the seaside resorts, fact that agglomerates the Bucharest -Constanta highway, but also the road traffic flow between the resorts, as well as the accommodation and catering units or the beaches. Such a developed phenomenon brings a certain discomfort for the tourists on holidays and leaves. (Simon *et al.*, 2011)

MATERIALS AND METHODS

We used the method of Causal Loop Diagrams Mind Mapping and the software iModeler, product of CONSIDEO GmbH. The methodology used adapted the initial idea of the value chains into a suitable method for the Study of Coastal Tourism.

Causal Loop diagrams using iModeler

A causal loop diagram (CLD) is a causal diagram that aids in visualizing how interrelated variables affect one another. The diagram consists of a set of nodes representing the variables connected together. The relationships between these variables, represented by arrows, can be labelled as positive or negative (Wiki, 2012).

Causal loop diagrams provide a language for articulating our understanding of the dynamic, interconnected nature of our world. We can think of them as sentences which are constructed by linking together key variables and indicating the causal relationships between them. By stringing together several loops, we can create a coherent story about a particular problem or issue (Kim, 1992).

The IMODELER is a tool that can be used to visualize and analyse the cause and effect relationships that exist in any complex situation within business, politics, and science and even in your own private life. It can create a new culture of better planning, better decision-making and better communication (Neumann, 2009).

There are 2 options:

- Qualitative modelling—to quickly weights the connections for factors using the values "weak," "middle" and "strong." Already rough weighting allows us to identify the positive factors (e.g. measures) and the negative factors (e.g. risks) that are involved in a challenge for both the short-term and the long-term.
- Or Quantitative modelling—to use data and formulas in order to run scenarios in simulation cockpits to foresee the likely development effects of both risks and specific measures.

Visualizing and analysing cause and effect relationships — in short: “modelling”—serve to enhance visual thinking. You can use modelling to develop important ideas, prevent failure, master complex processes, and foresee developments or to simply shorten your meetings through straighter communication.

Cause and effect models go beyond mind maps: arrows are used to indicate relationships that exist between factors and the effects that they have on each other. It can be represented arguments through a rough weighting of these effects (systems thinking). Or, alternatively, it can describe the relations mathematically by integrating data for what-if scenarios (system dynamics), (Kim, 1992).

The analysis of the model will show counterintuitive cause and effect chains as well as nonlinear developments that are a result of feedback loops. It can then be identified possible risks and promising measures to take—which perhaps no expert would have come up with. With the IMODELER it can be visualized and analysed the interplay of many of so-called factors (Neuman, 2009).

Qualitative Analysis: Showing the Insight-Matrix

The result of the qualitative modelling is the MODELER’s unique Insight-Matrix that it can get through the context menu for each factor. It compares the impact that the other factors have on the chosen factor. The matrix shows on the horizontal x-axis the sum of direct and indirect influences. On the vertical y-axis it shows the effect of reinforcing (R) and balancing (B) feedback-loops. A positive x value and a positive y value point to an increasing effect that is escalating. A positive x and negative y value means the increasing effect gets diminished over time. A negative x and y value point to an escalating decreasing effect of factors while a negative x and positive y value mean that the decreasing effect gets reduced over time. By this you can compare the short, medium and long term influences of factors (Neuman 2009).

Using IModeler program we can model the coastal tourism system. As shown, the elements that define this system are the Resorts. Through analysis and thorough research of the coastal tourism system in the context of marine habitats problems, coastal tourism can be summarized in the following figure. Analysis of the structure and functions of spatial planning system leads to the observation of system behaviour in detail.

Mind mapping

Over the course of the last twenty years, participatory modelling has increasingly been advocated as an integral component of integrated, adaptive, and collaborative water resources management. The old adage “if the only tool you have is a hammer, everything begins to look like a nail” can also apply to language. If our language is linear and static, we will tend to view and interact with our world as if it were linear and static. Taking a complex, dynamic, and circular world and linearizing it into a set of snapshots may make things seem simpler, but we may totally misread the very reality we were seeking to understand (Kim, 1992). For this reason we need to use as many visual methods in the description of the complex system of coastal tourism and the impact on the marine habitats.

