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TOWARDS AN INTEGRATED TOURISM LANDSCAPE ANALYSIS AND EVALUATION. THE CASE STUDY OF LINDOS (RHODES, GREECE)

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To my father and in loving
memory of my grandparents

Preface

This research study originates from a special interest and concern about tourism landscapes, which is gradually delineated and developed since my undergraduate studies in architecture school of the University of Thessaly (Greece). Born and raised on the island of Rhodes, a popular Greek tourism destination, since my childhood I have become witness of significant landscape transformations due to tourism development. Additionally, the identification of my homeland with an emblematic place of vacation has been a further motivation for trying to explain and better understand its particular nature, which consequently would be interpreted in my PhD thesis as a tourism landscape.

Nevertheless, after my graduation from architecture school, I have become aware that design approaches might not sufficiently embrace the complexity of human-nature relationships which characterize the tourism landscapes, and thus my interests have been addressed towards human sciences and particularly towards geography. My approach to geography has been arisen thanks to the geographical literature on landscapes with a particular focus on the European Landscape Convention, in which my supervisor Professor Benedetta Castiglioni has passionately introduced me, as well as during my participation to the geographical workshop “Landscape in a changing world” of the University of the Aegean, on Lesvos island (Greece) in 2012. The workshop was organized by Professor Theano Terkenli to whom I owe many theoretical references of paramount importance for developing my thesis.

Therefore, during my PhD studies, I have attempted to challenge my beginning observations and fragmented views on tourism landscapes due to my previous disciplinary background, aiming at acquiring a more holistic approach that would integrate multiple (socio-economic, cultural, visual, ecological) issues involved in tourism landscapes. Getting introduced to geography, which is by definition a holistic science, has been revealed the appropriate step in order to achieve the aim. As a matter of fact, the title of my thesis, expresses my primarily desire and consecutive attempt to make an integrated analysis and evaluation of the tourism landscape of Lindos area on the island of Rhodes. Evidently, the concept of integration has been fundamental throughout the structuring and developing of my research project, concerning the selection of both theoretical and methodological references. During my studies I have also had the opportunity to discuss my research project in the context of international conferences, as well as to confront it with researchers from different disciplinary backgrounds, especially during a 4 month-long visit at Wageningen University (NL).

Acknowledgments

I would like to convey my gratitude to the people who contributed in different ways to my research. First, I would like to thank my thesis supervisor Professor Benedetta Castiglioni of the University of Padua, for the confidence she has showed in me, as well as her availability, understanding and patience during the last three years, allowing me to conclude a research project which has been very meaningful to me. I would like to express my gratitude to Professor Theano Terkenli of the University of the Aegean, for her advice, guidance, availability and encouragement at important stages of my research. I would like to thank Professor Viviana Ferrario of the University IUAV of Venice, for her contribution in improving critical aspects of my research during the meetings of our research group. I would like to thank Dr. Arien Buijs of Wageningen University for his advice, generosity with his time and his assistance in improving my theoretical framework during my stay in Wageningen. I would like to thank Professor Claudio Minca of Wageningen University for his fruitful discussions on my topic. I would like to thank Professor Silvia Piovan of the University of Padua, Professor Michael Hodgson and Dr. Francesco Ferrarese for their advices on GIS. My special thanks to my colleagues at the University of Padua, for their support and friendship during all these years. I gratefully acknowledge Chiara Quaglia and Alessia De Nardi for their collaboration, assistance and friendship. Lastly, I would also like to thank my friends Leonardo, Eleni, Nancy, Christina, for their support and understanding as well as my father for his encouragement and confidence in me.

Abstract

This PhD thesis aims at responding to the emerging need for theoretical and methodological deepening of the multiple relationships developed between tourism and landscape, attempting, on the one hand to provide an appropriate conceptualization of the term “tourism landscape” and, on the other hand, a methodological framework for its integrated analysis and evaluation. In order to achieve this aim, a deep bibliographic research was performed, exploring research paradigms from various disciplinary fields, such as spatial sciences, landscape ecology, environmental psychology and cultural geography. On the basis of these bibliographic references, a theoretical and methodological framework has been developed, built upon three key factors of the tourism landscape (contextual factors, landscape character and mental images). In order to apply and verify this framework, the case study of Lindos has been adopted. The main reason for which Lindos area has been chosen as a unit of analysis is that the landscape of Lindos belongs to the characteristic typology of the Aegean coastal landscape, where the protected image of traditional settlements paradoxically coexists with great landscape transformations due to tourism development. Research methods used include both those aiming at the acquisition and analysis of objective data based on expert-based techniques (such as remote sensing, statistical analysis of primary and secondary data, application of indicators) as well as those focusing on the acquisition and analysis of subjective data through a questionnaire-based survey from which primary data have been collected from a considerable number of tourists. Using these methods, in the first place it has been possible to draw significant results concerning the case study which have allowed formulating some suggestions for future landscape management; in the second place, from this study, general considerations about the limits and potentialities of an integrated research on tourism landscape have been emerged.

