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Perceptions of the Beach Users: A Case Study of the Coastal Areas of North Cyprus Towards Establishment of a "Carrying Capacity"

Habib Alipour

Eastern Mediterranean University, null@emu.edu.tr

Mehmet Altinay

Eastern Mediterranean University, null@null.edu

Kashif Hussain

Eastern Mediterranean University, null@null.edu

Nazita Sheikhani

Eastern Mediterranean University, null@null.edu

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Abstract

Within the main elements of economic sustainability, socio-cultural sustainability, and environmental sustainability, the criteria of 'carrying capacity' have been emphasized through residents' perception analysis to explore practical methods towards the application and implementation of such criteria. As data analysis revealed, the main tourist resources in the case of North Cyprus –the coast and the beach- have a certain capacity to sustain the impact and pressure of tourism. Despite the significance of the indigenous environment and with respect to the residents' perception of optimum carrying capacity levels, this issue has not been given a due consideration. This has resulted in a process of coastal development which bypasses any measure or application of a standard to harmonize the degree of physical development and the capacity of the beach. The main objective of this paper is to establish the concept of 'carrying capacity' as the means to achieve the reconciliation of environmental impacts with tourism development. The study concludes that, if carrying capacity measurement and its implementation are not incorporated into the planning decision as a clear policy, there will be grave negative consequences for those resources attracting visitors.

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By Habib Alipour, Mehmet Altinay, Kashif Hussain, and Nazita Sheikhani

Within the main elements of economic sustainability, socio-cultural sustainability, and environmental sustainability, the criteria of 'carrying capacity' have been emphasized through residents' perception analysis to explore practical methods towards the application and implementation of such criteria. As data analysis revealed, the main tourist resources in the case of North Cyprus—the coast and the beach—have a certain capacity to sustain the impact and pressure of tourism. Despite the significance of the indigenous environment and with respect to the residents' perception of optimum carrying capacity levels, this issue has not been given a due consideration. This has resulted in a process of coastal development which bypasses any measure or application of a standard to harmonize the degree of physical development and the capacity of the beach. The main objective of this paper is to establish the concept of 'carrying capacity' as the means to achieve the reconciliation of environmental impacts with tourism development. The study concludes that, if carrying capacity measurement and its implementation are not incorporated into the planning decision as a clear policy, there will be grave negative consequences for the those resources attracting visitors.

Introduction

In less than two decades, over one billion tourists will roam the planet Earth. Resource depletion, environmental degradation, global warming, population growth, and the collapse of basic services have become an alarming concern for the United Nations. To achieve sustainability, there is almost no other alternative but to 'plan' ahead. Sustainability has been proposed as an antidote to overcome the consequences of these negative realities in the future (WCED, 1987; WTO, 2004).

Carrying capacity has now become a central research theme (Silva, 2002; Graefe *et al.*, 1984; Shelby and Heberlein, 1984; Stankey and McCool, 1984). Research issues such as crowding and recreation satisfaction have been used recently to measure the experiences felt by tourists and locals and as theoretical concepts to help define the recreation carrying capacity of tourist destinations (Manning, 1999). 'Carrying capacity' is defined as: "the maximum number of people who can use a site without an unacceptable alteration in the physical environment and without an unacceptable decline in the quality of experience gained by visitors" (Mathieson and Wall, 1982). The concept of carrying capacity has been expanded to include much broader aspects of the destinations from both tourists' and residents' points of view. It has been extended to include not only the physical environment, but also social, cultural, economic, and infrastructural capacity of the destinations (Inskip, 1991).

It is not surprising that people have always been attracted to coastal areas. These areas are considered to be the most valuable parts of many countries' territories, either with respect to their natural and environmental qualities or with regard to their potential for national socio-economic development (DESUA, 2002). Nine out of the ten largest cities in the world are located on sea coasts; the world's most populous countries in terms of population density are coastal nations and more than half of the world's population live within 100 kilometers (60 miles) of the sea (Marsh and Grossa, 2002). In the meantime, most of the destinations have local jurisdictional orientations within which their development and operations decisions take place at the local level. Therefore, "many of the factors causing ecosystem decline such as rapid urban development, urban-run off, and habitat fragmentation occur at the local level and are generated by local land use decisions" (Brody *et al.*, 2004 : 33). Carrying capacity needs to be part of the planning process at the local level with a focus on a broader spatial scale in relation to ecosystems beyond the local jurisdictions.

Defining the carrying capacity of coastal areas is easier in terms of physical carrying capacity, where the limits are set by the available space for building, the dimensions of the infrastructure and the limitations of island characteristics. In contrast, the evaluation of social carrying capacity limits is much more difficult to achieve (Schreyer, 1984). The carrying capacity idea is inherently appealing though it may invoke discussion due to the two aspects it aims to balance. It recognizes the need to manage visitor usage and minimize the threat posed to the sustainable use of finite resources. In the meantime, there is a great desire, not by choice as much as by chance, to maximize all tourism growth opportunities and benefits from increased tourism activity. As this article has been written based on a 'sustainable' perspective, it is reasonable to make relevant comparisons between the 'carrying capacity' concept on one hand and the spcio-economic and physical characteristics of the Island State on the other.

"Their reduced areas, shortage of natural resources, geological complexity, isolation, and exposure to natural disasters, fragile ecosystems, demographic pressures [i.e., including tourism] and economic fragility make the environmental problems of islands usually very serious. Understanding and implementing preventive strategies [i.e., establishing carrying capacity] for sustainable development become critical issues for islanders" (Ramjeawon and Beedassy, 2004).

According to DESUA (2002), coastal areas are normally associated with mass tourism, large scale construction and infrastructure, intensive land development and extensive urbanization. Carrying capacity issues revolve around considerations about tourist density, the use of beaches and tourist infrastructure, congestion of facilities, sea pollution... etc. The carrying capacity of a beach is also a fundamental part of the coastal areas, especially in the island regions.

As Masters *et al.* (2004) noted: "The economic relevance of coastal and estuarine regions is unquestionable in today's world. Important economic activities such as; fisheries, tourism, industry or agriculture (which counts for a high percentage of the income of many countries), depend on the quality of estuarine and coastal waters. Additionally, these areas provide the environment in which a wide range of valuable natural functions take place. However, the growth of human related activity in coastal and estuarine zones has led to a progressive degradation of these environments".