RESULTS AND DISCUSSION

Causal Loop diagrams (CLDs) have long been used in standard system dynamics practice for purposes connected with simulation modelling. They are nowadays mostly used prior to simulation analysis, to depict the basic causal mechanisms hypothesized to underlie the reference mode of behaviour over time, that is, for articulation of a dynamic hypothesis of the system as endogenous consequences of the feedback structure (Randers, 1980; Richardson, 1999; Sterman, 2000). It also forms a connection between structure and decisions that generate system behaviour. Later, CLDs have started to be used for purposes not necessarily related to model building, namely, for detailed system description and for stand-alone policy analysis (Wolstenholme, 1999, Homer & Oliva, 2000; Binder *et al.*, 2005).

The use of CLD in this case comes first in the combination with an extensive literature review. Based on new studies and references, intensive talks and virtual meetings, the team designs a first sketch of the coastal tourism relevant for this Study. This first draft is afterwards discussed and actualized based on interviews, focal groups or other participatory approaches, where the stakeholders together with the scientists can complete the mind mapping process.

The need for resorts is one of the most important outcomes of the growth of tourist numbers and worldwide mobility. The increased pressure from the built of the mass touristic resorts with all the additional facilities comes firstly from the Land Reclamation issues. Extension of beaches, huge resorts for bigger number of tourists, for wider accommodation spaces or more divers facilities, important natural areas removed for open beaches or constructions and hydro-technical structures are increase the need for land reclamation for the resorts. And so, the natural landscape is replaced by the artificial constructed one. Once increased the number of tourists, other industries develop: food industry, energy industry (by increasing the need and use of water and electric energy), commerce and others.

Also, resorts increase the need for a well-connected transport infrastructure. Either by air, by water or land, resorts are successful when they are fast accessible.

On the other hand, the environmental impact of this mass touristic facilities come from additional noise, air pollution, waste, waste water, overfishing, consumption of sea food, collection of marine souvenirs, overfishing, boating, diving, scuba diving.

The effects on the marine habitats come in direct or indirect ways. The most important influence comes in the water quality due to the waste water or regular waste. But the intensive tourism has influences also on the sea bed (causing morphological changes and disturbing the marine fauna).

All the information introduced in the causal loop diagram above was extracted based on previous experiences from the Romanian Coastal Zone and the European References for the coastal areas of Black sea and Mediterranean Sea.