Riassunto

Questo lavoro di tesi di dottorato vuole rispondere alla necessità emersa di un maggior approfondimento teorico e applicativo sulle molteplici relazioni tra turismo e paesaggio, cercando da un lato di fornire una concettualizzazione appropriata al termine "paesaggio turistico" e dall'altro un quadro metodologico per la sua analisi e valutazione integrata. Al fine di ottenere tale obiettivo, una profonda ricerca bibliografica è stata eseguita esplorando paradigmi riferibili a vari ambiti disciplinari, come le scienze spaziali, l'ecologia del paesaggio, la psicologia ambientale e la geografia culturale. In base ai riferimenti studiati, un quadro teorico e metodologico è stato sviluppato attorno a tre aspetti chiave del paesaggio turistico (fattori contestuali, caratteri del paesaggio e immagini mentali). Per l'applicazione e la verifica di tale quadro è stato utilizzato il caso studio di Lindos, dove il paesaggio appartiene alla caratteristica tipologia dei paesaggi costieri dell'Egeo, e dove si sviluppa il paradosso della compresenza dell'immagine protetta degli insediamenti tradizionali e del forte cambiamento di carattere paesaggistico dovuto allo sviluppo turistico. I metodi di ricerca che sono stati utilizzati comprendono sia quelli che mirano all'acquisizione e all'analisi di dati oggettivi basati su tecniche esperte (come il telerilevamento, l'analisi statistica di dati primari e secondari, l'applicazione di indicatori) sia quelli che mirano all'acquisizione e analisi di dati soggettivi con la costruzione di un questionario che raccoglie dati primari da un numero considerevole di turisti. Tramite questi metodi è stato possibile in primo luogo trarre risultati significativi riguardo al caso studio, che hanno permesso la formulazione di alcuni suggerimenti per la gestione del paesaggio; in secondo luogo da questo lavoro emergono anche considerazioni più generali sugli ostacoli e le potenzialità di una vera ricerca integrata sul tema del paesaggio turistico.

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Chapter 1.
Introduction to research topic

1.1 Research topic placement

"Landscape" and "Tourism" constitute two multidimensional concepts for which many different research approaches deriving from a broad range of disciplines (Spatial Planning, Landscape Ecology, Environmental Psychology, Tourism Sciences, Cultural Geography, Anthropology, etc.) can be employed in the attempt to identify and explore their interrelationships. Therefore, it becomes evident that the definitions that one could give to the notion of "tourism landscape" are as numerous as the contexts in which it could be used. Indeed, in literature the lack of attempts of giving a clear and common definition of the "tourism landscape" is noticeable.

The main objective of this research project is the creation of a theoretical and methodological framework for the conceptualization, analysis and evaluation of the tourism landscape integrating and comparing concepts and methods from a broad range of disciplines (spatial sciences, landscape research, tourism studies and environmental psychology) in order to respond to the need of an integrated approach to the tourism landscape, as well as to the need for a more coherent planning and management characterized by a broader awareness about tourism landscapes.

The pathway I followed to structure my theoretical and methodological framework for tourism landscape analysis and evaluation has essentially been based on the following statement: *"As a focus of research, the tourism landscape requires contextual interpretation and cannot be detached from questions of positionality and from its historical and socio-cultural context, - its relationship with an observer."* (Terkenli, 2008)

With this delineation, the approach of my research project is positioned among those studies that recognize the tourism landscape as an empirical manifestation of territoriality (Turco, 2002), attempting to associate it with the contextual factors and

processes that continuously affect it. In this view, in this project, the notion of tourism landscape incorporates the physiognomy of the space delineating a tourism destination, intended as a combination of natural and cultural elements and values, the consequences of tourism activity and other interrelated processes within this space and its broader territory, as well as the images that tourists form during their active and participative experience within it.

In order to achieve the research objective, at the first part of this study, a deep bibliographic research was performed, exploring research paradigms from various disciplines. Besides the different insights on human-environment relationships provided by each disciplinary field and the variability in terminology and research objectives, I have distinguished and analyzed three concepts with a lot of underlying conceptual and methodological linkages between them: "Landscape", "Tourism destination", and "Destination image". After the clarification of each concept, I studied several methodologies that have significantly contributed to the formulation of the suggested final framework for tourism landscape analysis and evaluation which included a considerable number of objective and subjective variables analysed in different spatial scale of reference.

At the second part of this study, in order to apply and verify the framework, the case study of Lindos, on the southeast coast of the island of Rhodes has been adopted. The main reason for which Lindos area has been chosen as a unit of analysis is that the landscape of Lindos belongs to the characteristic typology of the Aegean coastal landscape, where the protected image of traditional settlements paradoxically coexists with great landscape transformations due to tourism development. Therefore, this typology of landscape is extremely difficult to manage due to two coexisting symbolic dimensions: the historical dimension associated with an anachronistic cultural identity of the Greeks, and the symbolic dimension of the Greek tourism, expressed by three (sea, sand, sun) fundamental attractions (Terkenli, 2001).

With these two general steps of study, I attempted to respond to the following research questions:

1. In what tourism destination context is the landscape of Lindos area involved?
2. How can the landscape character of Lindos area be described? And how contextual factors have affected it?
3. What are the prevailing images of tourists, formulated during their tourism landscape experience in Lindos area? How do subjective factors affect them? How these images do affect tourists' attitudes towards the tourism landscape of Lindos?

4. How the outcomes of each analysis can be interpreted in an integrated perspective? Is there any indication about the future management of the tourism landscape of Lindos that can be emerged from the integration of outcomes?

For the first two research questions, the employed methods of research have included the collection of qualitative and quantitative secondary data from databases, expert's reports and historical literature, as well as the collection of primary qualitative and quantitative data from remote sensing techniques and fieldwork. The acquired data have been elaborated through application of indicators and statistical descriptive analysis and they have been represented in thematic maps which have facilitated their integrated interpretation. For the third group of research questions, a questionnaire-based survey has been constructed and implemented in order to acquire primary data on a considerable number of tourists in Lindos area. The acquired data have been elaborated through multivariate Statistical analyses and they have been represented in graphs and thematic maps. In order to respond to the fourth group of research questions, a descriptive method has been used based on the collective interpretation of the overall research findings.