Beach carrying capacity is not only related to the area of sand space available to users, other factors also play an important role and need to be considered. For example, beach accessibility, car park availability, facilities, and peoples' behavior can also influence the determination of carrying capacity criteria (Morgan, 1999 and Hecock 1983). Therefore, carrying capacity as a means of beach management is an important topic to consider for destinations that seek to generate tourism and recreation activities in a sustainable manner. The current study aims to explore the perceptions of the beach users in order to provide a comprehensive understanding for the public and local authorities to achieve efficiency and sustainability in tourism.

Carrying capacity as a planning tool:

The theory of tourism has recognized a set of comprehensible constructs essential for the functioning of tourism system as well as its sustainability. To name a few; environmental quality, sustainable and efficient use of the limited resources, competitive characteristics of the industry, its global connection via international capital, and its recognition as means to achieve economic growth and development (Inskeep, 1991; Gunn and Var, 2002; Mihalic, 2000; and Burns, 1999). Within this context, the tourism product can be promoted, marketed, and profitable if certain fundamental measures are in place in terms of planning and management. This study's perspective is based on the fact that, tourism has suffered tremendously because of ignorance and the apathetic behavior of the early developers-public and private- who misperceived the sector as "smokeless" industry or "candy floss image" of tourism at the official level up to 1970s (Burns, 1999).

This type of perception and behavior mixed with boosterism based on European Laissez-faire and the North American frontier capitalism, by passed certain “planning” laws and principles, especially in terms of control and limit to growth. In this regard, Hall (2000) noted : ‘Under the boosterism tradition, residents of tourist destinations are not involved in the decision-making and planning processes surrounding tourism development and those who oppose such development may be regarded as unpatriotic or excessively negative . However, by the 1980s, the so called negative consequences of lack of planning and specialized management system for tourism development began to appear and the overall outcome of this raised many eyebrows among scholars regarding the social , environmental, political, and economic impacts of the sector. These views lead to criticism of the prevailing myopic understanding of tourism, especially if it is examined against backdrop of sustainability and local participation. This change in perspective was not limited to the officials in the destinations themselves; it was also detectable in the Terms of References (ToR) of the International Organizations who were supporting tourism development in so called Third World Countries. Therefore, “the type of planning espoused by the World Bank and executed by the major consultancy firms confused the purpose of tourism” (Burns, 1999). Consequently, certain polarities developed to distinguish different development patterns with development outcomes. Thus, at one end of the spectrum some commentators perceived tourism as “business” while others recognized it as “impact” (Burns, 1999).

Eventually, the discourse on tourism development in relation to negative impacts; disenfranchisement of the local communities, and naivety of the officials in welcoming the application of neo-liberal ideas of the “magic of market” mechanism (Clancy, 1999) resulted in an awakening that tourism has its own unique dynamism and evolution. As Richter elaborated: “despite the apparently much frivolous nature of tourism, it is a massive and intensively competitive industry with acute social [environmental] consequences for nearly all societies” (Winson, 2006). Thus, it has generated a so called ‘paradigmatic’ view which has been crystallized into tourism policy and planning. It is based on such dialectical discourse within the tourism research that this study focuses on “carrying capacity” as a fundamental planning tool to achieve the positives of master planning on one hand and the empowerment of the local players in overcoming the vagaries of haphazard planning and the destruction of environmental resources essential to develop a sustainable tourism on the other.

As Murphy and Murphy (2004) reiterated: “...tourism carrying capacity should be viewed more as a network of factors rather than as a simple direct relationship between usage levels and negative impacts. The network involves linking the physical characteristics of the site with visitor satisfaction, community interest and political goals.” The concept has been elaborated furthermore and intertwined with Visitor Impact Management (VIM), which pinpoints the threshold capacity in each ecosystem and warns us against possible environmental destruction (Murphy and Murphy, 2004). VIM and Carrying Capacity Standard (CCS) are policy guidelines concerning two issues: the physical and the human. The physical aspect is dealing with the state of the environment and the impact to it; and the human aspect is dealing with the community members and tourist’s experiences as they pass through a mosaic of tourism development (Inskip, 1991; Gunn, 2002; Murphy and Murphy, 2004).

The carrying capacity concept has been around since the 1930’s in various forms and models, which adapted and used it in the recreation sector. (Gamini, 2002). However, because of the inadequacy of quantitative analysis, especially in relation to ecotourism and ecosystems, it had not become a major policy decision making tool until recent times. This attitude continued in relation to mass tourism which was considered a smokeless industry up until the 1970’s and 1980’s. Furthermore, factors such as the lack of environmentally acceptable indicators; the subjectivity of certain parameters; resource use conflicts; and the complexities of the techniques used by researchers all have helped inhibit the use of this concept.

Having said this, tourism carrying capacity, as it began to draw attention in the 1970's and 1980's, eventually emerged as a legitimate research tool that can be used in the planning process. In spite of its ambiguity, and its lack of a standardized application, it is still a useful tool and a credible mechanism to be concerned in any planning decision for tourism. The threat to the fragile environments and protected areas are increasing as ever before and the level of use, in many environments is disturbing fragile soils, vegetation, and wildlife, and may cause unacceptable crowding and visitor conflicts. Therefore, outdoor recreation research has adopted the concept of carrying capacity (i.e., including the coastal areas) and devised numerous frameworks towards upholding the concept's validity to achieve the safeguarding valuable environments. In Lawson *et al.*'s (2003) terms: "a number of frameworks have been developed to provide managers with a basis for making decisions about the carrying capacity of parks and protected areas, including Limits of Acceptable Change (LAC), Visitor Impact Management (VIM), and Visitor Experience and Resource Protection (VERP)." Models such as the precautionary principle (PP); safe minimum standard (SMS); ultimate environmental threshold (UET); and multi-attribute utility theory (MAUT) have been used to quantify the concept of carrying capacity (Gamini, 2002).

"The concept of sustainability has been widely used as an organizing framework since the Brundtland commission and the UN conference on economic and development in Rio de Janeiro in 1992 promoted this *leitmotif* at an international level. The general objective is to maximize various developmental goals across the biological, economic and social systems thus generating trade-offs among them" (Kammerbauer *et al.*, 2001).

Albeit its ambiguity, 'sustainability' has remained a powerful conceptual paradigm and it has captured a great deal of space within the developmental literature. "Sustainable tourism" has also gained increasing importance on the international agenda and the Johannesburg Plan of Implementation highlighted promoting sustainable tourism development and capacity building to contribute to the strengthening of rural and local communities (Strachan and Roberts, 2003).

