

ON MATHEMATICS TECHNIQS FOR THE STUDY OF TOURISM GROWTH AND IT'S REPERCUSSIONS IN THE AREA OF RHODES ISLAND

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INTRODUCTION

The traveling industry has been recognized as one of the most important sectors of economic growth of 21st century. According to the up to moment forecasts, three will be the industries that will lead in the promoted from the information world economy in the next century – the telecommunications, the technology of information and the tourism. The tourism and more generally the traveling industry, has presented an unprecedented growth the last decades in the whole world. Indeed, while in 1950 the international arrivals of travelers were 25 millions roughly, in the shooting of millennium exceeded the 600 millions and in 2005 exceeded the 800 million (will percentage of increase 5.5%), while the forecast of World Organism of Tourism for year 2010 increase the relative number in the 1 billion roughly.

The tourism today, is the main productive sector for most Greek islands, as they are depended on this, for their economic progress and growth. As a matter of fact, because of the peculiarities that many of them present, they do not have a lot of alternative solutions for the economic progress and their growth. Nevertheless the tourist growth that proceeded in many of the islands of our country created problems many times insuperable. It is proved that the growth of a basic model of tourism – the mass coastal tourism- did not constitute a sustainable type of our country's development.

In this study there will be a recording and analysis of opinions of local society of Municipality of Kallithea with regard to the tourist growth of its region, economic, social and environmental repercussions that are involved, but also how its tourist future is predicted. Reason stood the make that the last years the region appears to follow a downward course. Factors that played fundamental role in this cathodic course are the world economic crisis, the terrorist blows, the world crisis that

passes the particular tourist product (massive tourism), the libel of region because of the incidents that happened 3-4 years ago. In this point it should be reported, that the basic tourist region of Municipality is Faliraki for which there have been reported various negative comments in the printed and electronic means of briefing.

Basic parameter for the rational tourist growth is the protection of environment with his more general significance. Here precisely enters the environmental education, as one of its main aims is the education of citizens in order them to acquire the essential knowledge to have a positive attitude and attendance in each problem relative with the environment. From the moment that the environment is considered today as necessary and also capable to treaty on the sustainable and viable tourist growth of destination, the role of environmental education is upgraded, neurological and particularly essential (Skanavi, 2004). According to the report's Brundland viable growth is considered as the growth that satisfies the needs of today without decreasing faculty to satisfy the needs of the future (Brundland, 1987). With the environmental programs, beginning from the infantile age and in all the education, it is constituted a small army and it's created a team of citizens of future with conscience and sensitivities, that they declare ready to defend the future of planet. In therefore, we can conclude that the contribution of environmental education is decisive in the objective of vision of sustainable growth that is the one that will inform, sensitizes, will work out, will contribute in the change of values, in the growth of dexterities and in the configuration of suitable behavior of the citizens (Skanavi, 2004).

The newly established Municipality of Kallithea finds itself in the north-western department of island and southernly of the city of Rhodes, includes three municipal apartments: Kallithies, Koskinou and Psinthos, with total population 10.251 residents at the last inventory. The most well region of municipality is Faliraki. It is found in the Eastern region of island and abstains 13 km from the city of Rhodes. Faliraki is famous for the hotels of all categories, from the big cosmopolitan groups to the small familial hotels, as well as the rented rooms and the self-service apartments. There is also, the biggest sandy beach of Rhodes, perhaps and the biggest organized beach of this type in Greece, which extends in length roughly 4 km. All the municipality allocates roughly 6.500 rooms in hotels and rented rooms of total capacity near 20.000 beds. Precise elements for the arrivals and the overnight stays that concern only the municipality of Kallithea do not exist. Persons of municipality estimate that roughly the 30% of arrivals and overnight stays of island are done in the territorial limits of municipality of Kallithea. It appears that the tourist product of municipality and the island is generally in the phase of maturity. It is found in a critical turning-point, after 30 years of tourist growth and wants particular attention in the planning of course for the next years. The basic tourist products of the municipality all the years are the mass coastal tourism and the markets in which it is addressed are the German speaking people and England. Alternative forms of tourism exist in the region but are rudimentary form, they have not been appeared duly and they cannot help, at least in this phase,

the basic tourist product. The potential tourist hearing Rhodes and specifically the region of Faliraki has in his brain tourism of '3S' that is to say the mass coastal tourism, something not particularly positive for the product of the region.