1.2 Research value and usefulness

The scientific contribution of this study could be mainly sought in the effort to capture the multifaced nature of the landscape, using it as an integrative concept in order to address a variety of issues related to tourism dynamics on the territory and tourists' images. Accepting the transactional nature of the landscape, lying between reality and the image of that reality, which is particularly emphasized in the definition of the landscape given by the ELC, has led to the effort to consider both the outcomes of specific experts' based techniques for tourism landscape analysis and evaluation as well as visitors' evaluative perception. Therefore, another contribution of this research project could be sought in the attempt of mixing expert knowledge with that of non-experts (visitors), a research frontier which remains unexplored (Cassatella and Peano, 2011). As regards the exploration of the visitors' images, the originality of this research project could be found on the effort to explore the onsite images that are not detached from visitors' personal experience of the site, introducing, therefore, to the tourism landscape evaluation the visitors' personal characteristics as influencing factors. Furthermore, this research project although its limitations, has constituted a struggle for creating a unique database, bringing together as much as information as

possible concerning the case study. Collected secondary data and cartographic materials have then processed, in order to make them applicable to the scale of interest, incorporating them as well with the results obtained from original analyses and the empirical study. One of the challenges has been the integrated interpretation of the results. For this reason, in order to facilitate interpretaion and make the results more useful to decision making, another attempt of this study has been the representation of information in thematic maps. The main subjects for which this research is intended are the Greek bodies involved in tourism landscape transformation and management, in other words the administrations which, at various levels are responsible for management plans for tourism areas characterized by natural and cultural attractions.

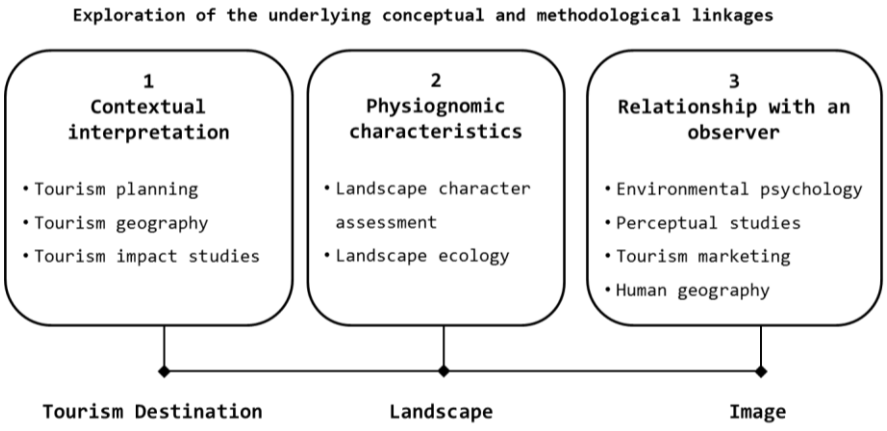
Chapter 2.
Theoretical & methodological framework

Introduction

This chapter describes the theoretical and methodological references which have been explored in my attempt to create a basis for the conceptualization of the tourism landscape and an appropriate framework for its analysis and evaluation.

As a first step, a thorough literature review has been conducted within a broad range of disciplines, starting from spatial sciences and landscape research and advancing towards tourism studies and environmental psychology. Besides the different insights on human-environment relationships provided by each disciplinary field and the variability in terminology and research objectives, three concepts with a lot of underlying conceptual and methodological linkages between them are distinguished and then analysed in the following paragraphs: “Landscape”, “Tourism destination”, and “Destination image”. As a second step, following the clarification of each concept and the description of the various approaches existing in literature, I expose some important methodologies that have significantly contributed on the formulation of my suggested framework for tourism landscape analysis and evaluation illustrated at the last part of this chapter.

Figure (2.1) Theoretical inputs and concepts



2.1 Landscape concept and approaches

2.1.1 The ambiguity of landscape term

Landscape constitutes a concept that has always contained multiple meanings and has been characterized by various approaches. The representation, design and understanding of landscapes has been a topic of research at least since the Renaissance (Taylor et. al, 1987). Over time, different definitions and ways of dealing with the landscape have been developed, each one contributing to a broader even though more ambiguous understanding of the landscape. Today, landscape is used across a wide disciplinary spectrum and constitutes an adjunct to a range of research and policy agendas.

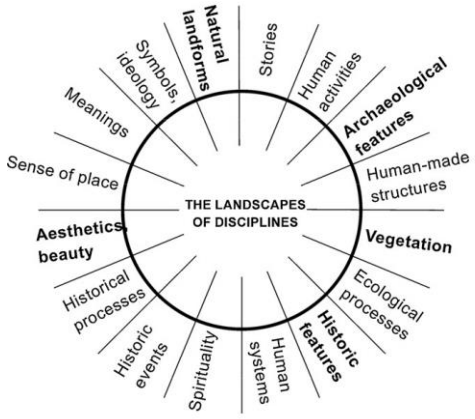


Figure (2.2) The main facets of landscape of interest to disciplines (Stephenson, 2008)

The ambiguity of the landscape term increased rather late in its own life history (Renes, Kolen 2015). During the Middle Ages, the territorial meaning of the words *landschap*, *landskab* and *landschaft* referred to the incorporated and without confusing ambiguities trinity of land, people and territory (Olwig, 1996). However, with the emergence of landscape painting as a separate artistic genre in Europe around 1500, and especially from the early sixteenth century onwards, the concept of landscape acquired an ambiguous meaning that stands between the real outside world and its representation. Nevertheless, with the Enlightenment and the increasing importance of natural sciences from the end of the eighteenth century, the concept of landscape was isolated, objectified and dissected into smaller parts of nature in order to be analyzed. Therefore, by then the landscape become not only more ambiguous but even dualistic. During twentieth century, however, geography attempted to restore the unity of the landscape reconnecting nature and culture, while phenomenologists included the present

and personal experience as an important factor for understanding the landscape. In these circumstances, Meinig (1979) affirms that "Landscape is an attractive, important, and ambiguous term (that) encompasses an ensemble of ordinary features which constitute an extraordinarily rich exhibit of the course and character of any society" and that "Landscape is defined by our vision and interpreted by our minds." In the last decades and principally after the formulation of European Landscape Convention (Florence 2000), a broader socialization of landscape took place, emphasizing the transactional aspect of the landscape, lying between reality and the image of that reality, between objectivity and subjectivity, actuality and potentiality (Turco, 2002; Castiglioni et al.2015) and extending its meaning from the extraordinary and scenic natural environments to ordinary places where lay people live. Indeed, ELC defines the landscape as *"an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors"*, and acknowledges its *"important public interest role in the cultural, ecological, environmental and social fields"*. This wide and still unresolved ambiguous definition of landscape, even though attempts to embrace the multifaceted substance of landscape, leads to even more great expansion of the use of the landscape term among different academic and technical fields.