The main assumption is that, a carrying capacity establishment has been introduced in this study as a legitimate policy mechanism and planning tool towards the broader objectives of sustainability which has been criticized for only being useful at a conceptual level, not at an operational level (Kammerbauer *et al.*, 2001).

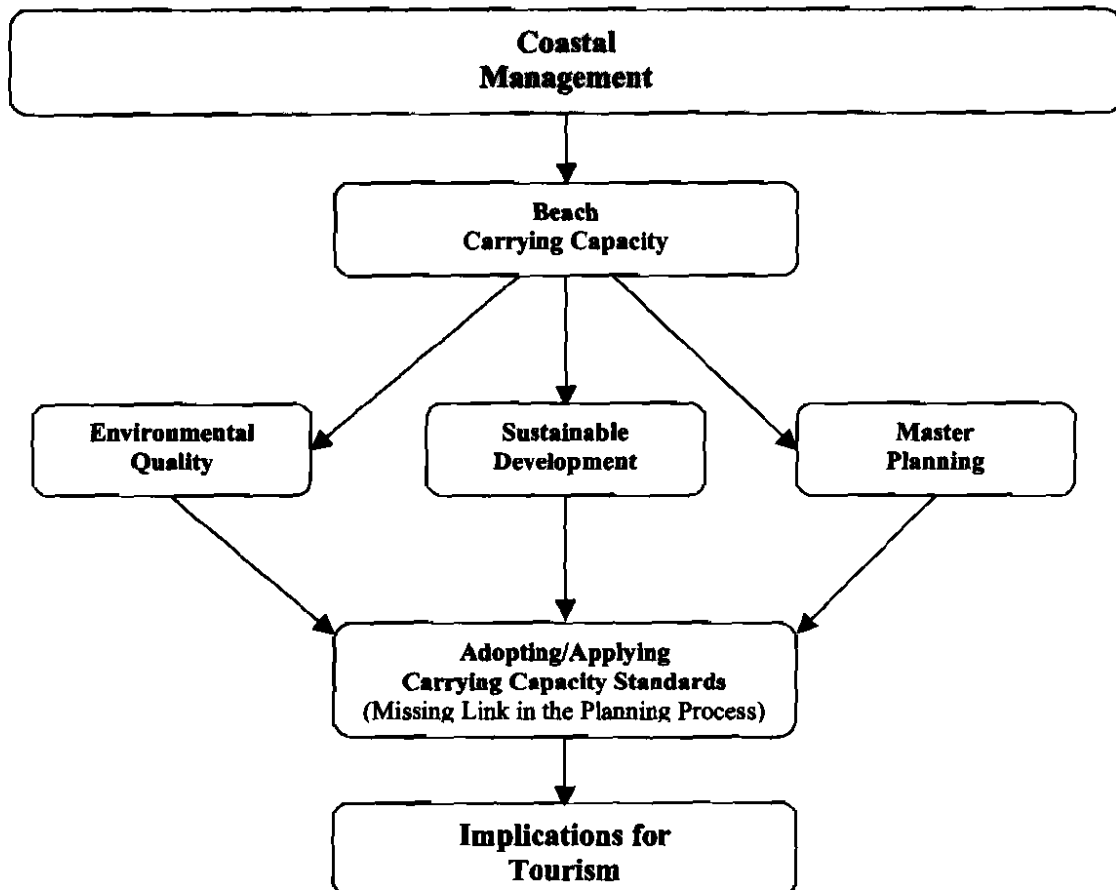
This study is the first major step in developing a conceptual framework based on a model (see figure 1) which places the 'carrying capacity' analysis within a sustainable tourism planning. This also is an effort (i.e., regarding the case of TRNC) to extend established planning theories and initiate a practical mechanism by adding the carrying capacity considerations to the existing conceptions. Therefore, the study builds on a model which identifies the factual basis on grounds which are not necessarily based on policies and plans to achieve the goals of sustainability.

This study is an effort to explore the case of North Cyprus, on which coastal resources are the main tourist attractions, it is therefore extremely vital to control and protect them. Two aspects are emphasized: one is the 'ecological capacity' issue, which is 'how many tourists can be accommodated before some negative impact occurs'; and, a 'perception capacity', which refers to 'how much tourism is acceptable before there is a decline in visitor satisfaction' (Burton, 1995). "In tourism both the quality of the environment and the tourist experience need to be considered, hence the industry needs to monitor and control (i.e., dual controls) both at once" (Murphy and Murphy, 2004).

Carrying capacity analysis becomes a justified practice when tourism is perceived not just because it is the world's largest industry or largest employer, 'also because of the enormous impact it has on people's lives and on the places in which they live, and because of the way in which tourism is itself substantially affected by the world around it' (Hall, 2000).

Alas, in many parts of the Mediterranean, the coastal areas/shores are poorly managed and regulated (Snoussi and Aoul, 2000). And in the case of TRNC, a coastal planning system is nonexistent. This is contrary to increasing interest in an integrated vision of coastal zone management. Therefore, the aim is to bring the concept of 'carrying capacity' into the planning process hoping it will eventually become a legislative reality and an institutional arrangement towards the sustainable development of fragile coastal areas.

Figure 1: Sustainable Tourism Planning Model



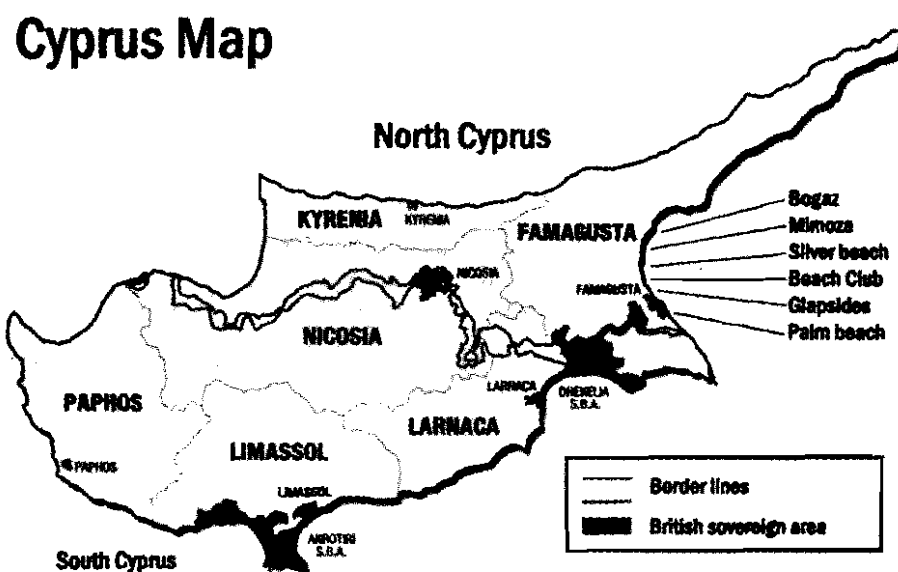
The authors firmly believe that, the 'carrying capacity' (CC), Limits of Acceptable Change (LAC), Visitor Impact Management (VIM), and Visitor Experience and Resource Protection (VERP). And/or models such as 'the precautionary principle (PP); safe minimum standard (SMS); ultimate environmental threshold (UET); and multi-attribute utility theory (MAUT) are tools which can be made operational to reinforce the objectives of the sustainability which is addressed by the United Nations Environmental Program (UNEP).