METHOD

The theme of social repercussions is connected with the subject of social changes in the local social structure. The objective of the methodology that we selected was precisely to show the total of these changes but also the cross-correlations between them. We selected for this reason, all the spectrum of social changes that is presented in the place of reception and most concretely changes: in the social structure, in the environmental structure and in the corresponding economy. We considered the local structure as a complex field of report, in which the presence of tourism has multiple and complex repercussions that should be studied together (Tsartas, 1995). The method that we used is the sampling method. The sampling research constitutes a research of modern social reality and it gives the possibility in the researcher of shaping his own classifications, typologies and measurements, of drawing immediately the material that interests him from the particular society, but also to exercise the ways of collection and treatment of elements, in order in some cases to shape even new inquiring strategies. This method gives them the possibility of locating the way with which the various characteristic are distributed in their members of society or smaller social teams, it also gives them the possibility of seeing, in some degree, the way that these distributions are related them. Of course this method does not have the possibility to explain them, neither still to tell them why these distributions are presented, because it is beyond their limits. The studies therefore that are based on the sampling method give measurements and descriptions, but do not have the possibility of explaining them the social growth and underdevelopment. And this because the method does not give the possibility in the researcher to be referred to the social classes and the teams of interest or in other words the persons as creators of their society.

The research was carried out in a not accidental sample (directed) of the population of municipality of Kallithea in January 2006. The opinions of residents have particular importance, not as simple information, but as expression of social changes that involved their tourism, from which the residents were influenced. The questionnaire (totally 42 questions) was separated in 5 units: in first we examined the demographic characteristic of the asked person, the second, the professional employment and movement (it was difficult to be informed about his income situation because of objective difficulties), in the third, the opinion of residents for the presence of tourism and tourists in their place, in the fourth, their opinion about the influence of tourism in the social values, the morals and the customs of region and finally in the fifth unit the questions that we addressed had the aim to investigate the opinions of residents with regard to the environment. We totally collected 39 questionnaires from residents of villages Koskinou and

Kalythies with structured interview, while then the treatment adopted the method of analysis of content. The thoughtful of the choice of sample was to be constituted for the most part, from productive ages (20-50 years), separated isomerically in men and women and to participate all the rungs of education, we also tried, all the sample to be constituted by permanent residents of the region. The problems that we faced in this small research were of more or less importance, and basically they concerned the difficulty of collection of answers in the questions of economic-income content, and for this the reason in deed we removed then later. Finally, the main objectives of research that we have done were (Tsartas, 1995):

- To record the opinion of residents for the tourism and its repercussions in the social, cultural and economic structure of region
- To analyze the relation of locals with the tourists
- To located the changes that have befallen in the economic structure and in the professional structure of region because of the tourist growth
- To record based on the residents opinions, the problems that the tourist growth created, something that will allow interventions in local and government level
- To record the opinions of residents for the role that the environment and the education plays this, in their tourist future.

RESULT AND DISCUSSION

1. Demographic characteristics of sample

In the empiric research the presentation of demographic structure of sample constitutes basic beginning because the demographic characteristic are the basic independent variables with which the attitudes and the reactions of the asked persons about the researching object, show the existence or not of some dependence on them. The population in the present research was 39 individuals. More concretely:

Table 1. Distribution of sample

AGES	Fi	fi%
20-30	8	20
30-40	18	46
40-50	10	26
50-60	1	3
60 and above	2	5
TOTAL	39	100

The sample is equally devised between men (20) and women (19), while the 77% of the sample were married, 15% bachelors and 8% divorced.

Table 2. Level of education

LEVEL OF EDUCATION	fi	fi%
First Degree	6	16
Secondary	20	51
Superior	4	10
Maximum	7	18
Postgraduate	2	5
TOTAL	39	100

Our basic concern was the sample to include, as far as this is possible, all the levels of education so that we have a right representation of this particularly critical variable.

2. Analysis of the professional situation of sample

The changes that are marked in the professional and income structure of tourist region are emanation of the type of tourist growth that is followed, and the inevitable need to be created in these region an infrastructure of services for the service of tourism. Our objective is to record the changes that the tourism has involved and the repercussions of these changes in the social and professional models of the asked. More concretely:

Table 3. Professional employment of the sample

EMPLOYMENT	Fi	fi%
Unemployed	2	5
Agriculture/livestock-farming	3	8
Fishery	1	2
Tourist profession	15	39
Civil servant	9	23
Student	3	8
Doctor/nurse	2	5
Businessman except tourism	4	10
TOTAL	39	100

We see predominance of tourist profession in the sample of the asked and a small participation of the occupied in the livestock-farming and in the fishery. The 46% of the asked people, answered that in their decision on the profession that they have, decisive role played tourist growth of the region, while the 51% answered negatively. Also in the question if they want their children to follow the profession that they have, the 54% answered positively (mostly the civil servants and some who have tourist profession), while also a 46% answered negatively as the want a better future for them.