In the 90's several researchers tried to explain this apparent ambiguity of landscape phenomenon in biological terms. According to Aoki (1999) this ambiguity originates from the developed analytical systems of the brain, while Bourassa (1991) suggests that the difficulty of understanding landscape derives from human evolution, being affected by both ontogenesis[1] and phylogenesis[2], proposing three steps of clarification in landscape appreciation: *Biological, Cultural and Personal Landscape Acquisition*.

Although the categorization of the various meanings and approaches attributed to landscape is quite difficult due to conceptual and methodological linkages that make difficult their distinction, three main approaches can generally be recognized on the basis of the origin of their philosophical theory.

A. According to positivist understanding, the landscape is a specific portion of the earth's surface and the material result of human-nature relationship in a given area which constitutes a concrete an objectively existing reality. Environmental sciences are those mainly characterized by this positivist approach, with landscape ecology having a leading role. Indeed, Forman and Godron (1986), the founders of the discipline of landscape ecology defined landscape as "a heterogeneous land area composed of a cluster

[1] In Biology: the development or developmental history of an individual organism.
[2] In Biology: the evolutionary history of a group of organisms, especially as depicted in a family tree.

of interacting ecosystems that is repeated in similar form throughout". This approach is based on knowledge gained from scientific methods and on the belief that a researcher, by discovering general patterns of cause-and-effect with strict methodological rules, avoids subjective bias and the objective results can be used as a basis for predicting and controlling natural phenomena.

B. According to social constructivist approach, the landscape is a cultural and social construction whose quality is in the eye of the beholder. In this view, the landscape is "not merely the world we see, it is a construction, a composition of that world. Landscape is a way of seeing" (Cosgrove, 1984). This definition of landscape is dependent on subjective pre-requisitions and individual feelings as well as influenced by cultural factors such as norms, values, ideologies, or attributions of meaning (Gailing, 2012). Human sciences, such as historical and cultural geography, are those mainly characterized by the social constructivist approach according to which there is no absolute knowledge, just peoples' interpretation of it. With this assumption, the acquisition of knowledge requires the individual to consider the information and based on their past experiences, personal views, and cultural background, construct an interpretation of the information that is being presented to them.[3] Therefore, in contrast with the positivist approach the social construction of landscape not only emphasizes its subjective meanings and interpretations but also the neglected influence of cultural and institutional factors (Gailing, 2012).

C. According to integrated approaches that aim to restore the unity of the landscape, landscapes are both materially and perceptually constructed (Terkenli, 2001) and they are understood as a combination of forms, functions and meanings (Wascher 2002, Terkenli and Kizos, 2003). As Gailing et al. (2013) claim, "recent work in human geography and sociology (Jones, 2006; Kaufmann, 2005; Kühne, 2008; Robertson and Richards, 2003) has widened the perspective of landscape research: while the physical "reality" of landscapes remains an important point of reference, human agency, symbolic representations, normative constructions of spatial images and – more generally – forms of cultural and social practice are acquiring greater importance."

Therefore today, "the word "landscape" implies a multidimensional and holistic concept, unifying physical objects and mental representations at the interfaces between nature and culture, between the material and the immaterial, or between the subjective and the objective" (Jones, 1991).

[3] http://www.ucdoer.ie/index.php/Education_Theory/Constructivism_and_Social_Constructivism

2.1.2 Underlying concepts in the landscape evaluation process

Assuming the broader definition of landscape, as both physical object and mental representation, several underlying interrelated concepts have been explored in order to better understand the process of landscape evaluation by individuals and groups of people: Information, Experience(s), Perception(s), Preference(s), Need(s), Desire(s), Value(s).

In psychology, perception[4] is defined as the process in which information is derived through senses, organized and interpreted, while in environmental psychology, it is further specified as an active process which takes place between the organism and environment (Hilgard, 1951 in R. Kaplan & S. Kaplan, 1978). Zube (1987) defines landscape perception as the product of transactions between individuals and landscapes and recognizes that land forms and land use patterns are important sources of information. Both Appleton's prospect-refuge theory (1975) and Kaplan and Kaplan's information processing theory (1989) emphasize the importance of information as being central to human experience and survival throughout the evolution of human being. According to these theories developed within the field of environmental psychology, people need to gain information from the contents and the organization of the environment to make sense out of it, to feel secure, to look for new challenges, as well as to enhance their ability to function within it (Kaplan et al., 1998). These theories however, are based on the assumption that the process of selection of important information discernible in specific landscape structures is not individually or culturally but innately or biologically determined, recognizing a consensual preference among people on certain landscape types and attributes of landscape. For this reason, these theories have been criticized in more recent literature, as latter studies in human geography have explained that landscape structure or attributes cannot be considered enough to create landscape perceptions or preferences but they can only be sources of information that people interpret in various ways (Weinstoerffer and Girardin, 2000). According to Simmel (1993) the values and meanings assigned to landscape structures, allow people to combine landscape elements to a consistent landscape picture.

