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The Identification and Evaluation of Risks Impacting on the Locals and on Tourist Activities in the Town of Sulina

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Abstract: Tourism is a vulnerable sector, as it is increasingly exposed to several risks, which can sometimes feature adverse effects. Each tourist destination is unique, being exposed to different risks. Choosing a destination depends - to a large extent - on the degree of safety it offers to tourists and on the existence of a clean environment. In the mind of the tourist services' consumer, the feeling of safety associated with the destination and risk factors are strongly linked, generating the overall picture he or she is making about the destination. Safety and security represent a key factor in the stability of an area that accommodates tourists, as is the case of the town of Sulina. This is a geographically isolated locality, but it has an attractive and favourable location for practicing various forms of tourism (cultural tourism, ecotourism, sport tourism, adventure tourism, helio-marine tourism, cruising, air gliding, and so on) against the background of the unique landscape scenery (combining the landscapes offered by the Danube, the Sea and the Danube Delta). Awareness of the risks associated with the town of Sulina offers the tourist the possibility of carefully considering them, in order to increase the level of protection of the tourists as consumers.

Keywords: evaluation, risks, impact, tourist activities

INTRODUCTION

The beginning of this paper is dedicated to the analysis of the current situation of the territory of Sulina, regarding the socio-economic aspects and the current state of tourism valorisation in this area. The final part of the paper aims at identifying and evaluating the risks impacting on the population and on tourist activities.

I. SOCIO-ECONOMIC ASPECTS

1.1. Demographics

Referring to the evolution of *the population* of Sulina between 2013 and 2017, from the information available in the "Tempo" database of the National Institute of Statistics, we can notice that there is a tendency of decrease in the number of inhabitants, from 4,316 inhabitants to 4,045 inhabitants. In 2017, according to the same source, out of the total stable population of Sulina, 2,022 persons were male residents while 2,023 persons were female inhabitants. In the same year, the highest share of the total population of the town was held by the "20-64" age group (approximately 69.9% of the total population). This rather significant percentage indicates that the town houses enough young and adult people and that they make up the human resources necessary for running and developing Sulina's economic activities, thus implicitly the tourist ones. Other age categories accounted for lower percentages, respectively 14.2% (the "0-19" age group), and 15.9% (the age group of inhabitants who are older than 64). Also stand out the gradual decrease of the young population between 2013 and 2017, along with the increase of the senior population.

From the point of view of the distribution of population, there was a slight predominance of men over women between 2013 and 2016. We also notice the negative natural increase of the population in this locality, between 2012 and 2016, with more deaths than births being registered.

1.2. Workforce

The average number of employees in Sulina was of 562 in 2016 (also according to the National Institute of Statistics), registering a decrease from the previous year - when nearly 586 employees were registered. In fact, two distinct periods stand out in the evolution of the average number of

employees over the last 5 years: the period between 2012 and 2014, when the number of employees increased, and the period between 2015 and 2016, when their number decreased. With regard to the number of unemployed persons, this parameter was higher between 2012 and 2013, while in 2015 and 2016 the number of unemployed persons was lower. The share of registered unemployed out of Sulina's total workforce decreased from 6.4% in 2013 to 2.7% in 2016.

1.3. Local Economy

Currently, as stated in the Local Development Strategy of Sulina, the main economic activity developed in the town is considered to be **fishing**, still practiced with traditional fishing boats that can go through the narrow canals in order to reach the large lakes in the area (some exceeding 5,000 hectares). Fishing is practiced in three professional organizations. The fishing effort of the three organizations covers about 200 vessels and boats. The town has four wharves and first sale centres. Another interest of the locals is the cultivation of plants and the keeping of pastures for **animal husbandry** that covers some of the rafters.

Tourism is also an important activity in Sulina, which, during the warm season, turns into an ideal destination for those who want to relax away from the noise of a regular city, in the tranquillity that characterizes this location. Specific tourist activities consist mainly of tours organized by locals, who are either former fishermen or young people who know very well the places and are familiar with the wilderness of the Danube. A niche of tourism, which has been developed recently more and more, is represented by sport fishing, for which more and more tourist companies operating in the Danube Delta have met the legal demands, providing thus to the clients at the fishing grounds the necessary equipment, transport and assistance.