UNEP has addressed the concept of sustainable development within three environmental components: (1) environmental assessment: through the evaluation and review, research and monitoring and the exchange of views on the environment; (2) environmental management: through comprehensive planning that takes into account the effects of the acts of humans on the environment; and (3) supporting measures: through education, training and public information [making environmental auditing a managerial policy] and also through financial assistance and organizational arrangements (Abeyratne, 1999).

Case of North Cyprus (TRNC)

North Cyprus, which is known as the Turkish Republic of North Cyprus (TRNC), geographically refers to the northern part of the Island of Cyprus which has been declared independent since 1983. It occupies approximately the third of the Island with an area of 3355 sq. km (figure 2). North Cyprus is dominated by 320 kilometers of coastline, which is approximately half of the coastline of the whole island. The amount of coastline in this part of the island is relatively high (i.e., in proportion to the land mass it occupies), and to a large extent undeveloped.

Figure 2: Map of North Cyprus TRNC).



With nearly a half million tourists per year, and home to six universities with 37,000 students, the impact on the main beaches is challenging. The prediction is beach use will intensify as the prospect of a political solution to the Island's division is likely. For tourism activities in the north, see table 1.

Table 1: Tourism activities in TRNC

	2001	2002	2003	2004
Number of arrivals	492.843	562.375	589.549	733.898
Mode of arrivals				
Air	59.7%	58.3%	57.3%	55.8%
Sea	40.3%	41.7%	42.7%	44.2%
Accommodation				
Bed capacity				
1 star	1.398	1.542	1.538	1.576
2 star	2.202	1.974	2.064	2.084
3 star	2.855	3.043	3.666	3.782
4 star	1.932	1.932	1.962	2.272
5 star	2.120	2.120	2.320	2.212
Total				11.926
Economic impact of tourism				
Employment	5.995	6.056	6.083	6.699
% Share in GDP	2.80	3.20	3.55	3.75
Net tourism income (Million US \$)	93.70	114.10	178.80	271.10

Source: Ministry of Tourism and Environment (2004).

Another dimension to this case is 'size'. TRNC is a newly formed independent state, which has a *de facto* independent status along numerous unrecognized countries in the world. Most of these regions have broken off their home countries and characterized as "small size and the sub-optimality of small states". TRNC is no exception and fits into this conceptualization, along with Malta, within the European Continent in terms of population, GDP, GDP per capita, and topography (Armstrong and Read, 2003). The issue of the 'size' has its advantages in some in relation to our study, but it has also numerous disadvantages as the TRNC's environments are highly vulnerable to the pressure and impact of development. The threat to those environments is even higher when a formal planning system is not in place.

Nonetheless, further changes in the political environment will likely open the northern destinations to a tourism boom, and this can catch officials off guard. In this sense, and with respect to tourism theory, sustainability is illusory without a proactive planning and impact prediction system. Carrying capacity analysis will work as a vital mechanism to resolve the environmental debate in tourism, conflict with biological conservation, threat to undisturbed landscape, the expansion of recreation activities, wilderness protection, composition of the flora and fauna, pollution, erosion, and visual impacts (Garrigos Simone et al., 2004).

Therefore, this study aims to explore the perceptions of beach users so as to pave the way for the establishment of a 'carrying capacity' mechanism as an essential aspect of a larger picture which is 'sustainability'. The scope of this study is limited to six beaches located between Famagusta and the Bogaz coastal zone. (Refer to figure 1).

The 'carrying capacity' concept can be also contemplated when it is examined against the 'product life cycle' model as elaborated and furnished by Butler (1980). As elaborated by Priestly and Mundet (1998). Our model foresees future development in terms of organized mass tourism, a declining market, an increasing number of weekend or one day visits, and the conversion of hotels into apartments for permanent settlement or retirement homes. By this stage, many resorts have suffered declining patronage because of changing fashion and consumer tastes, resident resentment and environmental change. Rejuvenation, or renewed development will almost certainly require, in Butler's opinion, a complete change in the attractions on which tourism is based.

The case of TRNC is rather unique as the TRNC has been under embargo and sanctions since its separation from the south in 1974. This situation has hampered, but did not halt, its progress in overall economic development (Alipour and Kilic, 2005; Altinay et al., 2002). However, with the recent improvement in the communication between north and south, and further popularization of the north (i.e., EU connection), tourism has reached the stage of development which is characterized as: "rapid expansion of facilities; increasing investment by non-local companies to develop accommodation, natural, cultural and manmade attractions" (Burton, 1995). At this stage, a carrying capacity scenario is critical to the future of tourism and its sustainability.

Methodology

This study used both qualitative and quantitative research approaches. Generally qualitative research focuses on subjective experience and perception of the research subjects. In qualitative research, the researcher is the key instrument of data collection. Tools used include open ended interviews, field notes, and 'conversations' with participants or journal diaries. The focus of qualitative research is not only to describe but also to analyze. It seeks to look at the why of events not just the what (Tuckman, 1988). Therefore, North Cyprus is taken as a case study in the hope that it will produce a guideline for the planners and decision makers to achieve a certain degree of sustainability. On the other hand descriptions of quantitative research typically discern a cycle of successive phases of hypothesis formulation, data collection, analysis

and interpretation (Huysamen, 1997). Using a deductive approach, quantitative research seeks to establish facts, and make predictions possible in this study.

Fieldwork was carried out in order to determine the factors of carrying capacity of the beaches. A primary research process was developed to form structured data collection which followed a preparation stage; designing questionnaires and the selection of samples. A pilot study resulted in the survey instrument. A qualitative method was used in order to collect the primary data. The in-depth survey instrument in this study was requested from Silva (2002) in Portugal via e-mail. After receiving the instrument, it was adopted to prepare a final survey instrument based on ten factors.

