

PRIORITY  
ACTIONS  
PROGRAMME

MEDITERRANEAN  
ACTION PLAN



# GUIDELINES

for carrying capacity  
assessment for tourism in  
Mediterranean coastal areas

PRIORITY ACTIONS PROGRAMME  
REGIONAL ACTIVITY CENTRE  
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# CONTENTS

List of Figures.....	ii
List of Tables.....	ii
List of Boxes.....	iii
Preface.....	v
Executive Summary.....	vii
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 Objectives, Purpose and Structure of the Guidelines.....	1
1.2 Main Characteristics of Tourism in the Mediterranean Region.....	1
1.3 Impact of Tourism on the Environment.....	3
1.4 Concept of Carrying Capacity Assessment.....	4
1.5 Reasons for and Benefits from the Preparation of CCAs.....	5
1.6 Specific Features of CCA for Tourism.....	7
<b>2. INSTRUCTIONS FOR THE PREPARATION OF CARRYING CAPACITY ASSESSMENT.....</b>	<b>8</b>
2.1 CCA as a Part of ICAM.....	8
2.2 Phases and Contents of Work.....	15
2.3 Documentation Phase and Mapping.....	16
2.3.1 Required documentation.....	16
2.3.2 Boundaries of the destination area (region).....	17
2.3.3 General characteristics of the destination (region) and its development.....	18
2.3.4 Tourism attractions.....	18
2.3.5 Tourism, economy, population.....	21
2.3.6 Status of documentation.....	22
2.4 The Analysis Phase.....	22
2.4.1 Typology of a destination.....	22
2.4.2 Destination under study in view of its wider environment.....	22
2.4.3 Regulations and restrictions.....	23
2.4.4 Evaluation of tourism resources, tourist demand and tourism product.....	23
2.4.5 Standards.....	24
2.4.6 Alternative CCAs.....	24
2.5 Tourism Development Options.....	25
2.5.1 Free development without any restrictions.....	25
2.5.2 Intensive tourism development.....	26
2.5.3 Alternative tourism development.....	26
2.5.4 Sustainable development.....	27
2.6 Analysis of Scenaria and Selection of the Most Favourable One.....	29
2.7 Definition of Tourism Development Model as the Basis of Carrying Capacity Assessment.....	31
2.7.1 General considerations relative to the final carrying capacity assessment.....	31
2.7.2 Specific features of carrying capacity assessment in the Mediterranean.....	31
2.8 Instructions for the Application of CCA.....	33
<b>3. INTEGRATION INTO THE COASTAL AREA MANAGEMENT PLANS.....</b>	<b>34</b>
3.1 Role and Significance of Tourism in the ICAM Process in the Mediterranean.....	34
3.2 CCA as a Tool of ICAM.....	34
3.3 Integration of CCA into Various Phases of ICAM.....	34
<b>ANNEXES.....</b>	<b>37</b>
Annex I CARRYING CAPACITY ASSESSMENT FOR TOURISM DEVELOPMENT IN THE ISLAND OF VIS - CROATIA.....	39
Annex II CARRYING CAPACITY ASSESSMENT OF THE CENTRAL-EASTERN PART OF THE ISLAND OF RHODES - GREECE.....	45
<b>REFERENCES.....</b>	<b>51</b>

LIST OF FIGURES

	Page
1. Flowchart for Integrated Coastal and Marine Areas Management (ICAM) Process	10
2. The tourism industry, the environment and the community	12
3. Carrying capacity and sustainable tourism development	12
4. Basic groups of parameters important for the carrying capacity assessment	13
5. CCA as part of the ICAM process, integrated plans and tourism development plans	13
6. Graphical presentation of tourist season along the Croatian coast by months and tourist interests	18
7. Scheme of the relations between alternative scenarios and the carrying capacity	27
8. Philosophy of sustainability	28
9. Scheme of the process of CCA integration into various phases of ICAM	35

LIST OF TABLES

1. Regional distribution of international tourist arrivals and receipts from international tourism (1981-1991)	1
2. Rates of increase of tourist overnight stays in the Mediterranean in 1981-1991	2
3. International tourist traffic, receipts and expenditure in the Mediterranean (1991)	2
4. Stages, phases, activities and outputs of the ICAM process	11
5. Positioning of the CCA process in the ICAM process	14
6. Phasing and contents of work on the preparation of CCAs	15
7. A review of tourism resources and activities in the island of Vis	19
8. Elements of the carrying capacity in the Mediterranean countries that must be given a special attention due to the specific general and tourism features	32

## LIST OF BOXES

	Page
1. Tourism and environment in the Adriatic	4
2. A definition of carrying capacity for tourism	5
3. Parameters of CCA	6
4. Marine environmental protection	9
5. Semi-enclosed seas, coastal areas and the protection, rational use and development of their living resources	14
6. Database and information	17
7. Main parameters used in the CCA of the island of Vis	20
8. Standards applied in Vis	23
9. Standards applied in Brijuni	24
10. Standards applied in Rhodes	24
11. Free development in the north-eastern part of the island of Rhodes	25
12. Intensive tourism development in Porec	26
13. Alternative tourism development	27
14. Carrying capacity values in the island of Vis	29
15. Carrying capacity values in Rhodes	29
16. Assessment of scenarios in Rhodes	30

## Preface

Since 1985, the Priority Actions Programme Regional Activity Centre (PAP/RAC) of the Mediterranean Action Plan - UNEP has been implementing the priority action entitled "Development of Mediterranean Tourism Harmonized with the Environment". In this action, which is one of numerous others with which PAP/RAC has been entrusted, a total of 14 Mediterranean countries participate actively. This action is based on four major goals set within the framework of the Mediterranean Action Plan of UNEP, namely:

1. integrated planning of development and management of the Mediterranean basin;
2. pollution monitoring and research programme for the Mediterranean basin;
3. development of relevant legislation; and
4. institutional and financial framework.

The first phase of the action (1986-1989) included a series of seminars and expert meetings organized on the basis of national reports and case studies produced by the participating countries. These reports and studies provided grounds for the preparation of Guidelines for an Environmental Approach to the Planning and Management of Tourism in Mediterranean Coastal Zones and, later on, a proposal for the methodology for carrying capacity assessment (CCA) in tourism.

After that proposal had been presented and discussed at a workshop organized in 1990 by UNEP Industry and Environment Office and World Tourism Organization, pilot projects for CCA were prepared for the Brijuni archipelago and the island of Vis (Croatia). The CCA study for the island of Vis was presented in 1991 to the national authorities of Croatia plus also to the local authorities and people of Vis, and was very favourably received.

Shortly after the presentation of the Vis study, a similar one was prepared for the central-eastern part of the island of Rhodes (Greece), and presented in 1992 to the central and local authorities which expressed their appreciation for the work done. Another two CCA studies are currently in preparation, in the area of Marsa Matrouh - Fuka in Egypt, and in Lalzit Bay in Albania.

At the beginning of 1994, making use of the experience obtained through the work in the first phase of the activity, a team of experts drafted the Guidelines for Carrying Capacity Assessment for Tourism in Mediterranean Coastal Areas. Their aims were to provide a comprehensive methodological document and a procedure for the analysis and assessment of carrying capacity, and to incorporate it within the integrated planning and management of Mediterranean coastal areas. The Draft Guidelines were reviewed first and amended at an expert meeting organized in Split in June 1995, and then adopted at the regional workshop in Split in January 1997.

It is hoped that these Guidelines will be used as a tool by a large body of people and of organisations for the implementation of CCA. We shall be grateful for any comments, amendments, and proposals for the improvement of these Guidelines, especially if these suggestions arise from experience of using them in practice.

## Executive Summary

1. These Guidelines are an integral part of the project "Development of Mediterranean Tourism in Harmony with the Environment" which has been implemented for several years within the framework of the Priority Actions Programme of the Mediterranean Action Plan - UNEP. The study departs from the multifaceted nature of tourism which is always dependent upon the given time and space, type and size of tourist attractions, types and level of tourism development, relationships between micro- and macro-tourism policies and, finally, the preferences of the local population.
2. The principal objective of these Guidelines is to provide a comprehensive methodological and procedural framework which will contribute to a full understanding of the carrying capacity concept in the field of tourism, to its analysis and assessment and, finally, to its efficient application within integrated management of coastal areas.
3. The Guidelines focus upon Mediterranean countries, which together provide destinations for 30 per cent of the world's tourist arrivals and where some 28 per cent of the total world's receipts from tourism originate. This clearly indicates that tourism is one of the most important industries in and of the Mediterranean. The need felt for more appropriate methods of tourism planning and management arise from the conflicts between tourism and other branches of economy, and tourism's negative impacts upon the environment. It has become increasingly evident that the interests of the public sector and of the entrepreneurs are co-incidental in the long run.
4. Today, it can be stated with assurance that the inclusion of Carrying Capacity Assessment (CCA) in the process of integrated planning and management is a necessity for successful tourism, and for further economic development of Mediterranean countries in the future. This also means that CCA must be part of tourism development plans, and be put within the process of Integrated Coastal Area Management (ICAM).
5. In preparing CCAs, the following summary step by step approach is recommended:
  1. **Documentation, inventorisation and mapping phase;**
  2. **Community participation starts;**
  3. **Analysis phase;**
  4. **Evaluate a range of tourism development options, and choose preferred development scenario;**
  5. **Define in more detail development scenario, then define carrying capacity;**
  6. **CCA defined and formulated;**
  7. **Integrate CCA in ICAM, if not already done, then prepare instructions for different user groups;**
  8. **Pre-feasibility studies, as end phase of CCA process;**
  9. **Start of main tourism development planning process, with plan acceptance, and plan implementation process.**

Each of these steps has its own structure and content, as spelt out in this Guidelines Document. The value of carrying capacity is assessed in the light of a choice of tourism development scenarios, and the CCA needing to be adjusted to the development requirements of different destinations. The examples of various types of tourism development thus indicate the varying values of CCA with regard to the analyzed physical, ecological, economic and socio-demographic components of the recipient environment.

6. Being part of the tourism planning and management process, the analysis and assessment of carrying capacity must be presented to the local and regional authorities, as well as to the tourist industry. Since CCA is indeed one of the main inputs into tourism plans that are prepared for various destination-areas, it must be both open to public scrutiny, and involve public participation in the process. Proposals on CCA must be built into various ICAM phases, if such a programme exists for the destination area concerned. If there is no such official document, each and every tourism plan must contain analysis and assessment of its carrying

capacity, in order to be able to respond to the problem of scale and to the requirements of sustainable development of the area for which the plan is drafted.

7. With regard to the examples of CCA prepared for the islands of Vis and Rhodes, it is possible to draw the following conclusions:

- Although CCA procedure is basically the same for all areas, each destination requires an individual approach that is tailored to its specific features.
- To assess the carrying capacity correctly, it is insufficient just to visit the area and identify its resources and attractions; it is necessary also to realize the felt needs of the local population, because even the best paper-plan is difficult to implement if not backed by the residents of the destination-area. Sustainable tourism is impossible without the interest and commitment of the tourism destination area's residents.
- Only by analyzing and evaluating a number of alternative development scenarios it is possible to assess CC, and to determine accordingly the form of tourism development which will be optimal for the area under study and, at the same time, will be possible to implement in practice.

# 1. INTRODUCTION

## 1.1 Objectives, Purpose and Structure of the Guidelines

These Guidelines are the response to the growing need for there to be a speeded -up ability for people to do carrying capacity assessment procedure in Mediterranean coastal environments, within the general planning and management of tourism. The immediate purpose of the Guidelines may be specified as follows:

***The formulation of a comprehensive and consistent methodological and procedural document which will facilitate understanding the concept of carrying capacity, its analysis and assessment in various Mediterranean destinations, and particularly, its application, either within or outside of the integrated management process in coastal regions.***

The Guidelines are addressed to decision makers, to professionals and to public institutions which deal with tourism planning specifically, and with physical planning in general. Since the document focusses, among others, upon Mediterranean tourism practice and offers an insight into entrepreneurial behaviour in tourism, it is also addressed to the private sector.

The Guidelines depart from the main characteristics of tourism development in the Mediterranean, and view it, in particular, from the aspect of the impacts which tourism has upon the environment. The document (a) explains the concept of carrying capacity assessment (CCA), as well as the reasons for it, and benefits arising from the CCA analytical studies; (b) offers instructions for the preparation of CCAs, which include the basic location, spatial, ecological, social, cultural and market criteria respected in the assessments, and in the selection of optimal solutions; and (c) elaborates upon the integration of CCA in the plans for integrated management of coastal areas (ICAM).

## 1.2 Main Characteristics of Tourism in the Mediterranean Region

Owing to its favourable position in terms of geography and transportation, its mild climate, its natural beauty, lavish cultural and built heritage, the Mediterranean basin is the main tourist region in the world, attracting 30 per cent of international tourist arrivals and accounting for 28 per cent of receipts from tourism (Table 1). Three countries of the region, namely France, Italy and Spain, are among the ten strongest market-destinations in the world, being the countries which have the highest net income gained from international tourism.

**Table 1. Regional distribution of international tourist arrivals and receipts from international tourism (1981-1991)**

Region	Arrivals in '000			Receipts in million US\$		
	1981	1985	1991	1981	1985	1991
World	288,848	329,636	455,100	102,008	115,424	261,070
Europe	192,726	214,264	277,904	61,654	61,181	138,234
Mediterranean	110,201	121,120	139,139	28,910	32,812	72,696

Source: Compendium of Tourism Statistics 1981-1993. WTO, Madrid

France, Italy and, more recently, Spain, are also countries which are important tourist generators, and have large-scale domestic tourism.

Between 1981 and 1991, the number of foreign tourist arrivals in the Mediterranean increased from 110 to 139 million, the average annual rate of increase being 2.4%. Over the same period, the income for the area from international tourism was increasing much more rapidly - at the average rate of 9.6%. Increased rates of overnight stays, which were higher than the Mediterranean average, were recorded in the countries of the southeastern part of the Mediterranean (Egypt being the strongest receptive country) where, until recently, tourism was



less developed than in the rest of the region. On the other hand, with the exception of Turkey, which has experienced a high annual rate of increase (19.5%), a drop of overnight stays has been reported for the countries of the northeastern Mediterranean, due to the stagnation of tourist traffic and war in the territory of the former Yugoslavia (Table 2).

**Table 2. Rates of increase of tourist overnight stays in the Mediterranean in 1981-1991 (in %)**

Region	1981-1985	1985-1991	1981-1991
NW Mediterranean	4.5	0.9	2.4
NE Mediterranean	5.4	-10.4	-4.4
SW Mediterranean	3.4	-1.8	0.2
SE Mediterranean	0.4	3.0	2.0
Total Mediterranean	4.5	-0.6	1.5

Source: Compendium of Tourism Statistics 1981-1993. WTO, Madrid

In the highly developed tourist countries of the northwestern Mediterranean (France, Italy and Spain) a moderate rate of increase of 2.4% has been recorded, due to tourism saturation and an increasing orientation towards higher-quality tourism. Much higher rates of increase were reported between 1981 and 1985, which was an economically and politically more favourable and quieter period, indicating that the stagnation of tourist traffic is a recent phenomenon largely caused by political and economic changes experienced in the area wider than the Mediterranean, and due less to decreased tourism attraction of the region, and to changing interests of the visiting tourists.

A conclusion may be drawn that no significant changes are expected in the Mediterranean tourist market. The bulk of foreign tourist traffic (over 90%) goes to the European coasts of the Mediterranean, where positive growth rates have been recorded. Only a small percent of the tourist traffic has been effectuated in the countries of the African (6.4%) and Asian (1.3%) parts of the Mediterranean (Table 3).

**Table 3. International tourist traffic, receipts and expenditure in the Mediterranean (1991)**

Country	Arrivals in '000	Overnight stays in '000	Receipts in million US\$	Expenditure million US\$
Spain	35,347	77,128	19,004	4,530
France	54,822	372,175	21,300	12,338
Italy	26,840	86,735	19,668	13,300
Malta	895	9,634	574	140
NW Mediterranean	117,904	545,672	60,546	30,308
Croatia	1,346	6,764	468*)	103*)
Slovenia	738	2,177	...	...
Greece	256	29,873	2,566	1,011
Turkey	5,158	9,699	2,564	592
Cyprus	1,385	8,275	1,026	113
NE Mediterranean	8,883	56,788	6,714	1,819
Algeria	1,193	669	64	149
Morocco	4,162	13,400	1,052	190
Tunisia	3,224	12,443	685	129
SW Mediterranean	8,579	26,512	1,801	468
Egypt	2,112	16,231	2,029	225
Israel	943	4,663	1,306	1,783
Syria	622	1,715	300	210
SE Mediterranean	3,677	22,609	3,635	2,218
<b>Total Mediterranean</b>	<b>139,043</b>	<b>651,581</b>	<b>72,696</b>	<b>34,813</b>

\*) Data refer to ex-Yugoslavia, in which Croatia and Slovenia made over 90% of the country's international tourist traffic.

Source: Compendium of Tourism Statistics 1987-1991, WTO, Madrid

The analysis of tourist traffic in the Mediterranean would not be complete without pointing out the importance of some tourism generator countries for the region's tourism. With the exception of France, the main generator- countries (Germany, Great Britain, France, USA and Japan) do not border the Mediterranean Sea. The cross-border and interstate traffic (excursion and transit tourism) account for a considerable portion of the tourist traffic in the Mediterranean basin.

The amount of foreign currency inflow directly depends on the volume of tourist traffic and the composition of visitors by nationality. In 1991, France, Italy and Spain gained the largest receipts from international tourism (82%). However, due to their considerable tourism-generator power, a great deal of the tourism income drains elsewhere directly or indirectly. In other words, 87% of the total expenditure of tourism go to these countries. It should be mentioned that the countries with smaller tourist traffic tend to spend foreign currency gained from tourism in a more rational way, and therefore only small amounts of these resources are being lost. The most favourable ratio of receipts and expenditure of foreign currency from tourism was reported for the countries of the northeastern and southwestern Mediterranean, where in 1991 the value of the expenditure was equal to about one quarter of the value of the receipts.

Forecasts of tourist flows in the world suggest that regardless of some structural changes (mostly in the quality of tourist supply), and further segmentation of the tourist markets, the upward trends will continue. What is needed is a continuous adjustment of the tourism products on offer, to the changing demands and, consequently, adjustments in the tourism marketing which is done. The Mediterranean basin, taken as a whole, is not yet saturated, and will continue to be a peak destination for international tourism, which will be dependent upon the stability of political and economic conditions, for tourism is attracted towards safer areas and those places which are better preserved ecologically.

### **1.3 Impact of Tourism on the Environment**

Tourist demand is oriented towards ecologically preserved areas which are not saturated in tourism terms. Thus, it should be pointed out that the Mediterranean region is indeed facing the problems of tourism saturation and endangered environment for some parts of its marine and coastal areas. The coastal and marine resources which are, in addition to tourism, being used for many other economic activities, are exposed to increasing competition. Being an enclosed and shallow sea with slow circulation of its waters, the Mediterranean can hardly absorb the large quantity of pollutants entering it from its rivers, those coming from the air, being discharged from its land edges, or caused by various waterborne accidents (oil spills, for example). Mention should be also made of the repeated occurrences of "red tide" (algae bloom) over large marine areas such as the northern Adriatic. With the growing threats to the environment, there is increased awareness of, and need for protection and preservation in the Mediterranean sea basin.