Zube (1987) affirms that the distribution of landscape elements (such as fields, buildings, water etc.) is perceived differently over time by different individuals and it is each individual's range of experiences that plays an important role in the

[4] Porteous (1996) discusses that there are two basic **modes of perception**; autocentric, which is subject centered, and allocentric, which is object centered. He explains that sensory quality and pleasure are involved in autocentric senses, while allocentric senses involve attention and directionality.

formation of landscape perception. He additionally points out that, different people may agree about the scenic beauty of a landscape but in their landscape evaluation[5] process they use different criteria that are mostly related to their specific (in terms of time, space, and social role) need(s) or desire(s). Therefore, landscape values[6] could be sought at the properties of the landscape that rend it desirable and/or useful to certain people[7].

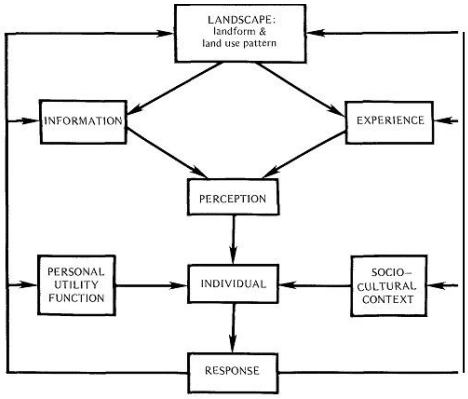


Figure (2.3) A transactional model of human/landscape relationships (Zube, 1987)

Besides individual experiences, cultural factors and social roles have a role in the formation of landscape perceptions as well. According to Buijs et. al (2006) "the way we look at the landscape may differ significantly through time, between cultures and cultural groups and between individuals", and thus "a differentiation of social perception of landscape can be identified in the different groups of social actors in the landscape". In addition, Lunginbuhl (2013) claims that landscape perception occurs at three different scale levels: a global/general scale linked to global/general cultural references and models; a local scale due to local practices and ways of life; and an individual scale. We can assume then, that even though landscape perception might be different for each individual, there are several global cultural references as well as collective experiences related to local practices that influence and lead certain

[5] Valuation is a constitutive part of human life and behavior, as humans' actions and reactions are not determined by instincts, but rather subject to (contingent) decisions (Bechmann, 1978)

[6] Buchecker et. Al (2007): "The term value has been defined in very different ways between, but also within different scientific disciplines. According to the classical economic theory, values were considered as characteristics inherent in goods. Later, they were understood as subjective judgments by economic agents of goods (Friendrichs 1968). Brown (1984) distinguished between values that are assigned through the process of evaluation and values that are held values as ideals of life. In social psychology values are widely defined as cognitive controls of behavior in the sense of 'desired values' (Oerter 1970). A definition of values often used in sociology and anthropology was formulated by Kluckhohn (1962:pg.395): "Values are the desirable which influences the selection from available modes and means". Especially anthropologists emphasize that value systems are specific for each culture (Kohl 1993) and form key mechanisms of collective identity."

[7] In the last decades a certain consensus seems to have emerged within the social sciences to view values as the criteria people use to choose between conflicting preferences and by which they justify actions and evaluate people and events (Bauerle 1984; Schwartz 1992; Taylor 1989).

groups of people to share similar patterns of landscape perception and preference at different levels/scales. Also "mental images"[8] of landscape, formulated from past experiences, may lead to different responses towards certain landscape types, attributes or features. For instance, if the "mental image" of landscape is associated with "nature", then people's criteria for evaluating landscapes and acting towards landscapes are probably mostly related to how they experience "nature". Similarly, if a certain landscape does not reflect that (culturally, institutionally or individually created) "mental image", it might be negatively evaluated, influencing at the same time people's way of experiencing it.

Therefore, landscape perceptions could be defined as the process in which each individual receives information through senses from landscapes functioning as "enormous communication device(s)" (Lynch, 1971), organizing and interpreting that information on base of his/her biological, cultural and personal acquisition.

Nevertheless, as the socio cultural context changes over time, new properties and functions of the landscape become more important for people's landscape experience(s) and even though people might be able to recognize a great range of values into landscape, the weights on the various values change. In this view, there is not an absolute idea about what makes a landscape attractive to people. The attractive landscape is a landscape perceived by a certain individuals as providing the utility function which satisfies their more or less ephemeral personal/collective needs and desires and invites people to become an active participant into landscape.

Therefore, as perception, cognition, and evaluation are highly interrelated processes (Kaplan, 1987; Antrop, 2009). "understanding how a landscape is valued involves understanding both the nature of the valued 'object' (or aspect of landscape), and the nature of the expressed value/s for that object. These values do not speak for themselves: they can only be identified when they are expressed by those who are part of the cultural context or by those who are in a position to observe and understand" (Stephenson, 2008).

A significant clarification about values is given by Brown et al. (2002), who support the idea that people hold certain "values" but also express "value" for certain objects. According to Buchecker et al. (2007) values held by individuals or groups determine their decisions and can be studied as well as quantitatively assessed on the

[8] Buijs et. al (2006): "They are the mental images to which the material landscapes are confronted and from which these landscapes acquire their meaning. But they not only influence our perceptions and meanings of nature, they are also shaped and transformed by our experiences, as the images are constructed through direct experiences in the life world as through popular, scientific and policy discourses (Eder 1996; Macnaghten and Urry 1998; Turnhout et al. 2004)".

basis of existing frameworks of hypothetical value categories. In contrast, values ascribe to landscape as they are generally unconscious to people, can only be indirectly interpreted through qualitative analysis. Nevertheless, due to the difficulty to access people's values and value systems, research on the impact of individuals' and groups' value systems on landscape perception has so far been neglected although they can be expected to be highly relevant (Meier and Buchecker 2005).

Some of the theoretical concepts suggesting Value Categories elaborated in the last decades in literature are illustrated in the following table even though most of them have not yet been systematically tested for their capacity to help identifying the value systems of individuals or groups in landscape relevant situations.