These factors are highly associated with the patterns of the process of change of the natural and built environments and of tourism growth. In fact, the critical limit of carrying capacity can coincide with the stage of the development which is before the consolidation and stagnation stages. Therefore, gauging beach users perceptions might become the underlying criterion which the rate and the level of maximum development must be maintained within limits which reduce the threat to the sustainability (Gossling, 1999; Abeyratne, 1999)

The current study concentrates on the beaches as described in Table 2.

Table 2: Characteristics of Famagusta and Bogaz beaches

Palm Beach:	A sandy beach located between the city of Famagusta and deserted city of Marash. The beach accommodates a five-star hotel- Palm Beach hotel. This beach consists of two parts; the principal part is owned by the hotel with an attractive setting—equipped with sun beds and umbrellas. It is used highly by the guests who are staying in the hotel. While the hotel guests are on the beach, they can use the facilities of the hotel like swimming pool, restaurant, beach bar and terrace. They can also use the car parking area belonging to the hotel. This is an urban beach highly accessible by the residents living in Famagusta. The second section of the beach is an open area to the public and to a large extent unmanaged. Because of accessibility and the fact that it is in a walking distance from the city, lack of parking is a problem, and overuse of the beach has resulted in a certain degree of pollution around the beach and the water. This beach has a limited carrying capacity as it is not a broad beach. To achieve a sustainable resource base regarding this beach, an application of carrying capacity concept is of immediate concern.
Glapsides beach:	It is a sandy beach nearly 3 kilometers outside Famagusta decorated with sun beds and umbrellas. This beach has an adequate parking facility. Glapsides has one restaurant bar, one beach bar and one disco bar. It has no accommodation facility like a hotel or guesthouse next to it. There are two stands which rent entertainment facilities; like canoes, sea banana, pedal boats, and Jet skies; water skiing and wind surfing are also available. There is also one volleyball court for young visitors. However, as the city is expanding and the university is planning to increase its student body; and with the prospect for tourism boom, this beach needs to contemplate a carrying capacity analysis as a proactive measure to overcome prevention of overuse and deterioration.
EMU beach club:	This sandy beach is located 5 kilometers outside Famagusta and owned by Eastern Mediterranean University. The beach is quiet for the time being, but as it is sandwiched between two crowded beaches, there is always a danger of spill over from adjacent beaches.
Silver beach:	This newly established beach is becoming popular and crowded as it is highly accessible; however, it suffers from lack of parking facilities and traffic jams. The beach is vulnerable if it is not managed properly. Carrying capacity becomes a necessity as the beach space is limited.
Mimoza beach:	This beach is about 12 kilometers outside the city popular among local residents. It is highly crowded beach as it is limited in space. It is also frequented by the guests from three hotels near by. The beach can get overcrowded and overused. To sustain the beach's attractively and health certain planning measures are necessary to achieve a degree of carrying capacity measure and control.
Bogaz beach:	Bogaz beach is located 24 kilometers outside Famagusta. It is limited in space and surrounded by numerous hotels and restaurants; a popular beach for dining in this area. It also contains a small marina. A carrying capacity analysis and implementation of certain measures are essential to achieve resources of this beach for the future of tourism in this area.

Sampling process

In order to get a representative sample for the study, a qualitative assessment of beach perception at six different beaches was carried out resulting in the acquisition of 50 survey instruments. The data gathering procedure lasted about 20 minutes for each user and occurred during the month of May, 2005. A convenience sampling technique was employed at this stage (Aaker *et al.*, 2001). The sampling process continued until the required sample size was achieved (Robson, 1993). The sampling also is "purposive" because the study's aim was clearly identified and target group dominated by a certain market segment; in this case college students (Trochim, 2001).

Later, a quantitative assessment of beach perception at six different beaches was carried out resulting in 300 usable responses. This survey took approximately 10 minutes per respondent and was conducted in June, 2005. Both studies were aimed at determining the perceptions of respondents visiting beaches of Famagusta and the Bogaz region. Samples in the study were considered to be adequate as the reliability of the study (0.76) was deemed acceptable (Churchill, 1979).

In order to analyze the data and produce the results shown, SPSS 10.0 for Windows was employed.

Findings

Demographics

Demographic breakdown of the sample in table 3 (see next page) shows that 61.8% of the respondents were males. The age distribution shows that the majority of respondents fall between the age group of "18 – 27" (52.9%); which proves that respondents in the sample are mostly young in age. With respect of their education, 58.2% of the respondents reported completion of formal education; the minimum being an undergraduate degree and 24.1% had masters/doctorate degrees. In the case of respondents' nationality, 64.1% of respondents were foreigners and 35.9% described themselves as locals. Only 8.8% of respondents had professional occupations such as engineers, doctors or lawyers, but the majority of the respondents (44.1%) were students. These students were being educated in Eastern Mediterranean University in the sample region. In the case of level of income, 37.1% of the respondents had an income of approximately \$12,000 U S dollars per year. Only 19.4% of respondents were residents of North Cyprus, 43.5% of them were tourists, of whom 66.2% planned to stay for a "2 week" holiday and 23.0% planned to stay for less than a week. To clarify the length of stay issue further, students who are staying on the island for a long period to complete their education are likely categorized under the "*more than 3 weeks*" category.

Table 3: Demographics (n= 170)

	Frequency (f)	Percentage (%)
Gender		
Female	65	38.2
Male	105	61.8
Total	170	100.0
Age		
18-27	90	52.9
28-37	15	8.8
38-47	16	9.4
48-57	29	17.1
58-above	20	11.8
Total	170	100.0
Level of education		
Secondary or high school	21	12.4
Vocational school	9	5.3
Undergraduate degree	99	58.2
Masters/doctorate degree	41	24.1
Total	170	100.0
Nationality		
Locals	61	35.9
Foreigners	109	64.1
Total	170	100.0
Occupation		
Self-employed	10	5.9
Professionals (e.g. lawyers, doctors, engineers)	15	8.8
Students	75	44.1
Executive of a corporation	19	11.2
Governmental employees (e.g. officers, police man)	25	14.7
Personnel of educational organization	20	11.8
Others (e.g. retired, housewives, laborers etc.)	6	3.5
Total	170	100.0
Income		
Less than 1000\$	63	37.1
1001-2000\$	25	14.7
2001-3000\$	47	27.7
Over 3001\$	35	20.5
Total	170	100.0
Residency		
Resident	33	19.4
Tourist	74	43.5
Students	60	35.3
Others	3	1.8
Total	170	100.0
Length of stay*		
Less than a week	17	23.0
2 weeks	49	66.2
More than 3 weeks	8	10.8
Total	74	100.0

*It is possible to have different variance of 'length of stay' in the sample, however, the average length of stay during the months of May and June recorded 7.6 and 8.2 nights respectively (MTE, 2001).