Agriculture has a very low share in the local economy. One of the reasons for this is the specificity of the area and its geographical location, because soils here are particularly poor in composition and are unfit for the development of agricultural activities. Part of the local population is making considerable efforts to grow leguminous plants in the gardens that surround their households for their family use.

1.4. The Health System - in the town, public health services include a health centre, a medical dispensary and a nursery, conforming to the Local Development Strategy of Sulina. Private health services include a surgery office, a dentistry office and there are two family medicine practices. However, for severe cases it is necessary to transfer the patients to the hospital in Tulcea and the travel time is of about three hours.

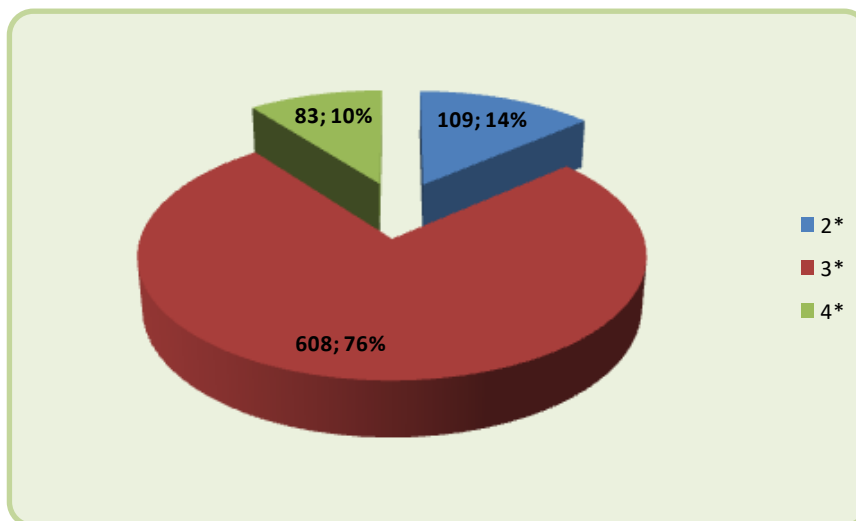
1.5. The Learning / Education System - currently, the schools in Sulina are represented by an elementary school (for grades I-IV), by the School of Arts and Crafts (for grades V-VIII), a high school (with majors in philology, mathematics, computer science and mathematics-physics), a kindergarten, a summer camp, and a sports hall, just as the Local Development Strategy showed. All educational establishments are located nearby, generating an educational area located in the east of the town.

II. CURRENT STATE OF TOURISM DEVELOPMENT

2.1. Tourist Accommodation Establishments that Offer Housing

In terms of the number of accommodation units classified / authorized by the Ministry of Tourism in the area of Sulina this was of 37 units in 2017, with a total of 794 accommodations. According to the Local Development Strategy, things are different "on-site", as the accommodation infrastructure provided to tourists is made up of several "under-the-counter" accommodation units. Most of the accommodation units in the locality were ranked with 3 stars (23 structures, 62%), the others being ranked with 2 stars (19%), and with 4 stars (19%). In terms of type of accommodation units, in 2017, mostly were represented by tourist boarding houses (67.5%), followed by villas (10.8%), rooms for rent (8.2%), camping areas (5.4%), while the other types of structures registered 2.7 percent each (hotels, apartments for rent, bungalows). In terms of number of accommodations, in 2016, the majority of them were concentrated in 3 star units (76%), followed by 2 stars units (14%), and 4 stars units (10%).