Table (2.1) Value categories elaborated in literature

The idea of good life of the western culture according to Taylor (1989)	▪ Naturalism ▪ Utilitarianism ▪ Expressionism ▪ Ideal of common life ▪ Asceticism ▪ Disengaged rationality ▪ Heroism
Theoretical model of relations among motivational types of values, and bipolar value dimensions (Schwartz 1992)	▪ "conservation vs. openness to change" ▪ "self-enhancement vs. self-transcendence" ▪ Needs of individuals as biological organisms ▪ Requisites of coordinated social interaction ▪ Welfare-needs of social groups
Values related to perceptions of landscape change - Hunziker (1995)	▪ Tradition ▪ Nature conservation ▪ Profit ▪ Emotions
Environmental values, Lengkeek et al. (1997)	▪ Use value ▪ Experience value ▪ Narrative value ▪ Appropriation value
Landscape values, Raymond C., Brown G. (2006)	▪ Aesthetic/scenic value ▪ Economic value ▪ Recreational value ▪ Life sustaining value ▪ Learning value ▪ Biological diversity ▪ Spiritual value ▪ Intrinsic value ▪ Heritage value ▪ Future value ▪ Therapeutic value ▪ Wilderness value

2.2 Landscape assessment

As a consequence of the ambiguity of the landscape term, since from the beginning of my bibliographic research, I have become aware of the plurality in landscape assessment approaches, and that researchers have not yet reached agreement on methods for landscape analysis, scientific description and evaluation of landscape (Aoki 1999). In this paragraph, various landscape assessment paradigms, approaches and methodologies

have been analyzed with the aim of selecting the appropriate methods to integrate in a methodological framework for tourism landscape analysis and evaluation.

The focus has been on both descriptive and quantitative methodologies, such as landscape character assessment, landscape quality assessment based on indicators, and the assessment of landscape capacity to provide ecosystem services based on land-cover data. Each methodology and study, even though not entirely adopted, has contributed in the analyses and the purposes of this research project. The way in which each concept and methodology is used is illustrated in the last paragraph of this chapter.

2.2.1 Landscape assessment paradigms and approaches

Landscape analysis is the scientific description of the factors and processes that formulated the landscape and can be conducted independently from planning purposes. In contrast, landscape assessment has originally been arisen as a specific field within the discipline of spatial planning. In the ’70s a special emphasis has been given to “landscape evaluation” through which landscapes could be compared and consequently subjectively judged on the basis of their visual qualities/values[9]. As Taylor et al. (1987) claim, for a long time the methods used by geographers and landscape architects were individual and based on personal interests and values. Thus, landscape evaluation can be defined as the process of identifying the importance of a particular landscape, landscape type or feature (i.e. what makes an area different or distinct from another), by reference to specified value criteria (Swanwick, 2002).

In the ‘80s however, the term of “landscape assessment” appeared for the first time as a general term that distinguishes the description and classification of landscape character from its subjective evaluation. Indeed, the term assessment refers to the process of description and classification of landscape character through mapping, as well as the consequent judging process on landscape character (evaluation) for the aim of decision-making. By that time, many researchers have been interested and involved in landscape assessment, such as psychologists, public land managers, lawyers and ecologists without however agreement on how to assess landscape values. Notwithstanding the broadening of scientific interests, landscape values have been standardized (Taylor et al, 1987), as managers and policy makers, in order to include landscape values along with economic and technical considerations in decision making, needed quantitative landscape assessments that could offer numeric measures comparable to economic and

[9] Even though there is not a clear distinction between the two terms “quality” and “value”, usually, landscape quality often refers to measurable tangible characteristics, while landscape value to intangible characteristics that cannot be easily quantified.

technical measures. Therefore, different disciplinary paradigms of landscape assessment have been developed. By the 80's Zube et al. (1982) identified four research paradigms on landscape assessment and perception which are; expert, psychophysical, cognitive and experiential paradigms (Taylor et al., 1987).

1. The expert paradigm: this paradigm is based on expert judgments of visual quality of landscapes and has its origin in the fields of fine arts and design as well as in ecology and resource management. The evaluation of landscape quality depends on formal characteristics of the landscape such as landform, vegetation, color, texture etc. The main assumption of this paradigm is that natural unspoiled landscapes have the greatest aesthetic value. This paradigm is criticized for its lack of compatibility with lay peoples' perceptions (Lekagul, 2002). Furthermore, S. Kaplan (1988) mentions that experts' visual perceptions are different to other people, and expert judgments are "a dubious source of objective judgment" on what lay people perceive as valuable in the landscape.

2. The psychophysical paradigm: In psychophysical paradigm the visual quality of the landscape is evaluated by the general public or special interest groups rather than by experts. The main assumption of this paradigm originates from behaviorism: the landscape acts as stimuli to which observers respond without conscious thinking. Ranking and sorting are widely used techniques in visual assessments within this paradigm. The objective is to determine what landscape visual quality is in order to be able to manage and protect it.

3. The cognitive paradigm: The cognitive paradigm focuses on why people prefer particular landscapes mainly with the aim of developing a theoretical basis. In contrast to psychophysical paradigm, cognitive paradigm assumes that cognitive processes influence aesthetic judgments. In this view, humans do not only respond passively to environmental stimuli but they also attribute values and meanings to them. Mostly verbal evaluation techniques, such as semantic differential analysis and adjective checklists, have been used to evaluate preferences and meanings. Most of the evolutionary theories on environmental perception (e.g. prospect refuge theory and information processing theory) form a basis for this paradigm. However, this paradigm neglects the physical environment and rather focuses on meanings associated with landscapes (Taylor et al., 1987).