Evaluation and the results

As shown in table 4, 36.5% of respondents rated *accessibility* of the beaches as "good" but there are still 12.4% respondents who evaluate the beaches with "poor" *accessibility*.

Table 4: Evaluation of respondents about Famagusta and Bogaz beaches

	Frequency (f)	Percentage (%)
Accessibility*		
Very good	43	25.3
Good	62	36.5
Reasonable	37	21.8
Poor	21	12.4
Very poor	7	4.10
Total	170	100.0
Parking facility		
Very good	18	10.6
Good	51	30.0
Reasonable	42	24.7
Poor	21	12.4
Very poor	29	17.1
Don't know	9	5.3
Total	170	100.0
Roads access*		
Very good	9	5.3
Good	40	23.5
Reasonable	54	31.8
Poor	56	32.9
Very poor	9	5.3
Don't know	2	1.2
Total	170	100.0
Planning/management		
Very good	6	3.5
Good	18	10.6
Reasonable	29	17.1
Poor	73	42.9
Very poor	43	25.3
Don't know	1	0.6
Total	170	100.0
Cleanliness		
Very Good	7	4.1
Good	38	22.4
Reasonable	28	16.5
Poor	80	47.1
Very Poor	15	8.8
Don't know	2	1.2
Total	170	100.0

	Frequency (f)	Percentage (%)
Restaurants		
Very good	12	7.1
Good	34	20.0
Reasonable	62	36.5
Poor	46	27.1
Very poor	14	8.2
Don't know	2	1.2
Total	170	100.0
Natural beauty		
Very good	94	55.5
Good	55	32.4
Reasonable	14	8.2
Poor	2	1.2
Very poor	5	2.9
Total	170	100.0
Quality of environment		
Very good	19	11.2
Good	60	35.3
Reasonable	63	37.1
Poor	24	14.1
Very poor	4	2.4
Total	170	100.0
Accommodation		
Very good	19	11.2
Good	38	22.4
Reasonable	58	34.1
Poor	29	17.1
Very poor	15	8.8
Don't know	11	6.5
Total	170	100.0
Goods prices		
Very good	17	10.0
Good	29	17.1
Reasonable	84	49.4
Poor	19	11.2
Very poor	13	7.6
Don't know	8	4.7
Total	170	100.0

*** Accessibility refers to the value of distance from the place where beach users stay or live (distance- decay factor). Road access refers to the mode/ means of connection which in this case is car or coach.**

30.0% of the respondents rated *parking facilities* on the beaches as “good” and 17.1% of the respondents found these beaches had “very poor” parking facilities. Clearly, the parking facility at these beaches was a weak factor. Most of the respondents (32.9%) consider that there should be an alternative mode of access to these beaches besides car or coach. This result has another connotation besides the accessibility. The congestion on the roads and the lack of other alternatives including bike paths for the bicycle users might limit the use by some. The *Planning/ management* aspect of most of the beaches under study remained problematic. 42.9% of the respondents’ perception indicated this to be “poor” and 25.3% perceived them to be “very poor”. ‘Clean environment’ remains one of the most important concerns of the tourists; the survey demonstrated that, 47.1% of the respondents found the *cleanliness* as “poor”. Regarding the food outlets (i.e. restaurants and food establishments), respondents’ evaluation indicated an overall “reasonable” (36.5%); nonetheless, 27.1% indicated “poor” and 8.2% evaluated as “very

poor". Regarding the *natural beauty*, as shown in table 4, 55.5% of the respondents evaluated the *natural beauty* as "very good" and 32.4% of them found it as "good". Most of the respondents evaluated the *quality of environment* as "reasonable" (37.1%); this is an aspect which can draw the tourism planners' attention to the application of measures and mechanisms in the master plan to sustain these vital characteristics of the beaches. The *accommodations* and amenities around them are another factor which was considered in this study. Some of the older establishments have much better surroundings and green spaces; however, the new ones are lacking in this aspect. This was reflected by the respondents as they indicated 'reasonable' as only 34.1%. Nonetheless, respondents were affected by the price factor when expressing their views.

This detailed evaluation shows that there should be serious attention given to factors like *parking facility, alternative mode of access, planning/management, cleanness, food outlets' quality, quality of environment, accommodation and prices*. This verifies that any future planning decisions need to consider and incorporate these factors, which are not separate from the carrying capacity concept and its implementation. The factor of *crowding* has not the cause of much concern by respondents in the study at this time. This is because of the overall beachfront per user ratio, which is still relatively high. However, the assumption is that this situation can change as the political environment changes, resulting in the further increase in cooperation and communication between the south and the north. This may also affect the length of stay which is not very long at this moment.

Precautions concerning future events have been addressed and attended to at other destinations (Inskip, 1991). In fact the case of the south is highly relevant to the argument in the case of the north. Overcrowding and concentration on the beaches in the south has been alarming. The government and Cyprus Tourism Organization (CTO) in the south have embarked on a daring policy to divert the tourists from the coastal areas into the countryside/rural areas as the overcrowding (i.e., the carrying capacity threshold having been surpassed) is undermining the attractiveness of the beaches (Sharply and Sharply, 1997).

Evaluation of respondents about beach related activities

Beach related activities can be an important guideline to have a practical understanding of the carrying capacity concept; because each activity can have a different degree of impact upon the beach environment and eventually on the perceptual carrying capacity of the tourists and users themselves (Burton, 1995).

As demonstrated in table 5, out of 170 respondents, 97.1% considered *swimming* as a regular activity, 7.1% of them favored *spear fishing* activity, and 14.7% preferred *fishing*. The remaining respondents were against *spear fishing* and *fishing* activities. Generally, the respondents liked to visit *restaurants*, by 60.6%, and *walking* on the beach preferred by 81.8%. *Picnicking* on the beach preferred by some (35.9%), was disliked by the majority. Activities like *boat trips, scuba diving* and *snorkeling*, are also favored by some beach users. Coastal planners and managers can coordinate and plan each beach based on the beach structure and the users as some of these beaches currently are catering to tourists in their 30's and 40's.