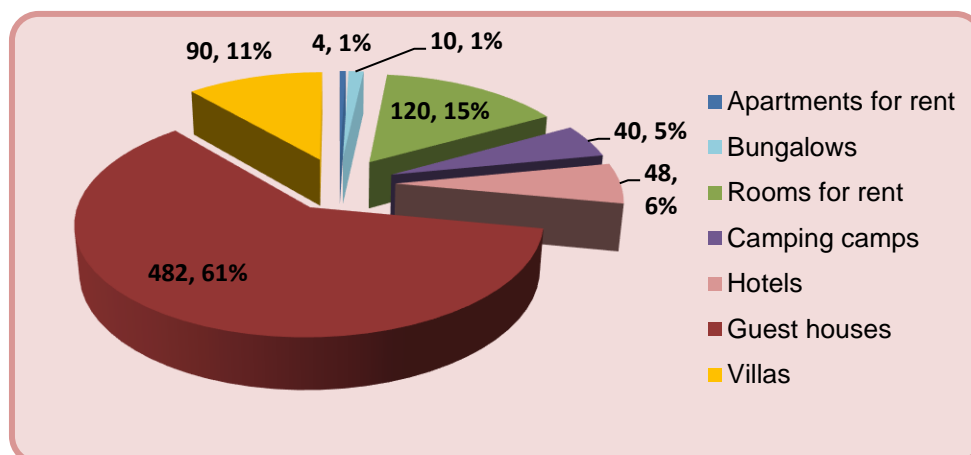
The structure of accommodations in the town of Sulina, broken down to quality ranking categories (2017)



Source: the database of the Ministry of Tourism (<http://turism.gov.ro/informatii-publice>) – processed data

Regarding the types of tourist accommodation establishments, the existing accommodations are distributed as follows: 61% in hostels, 15% in rooms for rent, 11% in villas, 6% in hotels, 5% in campsites, 1% in bungalows, and 1% in apartments for rental.

The structure of accommodations in the town of Sulina, broken down by types of units (2017)



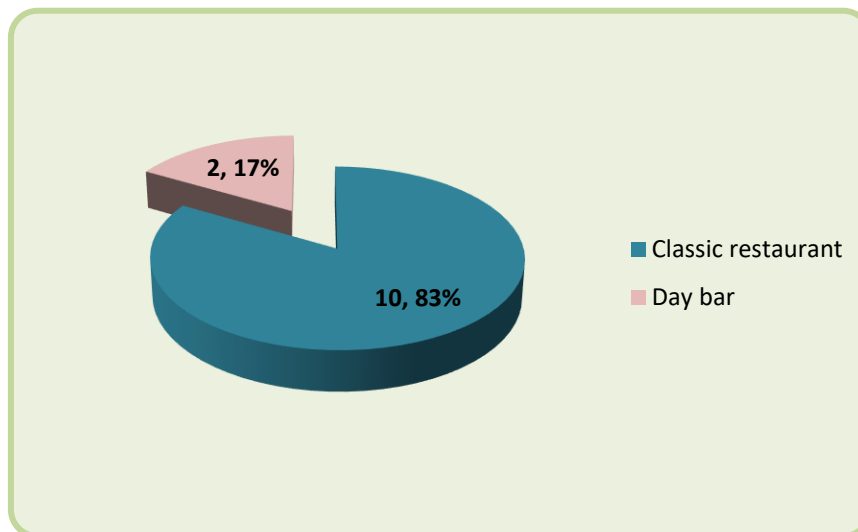
Source: the database of the Ministry of Tourism (<http://www.turism.gov.ro/informatii-publice>) – processed data

2.2. Tourist Accommodation Establishments that Offer Catering

In 2017, according to the database of the Ministry of Tourism, in the town of Sulina there were 12 classified catering units, with a total of 688 seats. With regard to these, the following can be observed:

- *Day-bar units* are only two in number (17%) and sum up to 45 seats; in the *classic restaurant* category there are ten structures (83 %) and they accumulate 643 seats. Most dining venues are distributed in classic restaurants (93.5%), and the rest of them in day bars (6.5%).