4. The experiential paradigm: This paradigm focuses on human-environment interaction. Human experiences affect the landscape's perceived value. This approach is commonly used in "sense of place" studies and mainly by geographers. However,

experiential approach is more subjective than cognitive and psychophysical paradigms; therefore reliability and validity of the results are hard to be measured (Taylor et al., 1987).

One can notice that notwithstanding the long tradition in the representation, design and understanding of landscape, methodologies for landscape assessment have been developed quite recently (after the passage of the major environmental values in the 60's and '70s) and most of them for landscape conservation, management and decision-making purposes. The changing process of landscape assessment over the years demonstrates the importance of continual reinterpretation of conceptions, methodologies, and ethical contexts of landscape, reflecting on what should be assessed in terms of both intrinsic and extrinsic values. Today, due to the plurality of approaches to landscape assessment, a dynamic framework would be needed in order to identify the different and usually not explicit criteria used in landscape assessment. In this view, the dynamic model suggested by Castiglioni (2007) and conceptualized as a "synthesizer" of approaches identifies six dimensions (channels) of the landscape, among which, three refer to the landscape as a system and three focus on the landscape as identity. For each dimension, every approach to landscape assessment can be placed between opposite polarities. One of the two poles expresses a more obsolete or traditional idea, which sometimes remains inertial and opposite to another idea/approach, which is more critical or radical. The aim of this model is not the attribution of judgments to the various approaches, neither their collocation with respect to the various polarities. In her view, every approach has a reason to exist despite of its possible fragilities and internal incoherencies, as the identification of the appropriate "synthesis" among the various channels depends on the specific purpose of study, or research project.

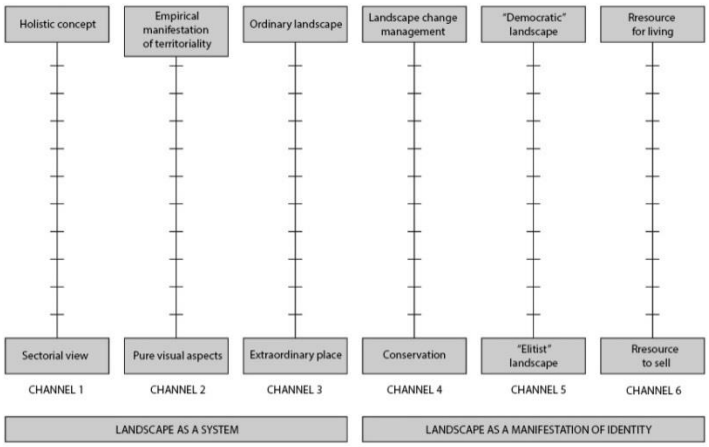


Figure (2.4) A 'synthesizer' of approaches to landscape and landscape evaluation (Castiglioni 2007)

First channel: between sectorial and holistic approaches

Very often the strict disciplinary boundaries lead to observe and consider only some of the landscape components, ignoring the relationships developed among several factors which also determine landscape characteristics (ELC). Adopting a holistic approach means giving considerable importance to the landscape as a system of relationships, and not as a simple sum of its parts. From a theoretical point of view, the idea of landscape, as a holistic concept, leads to assessments based on the stability and functionality of the system as a whole, and thus coherence and harmony established among the parties assume a prominent role. However, the evaluation of landscape coherence in a systemic and relational dimension is particularly difficult and lacks adequate tools to embrace the complexity and the significance of the "whole." The qualitative/descriptive methods are still somewhat privileged, with respect to quantitative analyses which appear still inadequate to capture the richness inherent in this relational dimension of landscape.

Second channel: between visual and empirical approaches

When the landscape is merely associated with its visual aspects, landscape assessment is disconnected from contextual factors and processes that continuously affect the landscape. For visual landscape assessments, methods are quite numerous, as well as research experiences. The criterion is mainly or exclusively aesthetic and subjective. At the opposite pole, there are approaches that consider the landscape in its deeper meaning, as a product of complex territorial dynamics. As Castiglioni (2007) claims, even though, landscape assessments in relation with territorial dynamics are undoubtedly more complex and require the evaluation of the dynamics themselves, understanding the landscape as an "empirical manifestation" of territoriality, may open new paths of research and potential applications that make use of the landscape as a complex indicator of territorial sustainability.

Third channel: between extraordinary and ordinary landscape approaches

One of the important points of the European Landscape Convention is the extension of landscape concept to any portion of the territory (Article 2), regardless of its quality, and with a strong attention to ordinary places where everyday people live. Nevertheless, the landscape thought as an exceptional place, or as a monument extrapolated from its context, constitutes the prevailing understanding of landscape. In this channel we can also individuate an intermediate approach to landscape which is mostly referred to rural landscapes, as a sign of a fair and balanced relationship between human and natural environment. The landscape thought as a "monument" is assessed

in relation with its exceptional nature, rarity, or, even in this case, to its beauty. This kind of assessment implies a priori positive judgment to landscapes with exceptional characteristics and which are scarcely affected by transformations. Instead, the assessment of ordinary landscapes implies to avoid preconceptions and standards of reference related to cultural heritage, and to look at the landscape with a kind of detachment identifying new criteria to combine with the more traditional ones, and recognizing essential values of the everyday life places.

Fourth channel: between landscape conservation and landscape change management

When accepting the dynamic nature of landscape as a continuously changing entity, landscape assessment with respect to transformations, becomes more critical. The perspective of landscape "conservation" seems meaningless whether considering the landscape transformations as a result of uncontrollable and dynamic territorial processes. The perspective of a simple landscape 'maintenance' however, engages the risk of transforming the landscape into museums without defined horizons. The criterion of these approaches is often the maintenance of the territorial identity, which however is also dynamic and does not merely depend on obsolete practices and their signs left on the landscape. As regards this dimension, Castiglioni stresses the need of including in the landscape assessment, criteria concerning the intensity (what has changed in a unit of time) and reversibility of landscape transformation in order to formulate active policies projected to future landscapes rather than those anchored to the past.

