

A STATISTIC ANALYSIS ON ROMANIAN SEASIDE HYDRO TOURISM AND ITS IMPORTANCE WITHIN ROMANIAN HYDRO TOURISM

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Tourism represents one of the ways of spending spare time for rest, recreation, treatment and entertainment, and the specific aspect of Constanta County economy is touristic and spa capitalization of Romanian seaside. In order to analyze hydro tourism on Romanian seaside we have used statistic indicators within tourism as well as statistic methods such as chronological series, interdependent statistic series, regression and statistic correlation. The major objective of this research is to raise the bid of hydro tourism on the Romanian seaside, and at the same time to elaborate a complex statistic study on the seaside hydro tourism activity level with a view to evince the issues to be solved for hydro tourism development and re-establishment at the Black Sea area.

Key words: chronological series, interdependent statistic series, regression and statistic correlation.

1. The importance of hydro tourism on Romanian seaside as part of the entire hydro tourism of the country

Within worldwide tourism, hydro tourism owns a position of priority for the latest 20 years because of some factors contribution to this: an increase in the occurrence of the so-called “illnesses of modern civilization” , an enhanced tendency to combine vacation with the need for active rest and reload of the vital capacities of human being, an increased concern for the senior age by means of health maintenance and ageing prevention and fighting, effort concentration on beauty and youth preservation.

Tourism represents one of the modalities of using spare time for rest, recreation, treatment and entertainment and one major aspect of Constanta economy is the possibility of hydro tourism capitalization of the Romanian seaside. Romanian seashore represents the most important touristic area by a concentration of almost a half of Romania’s accommodation facilities and approximately 2/3 of hospitality available for international tourism. Black Sea shore in Romania has a complex structure that enhances its touristic value. Seaside resorts are well known for international tourism such as: Năvodari, Mamaia, Eforie Nord, Eforie Sud, Techirghiol, Costinesti, Olimp, Neptun, Jupiter, Cap Aurora, Venus, Saturn, Mangalia, with accommodation and treatment facilities and various entertainment possibilities and also a chance for rest and treatment even out of season for some of them.

Because of the natural environment, seaside touristic activity comes together with the hydro tourism activity. The presence of the cure factors determined construction of appropriate spaces for treatment and prevention of various health conditions. Thus, the Romanian seaside has 5 resorts out of 13 that are destined for rest and hydro treatment and recovery. Hydro resources, represented mainly by mineral or mineralized waters and therapeutic mud provide the necessary elements for a complex treatment (prophylactic, therapeutic, recovery treatment), emphasizing attractive valuable potential of seaside tourism.

2. Statistic representation of hydro tourism on the seaside by means of chronological series

The demand for hydro tourism is mainly the expression of a social need that is the need for good health. Touristic demand that is specific to this kind of tourism presents with some particularities generated by the fact that its manifestation and dynamics are determined by a series of demographic, psychological, organizational factors that play a role in the way that different segments of population express their absolute needs for touristic services and hydro tourism input, needs that are influenced by a series of objective factors (need for good health, for maintenance and reload of work capacity). The fact that really needs to be outlined in case of seaside hydro tourism is that touristic resorts have a highly seasonal activity.

Touristic activity out of season is low with only a small part of accommodation capacity occupied and tourists coming for specific treatment do not have many opportunities for fun and entertainment, resume for a dull spending of spare time.

Analysis of time evolution of different phenomena and social and economical processes requires data systematization under the shape of chronological series. The chronological series, also called dynamic series or time series, is made of a succession of terms that reflect the evolution of a statistic variable according to time variable expressed under the shape of time or moment intervals. Acknowledge of phenomena in their historic evolution leads to certain theory concerning the future evolution of these phenomena.

Statistic measurement of hydro tourism circulation on the seaside by means of chronological series has the purpose of setting its dimensions, fluctuations from one time to another, notice of evolution similarities, setting of evolution tendency of the phenomenon and seasonal tourism analysis. Collection and record of statistic data has been done by us personally, directly from the information sources, that is the treatment bases in Saturn resort belonging to Black Sea THR, Paradiso Hotel in Mangalia and SC Mangalia SA.

PARADISO Hotel is situated on the sea cliff of Mangalia town, only 25 meters from the beach and perpendicular to the shore line with 272 rooms that have a view to the sea. Formerly known as Mangalia-Siemens Hotel, today's Paradiso Hotel has been completely renovated and available to all those who choose to spend a vacation on the Black Sea shore or to take advantage of the best hydro and recovery treatments for rheumatic conditions and more other. The hotel has a modern treatment base indoors that contains such as: "Ana Aslan" geriatrics cabinet, reflexology and massage, sulfurous water pools, hydro-thermo therapy etc.