Table 5: Evaluation of respondents about the beach related activities

	Frequency (f)	Percentage (%)
Respondents' routine activities at the beach		
Swimming	165	97.1
Spear fishing	12	7.1
Scuba diving	34	20.0
Picnics	61	35.9
Going to restaurants	103	60.6
Walking	139	81.8
Fishing	25	14.7
Boat trips	41	24.1
Surfing/windsurfing	15	8.8
Snorkelling	40	23.5

Note: The percentages (n=170) represents more than one positive attitude towards activities.

Evaluation of respondents about physical development along the coastal areas

This issue was addressed in three categories in our study. First, it involves an attitudinal evaluation by the beach users about the intensity of physical development (i.e. urbanization). Regarding this aspect, 41.2% of the respondents considered that the urban developments are integrated and in harmony with the landscape, 17.6% believed that, they are well integrated and in harmony with the landscape. Almost half of the respondents (46.5%) believed that, the present situation of urban development along the beaches was inadequate. 32.4% of the respondents blamed this on the action of local authorities as being inadequate, and 18.2% of them believed that the local authorities' action has remained "very poor". This is a clear reminder of the haphazard urban development in the case of North Cyprus, which is not necessarily a healthy approach to coastal sustainability.

Table 6: Evaluation of respondents related to urban development

	Frequency (f)	Percentage (%)
Respondents' thoughts about urban development		
It is well integrated and in harmony with the landscape	30	17.6
Only in some places it is integrated and in harmony with landscape	70	41.2
It's in conflict with the landscape	43	25.3
No opinion	27	15.9
Total	170	100.0
Respondents' perceptions of present state of urban development		
Excessive	10	5.9
Adequate	53	31.2
Inadequate	79	46.5
No opinion	28	16.5
Total	170	100.0
Respondents' views regarding the local authorities' approach to coastal conservation		
Good	22	12.9
Reasonable	41	24.1
Poor	55	32.4
Very poor	31	18.2
Don't know	21	12.4
Total	170	100.0

Evaluation of respondents about their favorite beach in the Famagusta and Bogaz region

This part of the questionnaire evaluates the attitude of respondents' about their favorite beaches and characteristics of those beaches in the Famagusta and Bogaz region. To analyze the

relationship of favorite Famagusta and Bogaz beaches with regard to respondents' age, educational level and gender, analysis of variance, (ANOVA), was performed. A significant difference was found, implying that respondents differed in their opinions about their favorite beaches. The results of the ANOVA led the researchers to conclude that the beaches of the Famagusta and Bogaz region are significantly different from each other. According to table 7, the favorite beach among respondents (24.8%) is found to be *Glapsides* beach. *Glapsides* is one of the most famous beaches in Famagusta, popular mostly with young locals, students and also young tourists. 23.5% respondents preferred *Palm Beach*. *Palm Beach* is generally used by tourists from different countries young and old, who stay in the Palm Beach hotel. This beach is also frequented by the locals as it is highly accessible. *Silver beach* was found to be the third favorite beach according to the respondents (17%), it is a fairly new beach in the region. *EMU beach club* with 12.9% fans is the Eastern Mediterranean University's establishment with a modern setting. *EMU beach club* has fewer respondents because it is only for the members of EMU Staff. The least two favored beaches are *Bogaz* and *Mimoza* which are located outside the city limits.

Table 7: Respondents' favourite beach in Famagusta and Bogaz region

	Frequency (f)	Percentage (%)
Palm Beach	40	23.5
Glapsides beach	42	24.8
Beach club	22	12.9
Silver beach	29	17.0
Mimoza beach	17	10.0
Bogaz beach	20	11.8
Total	170	100.0

One Way ANOVA		Age	Education	Gender
Sum of Squares		31.719	70.385	12.742
	df	4	3	1
Mean Squares		7.930	23.462	12.742
	F	2.925*	2.531*	4.591*

* p<0.05

Safety was another aspect which was considered in this study. 31.8% of the respondents believed safety to be adequate. However, beaches which are not catering to the hotels have a lack lifeguards. Although respondents indicated, by 43.5%, that parking facilities seemed to be adequate, however, they need a great deal of improvement. Limiting parking space can be a mechanism to limit the number of users and achieve certain degree of carrying capacity implementation.

Cleanliness is another issue, which 30.0% of the respondents found the *cleanliness* of their favorite beaches to be "adequate". Among the respondents, 41.2% of them believe that the *infrastructure* of their favorite beaches is "adequate". Respondents' opinion regarding the *natural beauty* or natural amenities of their favorite beaches happened to be "very good" by 53.5%. Regarding the *over crowdedness*, which relates to the *size*, respondents have an overall positive view as the beaches in north Cyprus are not crowded yet.

The beach activities offered at the moment do not vary that much. However, if various types of activities are enhanced, there will be new kinds of impacts and pressure on these environments.

Table 8: Respondents' perception regarding the beach quality based on their associated factors

	Frequency (f)	Percentage (%)
Respondents' evaluation on safety		
Very good	46	27.1
Good	54	31.8
Reasonable	29	17.1
Poor	30	17.6
Very poor	11	6.5
Total	170	100.0
Respondents' evaluation on parking		
Very good	16	9.4
Good	74	43.5
Reasonable	32	18.8
Poor	34	20.0
Very poor	7	4.1
Don't know	7	4.1
Total	170	100.0
Respondents' evaluation on cleanliness		
Very good	23	13.5
Good	46	27.1
Reasonable	51	30.0
Poor	41	24.1
Very poor	9	5.3
Total	170	100.0
Respondents' evaluation on infrastructures		
Very good	9	5.3
Good	28	16.5
Reasonable	70	41.2
Poor	54	31.8
Very poor	4	2.4
Don't know	5	2.9
Total	170	100.0
Respondents' evaluation on natural beauty		
Very good	91	53.5
Good	63	37.1
Reasonable	11	6.5
Poor	3	1.8
Very poor	2	1.2
Total	170	100.0
Respondents' evaluation on size		
Very good	43	25.3
Good	80	47.1
Reasonable	30	17.6
Poor	12	7.1
Very poor	5	2.9
Total	170	100.0
Respondents' evaluation on activities		
Very good	8	4.7
Good	40	23.5
Reasonable	47	27.6
Poor	52	30.6
Very poor	16	9.4
Don't know	7	4.1
Total	170	100.0

Evaluation of respondents about the activities of their favourite beach to be protected or banned

This part evaluates the respondents' perception about the current activities on their favourite beach, and whether those activities should be protected or banned. Such information can guide the coastal planners to coordinate and harmonize the beach profile and structure with the type of activities desired or undesired by the users (see table 8). This type of survey can have implications for the segmenting tourist type and marketing. As tourism is growing in this part of the island, and in the meantime, there is a market among the so called *third age* tourists, it is an efficient approach to identify the activities and its market segment. 'No business or destination community can be all things to all people, and it should not try to be. Rather the destination should segment its potential market into more or less homogenous subgroups, or tourist market segments, based on certain common characteristics and / or behavioural patterns, that they can serve and satisfy' (Murphy and Murphy , 2004).