Although tourism is less dangerous for the environment than the majority of other activities (industry, in particular), it does contribute, directly or indirectly, to the increased pollution of air, water and land (by solid wastes). Because of its seasonal character, tourism also burdens the infrastructural systems at peak periods. In addition to its impacts upon the natural environment, tourism also has considerable negative impacts upon cultural heritage, and social relationships. In consequence, the reluctance to accept tourism and/or hostile attitudes towards tourists have been experienced at many locations. As a result, tourists feel less at ease and dissatisfied, which in turn affects the productivity of the tourist industry.

The most important negative impacts of tourism on the environment are:

- **air pollution caused by increased vehicular traffic;**
- **pollution of the sea and of fresh waters by discharges of waste waters from tourist establishments;**
- **pollution of the sea by discharges from tourist vessels (yachts, speed boats, excursion boats), passenger liners and car-ferries;**
- **dumping of increased quantities of solid wastes in the sea and on land;**
- **overburdened infrastructural systems in the summer months (water supply, roads, telecommunications), due to the seasonal character of tourism;**

### Box 1

#### **Tourism and environment in the Adriatic**

In the last couple of years, a large number of hotels have been closed down in the northwestern coast of the Adriatic Sea, especially in the Veneto and Emilia-Romagna Provinces. These closures affect the economic well-being of many people who live solely off tourism. In addition to industrial pollution (from the River Po predominantly) of the shallow, enclosed and therefore very sensitive bay water basin, and the resulting unpleasant phenomenon of red algae, the drop in tourist visits has been also due to pollution caused by mass tourism. To this, one should add the lost interest of visitors in the tourism offer based on "sun and sea", and the outbreak of war in the neighbouring countries of Croatia and Bosnia and Herzegovina. Moving southward, although the Croatian coasts of the Adriatic are far less polluted, the catastrophic drop in tourist arrivals due to the war situation hit badly the parts of Croatia which lived almost solely off tourism, even the parts which were never threatened by the war.

- **alteration within the urban networks, causing decay of old towns, especially the traditional agricultural market towns;**
- **direct damaging of the natural and cultural heritage (excessive tourist visits);**
- **abandoning of traditional activities (agriculture, fisheries) due to the opportunity of larger earnings off tourism;**
- **negative effects of the adjustment of residents to tourists' life styles on the local socio-cultural identity, creation of drastic social differences, increased numbers of criminal acts, etc.**

Yet, tourism has some positive impacts on the environment too. In the first place, it protects the physical environment from some other, more dangerous, pollution generators (industry, in particular), increases the economic well-being of the society as a whole and, thereby, enables larger investments to be made in the protection of natural resources and the protection and reconstruction of monuments of culture, especially in the less developed countries. In many cases tourism enabled rehabilitation of old town cores, originally neglected due to relocation of economic activities (especially commerce) into other areas which are much more advantageous from the development and traffic viewpoints. As the high-quality of resources, and their well-preserved character create the reason for tourism, the tourist industry is highly interested in a sound environment for purely economic reasons. That is why most of the stimulus for more investment in the protection of the Mediterranean environment, has come from the tourist industry.

Many activities have been carried out for the protection of the Mediterranean environment, either as part of cooperative efforts within the Mediterranean Action Plan, the European Action Programme for the Environment, or within actions conducted at the level of individual states, regions or localities. The protection of the Mediterranean basin tends to extend to cover a wider coastal strip, since it has been estimated that about three quarters of the total pollution is land-generated, meaning that it has entered through waterways, come from the air, or via direct dumping of wastes into the sea.

## **1.4 Concept of Carrying Capacity Assessment**

Tourists, as temporary visitors of tourist resorts, buy goods and services which are part of the tourist supply. However, the exchange value in these transactions is not decisive in the choice of a tourist resort by visitors. The choice is rather influenced by a general attraction of the resort's natural and cultural features. Beaches, mountains, lakes, museums, cultural monuments are the assets which actually attract tourists. In this, the economic exchange relationship between pleasure from the resource, experienced by the tourist, and the price paid for enjoying that pleasure remain covert, rather than exposed and measured. What is important are the perceptions, expectations and complete tourism experience, rather than the specific use of any one service provided for the tourist. Tourist attractions have the power to create the market for a given tourist resort, and this makes tourism an economic activity, related to specific products and demands at a specific place.

## Box 2

### **A definition of carrying capacity for tourism**

The carrying capacity of a tourist resort may be defined as:

*The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of the visitors' satisfaction.*

Source: WTO, 1981

In terms of economy, tourist attractions are assets which cannot be reproduced. They are treated as a public good where market mechanisms do not show their normal allocative functions. A maximum number of users visiting tourist attractions may lead to their saturation and, in turn, result in a poorer quality of tourist experience. Negative effects of saturation can also be felt in the neighbouring, unsaturated areas, the attraction of which is diminished by unattractive environment and the associated lower quality of tourist demand in the immediate vicinity. In other words, the greater the intensity of tourist use, the more limited becomes the appeal of the tourist attraction.

These issues have been often discussed in the literature on tourism (WTO), the basic argument being that the ratio of the intensity of use and the user's satisfaction may vary considerably for different attractions. For example, in the case of museums or historic towns, saturation will be reached when the level of intensity of use becomes the same as the limit of the attraction's capacity. In contrast, in the case of mountain summits, saturation will be experienced long before the limit of the attraction's capacity is reached, since it may be assumed that the visitors enjoyment of a beautiful view will be frustrated by others who also wish to try and enjoy the same view at the same time.

If the physical capacity of a tourist attraction is determined by a maximum number of visitors there at one point in time, the balance can be maintained by physically limiting the number of visitors at a time (as, for example, is done in many national parks in the USA), or by pricing policy, etc. This shows that tourists use a public good as a service which cannot be priced in the way in which some other goods and services can.

This, of course, creates negative externalities, because if the real price were paid for the use of a public good, the problems of saturation would not be so disturbing. Any increase in supporting facilities (tourism infrastructure and superstructure) will have both positive and negative impacts on the environment including opportunity costs of alternative uses of tourism resources.

Setting a carrying capacity for a tourist destination will not only help in comprehensive planning and sustainable development of tourism, but will also secure a positive feed-back effect on the tourist market.

## **1.5 Reasons for and Benefits from the Preparation of CCAs**

The carrying capacity assessment has become one of the main techniques of tourism and recreation planning and management. Its aim is to determine the upper desirable limits of development, that is, the optimal use of tourism resources. There are numerous examples of tourist destinations where the carrying capacity has been largely exceeded, the consequences being the degradation of natural and cultural attractions and weakening of the tourist market. It has also become clear that free enterprise and the market mechanism without active planning and protection, negatively affects the environment, and is a direct cause for the loss of interest in some destinations by tourist markets.

The incorporation of CCA in the tourism planning and management process is therefore a necessity, and it should be taken as a set of instructions for the formulation of tourist plans at all levels. The benefits from CCAs are, thus, to the public and the private sectors equally, since past practice of tourism development, particularly in coastal regions, has proved that the interests of the public sector (in the protection of tourism resources) and those of entrepreneurs (in the protection of the market, and of profitability) are co-incidental in the long run.

### Box 3

#### Parameters of CCA

- (a) The physical-ecological parameters refer to all fixed and flexible components of the natural environment, as well as infrastructural systems, since these are mostly linked to natural resources. The fixed components include ecological capacity, the natural heritage capacity, length of the coastline, climate, etc. As these elements are mostly easy to measure, it is necessary to determine their numerical values which will then serve as the basis for determining the total carrying capacity.

The flexible components refer primarily to infrastructural systems, that is, water supply, sewerage, electricity and gas supply, transportation (road-traffic, in particular), public services (postal and telecommunication services, health services, law and order services, banks, shops and other services). Although the capacity of infrastructural systems is comparatively easy to measure, the numerical values cannot be used as the basis for determining their carrying capacity, but rather as a framework for orientation. That is because economic and political factors may have considerable influence on the raising of the infrastructural carrying capacity limit, through eventual state investments in infrastructure, tax allowances for investors (especially for the rehabilitation recycling of historic buildings in town centres, or new construction harmonized with the traditional vernacular architecture), etc.

- (b) The socio-demographic parameters refer to all the elements which concern social communities, as well as local resident population with tourists and their interrelations. Unlike the demographic elements which are, in general, easier to measure (available man power, educational level of workers), the socio-cultural elements, such as cultural identity of the local population, tourist experience, and the absorptive capacity for receiving new workers and tourists, are less measurable.

Although to a lesser degree than in the case of infrastructural systems, the political and economic factors may also have some impact on the modification of some socio-demographic limits. This may be claimed, in particular, for the policy of a wider community regarding additional man power to be brought from outside the area, and to implement certain concepts of tourism policy (stimulating/encouraging versus restrictive/controlled / or limited). Of considerable importance also are the differences (in mentality and of behaviour) between the local resident population on the one hand, and the new labour force and tourists on the other, as well as the attitude of the local community towards development in general, and to tourism development in particular.

- (c) The political-economic parameters primarily refer to the anticipated investment and economic measures for tourism development. These issues should be attempted to quantify wherever possible, particularly with regard to the lower limits of the total carrying capacity. If, for example, water supply is a major limit to development, and if the state administration offers to invest in the construction of new pipelines without encumbering potential investors in tourism, then, in determining the water supply capacity what should be taken into account is the situation after the new pipelines have been laid rather than the existing state. Similar to that, limits with regard to manpower, for example, should be adjusted if some government documents clearly suggest that migrations to an area will be encouraged (to some islands, for example), and if the resident population is willing to accept the newcomers.

Although, in a way, the political-economic parameters are only the corrective factors of the physical-economic and socio-demographic parameters, in many cases they have had a key role in determining the carrying capacity. Not infrequently, the political-economic parameters are those which are the basis for deciding on a development scenario by choosing between two extremes, and so are they for determining the ultimate carrying capacity. Consideration of the political-economic parameters is also necessary in the process of merging frequently diverging results of the CCA, arrived at on the basis of separately analyzed physical-ecological and socio-demographic parameters. The political-economic parameters are also important for a full understanding of local environments and the ways in which they function.

## 1.6 Specific Features of CCA for Tourism

The understanding of what carrying capacity assessment means in the field of tourism has been evolving over the years, from the orientation to easily measurable physical and ecological parameters through to the socio-demographic and socio-cultural parameters which are not so easy to measure. With the increased role of state administration in tourism development planning, primarily through economic measures of stimulation or constraint (tax policy, construction of large infrastructural systems, etc.), the importance of political and economic parameters has become greater, calling for their special treatment in determining the carrying capacity, particularly so in the medium and less developed Mediterranean countries to which these Guidelines are addressed in the first place.

Therefore, in determining tourism carrying capacity in the Mediterranean, three groups of parameters, namely (a) physical-ecological parameters, (b) socio-demographic parameters, and (c) political-economic parameters, should be specially discussed.

Although a conclusion can be inferred from the above statement that for tourism carrying capacity assessment, the physical and ecological parameters are of lesser importance than other parameters, this is not really true. With regard to those parameters which have greater importance within the general carrying capacity, i.e. within ICAM, they apparently lose on importance in the assessment of strictly tourism carrying capacity. Also, when assessing carrying capacity for tourism, the socio-demographic, political and economic parameters are deliberately given greater importance, as they were neglected in the past, and because of the considerable difficulties now in their exact definition, unlike the ecological parameters which are comparatively easier to measure.

## 2. INSTRUCTIONS FOR THE PREPARATION OF CARRYING CAPACITY ASSESSMENT

### 2.1 CCA as a Part of Integrated Coastal and Marine Areas Management

Integrated coastal areas management (ICAM) may be defined as a process of resource-management aimed at the sustainable development of coastal areas. The prerequisite for sustainable development is the preservation of the high quality and quantity of coastal resources, whilst meeting not only the current needs, but also whilst securing long-term (or sustainable) economic and ecological benefits for future generations.

This statement is in accordance with the following principles of the Declaration on Environment and Development (points 3 and 4) which were adopted at the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992:

- The right to development must be fulfilled so as to meet equitably developmental and environmental needs of present and future generations.
- In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

The Conference gave special attention to marine and coastal areas management, particularly in Chapter 17 of the "Agenda 21" (United Nations, 1992). That part of "Agenda 21", which refers to integrated management and development process in marine and coastal areas, including the exclusive economic zones, is particularly important for the preparation of CCAs.

Preparation of a CCA has to be harmonized with the latest global orientation to sustainable development (Boxes 4 and 5), compatible with the process of Integrated Coastal Area Management (ICAM), take into consideration all modern methods for planning tourism development, and be based on a special concept of preparation (CCA concept).

Of particular importance for the compatibility of CCA preparation with ICAM are the flowchart for ICAM process (Figure 1) and stages, phases, activities and outputs of the ICAM process (Table 4).

Modern planning of tourism development and preparation of CCA are based on new relations between the tourism industry, the environment and the local community (Figure 2), and the relation between the sustainable development of tourism and CCA (Figure 3), as described in the document "Sustainable Tourism Development: Guide for Local Planners" (WTO, 1993).

An introduction to the CCA concept has been presented in the point 1.4. It is a result of the synthesis of experience gained in the implementation of the Priority Actions Programme Regional Activity Centre (PAP/RAC) project "Development of Mediterranean Tourism Harmonized with the Environment", and was explained in the "Methodological Framework for Assessing Tourism Carrying Capacity in Mediterranean Coastal Zones" (PAP/RAC, 1990). The concept was tested through PAP/RAC's projects in the island of Vis (Croatia), and on the central-eastern part of the island of Rhodes (Greece).

While the preparation of CCAs (type, volume and phasing of work) must be brought in line with the ICAM process, it should also be harmonized with the methodology of contemporary tourism development planning, respecting the principles of sustainable development of tourism.

Figure 4 shows the place and role of CCA in the preparation and implementation of integrated development plans for coastal areas, and their tourism development plans.

Table 4 indicates the phases of various activities envisaged by the CCA concept in relation to ICAM, following the Mill and Morrison model of tourism planning (WTO, 1985), and to how World Tourism Organisation (WTO) sees the link between CCA and the sustainable development of tourism. The phasing which has been so harmonized is needed since the process of CCA preparation must be reconciled or integrated with the ICAM process through the preparation of a sectoral plan of tourism development. There may be cases of CCA preparation outside either the ICAM process or that of the preparation of tourism development plans.

#### Box 4

##### Marine environmental protection

A proactive and anticipatory rather than a remedial approach is necessary to prevent the degradation of the marine environment. This requires, *inter alia*, the adoption of precautionary measures, environmental impact assessments, clean production techniques, recycling, waste audits and minimization, construction and/or improvement of sewage treatment facilities, quality management criteria for the proper handling of hazardous substances, and a comprehensive approach to damaging impacts from air, land and water. Any management framework must include the improvement of coastal human settlements and the integrated management and development of coastal areas.

States, in accordance with the provisions of the United Nations Convention on the Law of the Sea on protection and preservation of the marine environment, commit themselves, in accordance with their policies, priorities and resources, to prevent, reduce and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities. To this end, it is necessary to:

- a) Apply preventative, precautionary and anticipatory approaches so as to avoid degradation of the marine environment, as well as to reduce the risk of long-term or irreversible adverse effects upon it;
- b) Ensure prior assessment of activities that may have significant adverse impacts upon the marine environment;
- c) Integrate protection of the marine environment into relevant general environmental, social and economic development policies;
- d) Develop economic incentives, where appropriate, to apply clean technologies and other means consistent with the internalization of environmental costs, such as the polluter pays principle, so as to avoid degradation of the marine environment;
- e) Improve the living standards of coastal populations, particularly in developing countries, so as to contribute to reducing the degradation of the coastal and marine environment.

Source: United Nations, 1992

However, even in such an event, the CCA should be conducted so as to enable its inclusion in the ICAM process at a later stage.

Integrated management of coastal areas (ICAM) is characterized by three types of activities:

- initiation (motive);
- planning; and
- plan implementation.

The planning phase is divided into four sub-phases:

- preparatory activities;
- analyses and forecasts;
- definition of goals and strategies; and
- integration of detailed plans and management policies (PAP/RAC, 1993).

CCA is prepared in parallel with the first and the second planning phases of ICAM, which include preparatory activities, analyses and forecasts. A CCA synthesis serves as a part of the sectorial tourism analysis and input in the further planning phases of ICAM.



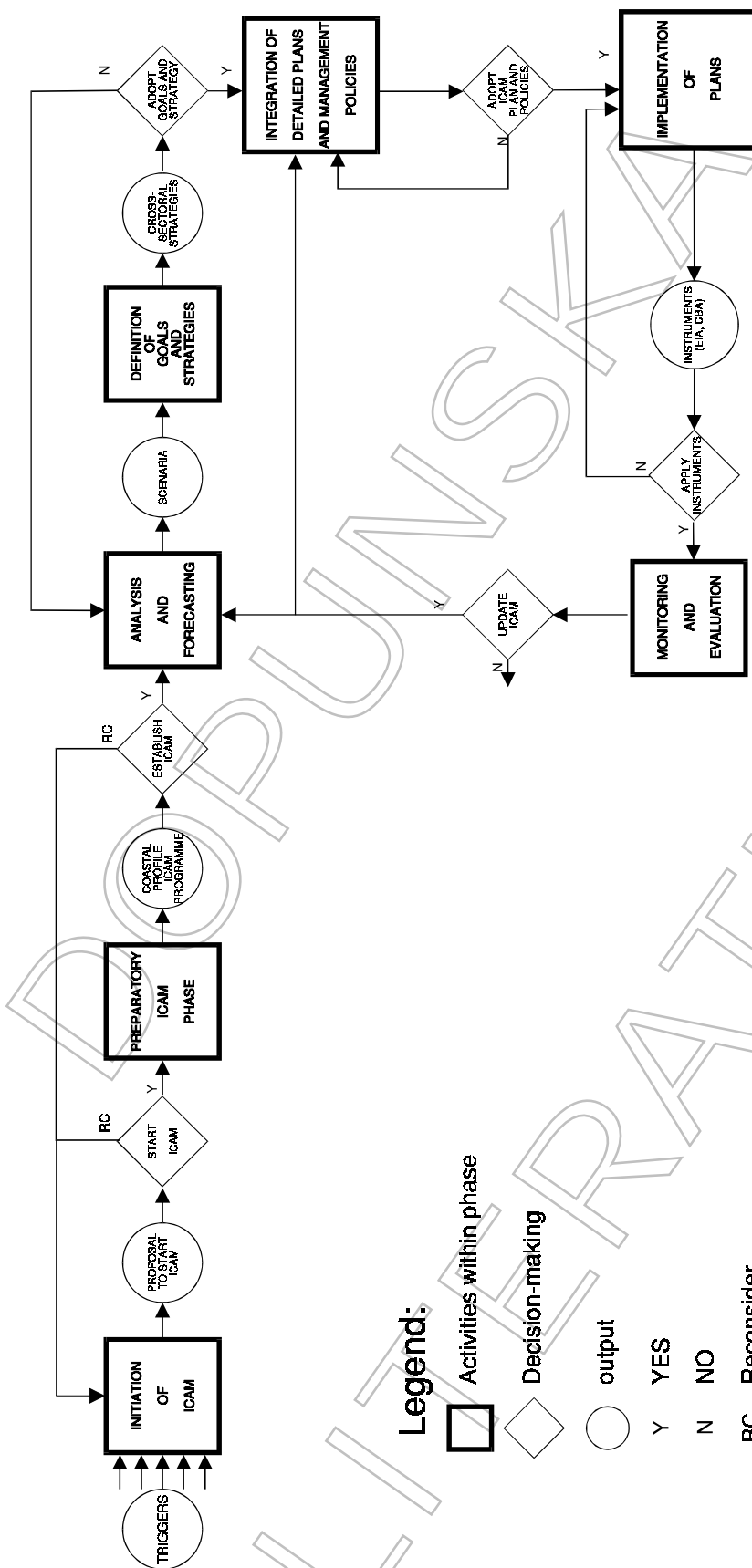


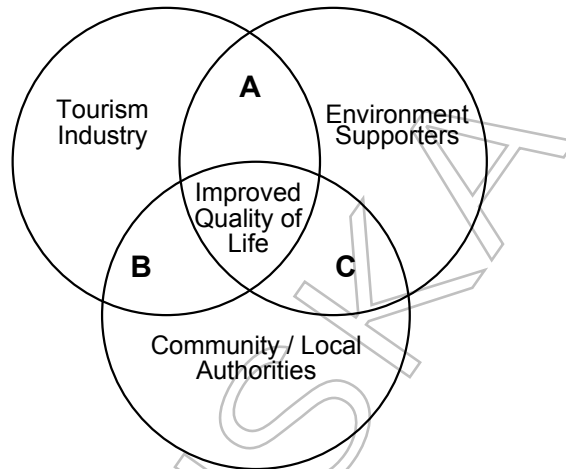
Figure 1. Flowchart for Integrated Coastal Areas Management (ICAM) Process

Source: PAP/RAC, 1993.