SC Balneoterapia Saturn SRL has three treatment bases since 2001 inside the Hora, Balada and Sirena Hotels on the account of rental agreement with the former SC Saturn SA, now SC THR Black Sea SA – CP Saturn. The existing arrangements in the treatment facilities provide the possibility of adequate treatment for rheumatic condition, post-traumatic, peripheral neurological, respiratory and other associate conditions. The three treatment bases are situated on the ground level and on the fourteen floor of the above mentioned hotels. The treatment bases are operated in ambulatory system. Patients are the tourists accommodated in one, two or three stars hotels that belong to SC THR Black Sea SA - CP Saturn.

The most representative statistic indicator that measures and characterizes touristic flow is the total number of tourists, as shown in table 1:

Total number of tourists for hydro treatment in seaside spa facilities

Table 1

Years	Absolute Indicators			Relative Indicators					
	Level	Absolute modifications (Δ)		Dynamic Indicators (%) (I)		Increase rhythm (decrease) R		Absolute value 1% of the increase rhythm (decrease) A	
		y(t)	Δt/1	Δt/t-1	I t/1	I t/t-1	R t/1	R t/t-1	A t/1
2001	19253	-	-	100	-	-	-	-	-
2002	22276	3023	3023	115,7	115,7	15,7	15,7	192,53	192,53
2003	22892	3639	616	118,9	102,8	18,9	2,8	192,53	220
2004	22790	3537	-102	118,4	99,6	18,4	-0,4	192,53	255
2005	20359	1106	-2431	105,7	89,3	5,7	-10,7	192,53	227,19
2006	20109	856	-250	104,4	98,8	4,4	-1,2	192,53	208,33
Total	127679	-	856	-	-	-	-	-	-

Source: Data gathered and processed personally from Saturn and Mangalia SA treatment bases.

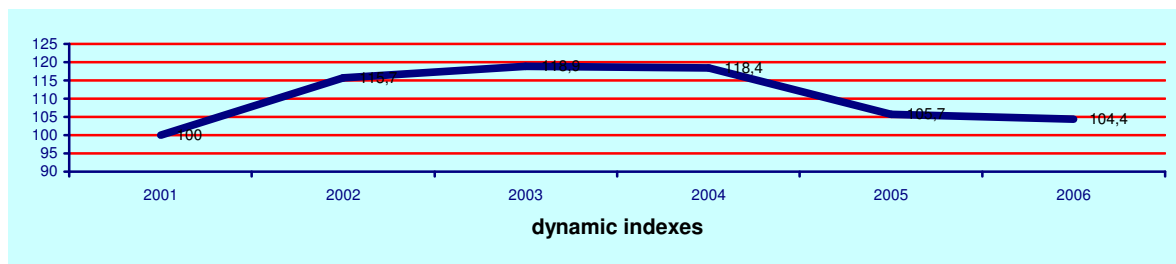
Medium Indicators

Calculated of absolute units (tourists per year)	Calculated of relative units
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\bar{y}	$\bar{\Delta}$	\bar{I}	$\bar{R} \%$
21279,83	171,2	2,53	15,3

The total number of tourists that chose for hydro tourism on seaside in Saturn and Mangalia resorts has recorded an increase since 2001 up to 2004 in the period of 2001-2006, the highest increase being in 2003 that is 3639 tourists more than in 2001, with a fix base index of 118,9%. However, in the years 2005 and 2006, even though the number of tourists has increased with 1106 tourists in 2005 (105,7%) in comparison to 2001, and with 856 tourists (104,4%) in 2006, there is still a decrease of this indicator during these years, that is 2431 less tourists in 2005 (89,3%) and 250 less tourists (98,8%) in 2006 against 2005.

Relative indicators show serial increase, reaching climax dynamics in 2003, that is of 118,9% . Since the medium dynamics index is higher than 100%, we acknowledge a progress of tourism in the balneary sector, in comparison to 2001, also because of investments made in the existing treatment bases (Mangalia Hotel, that is Paradiso Hotel today), but also the building of new modern hydro spas as the one in Saturn resort. Medium indicators show that all along the analyzed period of time (2001-2006), the total number of tourists has recorded a yearly increase of 21279,83 tourists/year, with an absolute medium increase of 171,2 tourists/year.