Table 4. Which profession do you want your children to follow;

PROFESSION	Fi	fi%
Scientifically	30	60
Commercial	10	20
Tourist	7	14
Domestic	1	2
Something else	2	4
TOTAL	50	100

Here we have 50 answers because some of the asked gave more than one preference in the question. It is explicit the preference of scientific but also commercial professions because as they told us they offer bigger economic benefits and have more prestige. No one from the asked persons selected the traditional professions which they were having up to some years ago, that is to say agriculture-livestock-farming-fishery.

3. Analysis of the third category of questions (tourism)

In this sub-section of questions we try to investigate the percentage of dependence of the local economy from the tourism, the opinion of local people about this phenomenon and their opinion about the type of tourism that has been developed. Also, our objective is to analyze the case of social acceptance of tourism in the examined region. The significance of social acceptance is connected with a series of more special factors of tourist growth that we will attempt to approach as: the perceptions of the society about the importance and also the problems that the tourism has created, the advantage and disadvantage that which is connected directly with the type of tourism that has been developed, with the preferences for the type of tourists. More concretely:

Table 5. Which percentage of your income emanates from the tourism;

	Fi	fi%
By no means	14	36
Up to 25%	8	20
Up to 50%	8	21
100%	9	23
TOTAL	39	100

The results show that even with direct or with indirect way a percentage 66% have relation with the tourism and have incomes from this. This shows the big importance that tourism has for the region and how important role it plays in its growth. The research has also revealed to us almost all the tourist enterprises in the region, roughly 86%, belong in local residents, while these enterprises are mostly rented rooms, restaurants, kafebars.

Table 6. In which sector do you believe that the state could help;

	Fi	fi%
Exterior connection	28	42
Sewerage	5	7
Layout	13	19
Communication	11	16
Health	11	16
TOTAL	68	100

The local residents in general lines have negative opinion with regard to the contribution of state in the tourist growth of the island, as hardly 15% believe that this helps in a capable degree. The exterior connection (42%), the layout (19%), the communication and the health (16%), are the sectors in which the residents want the help of the government mechanism. We have totally 68 answers because many of the asked people gave more than one answers.

Table 7. You believe that the tourism has for the place:

	Fi	fi%
Has good repercussions	22	56
Has bad repercussions	0	0
Good and bad	17	44
TOTAL	39	100

Here appears the positive opinion and attitude of local residents for the tourism as roughly 56% believes that it only has positive repercussions for the region, while no one (0%) reported that the tourism has only bad consequences, even if they are all influenced by the possessed bad tourist period.

Table 8. The tourist in your island are:

	YES	NO	IT DEPENDS
Clean	17(51%)	2(6%)	14(43%)
They have good behavior	16(43%)	6(16%)	15(41%)
They spend a lot of money	10(29%)	10(29%)	14(42%)
They are careful about environment	20(63%)	5(16%)	7(21%)
They are moral	9(35%)	3(12%)	14(53%)
They are polite	17(57%)	1(3%)	12(40%)

Table 9. Do you believe that the presence of tourists has influenced your attitude on issues such as:

	fi	fi%
Relation parents of/two seces	12	20
Way clothing of/diet	22	36
Decoration of home	1	1.5
In the professional sector	21	34.5
No answer	5	8
TOTAL	61	100

In table 9 it is shown clearly for one more time, the positive opinion of local people the tourists that come in the island, as the negative opinions are few. This reveals the positive approach of residents of the region for the tourism, which of course, is not without criticism. The 35% of the sample declared that they does not bother them if the tourists are Greeks or foreigners. A big percentage of sample (90%) declares that it has been influenced by the presence of tourists on issues as the professional and the way of clothing and diet, which is absolutely reasonable, as the coexistence between the local people with the tourists exists 30 years.

4. Social and cultural repercussions of the tourist growth in the municipality of Kallithea.

Our objective in this sub-section is to analyze the most important social changes that (if this happened) the tourism created in the social and cultural life of region. We will examine the theme of social changes in the morals and in the values, the subject of changes in the local customs and finally the opinions of residents for subjects of social changes and particularly for the changes which happened because of the tourism. We will see all of them in the following tables that include the questions and the results of these from the small research that we have done last January. More concretely:

Table 10. Do you bother that in the summertime the beaches are full of tourists:

	Fi	fi%
By no means	25	64
Little	10	26
A lot	4	10
TOTAL	39	100

We can conclude that the residents of region are familiarized with the presence of foreigners. This makes the residents to be receptive with the tourists, from whom do not forget that they have enough economic profits.