Sectoral inputs	Stages	Phases	Activities	Outputs	Political decisions
Triggers: past decisions, new decisions, external influences	<b>INITIATION</b>	<i>INITIATION OF ICAM</i>	Analysis of prerequisites for ICAM Tentative boundaries of the area Preparation of the proposal for initiation of ICAM	Proposal for the preparatory phase of ICAM	To start ICAM
Sectoral Problem identification	<b>PLANNING</b>	<i>PREPARATORY ACTIVITIES</i>	Definition of coastal area. Identification of sectoral and cross sectoral problems. Proposal for general goals and objectives Preparation of development environment, outlooks and tentative strategy. Identification of information gaps. Definition of legal financial and institutional requirements for ICAM Proposal for integrated Coastal Master Plan preparation procedure.	Coastal Profile. ICAM programme.	To establish ICAM as a continuous and long term process
Sectoral analysis and forecasting		<i>ANALYSIS AND FORECASTING</i>	Issue - oriented new surveys (generation of missing primary data) Analysis of natural and socio economic systems. Forecasting of future demand. Generation of cross sectoral scenarios and selection of preferred scenario.	Alternative scenarios	
Definition of sectoral goals and strategies		<i>DEFINITION OF GOALS AND STRATEGIES</i>	Proposal for sectoral and cross sectoral goals and objectives. Preparation of alternative strategies including, legal requirements, financial implications and institutional arrangements. Evaluation and selection of strategy.	Management strategy	Approval of goals objectives and strategies
Sectoral plans		<i>INTEGRATION OF DETAILED PLANS</i>	Allocation of land and sea uses Proposal for implementation procedures (legal, institutional, financial) and relevant instruments (EIA, CBA, etc.) Definition of implementation stages Draft integrated Coastal Master Plan presented to relevant body for approval	Integrated Coastal Master Plan	Adoption of Integrated Coastal Master Plan and relevant policies
Sectoral plans and policies	<b>IMPLEMENTATION</b>	<i>IMPLEMENTATION OF PLANS</i>	Phasing of ICAM proposals and policies. Application of economic, regulatory, and environmental evaluation instruments in development control Adaptation of institutions to ICAM.	EIA CBA	Approval of implementation instruments used in the development control process
Sectoral monitoring		<i>MONITORING AND EVALUATION</i>	Redefinition of cross sectoral problems Identification of inadequacy of instruments	Evaluation study	Update of ICAM process

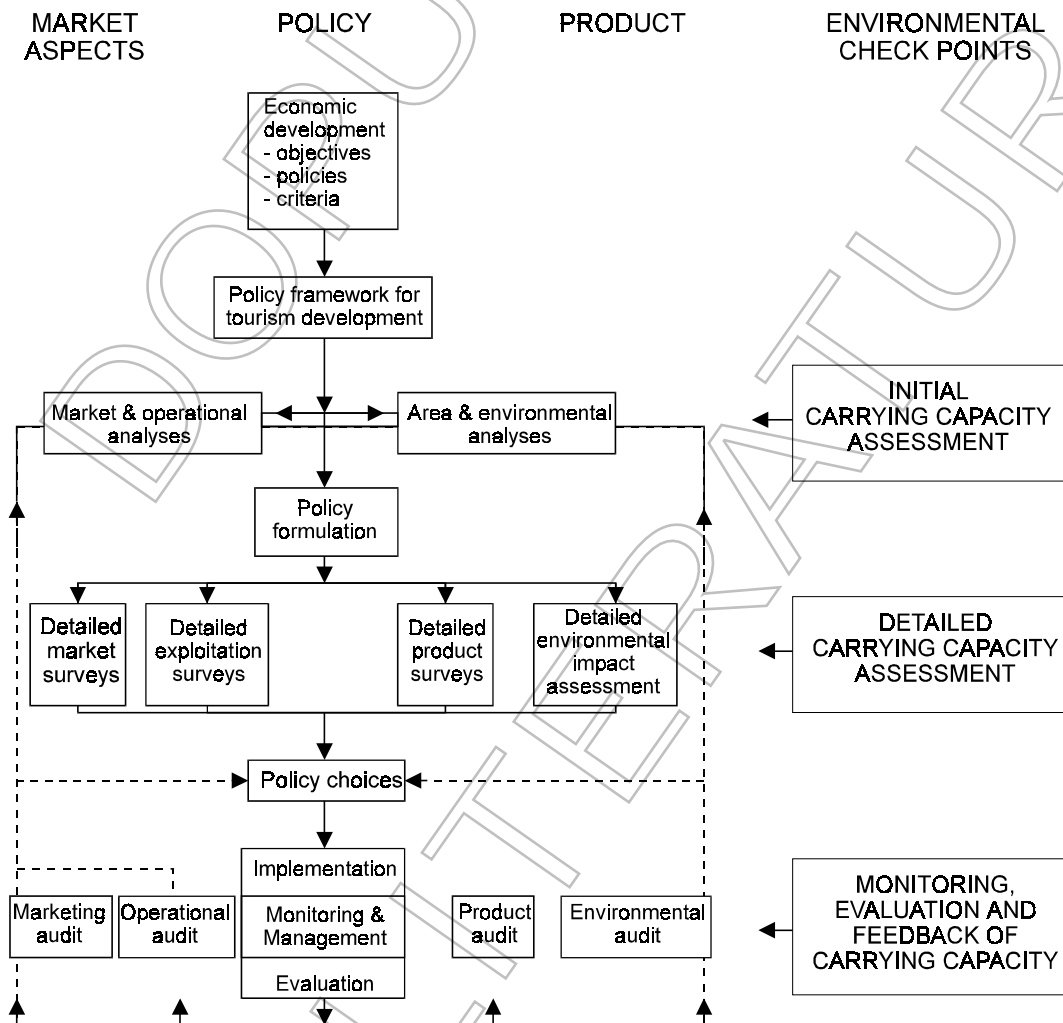
**Table 4. Stages, Phases, Activities and Outputs of the ICAM Process**

Figure 2. The tourism industry, the environment and the community



Source: WTO, 1993

Figure 3. Carrying capacity and sustainable tourism development



Source: WTO, 1993

Figure 4. Basic groups of parameters important for the carrying capacity assessment

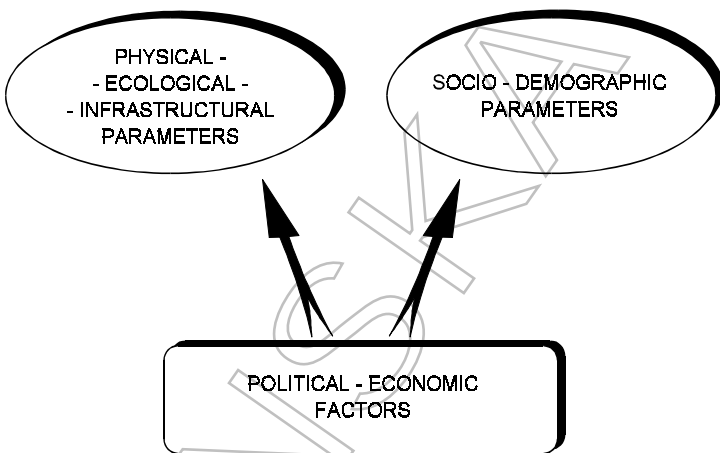
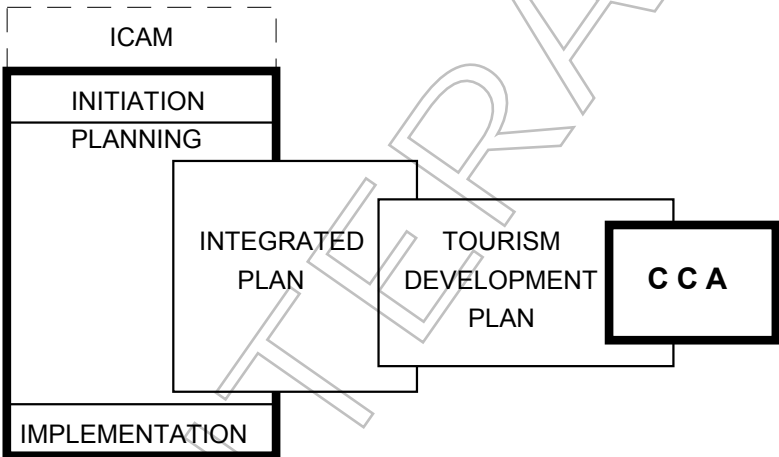


Figure 5. CCA as part of the ICAM process, integrated plans and tourism development plans



## Box 5

### Semi-enclosed seas, coastal areas and the protection, rational use and development of their living resources

The marine environment - including the oceans and all seas and adjacent coastal areas - forms an integrated whole that is an essential component of the global life-support system and a positive asset that presents opportunities for sustainable development. International law, as reflected in the provisions of the United Nations Convention on the Law of the Sea referred to in this chapter of Agenda 21, sets forth rights and obligations of States and provides the international basis upon which to pursue the protection and sustainable development of the marine and coastal environment and its resources. This requires new approaches to marine and coastal area management and development, at the national, subregional, regional and global levels, approaches that are integrated in content and are precautionary and anticipatory in ambit, as reflected in the following programme areas:

- Integrated management and sustainable development of coastal areas, including exclusive economic zones;
- Marine environmental protection;
- Sustainable use and conservation of marine living resources under national jurisdiction;
- Addressing critical uncertainties for the management of the marine environment and climate change;
- Strengthening international, including regional, cooperation and coordination;
- Sustainable development of small islands.

Source: United Nations, 1992

**Table 5. Positioning of the CCA process in the ICAM process**

ICAM PROCESS		MODEL OF TOURISM PLANNING	CCA ACCORDING TO WTO	CCA ACCORDING TO PAP
INITIATION PLANNING	INITIATION OF ICAM			
	PREPARATORY ACTIVITIES	BASIC ANALYSIS	INITIAL CCA	INITIAL CCA
	ANALYSES AND FORECASTS	DETAILED ANALYSIS	DETAILED ANALYSIS OF CCA	CCA ANALYSIS
		SYNTHESIS		TOURISM DEVELOPMENT SCENARIOS
	DEFINITION OF GOALS AND STRATEGIES	GOALS AND STRATEGIES		CCA SYNTHESIS
	INTEGRATION OF DETAILED PLANS AND MANAGEMENT POLICIES	PLAN		
IMPLEMENTATION	PLAN IMPLEMENTATION MONITORING AND PLAN EVALUATION	IMPLEMEN-TATION	MONITORING, EVALUATION AND FEED-BACK EFFECTS OF CCA	MONITORING, EVALUATION AND FEED-BACK EFFECTS OF CCA

## 2.2 Phases and Contents of Work

The preparation of CCA is conducted in four main phases:

- (a) Documentation phase and mapping
- (b) Analysis phase
- (c) Tourism development options
- (d) CCA formulation phase

These four phases are followed by the use of the results of the CCA, first in the integrated planning process, and then in its implementation. The contents of each phase are indicated in Table 6.

While preparing the CCA, the following should be kept in mind:

- (a) Some of the data will be collected through the ICAM process, but some other specified data will have to be collected in another way, as explained in the section 2.3. Having in mind the possibility for the CCA to be prepared outside the ICAM process, for the sake of methodological clarity, and in cases of insufficiently detailed sectorial tourism planning, this particular phase of CCA preparation will be discussed in detail in the following chapter.
- (b) The analytical phase implies assessments of the tourist destinations which will be of importance for the subsequent phases of the CCA preparation. This includes relationships of the destination with its immediate and wider environment, typology of the destination, stated restrictions, etc.)
- (c) In order to be able to create different scenarios of tourism development, it is necessary to use forecasts arising from the analytical phase of the ICAM process (where they exist), in addition to the direct results of the CCA analysis.
- (d) Once the desired scenario of tourism development is selected, a synthesis of CCA work should provide indications as to the maximum number of visitors, as well as structure and category of their accommodation.

**Table 6. Phasing and contents of work on the preparation of CCAs**

<b>I</b>	<b>DOCUMENTATION PHASE AND MAPPING</b>
	<ul style="list-style-type: none"><li>1. BOUNDARIES OF THE TOURIST DESTINATION AREA (REGION)</li><li>2. GENERAL CHARACTERISTICS OF THE TOURIST DESTINATION (REGION) AND ITS DEVELOPMENT</li><li>3. TOURISM APPEAL AND ATTRACTIONS</li><li>4. TOURISM, ECONOMY AND POPULATION</li><li>5. STATE OF DOCUMENTATION</li><li>6. ADDITIONAL COLLECTION OF DATA</li></ul>
<b>II</b>	<b>ANALYSIS PHASE</b>
	<ul style="list-style-type: none"><li>1. TYPOLOGY OF THE TOURIST DESTINATION</li><li>2. RELATIONSHIP OF THE TOURIST DESTINATION TO ITS WIDER ENVIRONMENT</li><li>3. STATED LIMITATIONS OR CONTROLS</li><li>4. EVALUATION OF TOURISM RESOURCES, TOURISM DEMAND AND TOURIST PRODUCT</li><li>5. ALTERNATIVE SOLUTIONS</li></ul>
<b>III</b>	<b>TOURISM DEVELOPMENT OPTIONS</b>
	<ul style="list-style-type: none"><li>1. PREPARATION OF ALTERNATIVE SCENARIOS</li><li>2. ANALYSIS OF SCENARIOS</li><li>3. SELECTION OF THE MOST SUITABLE SCENARIO</li></ul>
<b>IV</b>	<b>CCA FORMULATION PHASE</b>
	<ul style="list-style-type: none"><li>1. TOURISM DEVELOPMENT MODEL DESIGN</li><li>2. CALCULATION OF CARRYING CAPACITY</li><li>3. INSTRUCTIONS FOR THE APPLICATION OF CCA</li></ul>
<b>V</b>	<b>APPLICATION, PROPOSALS AND MONITORING</b>

Tourism development planning is only one of many sectoral planning activities within ICAM. The CCA concept is one of the tools of tourism development planning and, thereby becomes one of the instruments of ICAM. The check list in Table 6 applies in full only when a CCA is prepared independently. When CCA is part of the preparation of a tourism development plan or ICAM, the following items will be directly taken from it:

- boundaries of the tourist destination area;
- general characteristics of the tourist destination area and its development;
- characteristics of tourism development (some portions of it); and
- elements of the integrated development scenario.

## 2.3 Documentation Phase and Mapping

### 2.3.1 Required documentation

To prepare a CCA, data are needed which can rarely be found in the usual sources of documentation, tidily organised, and ready for use. Therefore, one must resort to field research as a substitute (i.e. observations, sketching, photographs, questionnaires, interviews).

To identify the general characteristics of a tourist resort, area or region, the relevant information needs to be obtained from monographs, encyclopedias, tourist guides, periodicals and reports of local and national authorities. These data can be found indexed in some municipal libraries in so-called "domestic collections" which contain much on the socio-cultural image of a place. As a rule, summarized texts on a resort already exist. They may have been produced for other purposes and only need to be sorted out appropriately and updated.

To get an insight into political decision making, it is important to get hold of legislation, regulations and decisions relating to the goals and policy on tourism development and environmental protection. Approved land use plans and detailed urban action plan proposals should be given special attention. The designated local planning authorities should be asked to provide information on specially protected areas and upon conservation, if such matters are excluded from physical plans. For a spatial perspective, all relevant data must be put on deposited maps.

Basic demographic data can be found in national statistics, together with other information of importance for doing a CCA. Data on tourist demand, capacities of tourist supply, traffic, as well as tourist financial returns, and business results have to be obtained from tourist establishments, associations and statistical reports. For data on the potential tourist demand (international, in particular), one should turn to the specialist world and international organizations which act in this sphere.

The on-site collection of data refers to:

- on-site verification of obtained documentation (analysis of the size and quality of tourist attractions);
- assessment of the tourist superstructure (capacity, category, technology, appearance, quality of the service, possibility of transformation);
- assessment of the state of environment;
- identification of eventual socio-cultural conflicts;
- identification of local population's preferences;
- a global impression of the tourist destination; and
- general framework of regional organization (tourist destination area).

Data obtained by the use of the Geographical Information System (GIS) are of special importance for the preparation of CCAs. A graphical presentation of spatial data as well as data on the spatial distribution of various tourist facilities over an area greatly facilitates the work on CCA.

## Box 6

### Database and information

- a) Improving the use of data and information at all stages of planning and management, making systematic and simultaneous use of social, economic, developmental, ecological and environmental data; analysis should stress interactions and synergy; a broad range of analytical methods should be encouraged so as to provide various points of view;
- b) Adopting comprehensive analytical procedures for prior and simultaneous assessment of the impacts of decisions, including the impacts within and among the economic, social and environmental spheres; these procedures should extend beyond the project level to wider policies and programmes; analysis should also include assessment of costs, benefits and risks;
- c) Adopting flexible and integrative planning approaches that allow the consideration of multiple goals and enable adjustment of changing needs; integrative area approaches at the ecosystem or watershed level can assist in this approach;
- d) Adopting integrated management systems, particularly for the management of natural resources; traditional or indigenous methods should be studied and considered wherever they have proved effective; women's traditional roles should not be marginalized as a result of the introduction of new management systems;
- e) Adopting integrated approaches to sustainable development at the regional level, including crossboundary areas, must be subject to the requirements of particular circumstances and needs;
- f) Using policy instruments (legal/regulatory and economic) as a tool for planning and management, seeking incorporation of efficiency criteria in decisions; instruments should be regularly reviewed and adapted to ensure that they continue to be effective;
- g) Delegating planning and management responsibilities to the lowest level of public authority consistent with effective action; in particular the advantages of effective and equitable opportunities for participation by women should be discussed;
- h) Establishing procedures for involving local communities in contingency planning for environmental and industrial accidents, and maintaining an open exchange of information on local hazards.