The evolution of fix base dynamic indexes for tourists recorded during 2001-2006 Fig.1

As concerns the number of foreign tourists that chose hydro treatment on Romanian seaside, within the treatment facilities belonging to SC Balneoterapia Saturn SRL and SC Mangalia SA, during 2001-2006, data is shown in table 2:

The number of foreign tourists for hydro treatment in the spas

Table 2

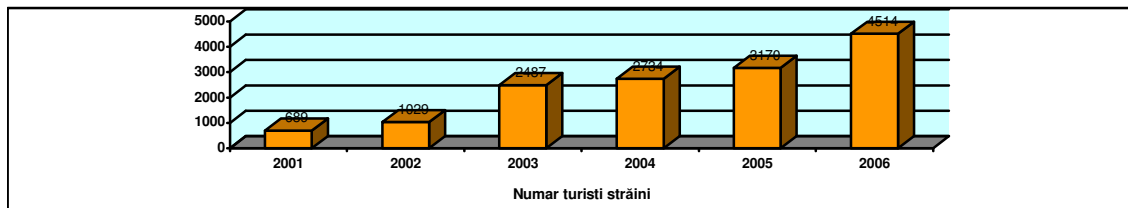
Years	Absolute Indicators			Relative Indicators					
	Level	Absolute modifications (Δ)		Dynamic Indicators (%) (I)		Increase rhythm (decrease) R		Absolute value 1% of the increase rhythm (decrease) A	
		y(t)	$\Delta t/1$	$\Delta t/t-1$	I t/1	I t/t-1	R t/1	R t/t-1	A t/1
2001	689	-	-	100	-	-	-	-	-
2002	1029	340	340	149,3	149,3	49,3	49,3	6,89	6,89
2003	2487	1798	1458	361	241,7	260,95	141,7	6,89	10,29
2004	2734	2045	247	396,8	109,9	296,80	9,9	6,89	24,87
2005	3170	2481	436	460,1	115,9	360,08	15,9	6,89	27,34
2006	4514	3825	1344	655,2	142,4	555,15	42,4	6,89	31,69
Total	14623	-	-	-	-	-	-	-	-

Source: Data gathered and processed personally from Saturn and Mangalia SA treatment bases

Medium Indicators

Calculated of absolute units (tourists per year)		Calculated of relative units	
\bar{y}	$\bar{\Delta}$	\bar{I}	$\bar{R} \%$
2437,17	765	3,62	26,2

There is a continuous increase of absolute indicators for foreign tourists during the analyzed period, with a maximum of 3825 more foreign tourists in 2006 against 2001. Relative indicators show the same increasing evolution, so that the fix base dynamic index in 2006 has a value of 655,2% against 2001, and the chain base index has a value of 142,4% in 2006 against 2005. Medium indicators show that, during the analyzed period, the foreign tourists have recorded a yearly average of 2437,17 tourists/year, with an absolute medium increase of 765 tourists/year, that is a significant progress for seaside hydro tourism.



The evolution of the number of foreign tourists during 2001-2006

Fig. 2

Just as hydro tourism in the country, seaside hydro tourism has financial state aid. The demand for hydro tourism is formed mainly from senior people that are provided with aid from CNPAS for treatment ticket costs (that are born by the Retirement House) and who may be regarded as loyal to hydro tourism, with more spare time and longer vacations.

3. Representation of hydro tourism on the Black Sea shore by means of interdependent statistic series. Regression and statistic correlation

The statistic analysis of the relationship ratio between phenomena is about measuring the relationship among two or more characteristics of the research program of mass social economic phenomena. This asks, firstly, for a relationship between the x characteristic, so-called factorial characteristic that is independent and the y characteristic, so-called dependent or resultant characteristic, and secondly, in the case such a relationship does exist, it shall be expressed by a simple correlative or synthetic indicator to show the manner that x, the factorial characteristic leads to y, the resultant characteristic under the aspect of nature, direction and link between the two of them.

Within the present study, in order to present a statistic analysis of seaside hydro tourism by means of interdependent statistic series, we have used analytic methods of measuring and interpretation of statistic links, that is the statistic analysis of the link between the number of tourists that came in Saturn resort for hydro tourism and the income obtained from hydro treatments, during 2001-2006 in SC Balneoterapia Saturn SRL. In order to achieve this statistic analysis we shall use data from Table 3:

Evolution of tourists' number and income during 2001-2006

Sc Balneoterapia Saturn SRL

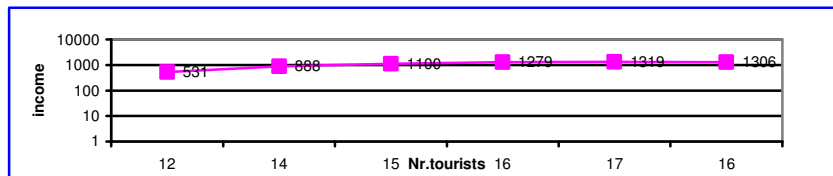
Table 3

Years	Number of tourists (thousands of tourists) x_i	Income out of treatment bases operation (thousands RON) y_i
2001	12	531
2002	14	888
2003	15	1100
2004	16	1279

2005	17	1319
2006	16	1306
Total	90	6423

Source: data provided by CP Saturn

In order to emphasize the correlation between the two variables we shall use the graphic method (see picture no. 3):



The link between the number of tourists and the amount of income Fig. 3

In picture 3, the link between the two variables is obvious, that is between the number of tourists that came to Saturn resort for hydro treatments (x_i) and the income from spa operation (y_i) is a direct linear link, thus the equation of the regression function is $y_x=a+bx_i$. A and b parameters of the linear function are

determined by solving the following system of ordinary equations:
$$\begin{matrix} na + b \sum x_i = \sum y_i \\ a \sum x_i + b \sum x_i^2 = \sum x_i y_i \end{matrix} \quad \text{To}$$

solve it, we shall use data in Table 4.