Table 11. Which are the most important changes that the tourism has done the last years:

	Fi	fi%
Change of morals and customs	10	12
Rise of standard of living	24	29
Construction	14	17
Illegal layout	25	30
Devalorisation of environmental	10	12
TOTAL	83	100

Table 11 shows clearly that the tourism can help in the rising of the standard of living (29%), but also it brought enough negative changes as the arbitrary and illegal layout (30%) and the devalorisation of environmental (12%), factors very important for the future of this activity. Also, a percentage of 69% of the people believe that the relations between the residents have changed. The 52% believe that they have become worst, while the 26% that they are better. In the discussions that we made after the research with persons older in the age, they told us that the relations have changed indeed to the worse and cause –primary at least- for this is not the tourism, but the lack of solidarity –individualism- that we observe today as well as the economic reasons. Almost all the asked persons hope the next years the region will be tourist developed, thing which is to the benefit all residents. Of course they all recognize enough mistakes that exist in the current tourist growth and ask insistently to be corrected. We should in this point stress that a number of sample is generally pessimistic for the future course of tourism in the region.

5. Repercussions of tourist growth in the environment

The fact that growth of tourism in the region of municipality of Kallithea has involved changes –negative- in the environment, is a common secret. What we wanted to realize in this sub-section they are how residents have realized these changes and if they are ready to face them and press for their resolution.

Table 12. Tell us your opinion for the repercussions of tourism at the postwar period in the following sectors:

ENVIRONMENT	VERY NEGATIVE	NEGATIVE	NEUTRAL	POSITIVE	VERY POSITIVE
	1	2	3	4	5
NATURAL ENVIRONMENT	8(24%)	15(44%)	9(27%)	1(3%)	1(3%)
STRUCTURED ENVIRONMENT	9(27%)	13(40%)	7(21%)	4(12%)	0
MANAGEMENT OF NATURAL RESOURCES	6(18%)	13(38%)	10(29%)	3(9%)	2(6%)
USES OF GROUND	7(21%)	8(24%)	11(33%)	4(13%)	3(9%)

Biggest percentage of sample therefore, appears to have realized the negative repercussions of tourism in the environment as to this direction it answered: for the natural environment (68%), structured (67%), the management of natural resources (56%) and the uses of ground (45%), while on the contrary minimal were those that expressed the opinion that the tourism functioned positively to the environment. Also, the sample showed the residents to agree in general lines that the massivity of tourism leads to decrement of this quality, as the 69% answered that it agrees or at least does not disagree, that the over-concentration of tourists in the beaches leads to depreciation of product. Also, the 77% of sample showed it agrees that the illegal layout of hotels has led to the destruction of natural environment. Most agree that in decade of '80 most environment changes took place. The last questions concerned the education and they showed that the 95% of sample did not have any type of education relative with the environment, thing that shows an enormous void that requires direct interventions. The 92% of asked people agree that the informed environmental citizen is more effective, while the 82% consider the via life education essential in the modern conditions of life.

CONCLUSIONS

The main conclusions that resulted from the research that we carried out were the below:

1. The big increase of incomes that involved the tourism, led to real growth, as in our opinion were not solved problems of infrastructure as the right layout, the growth with long-term objectives, the education, the protection of environment, etc.

2. The tourism is the only sector of local economy that acts competitively to the other sectors and branches. More specifically the abandonment and the decline of local agriculture is one from our ascertainments, while the tourism acts competitively in the agriculture and the livestock-farming. Positive repercussions are observed in the creation of employment in the hotels and generally in the tourist employments as the 66% of sample have direct or indirect with them.
3. A big percentage of 59% would prefer their place not to have the need of tourism justifying it saving that the tourism is capable to offer important incomes, but it is also a changeable phenomenon that does not offer sure and regularly incomes. To this direction the sample has been influenced by possessed bad tourist period.
4. They consider the scientific, commercial and tourist professions as ‘good’ and they would want their children to follow as well. We had no relative report to traditional jobs (agriculture, livestock-farming, fishery).
5. The residents do not consider that the state helps sufficiently in the growth of the island and region as the 82% as sample answered to this direction. The exterior connection of the island and the layout are sectors that the residents would want the state to contribute more.
6. The majority of sample has adopted a positive attitude to the tourism and the tourists and it would want the further growth of the region, under terms and circumstances so that the mistakes of the past not to be repeated.
7. They consider that the environment with its wide significance has been downgraded by the particular type of tourism growth that was adopted. They believe that the environment constitutes essential parameter for the right and sustainable tourist growth and for this should be taken direct measures for its protection. The proposal of Mayor Mr Iatrides was that there should exist a permanent and intense education of –more specifically new generations –with regard to the environment, which will help them acquire environment conscience, a thing that unfortunately today appears to be in effect for the generation that possesses the reins of economic life. In this point it becomes obvious the important role that the environmental education should play.
8. Even if they did not have any educational experience relative with the environment (95%), they believe that the informed and educated citizen is more effective and they consider the via life education essential (82%), so that they face the modern conditions of life.

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