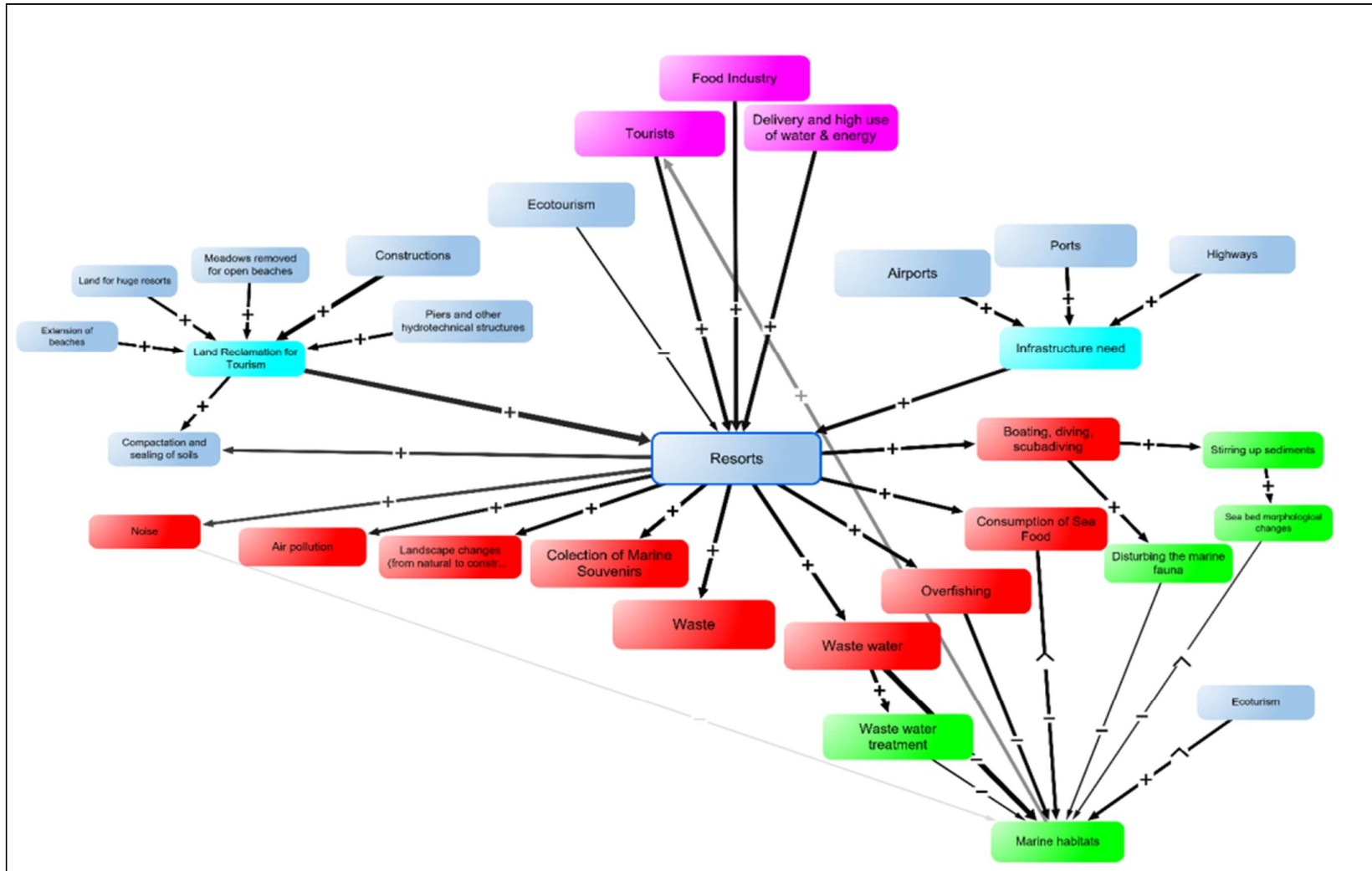


Figure 1. Causal loop diagram for the coastal tourism development impact to the marine habitat

Starting from the statistics and experience, which is the impact of the Coastal Tourism Development on the Marine habitats, this diagram (Fig. 1) presents the factors that intervene in this storyline.

The central factor that starts this story and most of the studies regarding coastal tourism is the aspect of the intensive development of 'RESORTS'. This major structure that come to fulfil the economic needs of a certain coastal area reveal a complicated structure of factors that complete the system behaviour. Factors in pink describe the needs of the mass touristic resorts and in blue the components of the mass tourism; they form the upstream level of the system, the inputs. The output of the resorts goes for several environmental problems (in red) which continues to affect the system downstream towards the marine habitats.

The upstream part of the diagram starts from the needs (spatial, human, economic, infrastructure of the major touristic resorts and its' implications. 'Land reclamation for tourism is the first pressure that resorts apply on the coastal area. The idea of developing new resorts implies important structural changes on land use trough the extension of beaches for the tourists, the need for free land for the new civil or hydro-technical constructions and structures which attracts the destruction of meadows that are removed for the needs of this huge touristic settlements. The spatial aspect of land reclamation for tourism leads to a series of changes in the use of the land, many times up taking the natural use for the artificial, constructed use.

Another important section of the upstream sector is represented by the 'source' factors. What populates the resorts? The idea of resorts developments comes from the increasing interest of tourists for the coastal areas and from the need for comfort tourism. The basic components for resorts are based on the food industry and water and energy need. This factors develop important pressures in the resorts system and could create the basis for the behaviour change in the ocean literacy concept (since there are already several programs and regulations in this areas; e.g. the 'Save the water' program for the laundry in the resorts).

As mentioned above, development of successful resorts creates the need for infrastructure. As time for tourism is more and more short, the need for fast ways of transportation is one of the most important pressures that come with this type of touristic facilities (airports, ports and highways).

Passing from the upstream of the diagram through the resorts 'engine', the downstream part drives the story to the end of its objective. It describes the impact of the resorts on the marine habitats. Noise, Air pollution, Landscape changes- from natural to constructed, collection of marine souvenirs, waste, waste water, overfishing, consumption of sea food, boating, diving, scuba diving. Each of this impact damages in different ways the marine habitats: by stirring up sediments, changing the sea bed morphology, disturbing the marine fauna, evacuation the waters from the waste water treatment plants.

An important factor that has to be introduced in the diagram is the 'Ecotourism' factor, that, from references, it is seen as one of the most important solution and component in the 'Resorts' system. As more programs for ecotourism are applied, resorts could be less seen as an option for tourism. In this case, the citizen behaviour is one of the most important components of the system.