Estimating income amount according to no. of tourists that came to Saturn during 2001-2006 Table 4

No. of tourists (thousands) x_i	Income amount (thousands RON) y_i	x_i^2	$x_i y_i$	y_i^2	Y_{x_i}	$(y_i - Y_{x_i})^2$	$(y_i - \bar{y})^2$	$(Y_{x_i} - \bar{y})^2$
12	531	144	6372	281961	558	729	291600	263169
14	888	196	12432	788544	900	144	33489	29241
15	1100	225	16500	1210000	1071	841	841	0
16	1279	256	20464	1635841	1242	1369	43264	29241
17	1319	289	22423	1739761	1413	8836	61504	116964
16	1306	256	20896	1705636	1242	4096	55225	29241
90	6423	1366	99087	7361743	6426	16015	485923	467856

Source: data processed personally

By solving the equation system we have obtained the values of a and b parameters: $a = -1494$ and $b = 171$. Thus, the average equation for estimating the linear link between the number of tourists (x_i) and the amount of income (y_i) is: $Y_{x_i} = -1494 + 171 x_i$. Theoretic values of income (Y_{x_i}) shall be calculated by replacing each value of variable x_i in the regression function shown above (see column 6 in table 4). The regression function is just a statistic hypothesis that expresses regularity, tendency to express the link between the two characteristics, taking as variable the recorded factor only. In reality, the empiric values of the dependent variable are formed under the influence of all factors, including of the recorded factor. That is why more or less deviation may appear between the empiric values and the estimated ones, just as the influence of the other factors seen as random is more or less active.

In order to establish the intensity of the link between the two statistic characteristics there has to be calculated a synthetic correlative indicator, which is the correlation report and coefficient.

The correlation report is calculated by means of this formula:

$$R_{y/x} = \sqrt{1 - \frac{\sum (y_i - Y_{x_i})^2}{\sum (y_i - \bar{y})^2}} = \sqrt{1 - \frac{16015}{485923}} = 0,98$$

Consequently, the correlation link between the two analyzed variables is very tight because the correlation report has a high value of 0,98. By using the value of the determination report ($R_{y/x}^2$) we may state that, among all factors that determined the amount of income, the number of tourists that came in the analyzed period, 2001-2006, has a contribution of 96,2%. In order to verify the linearity of the function that estimates the link between the two variables we shall calculate the correlation coefficient by using this formula:

$$r_{y/x} = \frac{n(\sum x_i y_i) - (\sum x_i)(\sum y_i)}{\sqrt{[n \sum x_i^2 - (\sum x_i)^2][n \sum y_i^2 - (\sum y_i)^2]}} = 0,98$$

Since the correlation coefficient and the correlation report have the same value (0,98) we can state that the link between the two variables is linear.

Raising the bid of Romanian hydro tourism should be a major objective for those involved in the organization and development of this form of tourism. A strategic capitalization of Romanian hydro tourism shall lead to its re-establishment on both intern and international market. The success of this action depends on determined commitment of the authorities at the macro and microeconomic level, and economic and social effects shall be representative not only to Romania but also to the other countries member of EU, whose member we are since 2007. Defining adequate strategies for Romanian hydro tourism should start from a good knowledge of hydro tourism potential, its present degree of capitalization, as well as the economic, social and political background that influence the evolution of Romanian tourism in general and hydro tourism in particular.

Taking into consideration particularities of tourism on the Black Sea shore, it is necessary to pass from an intensive short-term use of existing infrastructure, to extensive planned all through the year use of it. This would improve both the degree of infrastructure exploitation and the efficient capitalization of accommodation areas. The ever increasing level of expectation of tourists for a superior quality of tourism sets us to maximize the capitalization of the whole touristic potential of the seaside, to apply all known strategies in order to meet every tourist's preference, both Romanian and foreign.

If we are to take into consideration keen touristic competition in Europe or worldwide, then it is necessary to make efforts to provide our tourists with up-to-date pleasant and attractive facilities, to appeal especially to those with higher income and level of expectation, to inspire them to choose Romanian seaside.

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