Countries could develop systems for monitoring and evaluation of progress towards achieving sustainable development by adopting indicators that measure changes across economic, social and environmental dimensions.

Source: United Nations, 1992

### 2.3.2 Boundaries of the tourist destination area (region)

The CCA concept cannot be applied in isolation, for only one location. It must include a whole tourist spatial entity, that is, a tourist micro-region. It means that boundaries of the area for which CCA will be made must be determined first. For example, the concept of CCA was actually applied for the entire island of Vis, and the entire Brijuni archipelago, but only for a section of, namely the central-eastern part of the island of Rhodes for it is much larger in area than Vis.

However, tourist attractions, tourist superstructure and capital infrastructure in the neighbourhood (the region) of the tourist destination in concern frequently have considerable impact on it. Thus, although the carrying capacity of that neighbourhood is not assessed, its influence must be taken into consideration. In the case of the Brijuni islands, for example, the associated tourist region included the area of the neighbouring Istrian peninsula, whereas in the case of the island of Vis, its associated region was not taken into account, because of the island's geographically isolated position.

As a rule, the spatial units for which CCAs are made were defined in the past either administratively, or for the purpose of plan or study preparation. Within the integrated planning process, they are defined for the needs of tourism development planning and those of integrated planning (ICAM).



2.3.3 General characteristics of the destination (region) and its development

A general picture of the tourist destination concerned should be built, based on the data relating to its:

- size;
- length and characteristics of the coastline;
- geology;
- hydrology;
- maritime characteristics;
- climate;
- relief;
- vegetation and wildlife species;
- natural and cultural landscape;
- system of settlements;
- distribution of tourist capacities (supplies);
- number of inhabitants;
- transportation/traffic network and other infrastructure systems;
- economic structure;
- existence or non-existence of physical and urban plans; and
- general problems faced in the tourist destination area (ecological, demographic, economic, socio-cultural).

Special attention should be given to the problems which may appear, connected with:

- urbanization and the way settlements have been developed;
- tourism and recreation;
- relation between new tourist building and existing structure of development;
- industries;
- fisheries and marineculture;
- agriculture;
- transportation; and
- energy production.

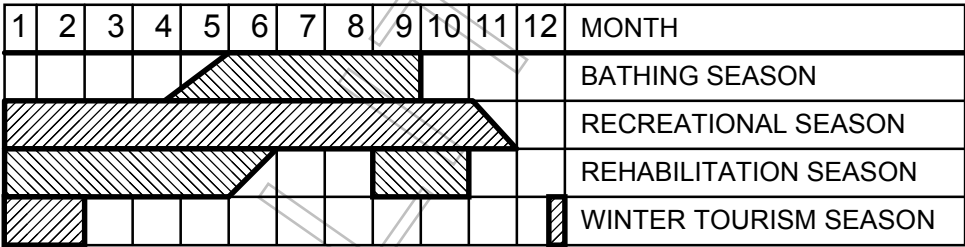
Finally, the general characteristics of the tourist destination in question must be presented on maps, and characteristic profiles of the coastal strip should be provided.

2.3.4 Tourism attractions

The quality of attraction of a tourist destination area and of its individual tourist attractions (with their capacity limits), are the most important tourism resources possessed by a destination. It is therefore necessary to identify, register and classify all tourist attractions of the tourist destination concerned, as well as identifying major attractions of the associated region. As a rule, the bulk of these data does not exist and must be specially collected as part of the process of CCA.

Although the sea, the coastline and the Mediterranean climate are the main attractions of Mediterranean coastal areas, other less conspicuous tourist attractions should not be neglected.

Figure 6. Graphical presentation of tourist seasons along the Croatian coast by months and tourist interests



Source: Based on research done by the Institute for Tourism, Zagreb on the Croatian islands of Brijuni, Pag, Vis, Brac, and Lastovo

**Table 7. A review of tourism resources and activities in the island of Vis**

RESOURCE		ACTIVITY	SEASON A		SEASON B	
			VI, VII, VIII, IX		I, II, III, IV, V, X	
			STAT.	VIZIT.	STAT.	VIZIT.
1.	THE CLIMATE	1.1. swimming and sun-bathing	0	0		
		1.2. health recovery stay			0	0
		1.3. sport and recreation on land and sea	0	0	0	0
		1.4. extended country life	0	0	0	0
2.	THE BEACH	2.1. swimming and sun-bathing	0	0		
3.	THE SEA	3.1. rowing	0	0	0	0
		3.2. sailing	0	0	0	0
		3.3. water-skiing	0	0		
		3.4. scuba-diving	0	0		
		3.5. surfing	0	0		
		3.6. sport fishing	0	0	0	0
		3.7. anchoring	0	0	0	0
		3.8. adventure nautics		0		0
		3.9. subsea photosafari - batiscaff		0		0
4.	THE LAND	4.1. walking and hill-climbing tours		0		0
		4.2. bicycle rides		0		0
		4.3. riding (donkies, mules)		0		0
		4.4. car rides (electromobils)		0		0
		4.5. rock climbing		0		0
5.	THE VILLAGE	5.1. country life style	0	0	0	0
		5.2. participation in agricultural works	0	0	0	0
6.	THE NATURAL SIGHTS	6.1. protected areas tours		0		0
		6.2. cave tours		0		0
		6.3. island tours		0		0
		6.4. bay tours		0		0
7.	THE HISTORICAL SITES	7.1. historical sites tours		0		0
		7.2. archaeological zones tours		0		0
8.	THE CULTURAL SITES	8.1. old city centers tours		0		0
		8.2. rural area tours		0		0
		8.3. cultural monuments tours		0		0
		8.4. museums and galleries tours		0		0
		8.5. cultural events tours		0		0
9.	ACCOMMODATION CAPACITIES	9.1. hotel	0		0	
		9.2. marina	0		0	
		9.3. residence	0		0	
		9.4. cottage - industry stay	0		0	
		9.5. farm stay	0		0	
10.	SPECIAL ACTIVITIES AND OFFERS	10.1. sport, recreation	0	0	0	0
		10.2. fitness, cosmetics		0		0
		10.3. entertainment, casino		0		0
		10.4. local cuisine		0		0
		10.5. domestic drinks (wines)		0		0
		10.6. rent-a-car, -bicycle, -boat, -mule		0		0
		10.7. boat service	0	0	0	0
		10.8. health, bank, post, trade services	0	0	0	0
		10.9. traffic connections	0	0	0	0

The following characteristics should be the criteria for the categorization of tourist attractions:

- type;
- seasonality;
- duration of stay/excursion;
- intensity of attraction; and
- vulnerability of the attraction.

The attractions are divided according to the related tourism and recreational activities:

- climate;
- coastal strip;
- coastal sea;
- land;
- rural area;
- natural beauty;
- culture heritage;
- historic heritage;
- performances and celebrations;
- associated celebrities and historic personalities associated with the place;
- style of life and work;
- gastronomy;
- accommodation capacities;\*
- catering capacities;\*
- special tourist facilities and advantages.\*

The tourism attraction of a destination varies seasonally. There may be only one, but also more tourist seasons differing one from another in intensity and, frequently, in content. The practice of Mediterranean tourist destinations is to divide the year in three periods: the main (bathing) season, pre- and post-season, and slack or off- season.

**Box 7**

**Main parameters used in the CCA of the Island of Vis**

1. Surface area (sq. km)
2. Resident population
3. Population density
4. Total number of tourist beds
5. Total beds in hotels and similar establishments
6. Total beds in complementary establishments
7. Percentage of hotels and similar establishments in the total accommodation capacity
8. Number of seats in catering establishments
9. Total number of tourists
10. Total number of foreign tourists
11. Total number of overnight stays
12. Overnight stays of foreign tourists
13. Percentage of foreign tourists in total overnight stays
14. Overnight stays in June
15. Overnight stays in July
16. Overnight stays in August
17. Overnight stays in September
18. Rate of occupancy (number of days in a year)
19. Average length of stay
20. Total number of active population
21. Active population in catering and tourism
22. Percentage of active population in total population
23. Percentage of active population employed in tourism in total active population
24. Total GNP
25. Total income from catering and tourism
26. *Per capita* income
27. GNP per one active resident
28. Income from tourism and catering per active resident employed in the two industries
29. Number of secondary homes (weekend houses)
30. Number of beds per 100 residents
31. Number of beds in main accommodation capacities per 100 residents
32. Number of beds per 1 sq. km
33. Number of seats in catering establishments per 100 residents
34. Number of visitors per resident
35. Number of overnight stays per resident

Source: PAP/RAC, 1991

In the main season, temperature of the sea water in the Mediterranean is above 20 degrees C, and the air temperature is very high. The main activities are swimming and sun-bathing, other activities being of minor importance. In the pre- and post-season other attractions gain importance (excursions, for example).

These differences should be systematized and shown in an inventory. Table 7 shows how this was done for the island of Vis.

Various components of a tourist attraction should be described, supported by relevant quantitative and qualitative data, and shown on a map.

Data of particular importance are those on the level of threat the resources have been exposed to, namely:

- sea pollution;
- air pollution;
- destruction of marine resources;
- destruction of land resources;
- degradation of natural and visual values;
- destruction of historic and archaeological resources;
- noise;
- littering;
- dangers of forest fires; and
- tourist saturation.

### 2.3.5 Tourism, economy, and population

Information on the characteristics of tourism development in the tourist destination under study should refer to the following aspects of development:

- current policy versus tourism development;
- national and local strategies of tourism development;
- existing tourist supply of the destination;
- existing tourist demand;
- financial results of the tourist industry;
- advantages and drawbacks of the tourist industry; and
- comparative data on the main tourist characteristics of the neighbouring areas.

Information on other branches of economy must be provided not only for the destination under study but also for the neighbouring areas. Therein, of particular importance are data on service activities which are closely related or complementary to tourism development.

The demographic data should, in the first place, enable insights into the movement of resident population of the tourist destination area, but also of the neighbouring areas over a long period (e.g. a 100 year timespan). Also these data should reflect the occupational structure of population, particularly with reference to the skilled labour force in tourism and catering.

Dependent upon data availability, various development parameters may be used. The development parameters needed for CCAs will be selected for each particular case separately. These parameters should be comparable with those obtained for other destinations and regions, and should be done in a time series so as to enable trends to be identified. Box 7 provides a list of main parameters used in the CCA studies of Vis, and the central-eastern part of the island of Rhodes. In addition to these parameters, for tourist destinations with a large number of tourist beds in relation to the number of resident population which are forced to employ seasonal labour force in catering and tourism, the following should be identified:

- number of seasonal workers;
- seasonal workers in total population;
- percentage of seasonal labour force in the total number of workers employed in tourism and catering;
- unemployed residents;
- average *per capita* income of resident population; and
- average *per capita* income in catering and tourism.

These parameters are indispensable for any CCA, and provide a basis for scenarios in the subsequent phases of CCA preparation.

### 2.3.6 The status of documentation

Once all available data are collected and systematized, some conclusions may be drawn even before detailed analyses are made. One can recognize how a tourist destination functions in terms of tourism, and what are the causal effects of such a model. What should also be clearly discerned are the problems, lack of balance and conflicts at the destination. However, all this has to be quantified in a detailed analysis.

Based on the conclusions of these analyses, one may decide whether available data is sufficient, or if a programme of supplementary data collection is necessary.

## **2.4 The Analysis Phase**

### 2.4.1 Typology of a destination

The typological categorization of a tourist destination may rule out the need for further analyses of its attractions. The category selection prevents them from offering other tourism products at that tourist destination. Tourist destinations may be categorized on the basis of:

#### **1. Level of tourism development:**

- only agriculture and fisheries without tourism;
- tourism monostructure: tourism, catering, transportation, sports, culture, entertainment, services (trade, health, post, bank, crafts);
- tourism, complementary activities (including agriculture and fisheries), clean/non-polluting industry and crafts; and
- tourism, complementary activities, polluting industries and energy production.

#### **2. The pattern of tourism development related to the overall sensitivity of a particular area:**

- highly restricted;
- restricted;
- controlled;
- integrated; and
- intensive.

#### **3. Homogeneous spatial entities:**

- virgin areas;
- uninhabited islands;
- small islands;
- medium-size islands;
- large islands and coastal areas outside urban areas;
- historic towns;
- other towns;
- saturated areas; and
- polluted and devastated areas.

### 2.4.2 Destination under study in view of its wider environmental context

Tourists may come to a destination from other parts of the region for a short visit or excursion (beaches, entertainment, recreation, cultural events, services, shopping, gastronomy). For the same reasons, a tourist based in that destination may visit other parts of the region. A similar situation may occur with daily migrations of the labour force employed in tourism and catering.

The tourist destination which can draw on its own region for any additional labour force and food products of good-quality and plentiful supply certainly has a tremendous competitive advantage. What needs to be specified precisely are the actual and potential tourist and working migrations from a wider region.

As a rule, the region provides capital transportation infrastructure (highway/freeway intersections, railway stations, airports, passenger and car-ferry harbours), communal infrastructure (water supply system, waste water treatment plant, solid waste disposal sites), hospitals, etc.

### 2.4.3 Regulations and restrictions

Analysis of the approved plans, by-laws, regulations and standards in force at the tourist destination area, will enable that part of the area to be identified where, due to various regulations, tourism is either excluded or is subject to strict limitations.

Some restrictions stem from standards and regulations based upon one or another law (for example, a Nature Protection Law, Law on the Protection of Monuments of Culture, Environmental Protection Law, Forestry Law, Water Resources Law, Law on the Physical and Urban Planning, etc.). Some other restrictions stem from statutory physical and urban plans, as well as from various national and local by-laws.

### 2.4.4 Evaluation of tourism resources, tourist demand and tourism product

Evaluation of the resource base is done, first for each group of resources, and then for the interrelationships between the groups:

- tourist attractions;
- communal and social infrastructure;
- tourist superstructure;
- demographic structure; and
- residents' preferences concerning tourism.

This part of the analysis includes existing conflicts and ends with a projection of tourist capacity for the destination. In less developed areas, the lack of drinking water supply, or of labour force for tourism work, may be a constraint. To achieve results which are as reliable as possible, use of SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) and tools such as the Geographical Information System (GIS) are recommended, wherever possible.

It is important to mention that characteristics of tourist demand are tending to change in favour of "individualization of tourists" and that criteria for assessing the quality of tourist experience are increasingly being recognized and introduced. Therefore, analysis of tourist demand for the needs of CCA preparation must be more subtle and complex than in traditional approaches, where it is sufficient to identify the existence or non-existence of interest of the tourist market in a tourism product, whether existing or planned. In such a case, what should be analyzed is the lower limit of tourist product quality for which tourists are willing to pay at a specific destination.

In analyzing the tourism product, what needs to be done initially is to identify, in accordance with "Methodological Framework for Assessing Tourism Carrying Capacity in Mediterranean Coastal Zones" developed by PAP/RAC (1990), if the existing tourism product is "ripe". If its transformation is found necessary, an optimal tourism product profile should be determined for the specific destination. In that phase of analysis, the economic component is then added to the physical, ecological, technological, infrastructural and socio-cultural characteristics of the optimal tourist product which was earlier identified.

Alternative solutions are the preferable answer, with the final choice of solution being dependent upon the selected scenario of tourism development, and upon effective tourism market demand.

#### **Box 8**

##### **Standards applied in Vis**

1. The bathing season starts when the sea temperature is 20 and more degrees Celsius.
2. The average surface area of sandy, pebble and rocky (or slate) beaches, is 10 m<sup>2</sup> per user.
3. Each available dwelling unit (apartment or house) can provide accommodation for 4 tourists.
4. Labour force needed per accommodation unit:
  - 0.7 persons per hotel room;
  - 0.8 persons per room in a marina hotel (stationed + charter);
  - 0.2 persons per berth in the marina (transit + charter);
  - 0.1 person per room in private residences;
  - 0.1 person per house in rural tourism.
5. Ratio of residents to tourists - 1 : 1.4.

### Box 9

#### Standards applied in Brijuni

1. Length of beach coastline - 2.0 m per person.
2. Length of coastline used as a nudist beach - 5.0 m per person.
3. Length of riding area allocated per horse rider - 100 m.
4. Length of road for horse-drawn carriage - 200 m per carriage.
5. Length of bicycle path - 50 m per cyclist.
6. Length of jogging path - 20 m per jogger.
7. Seaside promenade - 10 m per person.
8. Sea area for rowing use - 1 ha per boat.
9. Sea area for sailing use - 0.5 ha per boat (wind-surfing board or small sailing boat).

#### 2.4.5 Standards

Standards related to CCA preparation are diverse and numerous, and they are devised in the form of professional norms or regulations. The difficulty lies in the fact that frequently standards are different or non-existent for selected topics. A review of such standards by PAP/RAC, in 1989, revealed that some parameters which are used, differ considerably from one country to another, and in some cases vary by as much as 100%. Some authors, such as Baud-Bovy and Lawson (1977), have given a lot of attention to these standards.

Furthermore, standards related to CCA vary with the location which is being assessed, its physical characteristics, planned characteristics of the tourist experience to be offered, etc. Even the minimum required bathing area per user varies within a range of up to 6 m<sup>2</sup>, in regard to sandy beaches which are used intensively, and up to 25 m<sup>2</sup> in specific cases.

Standards related to tourism planning and coastal areas management may be divided into the following basic groups:

- standards related to the capacity of the physical environment;
- standards related to the construction of tourist accommodation establishments and facilities;
- standards related to protection against various forms of pollution;
- infrastructure and transportation standards; and
- standards related to socio-cultural, demographic and economic issues.

Experience gained from applications of the CCA concept (such as at Vis, Rhodes, Brijuni, etc.) indicates that the choice and the way of applying these standards will differ in each particular case. Below are some of the standards applied in the instances of the Vis, Brijuni and Rhodes studies.

#### 2.4.6 Alternative CCAs

The alternative solutions of CCA stem from the use of a mix of flexible and fixed components of tourist destination capacity. Water (construction of waterworks or a desalination plant) or some other type of infrastructure, labour force (immigration, education), and categories and type of tourists (increase or decrease of the quality level of tourist experience) are examples of flexible capacity.

### Box 10

#### Standards applied in Rhodes

1. Tourist density:
  - 50 guests per 1 ha in high-category hotels and similar establishments;
  - 90 guests per 1 ha in medium-category hotels and similar establishments.
2. Density of users on sandy beaches:
  - 6 m<sup>2</sup> per bather for medium-category hotels and similar establishments;
  - 8 m<sup>2</sup> per bather for high-category hotels and similar establishments.

The analysis of alternative solutions must provide answers as to the advantages and disadvantages of each individual solution, which is needed for the next phase of the CCA preparation, that is, the formulation of various options of tourist development (alternative development scenarios).