Table 9: Respondents' perception about banning or protecting different beach related activities

<i>n</i>	Protected	Banned	No Opinion
Respondents' view on spear fishing			
170	17	75	77
Respondents' view on speed boating			
170	130	2	38
Respondents' view on scuba diving			
170	59	15	96
Respondents' view on beach games			
170	80	12	78
Respondents' view on picnicking			
170	25	59	86
Respondents' view on camping			
170	41	35	94
Respondents' view on fishing/angling			
170	20	50	100
Respondents' view on parachuting			
170	76	8	86
Respondents' view on jet skiing			
170	41	59	70
Respondents' view on windsurfing			
170	45	22	103

Carrying capacity policy implications

From a 'sustainability' point of view, this study has tried to pave the way to establish a 'carrying capacity' criterion, as a significant policy agenda, which can be part of the planning process to apply, and will achieve a certain degree of sustainability objectives as intended. The study has explored that, 'carrying capacity' establishment is not necessarily to follow a prescribed pattern or process but to develop a systematic process, as part of tourism/environmental planning, which sets in place the policies to accomplish getting closer to the implementation of a sustainability concept. On this ground, the study has discovered numerous pitfalls. And those pitfalls are hindering the realization of the establishment of a carrying capacity on one hand and not permitting the goals of sustainability to be achieved in the other hand. Therefore, the following precautions need to be considered:

- a) No vehicles should be allowed to have access to the beach unless it is an emergency.
- b) Every beach should have a parking area constructed at least 500 meters offshore along with proper sign directing beach users to that particular beach.
- c) The rapid process of urbanization is going to exacerbate the pressure on the beaches nearby; therefore, precautions should be taken considering the resident's use of the beaches, especially during the peak season.
- d) Certain zoning laws are needed to limit the 'bulk' and the 'intensity' of the land use, especially the housing and second home development schemes.
- e) Controlling and monitoring the beaches closer to the urban areas not to allow the threshold of the beach capacity to boil over.
- f) Littering is a big problem, and various educational programs as well as penalizing the litterers can overcome this problem in the long run.
- g) Picnicking and overnight camping must have designated space.
- h) The carrying capacities of some of the beaches are highly limited as the hotels are constructed with minimal beach frontage area (e.g. MIMOZA beach and Palm Beach). First, there is a need for a planning law to prevent this type of development in the future, secondly, establishments adjacent to each other, can cooperate on sharing the beach front to prevent the overcrowding and over capacity.
- i) An overall coastal management plan must be established within which carrying capacity concept can be a factor.
- j) Some of the beach activities are geared towards certain age group. And some of these activities are highly noisy (e.g., jet skiing). These activities can be allocated to certain beaches but not to all. This can minimize the conflict of interest by different age groups and the tourist market segment.
- k) Last but not least, a compromise must be in place whether to go beyond the capacity and develop extensively, which may not be sustainable, or to apply a properly measured carrying capacity analysis to achieve sustainability. The latter can be achieved if the general landscape character is protected; the coastal communities are involved and accounted for, practices like ribbon development avoided; and disfigurement of the coastal areas is prevented.

Conclusion

This study aimed to introduce the concept of "carrying capacity" as an important tool to be considered seriously in any planning decision for tourism. The concept is not separable from the theoretical framework of "sustainable development" which has been evolving for the last two centuries (Basiago, 1999). The case of North Cyprus is rather unique in the way it is on the political threshold of either unification or recognition. This is a pivotal point to plan and decide on the future of tourism and the direction tourism should take. This study has explored one of the most important aspects of tourism planning and development (i.e. carrying capacity) as an essential means to achieving sustainable development. Carrying capacity and its practicality may sound vague, but the study demonstrates that it can be analyzed, understood, and practiced towards justifiable goals of protection of non-renewable resources, long-term economic growth and development, environmental stabilization, and pollution prevention.

This study revealed that there are some basic issues associated with the beaches of the Famagusta and Bogaz region which can become a costly threat to the basic natural resources that form the base for tourism in this region. In relation to accessibility, parking facility, accommodation, quality of environment, planning/management, and cleanliness of the beaches, the study revealed a lack of proactive planning and apathy towards the 'carrying capacity' analysis. The concept of "urban sustainability" should be considered and contemplated by the planners and a concerted effort should be taken to integrate urbanization, tourism, and resource protection especially in an Island environment as it is more vulnerable to pressure and impact.

This case study and its findings are significant. The public and local authorities, master planners, commercial developers and the North Cyprus Tourism Ministry should be guided by this study's findings. Although the idea of evaluating perception of beach users regarding implications for carrying capacities of the beaches is not a new concept, it is however, new and very timely in evaluating the ever-increasing beach usage within the Famagusta and Bogaz region. The findings of this study will assist and alert public and local authorities to the need for identifying and managing the existing and future beach carrying capacity problems such as overcrowded locations, the lack of adequate sanitation facilities, existing infrastructure improvements and the need to manage new development. This study can also assist future potential entrepreneurs, working in contact with public and local authorities, in ascertaining and identifying likely future development opportunities such as hotels, housing and beach related recreational operations and facilities to apply certain measures towards the adoption of carrying capacity before it is too late. Finally, this case study provides supporting evidence that a monitoring system (i.e., environmental auditing) is needed to incorporate data on carrying capacity with projects for tourism when those projects are still in the planning stages. Unfortunately, some of the pristine beaches in the north are subjected to intense accommodation development, without any carrying capacity measure, and their long-term sustainability are questionable.

Overall, the results suggest that the carrying capacity issue has become an urgent matter to be considered as part of the planning process in order to achieve project sustainability. We believe, through these cumulative factors, carrying capacity establishment could achieve the ultimate goal of developing a sustainable coastal tourism.

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About the Authors: Habib Alipour, Ph. D., Mehmet Altinay, Ph. D., and Nazita Sheikhani, M.S. teach at the Eastern Mediterranean University, School of Tourism and Hospitality Management, Kashif Hussain, M.S. also teaches at Eastern Mediterranean University, in the Department of Educational Sciences.