Choose one of 7 reinforcing (R) or balancing (B) loops

- B (4): Noise --> Marine habitats --> Tourists --> Resorts --> Noise
- B (4): Marine habitats --> Tourists --> Resorts --> Consumption of Sea Food --> Marine habitats
- B (4): Marine habitats --> Tourists --> Resorts --> Overfishing --> Marine habitats
- B (4): Marine habitats --> Tourists --> Resorts --> Waste water --> Marine habitats
- B (5): Disturbing the marine fauna --> Marine habitats --> Tourists --> Resorts --> Boating, diving, scubadiving --> Disturbing the marine fauna
- B (5): Marine habitats --> Tourists --> Resorts --> Waste water --> Waste water treatment --> Marine habitats
- B (6): Sea bed morphological changes --> Marine habitats --> Tourists --> Resorts --> Boating, diving, scubadiving --> Stirring up sediments --> Sea bed morphological changes

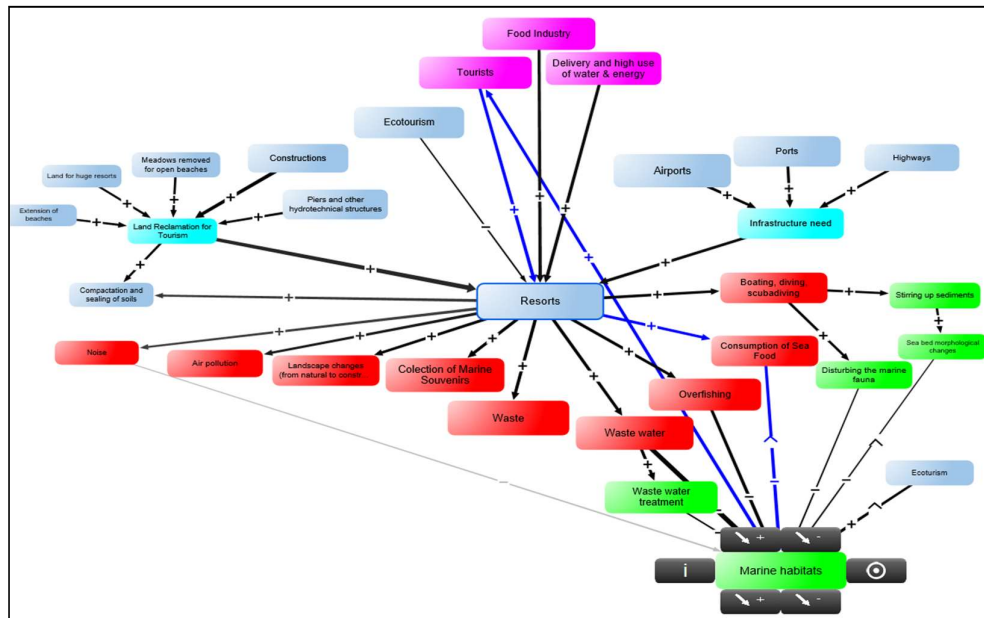


Figure 2 Description of the loops in the chain (one example of the loops, in blue)

Behind all the factors, the most important components of the causal loop diagrams are the connections between them. Each connection is described by three types of information:

- The time-line of the connection that develops between two factors
- The value of the impact from one factor to another
- The type of impact: positive or negative impact.

All this information (factors and connections), in this initial- draft stage of the study development was collected, as mentioned before from:

- Previous experiences, studies and expert-based
- References

From the final form of the diagram, the next important step of the methodology goes to the unique 'Insight matrix' of the system, extracted with the iModeler Software.

The Insight Matrix is used to illustrate the strength of the relationships between the factors: the further a factor is located to the right, the stronger the increasing effect of a selected factor is on the central factor. The opposite is the case the further a factor is located to the left. The orientation on the y-axis reflects the involvement in loops (either balancing or reinforcing) (Lorentz *et al.*, 2014).

In this study, the systemic analysis reveals the important negative impact that Resorts have on the Marine habitats (Fig. 3). This impact doesn't change from short to long term, but offers the possibility of being changed in the context of the system analysis, by compensating with the positive impact factors, such as 'Ecotourism'.