## 2.5 Tourism Development Options

Since it has been fully recognized that carrying capacity in general, and the carrying capacity of Mediterranean coastal areas in particular, is not a fixed category, it is clear that a number of different development options can be offered for the area whose carrying capacity is being assessed. All those development options have to be elaborated as separate scenarios of tourism development, which then have to be examined in turn, in order to arrive at the one which is best suited for that particular area. First, a framework scenario is made in accordance with the full range of carrying capacity alternatives, and independent of its flexible components. Then, an analysis focusing upon feasible scenarios can be prepared, rather than one based upon extremes. The results should enable the selection of the most suitable development option, which should then in turn be the basis for determining the exact carrying capacity of the area concerned.

In principle, the basic development scenarios choice should be the same for all areas (whether in or outside of the Mediterranean Basin), and may be subdivided into 4 basic types:

- (a) **completely free development without any restrictions;**
- (b) **intensive tourism development, with some elements of control;**
- (c) **more limited development, of alternative tourism or "eco-tourism"; and**
- (d) **balanced, sustainable tourism development.**

### 2.5.1 Free development without any restrictions

This is a scenario which is generally considered unacceptable, since it implies going over the top limit of carrying capacity in all spheres. This is really about giving over an area to competing entrepreneurs' capital on the open market, interesting only to those entrepreneurs who are after maximum short-term profit, and who don't really care what the long-term consequences may be for the environment. Hardly any country will resort to such a scenario, unless there is a total absence of concern for the environment, or a desperate need for quick replenishment of the state budget. The local population will, as a rule, strongly oppose any such destructive attempt at ill-conceived, and short-run development.

This scenario will require detailed elaboration only in the cases of evident attempts at its implementation in areas where tourism is still comparatively undeveloped, and where there are tendencies to try to avoid the preparation of environmental impact assessment studies. Naturally, analyses of such a scenario will be also made for the areas where such an approach has been already implemented, and where recovery and rehabilitation of saturated places are now necessary.

#### **Box 11**

##### **Free development in the north-eastern part of the island of Rhodes**

In a comparatively small area there are as many as over 40,000 beds in hotels alone. Although the northeastern zone covers only about 100 sq. km and stretches along some 30-odd kilometers of the island's coastline, there is a concentration of 10 % of all hotel capacities which make 15% of the total and over 17% of foreign tourist traffic of the entire Greece. A direct consequence of the saturation caused by uncontrolled free development is a decrease of tourists' satisfaction and direct economic damage (lower hotel prices to keep up the demand). As there was a real danger that the evidently wrong concept might be extended to the neighbouring zones, a decision was made to prepare a CCA study for the central-eastern zone of the island with a view to controlling development.



2.5.2     Intensive tourism development

In its basic elements, the intensive tourism development scenario is quite similar to the free development scenario since it anticipates comparatively large-scale intervention in the physical sense, and has, as its main goal, the achievement of maximum profit from tourism. The essential difference between the two is that the state administration has a substantive role in the implementation of the intensive tourism development scenario, thereby ensuring a certain degree of control. This scenario takes into account the carrying capacity of the environment as well as of the economic and political systems. However, it tends to disregard the socio-cultural carrying capacity which, as a rule, is given less weight than those of the environmental and economic-political carrying capacity. Public opinion frequently tends to be ignored, and the local community is often "persuaded" to accept this model by promoters inflating its likely economic benefits.

As such a type of scenario is offered as an alternative in almost all tourism plans, it calls for a detailed explanation, particularly in view of the socio-cultural problems and interrelationships between the visiting tourists and the local resident host population. The only cases where the intensive development scenario does not require a deeper insight, are those relating to restricted and highly restricted zones where the dilemma of future development is reduced to a decision whether to have sustainable development at a lower density, or re-orientate towards alternative tourism, which means that, in terms of tourism, some open areas and natural environment will remain undisturbed.

2.5.3     Alternative tourism development

The alternative tourism development scenario, or the scenario for so-called 'eco-tourism', is one which has become quite popular in the last couple of years. It came into existence as a critical response to the concept of mass or "industrial" tourism. Although the intentions of the alternative tourism promoters are basically positive, this use of the concept started to degenerate because of a phase of rigid anthropological and ecological critique of tourism in general, causing it to be rejected by the very host communities for whom it was originally intended. What happened, was a tendency to put the local population into a test-tube for observation. In extreme cases, even special reserves for "natives" have been recommended.

Characteristic of this scenario is the fact that it offers a one-way communication between residents and visitors (scientists, adventurers, "alternativism" supporters, etc.), instead of an interaction between them, and that it ignores likely net economic benefits from tourism. With regard to the role of carrying capacity, the alternative tourism scenario provides a counterpoint to the intensive development scenario, in moderate instances.

As this scenario tends to present the lowest possible values for carrying capacity, the importance of the socio-cultural and purely ecological spheres (concerned with disturbance of the natural balance) is overstressed, while- as a rule, the economic and political aspects are not taken into account at all. In extreme cases, when the proposed tourism development is below the lowest level of carrying capacity, or when any form of tourism is rejected, the alternative tourism concept appears as a counterpoint to the free development scenario.

**Box 12**

**Intensive tourism development in Porec**

In the area of Porec (the western coast of the Istria peninsula in Croatia) there are approximately 25,000 beds in hotels, 60,000 beds in camps, and 10,000 beds in other accommodation establishments on a surface area of about 350 sq. km and along the 65-kilometer long coastline. With nearly 8 million overnight stays of predominantly foreign visitors recorded in better tourist seasons, Porec is by far the leading tourist area in Croatia. Although this may lead one to believe that the area is saturated, the concentration of tourists seems far less visible there than in some other less important tourist areas. This has been achieved by a dispersal of tourist establishments over the area, by banning the traffic along the coast, by developing the system of "*cul-de-sac*" access paths to tourist establishments, and by organizing various supply and entertainment facilities in their immediate vicinity. In other words, some negative impacts of the intensive tourism development can be avoided by careful planning, designing and development control.

### **Alternative tourism development**

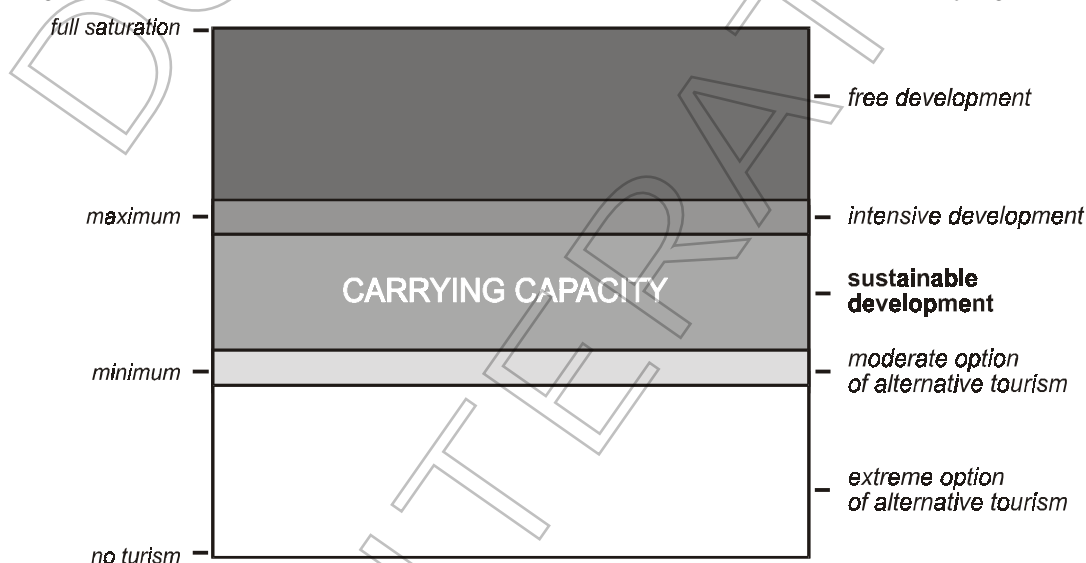
Examples of alternative tourism as the basic orientation are almost non-existent in the Mediterranean countries, unless we take into account the areas under strict control or isolated examples of areas where limited forms of alternative tourism have been accepted as a kind of "negation" of tourism. Destinations preferring alternative forms of tourism are more numerous outside the Mediterranean, especially in the isolated island regions of the Pacific and the Indian Ocean, and in some areas of highly developed countries such as the USA and Japan. As an orientation to alternative tourism one could perhaps count the restrictive attitude towards tourism due to religious or ideological reasons, present in Syria and Algeria to a lesser extent, and quite drastically in Libya. Until recently, a drastically restrictive attitude towards tourism was imposed by the communist government in Albania as well, but with the introduction of democracy and European orientation Albania is also opening-up to tourism and does not show the wish to limit it just to alternative forms.

The alternative tourism scenario needs to be considered wherever it appears as a realistic possibility, that is, in the cases which have been classified in accordance with the methodology of PAP as highly restricted and restricted zones. This scenario may also need to be considered in the cases of controlled areas, especially the areas of outstanding cultural and historic heritage, and those which are noteworthy for retaining the original identity of their local population.

#### **2.5.4 Sustainable development**

Finally, there is still the scenario of sustainable tourism which, theoretically, takes its place between the maximum and minimum carrying capacity, i.e. between the scenarios of the intensive and the moderate variant of alternative tourism. The essence of sustainable tourism is harmonization of the overall local situation with the regional and national interests, achieving a harmonious management of the resources which are the attraction for tourism, and of the planned tourism activities from the viewpoint of the market and the profile of the tourism product, and respect for the limitations set up with regard to environmental, socio-cultural, economic and political aspects.

**Figure 7. Scheme of the relationship between alternative scenarios and carrying capacity**



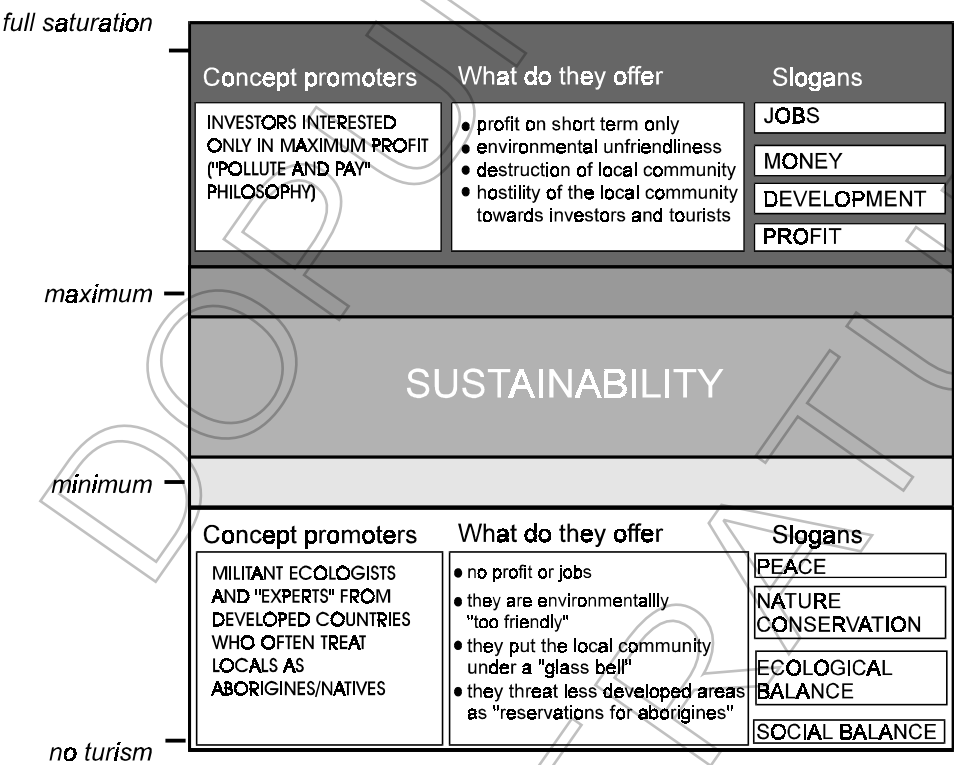
Quantification of a scenario of sustainable development, i.e. planning of the quantity and kind of tourist capacities and traffic, is directly dependent on the situation at the site in question. It is therefore necessary to identify the components of carrying capacity (physical, ecological, resources, and demographic capacities), which are constant in the main, as well as the range of values of the flexible components such as infrastructure and socio-cultural capacity of the local community. The principal corrective mechanism lies in the political-economy context, i.e. in the

readiness of the country to stimulate or discourage a specific tourism project, whether through legal measures or by direct investments.

Taking all these elements into consideration, a scenario for sustainable development can offer several optional values of the carrying capacity, or concepts of tourism development, or it can decide on one option. Whether that option will be closer to the scenario of intensive development or to the moderate scenario of alternative tourism, depends primarily on the situation at the given site.

The above factors bring us to the conclusion that almost every site asks for the application of the sustainable development model as the optimum level of development for the site in question. With regard to carrying capacity, the sustainable development approach is aware of the scenarios for intensive development and of the moderate variant for alternative tourism as the upper and lower limits of carrying capacity, which result from its flexible components (see Figure 7). The generally unacceptable variants would imply falling outside of the limits of the carrying capacity, whether above the maximum (free development without limitations) or below the minimum (extreme variant of alternative tourism), and in principle do not require elaboration, except in those situations of evident danger where it is possible that they will be applied.

Figure 8. Philosophy of sustainability



Whether a model for sustainable tourism will be closer to the upper or to the lower limits of the theoretical carrying capacity depends upon the specific features of a given site, i.e. on the requirements expressed at the local, regional and country levels. If among the deciding factors, the influence of investors and developers, who primarily want short-term profits, is the stronger force, and they do not really care about the environment or local community, so it can be expected that they "push" the carrying capacity towards its upper limits, and even beyond them. On the other hand, if greater influence is in the hands of ecologists and conservationists, who are not interested in economic benefits, or of tourism "experts" from highly developed countries who claim to care about protecting from change the indigenous way of life of the "natives", and "push" carrying capacity towards its lower limits or beyond. The former group justifies its view of carrying capacity, because of new jobs generated, and the creation of economic well-being for the local community, while the latter group finds its justification in the conservation of peace, social balance, and life in harmony with the nature (Figure 8).

#### Box 14

##### Carrying capacity values in the island of Vis

In the example of Vis, an isolated Adriatic island, the following values of carrying capacity were defined: 16,000 - 20,000 stationary tourists for the intensive development scenario; 2,500 for the alternative tourism scenario; and 4,900 tourists for the sustainable development concept. The specific features of the island of Vis and its environment influenced the decision to choose a value nearer to the alternative tourism scenario. Of particular importance was the socio-cultural aspect of the problem, i.e. the requirements of the local community, and the principal strategic orientation of the country with regard to the development of tourism in the islands (such as Vis), which are subject to heavy depopulation and to economic decline.

In some cases, it is possible to offer several options for sustainable tourism, depending on the particular circumstances, especially in the economic and political spheres. A model of tourist movements (based on day-tripping and short-stays) could enable a forecast of the transport and paths capacity, as well as posing the problem of the capacity of shopping centres, of historic sites and of other complementary resources.

Of course, changes in carrying capacity assessment are possible if, in the course of time, changes occur at the site in question, due to various factors, such as the changing structure of demand (dependant upon economic power, level of education, norms of behaviour, etc.), the ecological situation, new construction work, or the inward migration of new population.

## 2.6 Analysis of Scenarios and Selection of the Most Favourable One

From consideration of the kinds of alternative scenarios stated, each site for which carrying capacity is assessed requires elaboration of at least three, and possibly of even four scenarios. However, detailed elaboration is usually required for only one scenario, and occasionally for two, which remains after the elimination of other solutions which are unacceptable. Analysis of development scenarios should aim at trying to establish possible consequences of the implementation of each scenario, with particular stress on the areas where the greatest negative environmental effects may result.

Selection of scenarios depends upon the basic analysis of carrying capacity by individual groups of parameters. The basic framework within which favourable scenarios are sought is provided by constant and measurable parameters, especially in the physical and economic spheres. If these constant parameters show the lowest value for carrying capacity, all scenarios showing a higher carrying capacity can be discarded, and this reduces the analysis to just one scenario. However, such cases are very rare in practice, especially in the Mediterranean.

Contrary to the above situation, the limit for the lowest values of carrying capacity of tourist destinations in the Mediterranean is generally found among the flexible socio-demographic elements. Accordingly, the principal role in defining realistic development scenarios is played by the analysis of the political and economic parameters, i.e. of the specific features at a given site. Both constant and flexible parameters will have much greater importance in the allocation of various tourism facilities within the tourist destination area, at the micro-scale of location.

#### Box 15

##### Carrying capacity values in Rhodes

In the example of the central-eastern part of the island of Rhodes, the carrying capacity was assessed at approximately 30,000 tourist beds in an area of 400 sq. km and with 18,500 inhabitants (in 1991). The decision for sustainable tourism closer to the solution of intensive development was influenced by the facts that tourism is highly developed in the island as a whole, that the entire economy is oriented to tourism, and that the neighbouring zone in the north of the island is already saturated with tourism. Accordingly, it was estimated that it would be optimal to allow this zone to be for intensive, yet controlled, development, thus satisfying the investment initiatives and, at the same time, enabling protection measures to be implemented in the southern, still preserved and undamaged, parts of the island where tourism development is barely noticeable. Such development is allowed by both the physical elements of the carrying capacity, and, (unlike in the case of Vis), even by its socio-cultural elements, since the population, under the influence of the tourism development in the island as a whole, is ready and willing to accept the new strong development.

## Box 16

### Assessment of scenarios in Rhodes

In the case of the central-eastern part of the island of Rhodes, a scenario of sustainable development was suggested, which, compared to the island of Vis, has a much greater volume in terms of its physical space, but still remains within the limits of a controlled development. Namely, there is strong pressure for enlarging the capacities which discourages the application of more restrictive models, especially regarding the fact that the local population has already adapted to intensive tourism development, and the overall local economy is now based on tourism. So, the main arguments for rejecting the intensive development model were not in the ecological or socio-cultural spheres, but in the economical and political ones. The intention was, namely, to avoid the negative effects of tourist saturation which had already been reflected in a decreased profit from tourism in the northern area around the city of Rhodes, which was abandoned to free development and therefore saturated from a tourism viewpoint.

When deciding on a development scenario, it is particularly important to assess possible material and social expenses in case of implementation of activities related to raising the upper level of the carrying capacity in order to apply less restrictive models. If, for example, the infrastructural capacity (water supply, sewerage, wastewater disposal, traffic network, telephone lines) does not allow for more intensive development of tourism, it is necessary not only to calculate possible building costs, but also to define the conditions for financial investment. This means that the situation will change significantly if those expenses are not charged to the investors in tourism development, because the state, or another outside party, finds interest in covering or reducing those expenses.

Also, if, for example, the available labour force, by its size and educational background, is unable to meet the requirements of a new development, it is necessary to identify possible consequences of bringing a new labour force from elsewhere. With respect to this point, the situation is better if new development is planned in urban or developed areas, and worse if those are independent and isolated communities with pronounced local identity, especially if the new labour force should be brought from areas with significantly different habits and norms of behavior.