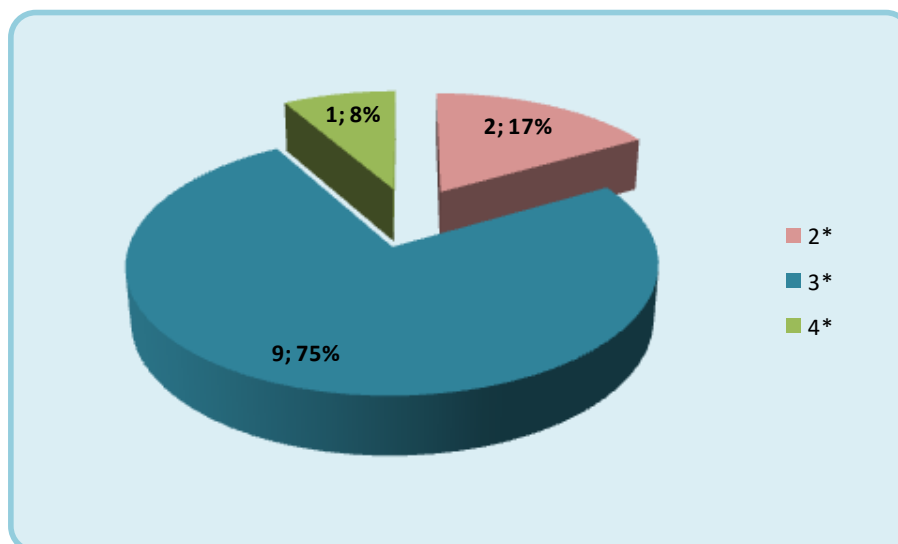
The structure of catering places in the town of Sulina, broken down by types of units (2017)



Source: the database of the Ministry of Tourism (<http://turism.gov.ro/informatii-publice>) – processed data

- 75% of the catering units are ranked with 3 stars, 17% were ranked with 2 stars, and 8% with 4 stars.

The structure of catering places in the town of Sulina, broken down by quality ranking categories (2017)



Source: the database of the Ministry of Tourism (<http://turism.gov.ro/informatii-publice>) – processed data

2.3. Tourist Circulation

According to the data provided by the National Institute of Statistics, during 2012-2016, the figures corresponding to tourist circulation were the following:

↘ Regarding the indicator "*number of tourists*", very much oscillation was noted in terms of the evolution of arrivals. Thus, 2014 accounted for about 11 times more tourists' arrivals (2,724) compared to 2012 (256). In 2015, the decrease was quite small (by only 3 arrivals), while a drastic decrease in the number of arrivals was recorded in the subsequent year (133).

Year	2012	2013	2014	2015	2016
Tourists' arrivals	256	no data available	2,724	2,021	133

↘ Similarly, for the same reference period, the "*number of overnight stays*" of tourists also showed a highly fluctuating trend, which was why the trend could not be clearly defined (see table below).

Year	2012	2013	2014	2015	2016
Tourists' overnight stays	680	no data available	14,514	11,690	542

↘ It can be noticed a decrease in the indicator "*average length of stay*" indicator between 2012 and 2016. This downward trend was recorded from a year to the following, with the value of the indicator decreasing from 2.5 days of stay in 2012 to 1.6 days in 2016.

Year	2012	2013	2014	2015	2016
Average length of stay	2.5	2.4	2.3	2.0	1.6

↘ As tourist arrivals and overnight stays have so high oscillations, the occupancy rate of accommodation structures decreased between 2012 and 2016 (from 9.5 to 1.7).

Year	2012	2013	2014	2015	2016
Index of net use of accommodation capacity	9.52	8.2	7.1	5.2	1.7

III. THE IDENTIFICATION AND EVALUATION OF RISKS IMPACTING ON THE LOCALS AND ON TOURIST ACTIVITIES

3.1. Risk Identification

A. Natural Risks

A.1. Climatic and Hydrological Risks

The Risk of Freezing - ice formation in the hydrological area of the Sulina area is determined by various factors (climatic ones, hydrological ones, and biochemical ones). Of these, climatic factors are the most important, being represented by air temperature, wind speed and wind direction. Frost periods in the hydro-local area network take place after the first decade of January and are heavily influenced by the Sea, and may occur until the beginning of March. Rapid freezing occurs in only 12-24 hours when the air temperature is of - 10 degrees and if the wind blows constantly with a speed of 8-10 m/s from the N-NE direction.