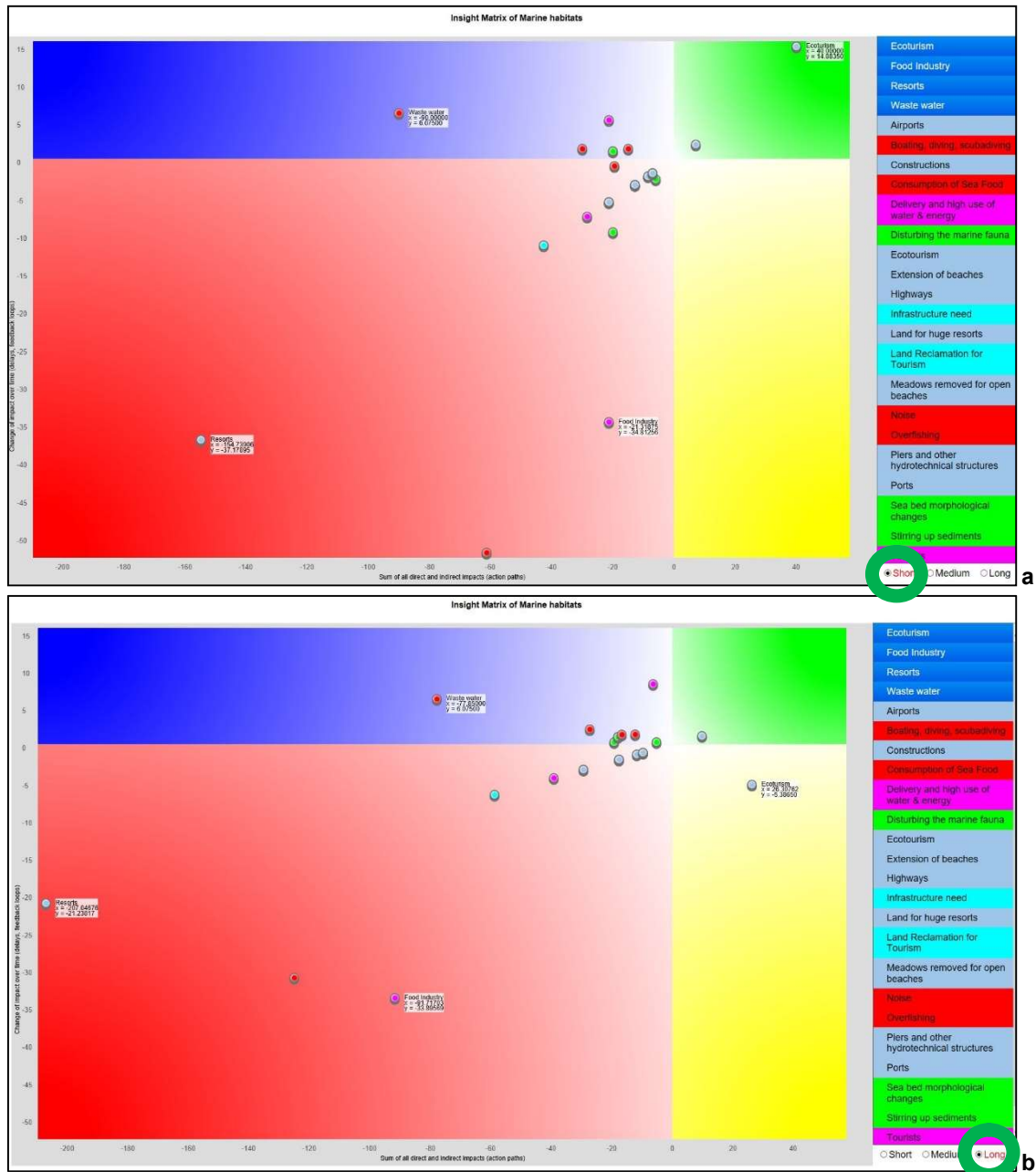


Figure 3. Example of short (a) and long term (b) insight matrixes of changes

CONCLUSIONS

This type of analysis gives an idea on how the mass tourism system in the coastal region of Romania functions in the wider context of coastal area- marine habitats. By presenting the components of the system and their relationships using the mind mapping process, it can be identified and quantified the most sensible parts of the system, that offer the opportunities for behaviour change and improvement. Based on the presented analysis insight matrixes, it can be noticed that the highest value of negative impact in the system comes from the resorts, followed by the waste water, food industry and land reclamation. This factors impact, strongly negative the marine habitats.

On the other hand, the most important positive impact in 'coastal tourism character' for the marine habitats is represented by the tourist behaviour towards ecotourism. The impacts of the factors change in time, which means that this are the main points for the behaviour change initiatives, trough programs, policies and raising awareness.

The orientation of the policies towards the ecological aspects of the tourism change the reaction of the marine system and offers the opportunities for an improved type of mass tourism in the coastal area. The results of the study can be the first step in a wider analysis of the problems of the mass coastal tourism and its' impact to the marine habitats. This could be developed through new studies as basis for new policies and programs.

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