Working in the field, even if sources of information are limited, it is possible to define a rough framework of possible development for an area on the basis of analysis of the actual situation of the local community. Experience gained throughout the world generally, and in the Mediterranean in particular, shows that a local community usually has a good "feeling" for what kind of development would suit it, and it is seen that conflicts most often arise where development concepts were imposed from outside. Consequently, selection of the most suitable scenarios is arrived at through a sort of "testing" of the relationship between the possible scenario and the expectations of the local community and potential investors. Solutions which are assumed to be unacceptable should then be rejected as unrealistic. Community participation and involvement is thus vital in the tourism development planning process.

During field work on the island of Vis, it was realized that only the two larger settlements there, presented two different views towards tourism development. The town of Vis was more inclined to a somewhat more intensive development with, among other things, the construction of a marina, which was in harmony with the physical possibilities and socio-cultural features of the town. Unlike Vis, the town of Komiza, as a relatively closed community with highly pronounced specific cultural identity, preferred a more modest tourism development which would not require the building of large accommodation facilities nor the import of a new labour force from outside the island. Since that view corresponded with the physical and environmental features of the site, there was every reason to respect it, and to include it in an appropriate development option.

Consequently, the basis for determining carrying capacity for tourism is formed by precisely defined and fixed elements of carrying capacity, and of an assessment of the material which is as accurate as possible. Precisely defined parameters offer a solid framework for deciding on the optimum development scenario, while offering several equally favourable scenarios, is possible only if the situation in the economic and political domains is undefined, i.e. in the instances when the principal factors dealing with tourism development at a given site, have different views.

## 2.7 Definition of Tourism Development Model as the Basis of Carrying Capacity Assessment

### 2.7.1 General considerations relative to final carrying capacity assessment

Selection of a specific development scenario implies that the carrying capacity of the area has been roughly defined. Accordingly, a precise definition of the carrying capacity can follow only after the decision has been taken about one, or exceptionally about two development options. This is the principal difference from earlier notions of carrying capacity, when they tried to define the carrying capacity immediately, while the recent practice is to define the development scenario first and only then can the carrying capacity be defined precisely. Since the fixed elements of the carrying capacity have been identified already during the previous phases of preparation, there is still a need to define the flexible elements precisely. This has been enabled by the decision to go ahead with one development scenario only.

For example, let us say we have two local communities in which the socio-cultural carrying capacity, as the limiting element of the carrying capacity, allows some 2,000 tourists at present. One local community does not want further development of tourism and is unwilling to accept new resident population, while the other desires even more development of tourism and is ready to accept possible immigrants. For the first community, the most appropriate solution would be to choose the sustainable development option for tourism, close to a moderate variant of alternative or "eco"-tourism, maintaining originally defined values for carrying capacity. For the second community, there is a possibility of raising the threshold of the carrying capacity to 2,500 or 3,000 tourists, especially if, at the country level, there is an intention to stimulate immigration and tourism development through improvement of infrastructure, allocation of agricultural land, tax incentives, etc.

The increase of carrying capacity threshold in this way is possible only if it does not imply passing the thresholds of the other elements in carrying capacity. If, for example, the above mentioned hypothetical local community aims at developing summer sea-bathing tourism, and the fixed capacity of the associated coastline is 2,400 tourists, the overall carrying capacity can not exceed 2,400 tourists, although in the new conditions the threshold of the socio-cultural carrying capacity might be raised beyond that number.

From the above it may be noted that **the key role in deciding upon a development scenario, and accordingly defining its carrying capacity precisely, is played by use of the component which represents the lowest values.** Therefore, those components have to be given maximum attention, since they define the lowest threshold, and eventually, the final carrying capacity.

Such a methodology of selecting scenarios and defining carrying capacity applies, in principle, to all areas, but in different sorts of area, different components of carrying capacity may gain greater importance. Thus, in highly developed urban areas with almost identical socio-cultural features of the local population and tourists, the physical and ecological components are more pronounced, which is why in those countries a technocratic approach to carrying capacity definition has prevailed.

In the medium and, particularly, less developed areas, to which category most of the Mediterranean coastal areas belong (except for France, Italy and Spain), the socio-demographic and socio-cultural components of carrying capacity have greater importance, and the influence of political and economic factors is also more pronounced. Therefore, the Mediterranean as a whole requires a somewhat different approach, and its parts require a differentiated approach adapted to the principal characteristics of the environment and types of tourism.

### 2.7.2 Specific features of carrying capacity assessment in the Mediterranean

The main common features of the Mediterranean environment which directly affect carrying capacity assessment are: sensitive eco-systems, specific Mediterranean climate (hot and dry summers and mild and wet winters), permeable soils, the fact that the Mediterranean basin is fairly closed, a great wealth of cultural monuments, specific tradition and behaviour of the local population.

Mediterranean tourism is characterized by a pronounced seasonality with greatest pressure in the summer, the tourist season for sea-bathing, and the fact that the Mediterranean, as one of the principal tourist regions of the world, has tourism as one of its basic economic activities for most of

the countries concerned. Therefore, when assessing the carrying capacity of Mediterranean countries, certain elements, schematically shown in the Table 8, have to be given more attention than in the case of other world destination regions.

Since many of the above elements were insufficiently taken into consideration in the past, the concept of carrying capacity assessment was not applied in most of the Mediterranean countries, nor were the guidelines defined by numerous studies, used in practice. In fact, carrying capacity assessment was often seen as a development ballast and a further unnecessary burden upon already modest and inadequate investment funds, rather than as a useful tool to avoid conflicts in development.

Such an attitude towards carrying capacity assessment in many Mediterranean countries resulted from the fact that most of the experts dealing with it, came from highly developed countries in Western Europe and USA, areas which were, at the same time, the main generators of tourist demand. Due to a considerably higher level of general development, those countries had higher standards of carrying capacity and greater material possibilities for implementing the necessary measures, especially in the ecological and infrastructure spheres. At the same time, due to similar habits and behaviour of the local resident population and of the visiting tourists, the socio-cultural sphere was largely neglected in those countries, or burdened by the so called "ecological" approach aiming at placing the local population of less developed tourist destinations under some sort of "glass bell", or in a "test-tube" for study.

**Table 8. Elements of the carrying capacity in the Mediterranean countries that must be given a special attention due to the specific general and tourism features**

Element	Reason of its particular importance	Possible negative consequences
eco-system	- increased sensitivity due to the specific climate	- disturbance of the natural balance, disappearance of rare wildlife species
attractive landscapes	- particular sensitivity of the most attractive areas (islands, protected areas)	- damage to the basis of the economy since tourist arrivals are motivated by the quality of the eco-systems
water supply	- shortage of water in summer; - soil permeability	- threat to the development of tourism; - threat to traditional activities, specially agriculture; - high prices of water
waste waters	- dry climate of summers; - the Mediterranean basin is closed	- further deterioration of the already high level of pollution of the sea and land waters
traffic	- exaggerated traffic increase in the summer season; - narrow roads, especially in historic settlements; - sensitivity of cultural monuments to air and noise pollution	- traffic congestion; - high levels of air pollution in tourist settlements; - devastation of cultural monuments
economic issues	- lower degree of economic development than in the countries from which tourists come	- further increase of social differences; - decline of the traditional Mediterranean economy
cultural and historic heritage	- exceptionally rich cultural and historic heritage; - limited funds for conservation and improvement of the cultural and historic heritage	- devastation of cultural monuments; - diminished appeal of tourist areas due to the threatened historic heritage
socio-cultural issues	- specific traditional culture and norms of behaviour; - existence of a number of small specific closed communities with preserved local identity	- destruction of local culture; - conflicts between local population and tourists; - increase in criminal activities

According to such opinions, the old concept of CCA was applicable only for highly developed Mediterranean countries with similar level of civilization, and similar structure of local population and of tourists, such as France, Italy and Spain, and somewhat less so for the medium developed countries such as Croatia, Greece and Turkey, while it was totally unacceptable for most countries of the Southern Mediterranean littoral. Therefore, the concept proposed here, based on defining development scenarios before defining the carrying capacity, has a much more adaptable structure which makes it applicable all over the Mediterranean.

## 2.8 Instructions for the Application of CCA

After the CCA for the entire area has been defined, instructions have to be prepared for its application, which must be simple, clear and adapted to and for the users. Therefore, separate sets of instructions have to be prepared for the following groups of users:

- local community;
- regional and governmental bodies;
- physical planners;
- tourism developers / investors / tourism industry practitioners, and
- tourism economy.

With the formulation of instructions it is particularly important that they can serve, without significant further interventions, as the basis for the preparation of prefeasibility studies, and they have to contain clear recommendations for environmental protection. Clarity, simplicity, and applicability of the instructions to the various groups of users is important also in order to enable efficient monitoring of the effects of the CCA.

A prerequisite for respecting the limits imposed by carrying capacity assessment, and for efficient implementation of plans according to the given development scenario, is a consensus between interested parties, i.e. between the local community, region, state, and local and foreign investors. The acceptance by the local community is specially important, since without it, a given development scenario can never function in practice, nor can it be possible to provide the quality of offer which would secure a pleasant stay for the tourists. Support by the region and the state is necessary in order to secure legal, and, perhaps, material support for implementation of the optimum development scenario, which automatically secures interest of investors in an area.

The flexibility and adaptability of the proposed concept of carrying capacity assessment enables the selection of a scenario for sustainable tourism development which is both environmentally acceptable, and feasible. If there are differences in the opinions between the local community and the state, it is necessary to study both attitudes carefully, in order to find clear and firm arguments for dissuading the group which is trying to impose an environmentally unacceptable development concept. In any case, the needs of the local community have to be put first, while those of the region and of the state have to be viewed more flexibly, in cases where there are differing opinions between the parties concerned.

The mechanism securing the most efficient implementation of the previously defined concept of CCA is fitted into integrated plans for coastal areas, as legal documents, i.e. into the ICAM process, which will be explained in detail later in the text. It is, therefore, recommended, wherever possible, not to prepare as a separate document, the carrying capacity assessment of an area, but rather to do it as part of an integrated tourism plan. If, however, the CCA is prepared separately, for some specific reason, it should be aimed at changing the existing development plans if they exceed the values for carrying capacity, and at incorporation into the integrated tourism plan which should be prepared at a later date.

In both cases, the general public should at least be informed of the work on the preparation of carrying capacity assessment, as maximum cooperation has to be achieved not only with the local authorities but also with the local resident population and general public as well. For, unless consensus of all interested parties is achieved, and especially if support by the local community is missing, even the best conceived development scenario will not be able to function in practice. Achievement of such a consensus is the basic prerequisite not only for the implementation of CCA at a given moment, but also for its successful monitoring in the future.



### **3. INTEGRATION OF CCA INTO INTEGRATED COASTAL AREA MANAGEMENT PLANS**

#### **3.1 The Role and Significance of Tourism in the ICAM Process in the Mediterranean**

The importance of tourism in the ICAM process in the Mediterranean is much greater than in most of the other regions of the world. There are two main reasons for that:

- a) In almost all Mediterranean countries tourism is one of the principal economic activities strongly identifying the overall economy of those countries. The need to develop tourism directly affects the development of agriculture, trade, and traffic, and indirectly all other activities. Tourism development plans have a key influence upon the development planning of traffic routes, of infrastructure, of communications, etc.
- b) Since the Mediterranean sea is a closed system and an ecologically sensitive one, the development of all other activities has a strong impact on the development of tourism. Therefore, it is necessary to harmonize overall development planning with the tourism development planning process, even in the areas where tourism is not particularly significant. This is especially important in the context of environmental hazards and dangers, since contemporary trends in tourism require effectively protected and attractive environments. As the Mediterranean environment as a whole risks becoming less competitive in the tourist market due to the excessive degradation of the environment, environmentally sound coastal area planning and management emerges as a basic prerequisite for further development of tourism.

#### **3.2 CCA as a Tool of ICAM**

Considered on the basis of current ideas about tourism development planning, CCA is a component of any tourism plan. From the above assertions it may be stated that CCA has to be a component of ICAM. The main purpose of CCA is to provide parameters relative to the development of tourism which should serve for planning the development of other activities, of traffic routes and of infrastructure. Should a CCA be made before the initiation of the ICAM process, it has to be integrated later, according to its position in ICAM.

If ICAM process is initiated before the preparation of CCA, the CCA must be included in ICAM, according to the instructions given below.

#### **3.3 Integration of CCA into Various Phases of ICAM**

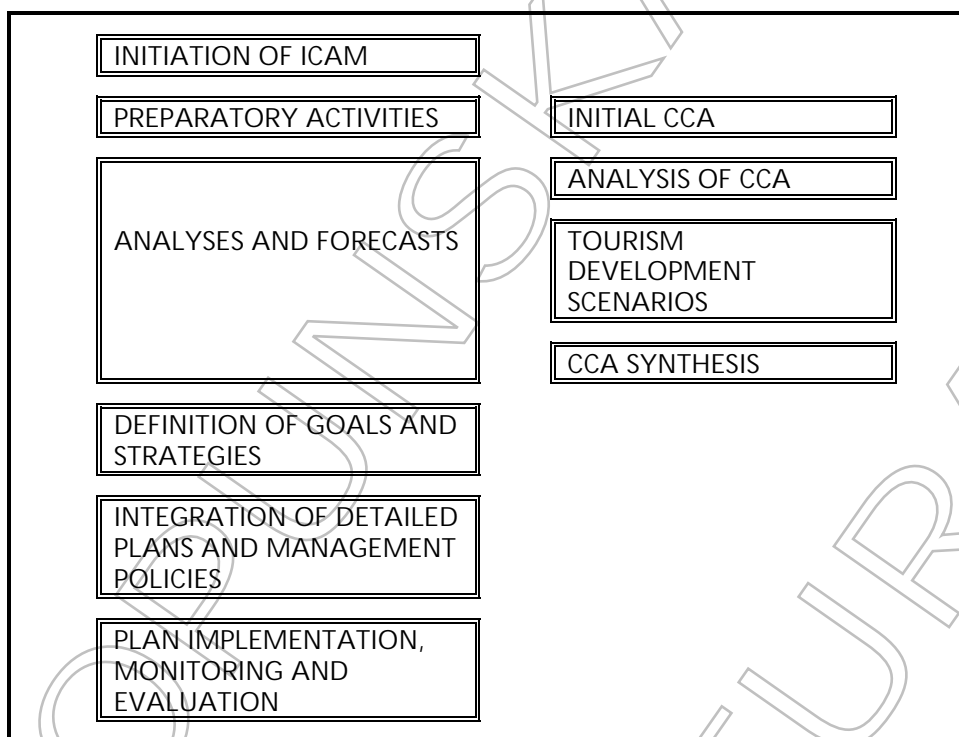
The position of CCA within the ICAM process is determined according to the scheme given in Figure 9 which results from a more detailed presentation given in Table 5 earlier in the text. It is therefore necessary to point out here the differences between the cases where CCA is prepared as a part of ICAM, and when it has been prepared separately and is integrated in ICAM later. The following steps can be recommended:

- a) If CCA has not been prepared before initiating the ICAM process:
  1. When undertaking preparatory activities relative to the planning of ICAM and making a basic analysis within the tourism plan, it is necessary to make a rough assessment of a possible CC span according to the generally assumed development scenarios. If possible, it is desirable to calculate immediately the values of that CCA component which is supposed to set the upper limit of the overall carrying capacity.
  2. Along with the preparation of detailed analyses and forecasts within the ICAM and the tourism plan, it is necessary to develop possible tourism development options as the basis for formulating carrying capacity.
  3. Within the preparation of tourism plan synthesis, along with the forecasts necessary for defining the objectives and strategies of ICAM, it is necessary to make a synthesis

of CCA, i.e. to decide upon one of the development options. Thus, the synthesis of CCA becomes a component of the objectives and strategies of ICAM.

4. Since the CCA, thus defined, has become a component of ICAM, the evaluation of effects and monitoring of CCA is done within the ICAM review process, and as part of the implementation of the tourism plan.

**Figure 9. Scheme of the process of CCA integration into various phases of ICAM**



When formulating various phases of work, and especially in the phase of collection of documents, care should be taken in order to avoid overlapping and duplication, i.e. doing the same things twice. Namely, most of the data collected for the needs of ICAM are the same as those required for CCA, as well as most of the data needed for CCA have their place in the documentation needed for ICAM.

- b) If the tourism plan and CCA as its component have been prepared before the initiation of the ICAM process:
  1. Within the preparatory activities, it is necessary to study the existing CCA as the basis for formulating further phases of work.
  2. Data from the documentation used for the preparation of CCA has to be included in the documentation needed for the preparation of analyses and forecasts within ICAM, meaning that CCA should be used as an input document in all phases of work on ICAM.
  3. Harmonize the goals and strategies to be defined within ICAM with the results of CCA.
  4. Act as in the 4<sup>th</sup> phase of the previous case.

## ANNEXES

## Annex I

# CARRYING CAPACITY ASSESSMENT FOR TOURISM DEVELOPMENT IN THE ISLAND OF VIS - CROATIA

The study "Carrying Capacity Assessment for Tourism Development in the Island of Vis" has been prepared within the PAP action on the development of Mediterranean tourism harmonized with the environment, based on two PAP documents: "Guidelines for an Environmental Approach to the Planning and Management of Tourism Development in Mediterranean Coastal Zones" (1989), and "Methodological Framework for Assessing Tourism Carrying Capacity in Mediterranean Coastal Zones" (1990).

With a surface area of 90.3 sq.km, the island of Vis is the tenth largest, and on the basis of its population size - 4,338 inhabitants in 1981, it is the eleventh largest island in the Adriatic. Together with the associated islands of Biševo and Sv. Andrija, as well as a number of small uninhabited islands, the municipality of Vis covers a surface area of 101 sq.km and has a population of 4,352 inhabitants. Unfavourable geographical features, in combination with the prohibition upon foreigners visiting the island, a decree which was in force until recently, contributed to a very high rate of depopulation of the island. Although the depopulation process has now been stopped, in the period 1971 - 1981 the population decreased by 18.1%. Besides the island as a whole, the population decreased in all its settlements, without exception. According to the GNP per inhabitant (in 1981) the area of the former municipality of Vis was, together with the municipality of Lastovo, the least developed island municipality of Croatia.

The population of Vis lives mostly upon agriculture and fishing, and to a lesser degree upon fish processing and tourism. In the case of Vis, all elements of CCA apply, for it is characteristic of the Mediterranean area, as indicated in the Table 8.

### **Description of the procedure**

The main objective of this case study was to test in practice the PAP methodological framework for assessing carrying capacity of the Mediterranean coastal zones for the development of tourism, and to provide the local authorities, investors, tourism experts, physical planners and environmental planners with a guide and a pilot project for tourism planning and management in the island. Research and formulation of the draft study took three months, and the work was undertaken in the first half of 1991.

The theoretical concept of carrying capacity was strictly adhered to, according to which it is necessary to determine the maximum number of people who can simultaneously visit a tourist destination and not cause unacceptable destruction of the physical, ecological and socio-cultural environments, or unacceptable reduction in the quality of visitor- experience (or satisfaction) gained. This concept breaks with the idea of a universal physical capacity, which was applied earlier when calculating total carrying capacity for the development of tourism.

First of all, both population features and migration characteristics, as well as the overall economy and tourism, were analyzed for the island of Vis, and the associated small island of Biševo. Then, the objectives and interests of tourism development on Vis were analyzed, and possible scenarios of that development evaluated.