In such situations, the first to freeze is the Gulf of Musura, followed by the lakes Roșu, Roșuleț and by the Old Danube. Under conditions of low hydrological levels and lack of currents, the canals Cardon, Busurca and Împuțita freeze and form ice bridges with thickness ranging from 40 to 60 cm. If the negative temperatures reach -15° C and the level of the Danube is low, then an an ice crust is formed on its surface, tending to incorporate the flowing ice-floes from the hydrographical basin, thus creating an ice bridge that can block the flow of the Danube, forming ice dams (ice clusters), which require the intervention of ice boats.

The frosting of the Danube is a major factor in diminishing the accessibility of localities in the Delta, in particular that of the town of Sulina, generating social and economic problems for all these

communities. Since in times of frost fast ships can no longer travel here because of technical reasons, access can only be ensured by classic ships of Navrom Delta; in case of an ice-floe thickness of 25 centimetres, these vessels cannot come here either. The social problems of the locals remain suspended: some of the inhabitants (employees, students) remain locked in Tulcea for several days, and the supply of food and liquefied gas is interrupted.

The most significant issue is that of the access to health services: following the dissolution of Sulina Hospital, locals with health problems have to travel to Tulcea on signage ship platforms for 12-15 hours and have to face very low temperatures.

The Risk of Flooding - Over the last years, Sulina has been constantly subjected to the risk of flooding, because of the high levels and fluctuations of the Delta waters, threatening to break the dams that protect the town. Floods have had negative effects, affecting the local population, fauna and vegetation in the area, and have had a significant impact on navigation on the Sulina Canal.

Sulina's local development strategy has identified the following causes of flood risk and that have led to the breakdown of the hydrological balance:

↘ *Natural causes:*

- changing in the temperate-continental climate, a phenomenon that affects the national, regional, and cross-border level, in the context of global climate change impacting on the whole Danube river basin;
- increases in the volume of water levels, caused by large amounts of precipitations falling in short time intervals over large areas, including the rich amount of snow deposited during the winter period throughout the hydrographical basin;
- sudden heating of the air, which causes rapid thawing during the spring period throughout the whole hydrographical basin;
- the increased levels of the Danube waters, triggered as an effect of the sea storms coming from the E-NE direction and resulting from the "high sea" effect, occurring accidentally, reaching values of about +2,2 m - a phenomenon ascertained by observations and hydro-meteorological measurements.

↘ *Anthropic causes:*

- hydro-technical works carried out without being based on impact studies, after 1965;
- the modification of the channels by enlarging and resizing the natural passage openings, for ensuring the industrial harvesting of the reed in order to feed the Chiscani plant.

Another hazardous area that can be affected by floods is the Caraorman Canal, whose making (for the purposes of the construction and exploitation of sand for the production of optical glass near the Caraorman Forest) had had negative effects on the Delta environment (according to studies conducted later). The development was abandoned after 1990, but the presence of the channel is still threatening the delta environment and poses a threat to the town, as the incoming flow cannot be discharged into the river or into Sea in due time; the increased water level has an eroding effect on the dams that defend the area of from floods, and the pressure resulting from the level difference has the tendency to break the protective dams (Ghinea, 1998). Thus, from a hydrological point of view, the impact on the hydrological regime generated by the closure of the natural discharge canals for the flows entering the Delta and running naturally toward the Sea are corroborated with the effects of building the Caraorman canal and favour large scale flood hazards in the area of Sulina.

Another canal whose building had a negative impact on the environment was the Sulina - Sfântu Gheorghe Canal, which was dredged before 1989, without an impact study, to ensure the filling needed to build a dam meant to support the power line in Sfântu Gheorghe. According to Sulina's local development strategy, the impacts of building the dam are multiple, including issues that may generate local risks both from the point of view of protecting the natural heritage and of favouring the flood hazard that would affect the locality.