Within the selected scenario a review was prepared of the resource basis with the attractions of the island of Vis, divided into climate, coast, sea, inland, village, natural attractions, historic monuments, cultural monuments, accommodation capacities, and special facilities and attractions. Apart from the textual analysis prepared, a graphic analysis was also done using topographic and thematic maps, of which the physical plan for Vis has to be emphasized as it shows existing land use, and the system of settlements and infrastructure, as well as planning proposals for the next 20-odd years. Also, the overall resource basis for tourism was mapped, and its analysis enabled the devising of the spatial model for tourism on the island of Vis.

The spatial model for the island of Vis shows certain geographical, demographic, economic, urban-rural, and socio-cultural features, which determine the rules according to which the island will be organized and developed. Large and naturally protected bays in the east and west of the island determined the two strong urban poles, the towns of Vis (in the east) and Komiza (in the west). They are connected by a road which runs through an uninhabited mountainous area. To the south of that axis, still in the inland, there is rich agricultural area marked by vineyards, fields, orchards

and olive groves. There are also six rural settlements. In the north and the south of the island there are two fishermen's villages (Oključna in the north, and Rukavac-Brguljac in the south).

A part of the coast of the island of Vis (excluding that of the two towns and of the two villages) is covered by a well preserved forest strip, 1-3 km wide, with a preserved coastline. The nearby island of Bisevo has a rural settlement in its centre, surrounded by agricultural land, and along its coast, forests and shores have been well preserved. With the withdrawal of the Navy from Vis bay, large potentials for the development of nautical tourism have been released. So far, tourism has been developed only in Vis and Komiza, both in hotels and room-lettings. A significant number of second homes can be found only in the area of the southern fishermen's village. The rural areas have not seen any development of tourism at all. It is estimated that in Komiza, Vis and the villages, there are 500-odd abandoned and/or uninhabited houses, which, if adapted, could provide additional 2000 tourist beds in the island.

The spatial model of tourism served as the basis for the carrying capacity assessment for tourism development in Vis. A parallel analysis was performed for the physical capacity (number of bathers), the socio-cultural aspect (relation between the numbers of tourists and the local population), the demographic capacity (numbers of the required and available labour force in tourism), and the environmental capacity (quality of the tourist experience). This resulted in a proposal for the number and structure of accommodation capacities, with the proportions of all users of the overall tourism resources of the island (carrying capacity).

### **Problems and dilemmas**

The greatest problem was posed by the status and needs of the army of the former Yugoslavia, as these were then only partially defined. The issue of further opening-up of the island of Vis towards its Adriatic and Mediterranean neighbours also arose. It was finally decided to calculate the optimum solution regarding accessibility for use of all tourism resources, and the full opening up towards the Mediterranean, especially to the neighbouring Italian coast, plus agree to the development of nautical tourism.

Another issue raised regarded the realistic possibility of fully discarding "mass" tourism in Vis. Namely, Vis is too small and its features are too specific, to allow for hosting, besides the higher and highest classes of tourist offer, the category of "mass" tourism as well.

Finally, renouncing the idea of building additional accommodation capacity was agreed, in favour of using the existing but currently unused buildings, in order to accommodate an additional 2000 tourist beds, as well as turning the entire construction-free coastal strip into an ecological reserve in which tourists could recreate. Here, no tourist accommodation facilities or housing for the local population would be allowed, except for the necessary tourist recreation facilities, such as changing booths, showers, toilettes, cafés, restaurants, and boat rentals, representing an ecologically, architecturally and even economically interesting solution, which might have met with great opposition from the local population.

### **Results of the CCA**

As a principal result of the study, we can consider the graphically presented spatial tourism model for Vis (Annex I-A), whose principles had only to be verified mathematically later in the suggested size and structure of accommodation provisions (Annex I-B) and the suggested proportionate use of total tourism resources of the island (Annex I-C), since the values anticipated were prepared simultaneously with the spatial model.

In the spatial model, the island is divided in five spatial divisions:

- urban area (towns of Vis and Komiza);
- rural area (agricultural plane with 6 villages);
- fishing-maritime areas (by the 2 fishermen's villages);
- mountainous area (300-700 m above sea level); and
- ecological reserves (remaining areas by the sea).

The spatial model also contains the number and structure of accommodation provisions located in the settlements, divided into hotels, residences, private accommodation, marinas and rural tourism.

To be able to understand the spatial model and the results of the assessment, it is necessary to consult the attached table (Annex I-A) showing the accommodation provisions and the proportion

of the users of tourism resources. It is interesting to note that after defining the tourist capacity of Vis, 65% of the island beaches remained unused. This means that other components of the carrying capacity of Vis for the development of tourism were more important than the physical one.

The physical plan of Vis municipality produced data on the physical capacity of the island beaches, which amounts to 14000 bathers. Subtracting from that number the bathing use by the local population, seasonal workers and weekend visitors, it can be calculated that the island of Vis can accommodate 10000 tourists, whose primary motive for coming to the island is swimming in the sea and sun bathing.

Respecting to the maximum the past rules for development of the island, on one hand, and the trends of tourist demand in the world market on the other hand, this could give the island of Vis a very high competitive rating in the market place. A local approach which is strongly against saturation and for ecological protection appeared as optimal during the selection of a scenario for the future tourism development in the island.

The principles are:

- outside the existing settlements, the coast will not be built up, and the maritime strip will not be enlarged;
- large new accommodation provisions will not be built;
- all suitable abandoned houses and apartments will be re- used for tourism purposes;
- appropriate nautical facilities will be built in the port of Vis;
- rural areas will be brought to life;
- all tourist attractions of the island will be used;
- living population will be retained in the island;
- seasonal labour force will be reduced to a minimum; and
- agricultural production will be adapted to the development of tourism.

Accordingly, the following are recommended:

- hotel capacities should not be considerably enlarged (700 persons);
- most of the tourist accommodation should be in the form of tourist residences and apartments (2000 persons);
- tourist boats should be accommodated in two types of marinas - traditional with accommodation of tourists on board their vessels, and those envisaging accommodation in buildings near marina berthing sites (1800 persons);
- tourists should occupy an estimated surplus living space in private accommodation in Vis, Komiza and the two fishermen's villages (900 persons); and
- rural tourism is estimated to accommodate a small number of tourists (100 persons).

From the above principles and a capacity set at 4900 tourists, it is obvious that for the island of Vis the following criteria prevailed over the physical capacity (10000 tourists):

- environmental quality (a high quality tourist experience);
- ecological criteria (preservation of the eco-systems of the island);
- economic criteria (relatively modest investment compared to the price such tourism products can achieve on the world market); and
- socio-cultural criteria (achieving as favourable a relationship as possible of the local population to the total number of tourists and to the size of the seasonal labour force).

The final confirmation of such a development projection and of socio-cultural capacities of the island was provided by the calculation of a necessary labour force of 945 persons in the peak season, of which some 750 can be recruited among the local population, and the remainder (some 200) who have to be employed specially as seasonal workers.

### **Lessons learned**

Regardless of the universal applicability of this overall procedure, when performing a CCA it must be borne in mind that each island is a distinctive entity whose rules of possible tourism development are hard to discover. For such purposes of understanding, a thorough field visit of the given area is essential, this includes interviews with the local population, in order to identify the resource basis of that area.

## Annex I - A: Suggested Accommodation Capacities Number and Structure

LOCATION		TYPE					
		Hotels	Residences	Marinas*	Cottage industry	Village tourism	Total
VIS	U	175	140	400	300	-	-
	P	350	560	1200	300	-	2400
KOMIZA	U	175	240	-	300	-	-
	P	350	960	-	300	-	1610
RUKAVAC BRGULJAC	U	-	-	-	200	-	-
	P	-	-	-	200	-	200
OKLJUCNA	U	-	10	-	-	-	-
	P	-	40	-	-	-	40
VILLAGES	U	-	110	-	100	10	-
	P	-	440	-	100	100	640
TOTAL UNITS		350	500	400	900	10	-
TOTAL PERSONS		700	2000	1200	900	100	4900
PERSONNEL COEFFICIENT		0.7	0.8	0.5	0.1	1.0	-
TOTAL PERSONNEL		245	400	200	90	10	945

\*

Marinas:

- Marina-hotel (stationary + charter) 200 berths, 150 rooms  
personnel coefficient 0.8, 160 staff
- Marina (transit + charter) 200 berths  
personnel coefficient 0.2, 40 staff

## Annex I - B: Suggested Proportion of Users of Total Tourism Resources of the Island (Carrying Capacity)

### THE MAXIMAL NUMBER OF PEOPLE IN A PEAK SEASON

INHABITANTS	5,000
SEASONAL WORKERS	200
EXCURSIONISTS	500
SUMMER - COTTAGE OWNERS	1,500
STATIONED TOURISTS	4,900
<b>TOTAL</b>	<b>12,100</b>

### TOTAL RATIO OF THE INHABITANTS AND THE GUESTS

INHABITANTS : GUESTS = 5,000 : 7,100 = 1 : 1.4

### EMPLOYED IN TOURISM

DOMESTIC	745
SEASONAL	200
<b>TOTAL</b>	<b>945</b>

### BEACH UTILISATION

BEACH POTENTIAL (with the simultaneousness coefficient) 14,000 customers

#### MASS MARITIME TOURISM VARIANT

INHABITANTS AND SEASONAL VISITORS	3,000
EXCURSIONISTS	500
SUMMER - COTTAGE OWNERS	1,500
STATIONED TOURISTS	4,900
<b>TOTAL</b>	<b>9,900</b>

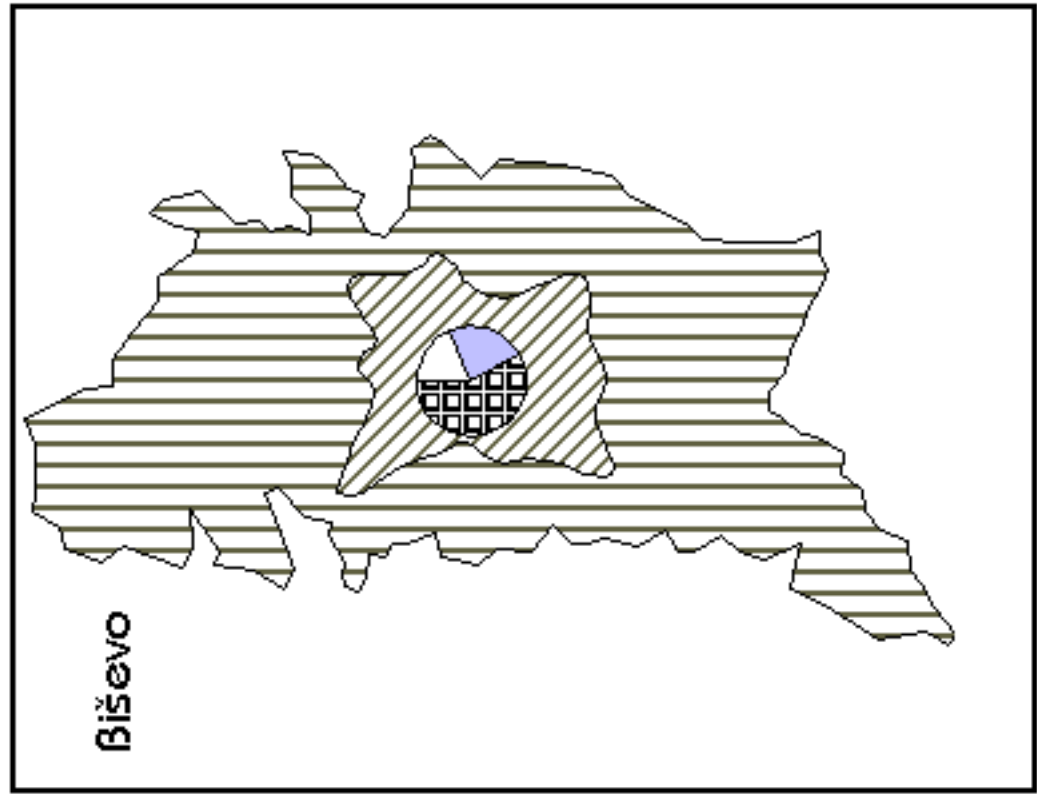
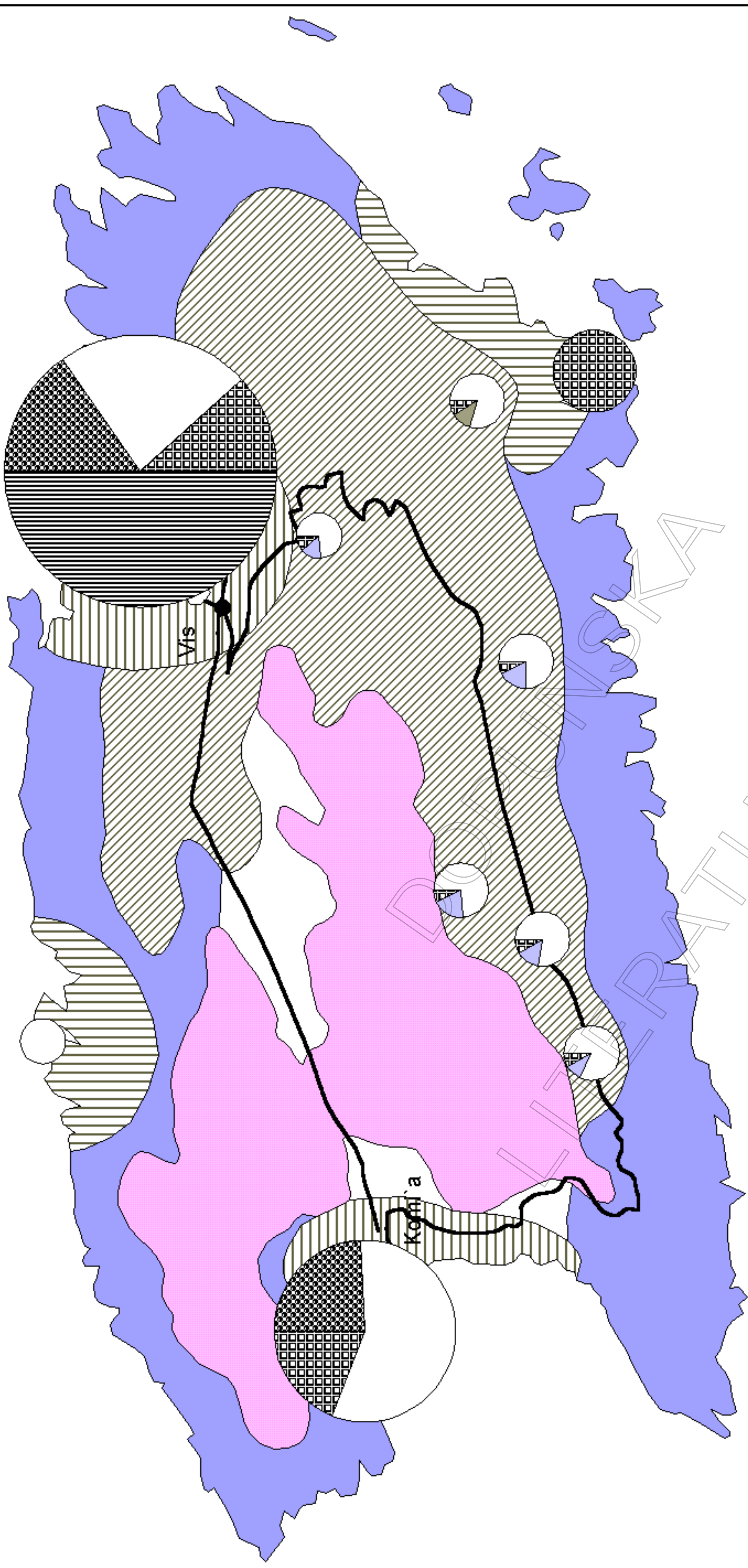
The unused beach potential  $14,000 - 9,900 = 4,100 = 30\%$

#### DESIRED TOURISM VARIANT

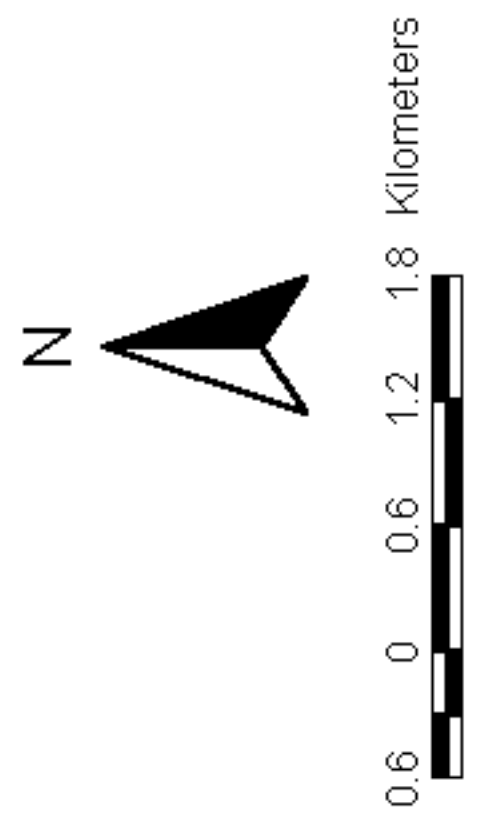
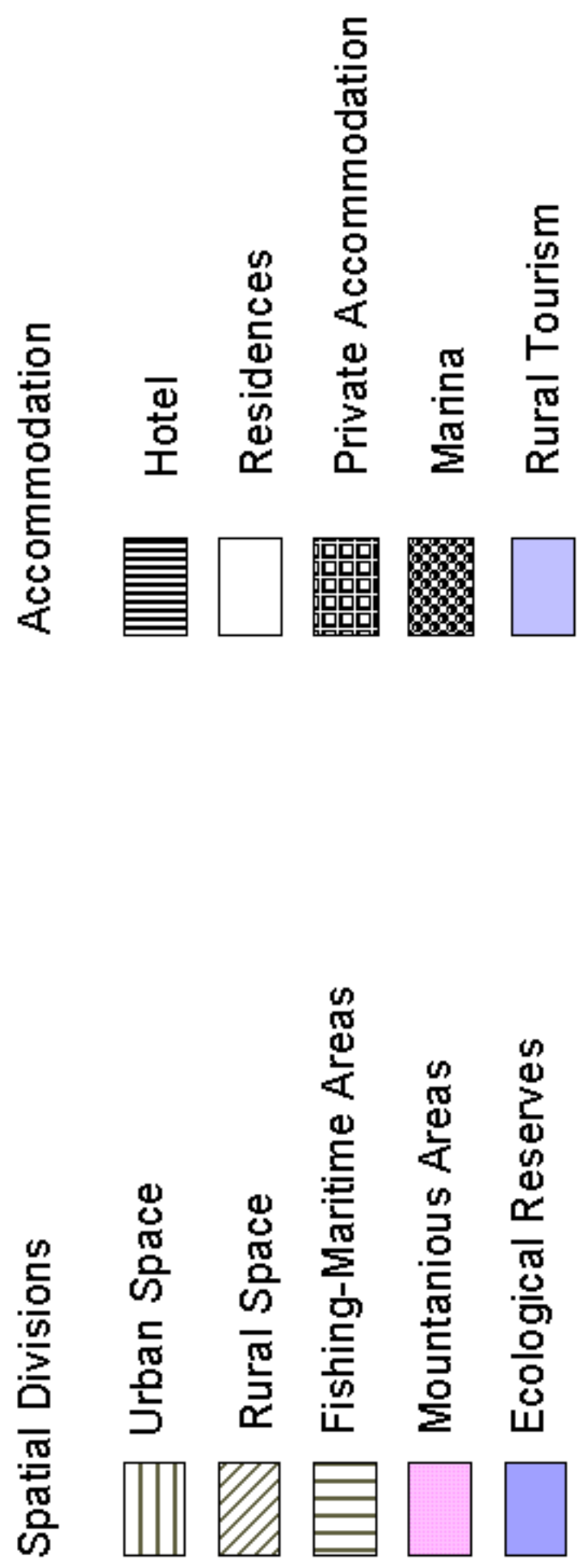
The time spent at the beach is decreased by 50% in favour of other activities, which leaves 4,950 simultaneous customers

The unused beach potential  $14,000 - 4,950 = 9,050 = 65\%$





Annex I C: Pilot Carrying Capacity Assessment of the Island of Vis  
SPATIAL TOURIST MODEL



## Annex II

# CARRYING CAPACITY ASSESSMENT OF THE CENTRAL-EASTERN PART OF THE ISLAND OF RHODES - GREECE

As in the case of the island of Vis, the CCA study of the central-eastern part of the island of Rhodes was a pilot study, but the situation there was very different to that on Vis. Namely, the object of research was just a part of a large island, the overall surface area of which is 1,398 sq.km, and the population 100,686 inhabitants (in 1991). The central-eastern part of the island, covered by the CCA study, has a surface area of some 400 sq.kms and some 18,503 inhabitants (in 1991).

Characteristic of the island of Rhodes is a very high influence of tourism - over 40% of the active population is employed in tourism, catering and transport. Of the remainder, 14% are employed in agriculture, commerce and public sector each, 9% in construction, and only 8% in manufacture and mining. There is a pronounced concentration of population and economic activities in the northern part of the island, around the capital, the city of Rhodes, with a tendency for it to spread southwards.

Since spreading towards the west is limited by the steeply sloping terrain, the only possible direction for development is along the eastern coast of the island, i.e. over the central-eastern area which is analyzed in the study. The far south of the island and the area inland are still comparatively sparsely populated and unspoiled by tourism development; there is a tendency to preserve them like that. It is also indicative that some parts of the island face the problem of securing sufficient drinking water, and there is a risk of forest fires.

Tourism in the island is highly developed, and the problems of saturation have already occurred in the northern part of it. Some twenty years of tourism development have caused numerous ecological changes and changes in the economic and social structures. Due to a prohibition to build in the saturated part of the island, all tourism activities now focus upon the central-eastern part of Rhodes, particularly the coastal area between the settlements of Afandou and Lindos.

### Description of the procedure

The entire procedure used has been harmonized with the adopted concept of CCA, which represents a calculation of several components of the CCA, and in regard to the lowest threshold. As in the case of the island of Vis, the principles were tested of the PAP methodological framework for assessing carrying capacity. Research and formulation of the draft study took about four months and were performed in the second half of 1992.

The theoretical concept of carrying capacity was applied in order to determine the maximum number of people who can simultaneously visit a tourist destination and not cause unacceptable destruction of the physical, ecological and socio-cultural environments, or unacceptable reduction in the quality of the visitor's experience (or visitor-satisfaction). This element was of a particular importance since almost the entire economy of the island of Rhodes is based on the development of tourism, and since, due to the appearance of all the negative effects of saturation in that part of the island, which is most highly developed for tourism, a reduction in the economic effects of tourism had already been faced due to reduced visitor- satisfaction.

First, the tourism profile of the island of Rhodes was analyzed, with special reference to the trend of building accommodation provisions, and oscillations in the total number of tourists and of overnight stays. The analysis followed the role and participation of tourism in the economy of Rhodes, including the population structure, employment and income by sectors and by geographic sectors of the island (north-eastern, northern, central-eastern, western, and southern zones). Finally, environmental effects of intensive tourism development were analyzed from the spatial-ecological, economic and socio-cultural aspects.

The analysis took into consideration the highly complex problems of tourism development in Rhodes as a whole, and of its individual regions. One principal and one secondary zones of tourist saturation were identified as the most prominent. The principal zone of tourist saturation is the area around the city of Rhodes, and it spreads towards the settlement of Kremasti in the west, and along the eastern coast towards Faliraki bay in the south. The secondary zone of tourist saturation relates to the town of Lindos and its immediate surroundings on the eastern coast. Since the observed central-eastern zone is situated in between those two tourist saturated areas, the logical

intention is to prevent the further application of this evidently harmful concept of free development, which causes tourist saturation.

The coastal strip in the eastern part of the island, from Lindos to the Plimiri bay, has been designated as a zone available for future development, while strict environmental protection has been envisaged for the entire western coast from Kremasti to the southernmost point of the Prassonission peninsula. This is dictated by the geographical conditions, such as the steeper coastline, and other environmental features. The protection should also cover the area inland; as for the western coast, the inland area of the island will be used almost exclusively for day-tripping, with a very small number of accommodation units, which will be of a family type.

The possibilities of tourism development in the island were explored via a number of scenarios, which pay special attention to the instruments currently in force for land-use planning purposes. This refers to the legal framework of physical planning, detailed plans and regulations to control the growth of tourism.

Only at that stage was the carrying capacity assessment started for the central-eastern part of the island of Rhodes. This was done through an analysis of the place of that area within the tourism development of the whole island, an analysis of the land use in that part of the island, and through the principal tourism development models. A detailed analysis was done on the resource basis of the central-eastern part of the island, a development programme was created with proposed spatial distribution of tourism capacities by tourist zones, and finally, carrying capacity was calculated.

**Problems and dilemmas**

The main problem and dilemma faced in the central-eastern part of Rhodes was how to reconcile two diametrically opposed hopes for development. On the one hand, there was a strong pressure by investors to allow in this zone, as in the tourism-saturated northern one, intensive, or even free development of tourism. On the other hand, there were hopes to place this zone under a regime of strict protection, or, at least, to limit effectively any new building there.

Since the physical elements of carrying capacity allowed for a comparatively strong new development, the analysis of the economic and socio-demographic situation led to the conclusion that there were no obstacles to developing tourism in this zone, but not in the same way as it was done in the northern zone. Accordingly, a development plan for specific development locations was made envisaging, along with the existing 14,000 beds, the building of additional 12,000 beds by the year 2000, and a further 4,000 by the year 2010. This would then reach the upper limit of the carrying capacity. It was concluded that any more building would threaten the overall development of tourism in the island, as is the case with the northern zone which loses in competitiveness due to its tourist saturation.

On the other hand, it was concluded that a drastic limitation on development would also be unfavourable, since that would be a hindrance to tourist and overall development of the island, and would also be against the interests of investors, of the local population and of political bodies. Apart from that, a controlled development of the central-eastern zone enables more efficient protection of the western and southern parts of the island, areas for which a regime of official protection is envisaged.

**Results of the CCA**

The final results of the study have been presented in the conclusions and recommendations, which envisage new building of capacities, along the existing ones, defined by smaller zones, as follows:

Target Areas	Existing beds	Additional beds	
		2000	2010
1. Ladiko	550	450	-
2. Afandou - Kolymbia	5,850	3,000	1,100
3. Archangelos	1,000	550	-
4. Charaki	1,000	500	-
5. Kalathos - Vlichia	1,700	5,000	2,000
6. Lindos	2,000	-	-
7. Pefki - Lardos	1,900	2,500	900
<b>TOTAL</b>	<b>14,000</b>	<b>12,000</b>	<b>4,000</b>

From the above table it can be seen that the maximum carrying capacity in the peak period for the projected year 2010 is 30,000 tourists. As in the case of the island of Vis, the value is well below the physical carrying capacity, which in the case of the beach area of the central-eastern zone of Rhodes amounts to 73,400 beach users. The projected value is also smaller than the ecological carrying capacity which was calculated at 57,000 visitors in peak periods.

In the case of the central-eastern zone, like that for the entire island of Rhodes, neither socio-demographic nor socio-cultural parameters represent a limiting factor to the development, owing to the local population being fully adjusted to a life based on tourism, and the related possibility of accepting imported labour force. The decision to recommend in the near future, limiting building to a total of 16,000 beds, was based on economic indicators, i.e. the fall of prices in tourism due to a reduction of tourists' satisfaction with this destination. That was caused by the tourist saturation of the neighbouring northern zone, and the related degradation of the environment by, among others, inappropriate new buildings, and numerous forest fires which had disastrous effects, due to inadequate safeguards against such events.

The tourist price of 30-50 US\$ per night, which is current, considerably reduces the positive economic effects of tourism development, and results in a calculation that similar prices would be achieved in the central-eastern zone, if larger-scale provision of accommodation were built. At the same time, even if less than the proposed 16,000 new beds were built, it would not be possible to achieve significantly higher tourist prices per night, because the vicinity of mass tourism in the neighbouring northern zone would not allow for the development of other parts of Rhodes as exclusive destinations.

The value of the carrying capacity, thus determined, was at a later stage within the study, specified by categories of accommodation, and by individual smaller units, and adequate maps were also prepared. It was especially emphasized that this zone and the entire island of Rhodes as a whole, required preparation of a tourism development master plan, and that the local and regional authorities should define Development Control Zones, based on the general regulations now used in Greece.

It was recommended that special measures be taken in order to stimulate restructuring of the tourist offer towards a higher quality by providing additional sports, amusement and other facilities. It was pointed out that the intention of the study was to serve not only as a planning and management tool for the central-eastern zone, but also for other parts of the island. From the conclusions and recommendations of the study it is possible to draw-out the basic elements for defining tourism development policy for other parts of the island as well, and the study can also serve as an initial step towards tourism restructuring for the entire island.

### **Lessons learned**

As in the case of the island of Vis, this example also proves that, in spite of the universal character of the CCA procedure, each Mediterranean area requires a distinctive approach, i.e. one which is tailor-made to local circumstances. Detailed field research and interviews with the local population and decision-makers provided information which led to the definition of CCA for the central-eastern zone of the island of Rhodes, which is significantly different from that for some other island zones with similar physical and even demographic features.

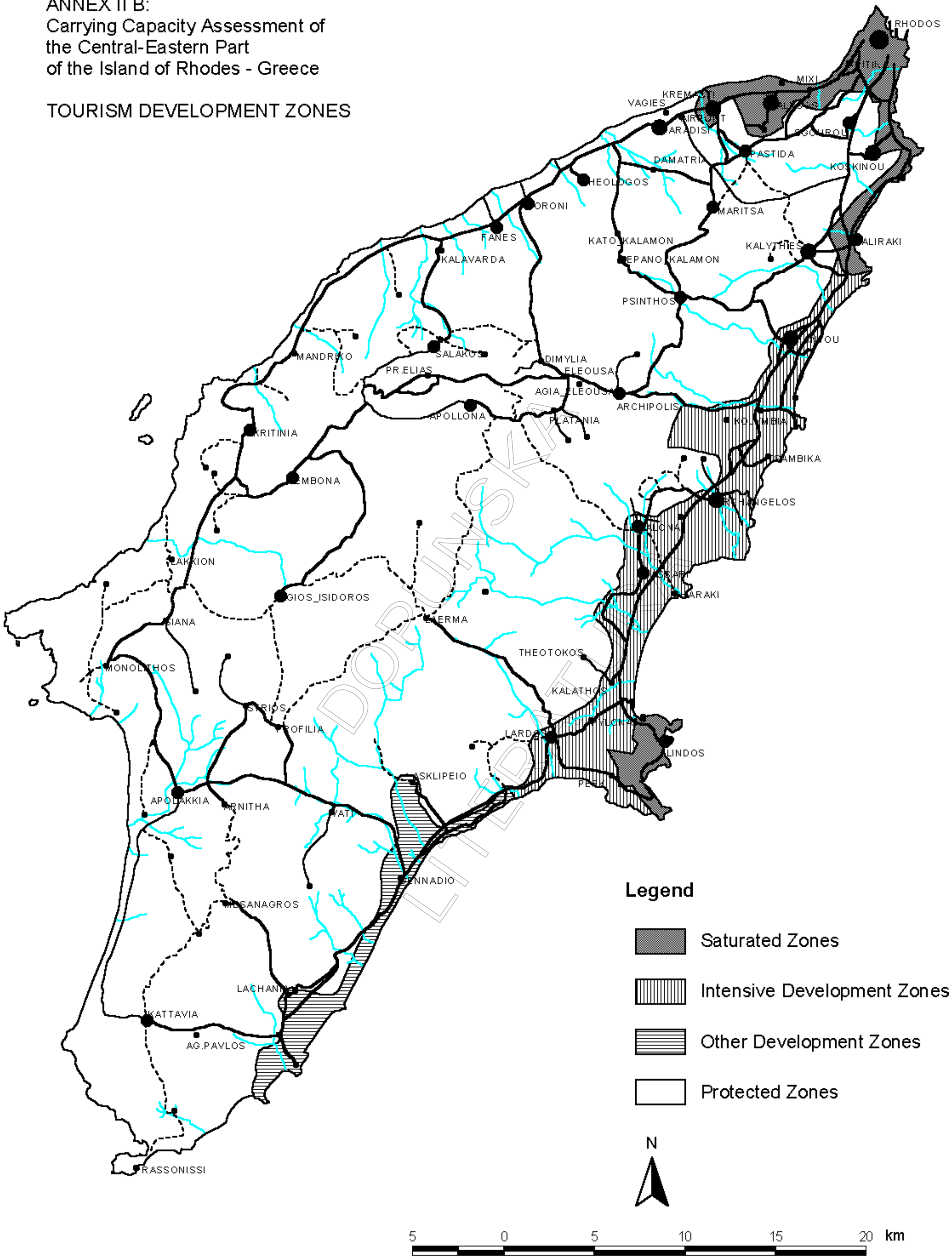
## Annex II - A: Realistic Framework of Tourism Development of the Central-Eastern Zone of the Island of Rhodes (Overall Carrying Capacity)

Constraints	1992	2000	2010
Population	20,000	25,000	33,400
Local labour	6,800	9,200	11,700
Migrant labour (i)	-	1,300	500
Migrant labour (ii)	-	3,300	6,300
Scenario I	1992	2000	2010
Number of beds	13,500	21,000	25,000
Number of bednights ( in '000)	3,600	6,020	7,300
Number of arrivals (in '000)	400	670	811
Tourism receipts (in million US\$)	144	391	584
Tourist/Local population	0.67	0.82	0.95
Average daily tourist expenditure (US\$)	50	65	80
Scenario II	1992	2000	2010
Number of beds	13,500	25,000	36,000
Number of bednights ( in '000)	3,600	6,844	10,250
Number of arrivals (in '000)	400	760	1,138
Tourism receipts (in million US\$)	144	410	717
Tourist/Local population	0.67	0.97	1.08
Average daily tourist expenditure (US\$)	50	60	70

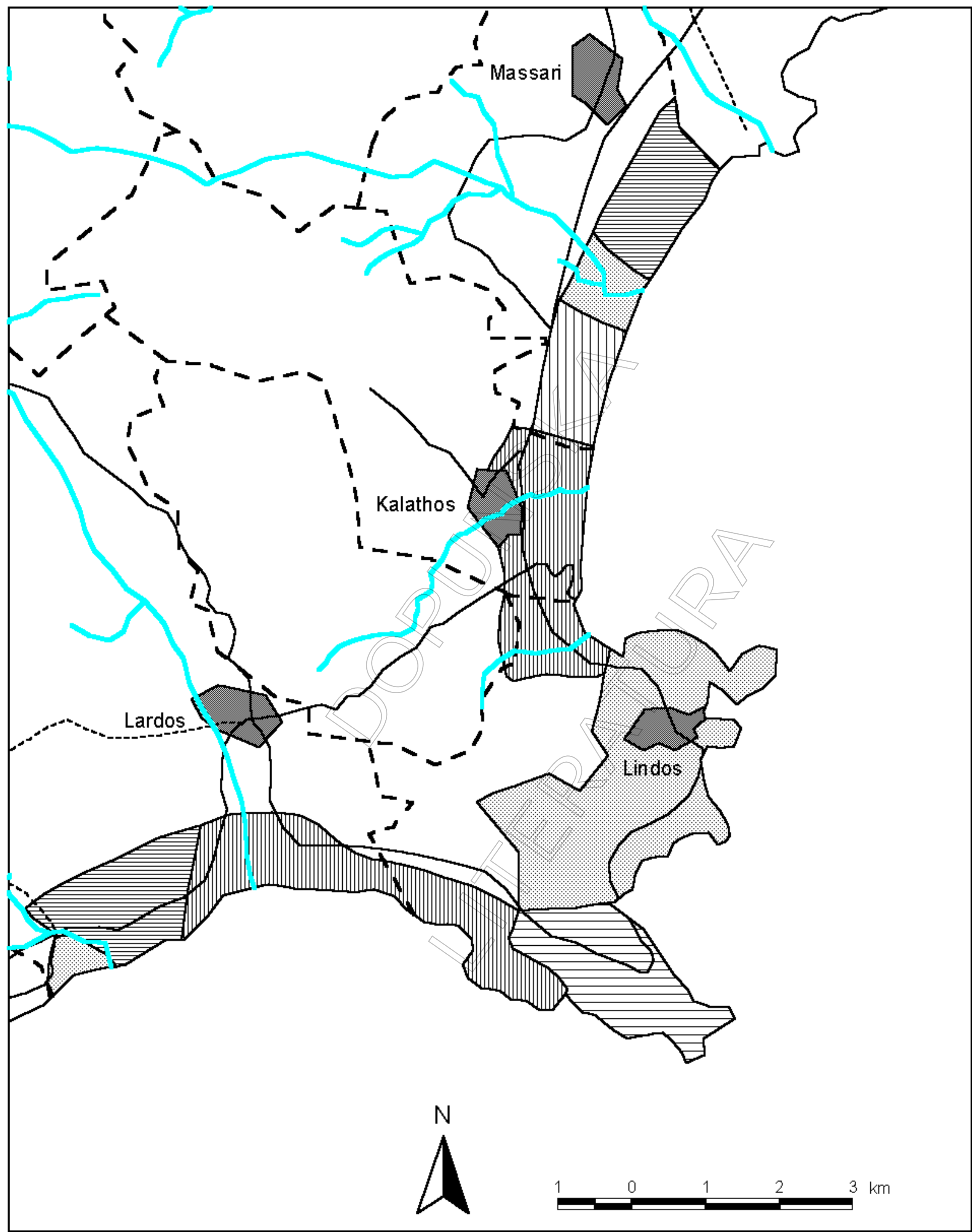


ANNEX II B:  
Carrying Capacity Assessment of  
the Central-Eastern Part  
of the Island of Rhodes - Greece

TOURISM DEVELOPMENT ZONES



TOURISM DEVELOPMENT PROGRAMME OF THE  
CENTRAL-EASTERN PART OF RHODES



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