A2. Ecological Risks

From the point of view of the *habitats*, the dam built on the Sulina Sfântu - Gheorghe Canal closes the flow discharge channels, which naturally reached the Sea and separates a broken site from the Delta itself, which it attaches to the seaside of the Black Sea. The distance from the dam to the sea shore is

of about 800-1,300 m, over a 32 km length. An area of approximately 3,500 ha is broken off from the natural ecosystem circuit due to the alteration of the hydrological regime and is consequently removed from the full protection system. The isolation of this area has disrupted the functional ensemble of interrelationships that ensure the harmonious structure, the operation and the balanced exchange that takes place in the dynamic complex of the plant and bird species communities and **has modified their natural habitat**.

Because of the erection of dams on the mouth of Sulina Branch, there have been profound changes in water and alluvium circulation along the Delta coast, to the north and south of the Sulina mouth, which constituted mainly in **shore erosion**.

The authors of Sulina's local development strategy have also noticed that a **qualitative diminution of the fish stock** is currently being observed in terms of a reduction of the share of valuable species. An ongoing threat to the fish stock is represented by poaching.

Against the background of anthropic pressure on the natural environment, another element of environmental risk, namely **pollution**, has developed in recent decades. Danube water pollution is caused by the following:

- the use of ships as means of transport (ensuring the only access to the area), but also the transit of seagoing vessels. Oil and oil-based products leaks or even the discharge of residues of any kind from commercial vessel jeopardize the aquatic ecosystems. Also, the aging of the river fleet increases the risk of leaking oil products into the Danube;
- the water supply system, which is based on water capture in the Sulina Branch. Therefore, the Danube is directly affected by any pollution incident that affects it;
- the landfill site in Sulina, which has a negative impact on the near-boundary area and on the low groundwater, because it is not enhanced properly.

Another environmentally damaging factor is **excessive grazing**, well above the limit.

A3. Geological and Geomorphologic Risks

The earthquakes that took place over the last decades have not caused material damage in Sulina, yet the locality is classified as one with seismic risk (according to The National Plan regarding Territory Enhancement, in terms of natural risk areas). Because of the geographical and geological conditions there is a danger of seismic movements on the Măcin - Tulcea - Sulina line, placed in the likely direction of propagation of an eventual earthquake. Also, as a result of seismic movements on the territory of Sulina, there is also the risk of terrain becoming loose, of landslides or soil cracks.

B. Economic Risks

From an economic point of view, currently the town of Sulina has enough economic units needed as a material base to ensure a very good development potential of the area but which, because of the difficulties related to the integration in the market economy, are faced with a precarious economic and financial situation.

Maintaining the area in a proper economic condition is increasingly dependent on the building of a national road traffic connection that would ensure the prospect of maintaining and running economic and tourist activities both for Sulina and for the neighbouring communes (Crişan and Maliuc). On the other hand, it would be less costly and less polluting if the water-based transportation routes were to be strengthened (conforming to the authors of the Integrated Development Plan of the Town of Sulina). The market share and attractiveness of public urban transport are affected by the poor viability of the roads. Also, the poor technical condition of the infrastructure has a negative impact on the accessibility.

The other economic risks are represented by:

- the low diversification of economic activities;
- the reduction of "industrial" activity over the last years;
- the low number of permanent jobs;
- the poor use of the human resources available;

- the poor organization of the producers;
- the dependence on imported raw material (with reference to the fishing activity).

C. Socio-demographic and Cultural Risks

Demographic risks consist in the following:

- decrease in population over the recent years, with a demographic decline also caused by negative natural growth between 2012 and 2016;
- the phenomenon of demographic aging, demonstrated by the drop in the share of the young population in the total population, together with the increase of the aging index;
- the migration of the population to the areas in which the economy is more developed.

Social risks cover the following areas:

- the most at risk are health emergencies, in case of which transportation even under favourable conditions takes several hours, whereas in unfavourable weather conditions it is necessary to appeal to SMURD helicopters;
- insufficient medical infrastructure;
- private companies whose object of activity consists in trade, fishing or offering services do not manage to provide the town with enough employment opportunities, while the isolation and the high commute costs make it difficult for the unemployed to work on a seasonal basis;
- lack of a comprehensive educational offer dedicated to the tourism (that is currently one of the main activity fields represented in the area);
- about 25% of the population who is fit to go to school is not enrolled in any form of education;
- lack of infrastructure for higher education;
- hard access to other educational institutions from the vicinity of the town.

From the analysis of the **tourist activity** in Sulina, a number of **vulnerabilities** could be identified, such as:

- the poor accessibility of the city during the summer season (absence of a proper road and air transport infrastructure); the exclusive dependence on shipping and meteorological conditions have led to a reduced mobility of tourists;
- the existence of "under-the-counter" activities, regardless of their capacity to offer or not optimal accommodation conditions for tourists;
- from a typological point of view, there is a predominant presence of low class (3-star) accommodation units, which may result in a certain limitation / constraint of accommodation options for potential tourists;
- as far as the catering units are concerned, they are also quite low in terms of classification and offer quite limited options;
- seasonal increase of activity during summer months (five months), which puts pressure on the area and on the environment during this period;
- extremely high oscillations of arrivals and overnight stays in the locality;
- the duration of tourist stays is relatively small (2,5 days / tourist); actually, tourists do not come to the area during their holidays / vacations; the decrease in the duration of the stay and the index of net use of the accommodation capacity indicate the existence of problems regarding the economic efficiency of the accommodation units;
- the neglect of the historical and of the environmental heritage. In this town, as reported by Ghinea (1998, p. 194) and by the List of Historical Monuments developed by the National Heritage Institute, 30 historical monuments were declared¹;
- the infrastructure for cultural services is under-dimensioned and non-diversified.

3.2. Evaluation of risks

In order to evaluate the risks identified above, we will consider their *effect* and *the frequency with which they may occur*, and from this point of view the risks may fall in one of the following categories²:

- a) insignificant risks – they have a very high frequency and they can cause very little damage and financial losses.

¹ Available at <http://www.cultura.ro/lista-monumentelor-istorice>

² AICST, *Tourism Risk Management in the Asia Pacific Region*, 2004, p. 19 (http://sustain.pata.org/wp-content/uploads/2015/02/Wilks_TourismRiskMgt-FINALv02.pdf)

- b) minor risks – they have a high frequency, they can cause personal damage that requires offering first aid measures, and they can cause average financial losses.
- c) moderate risks – they have an average frequency, they can cause personal damage that requires medical care, and they can cause high financial losses.
- d) Major risks – they have a small frequency, but significant negative effects. Can cause extensive lesions, loss of production capacity, major financial losses.
- e) catastrophic risks – they have a small frequency, but they can have extreme negative effects: loss of life, bankruptcy of the organization, destruction of the tourist destination.

Evaluation of the risks that may affect running tourist activities in Sulina

Typology of risks	Insignificant risks	Minor risks	Moderate risks	Major risks	Catastrophic risks
A. Natural risks					
A.1. Climatic and hydrological risks					
<i>The risk of freezing</i>				x	
<i>The risk of flooding</i>				x	
A2. Ecologic risks					
<i>Modification of the natural habitat</i>			x		
<i>Qualitative diminution of the fish stock</i>			x		
<i>Pollution of the waters of the Danube</i>			x		
<i>Excessive grazing</i>			x		
A3. Geological and geomorphologic risks					
<i>Shore erosion</i>			x		
B. Economic risks					
<i>Difficulties concerning the integrating into the market economy</i>		x			
C. Socio-demographic and cultural risks					
<i>Demographic risks</i>		x			
<i>Social risks</i>			x		
<i>Vulnerabilities related to the tourist activities</i>			x		

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Available at: <http://www.turism.gov.ro/informatii-publice>

Ghinea D., 1998 - Enciclopedia geografică a României, Editura enciclopedică, Bucuresti

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