Fifth channel: between elitist and democratic landscape approaches

One of the strongest provocations of the European Landscape Convention concerns the association of landscape values with "The aspirations of lay people". In this process of landscape democratization, landscape assessment appears to be very complex, especially when the populations lack the ability to express their aspirations regarding the landscape. This issue leads to the hypothesis that landscape can be a "mediator" between population and territory. In this case, landscape assessment by experts, does not seem appropriate. Instead, landscape assessments based on the analysis of social perceptions may be more appropriate in recognizing the values attributed to landscape by people. However, as regards this dimension Castiglioni the "Democratic" participation in the decision making process needs to be revised. Numerous difficulties arise, in the practical and theoretical level, as we give space to all different subjectivities. In this case, landscape value emerges as complex indicator, because it includes the objective data, the intangible and subjective dimension.

Sixth channel: between landscape as a resource to sell and resource for living

As regards the widespread reference to landscape as a resource for the local development, the proposals are moving mostly in the direction of tourism promotion, as the only way for increasing its value. Taking to account the known risks associated with tourism practices, such as material damages to local resources, and those related to the exploitation of the image of place, one may wonder if the recognition and enhancement of local identity constitute only a necessary tool for marketing (aimed at achieving an exclusively economic sustainability), or if it can also be a component of human resources of the local community (the perspective of social sustainability or, more broadly, territorial sustainability). In addition, among the economist's approaches, it can be distinguished the approach of considering Landscape as income from that which proposing it as investment. If we consider landscape as a "resource to sell", the criterion used widely for its evaluation is linked to the "amount of product sold" and the offering to pay for it. instead if we consider it as a "resource for living" the criterion becomes more complex, and probably we are not in possession of appropriate tools (and perhaps even the theoretical basis) for evaluating the landscape as part of wealth and as a quality of life, not just material. Somehow, even in this channel, it appears the potential of landscape as a complex indicator for 'measuring' the ability to build "Local self-sustainable projects."

2.2.2 landscape character assessment

Among the various expert-paradigm descriptive methodologies the most representative is Landscape Character Assessment (LCA). This methodology has been developed in the United Kingdom and it has been used extensively used during the last decades. It aims at distinguishing the basic composition of landscape elements as well as the arrangement of the land uses and how they vary by geographic unit. This methodology focuses more on the physical nature of the landscape rather than on the relationship with the observers and it is separate from “Landscape Visual Impact Assessment” which aims at assessing the visual impacts of new developments in the landscape and is generally undertaken by professionals involved in landscape design and management. These methodologies, even though with some variance, are applied in many European counties. Internationally, landscape character assessment is supported by national programs such as ELCAI (European Landscape Character Initiative)[10], ENRISK (Environmental Risk Assessment for European Agriculture) and Land Use and Land Cover Area Sampling.

[10] European Landscape Character Initiative (ELCAI) coordinates 14 national approaches generating different forms of landscape character assessments (in Austria, Belgium, Czech Republic, Denmark, France, Germany, Hungary, Ireland, the Netherlands, Norway, Portugal, Spain, Switzerland, the UK)

In this research project, Landscape character assessment methodology has been studied due to its usefulness in decision-making process and many methodological references have been used in the formulation of the suggested framework for tourism landscape analysis and evaluation.

The Landscape Character Assessment is generally used in order to:

1. Describe a landscape with reference to the characteristics that combine to make a place distinctive

2. Give spatial reference to baseline information/evidence via mapped landscape character areas/types

3. Inform understanding of key characteristics, sense of place, special qualities etc. that can then inform judgements – decision making - regarding, for example, development management and the siting, design, scale and massing of developments from housing developments and transport infrastructure to forests, woodlands, or renewable energy projects

4. Assist with the monitoring of change

Main applications in the UK involve following activities (Swanwick, 2002):

1. Planning:

- Informing development plan policies
- Research on development potential and providing an input necessary for new forms of development (e.g. housing, energy plants)
- Contributing to landscape capacity studies
- Providing information to Environmental Assessment

2. Landscape conservation and management:

- Serving as a basis for landscape management strategies
- Providing rich set of information for special areas, including the range of boundaries and identification of areas
- Guiding land use in sustainable ways, including recommendations for using of disturbed areas
- Taking part in agri-environment schemes
- Informing in national environmental programs (e.g. Biodiversity Action Plans, Natural Heritage Futures)

The term ‘landscape character’ appears both in scientific research and in common language. Swanwick (2002) defines landscape character as ‘A distinct, recognizable and consistent pattern of elements in the landscape that makes one landscape different from another’, whereas landscape characterization has a wider meaning and is defined as ‘The process of identifying areas of similar character, classifying and mapping them and describing their character’. Therefore, when undertaking landscape evaluation the judgements should be based on the application of a clear understanding of landscape characterization. Among the various steps of the methodology, objectivity and subjectivity coexist and equally supplement the whole process of assessment. The assessment is performed at different spatial scales (from local to regional and national levels).

Landscape Characterization specifically includes the following processes:

- Identification of areas of distinctive landscape character[11]
- Classification of areas of distinctive landscape character
- Mapping
- Description of landscape character

As a first step, the purpose and the scope of the characterization should be determined, gathering information through desk study and fieldwork necessary for the identification of areas of distinct character.

Classification can involve a wide range of quantitative and qualitative methods. Physical science classification such as geology, botany and soils use a mix of qualitative, quantitative, subjective and objective methods. Classification involves two phases: the design of a set of rules for defining the classes and the identification of the appropriate classes on the basis of these rules. As regards the mapping step, several natural and cultural/social factors are taken into consideration in the analysis and the preparation of the map overlays as illustrated in the following diagram of landscape character assessment methodology.

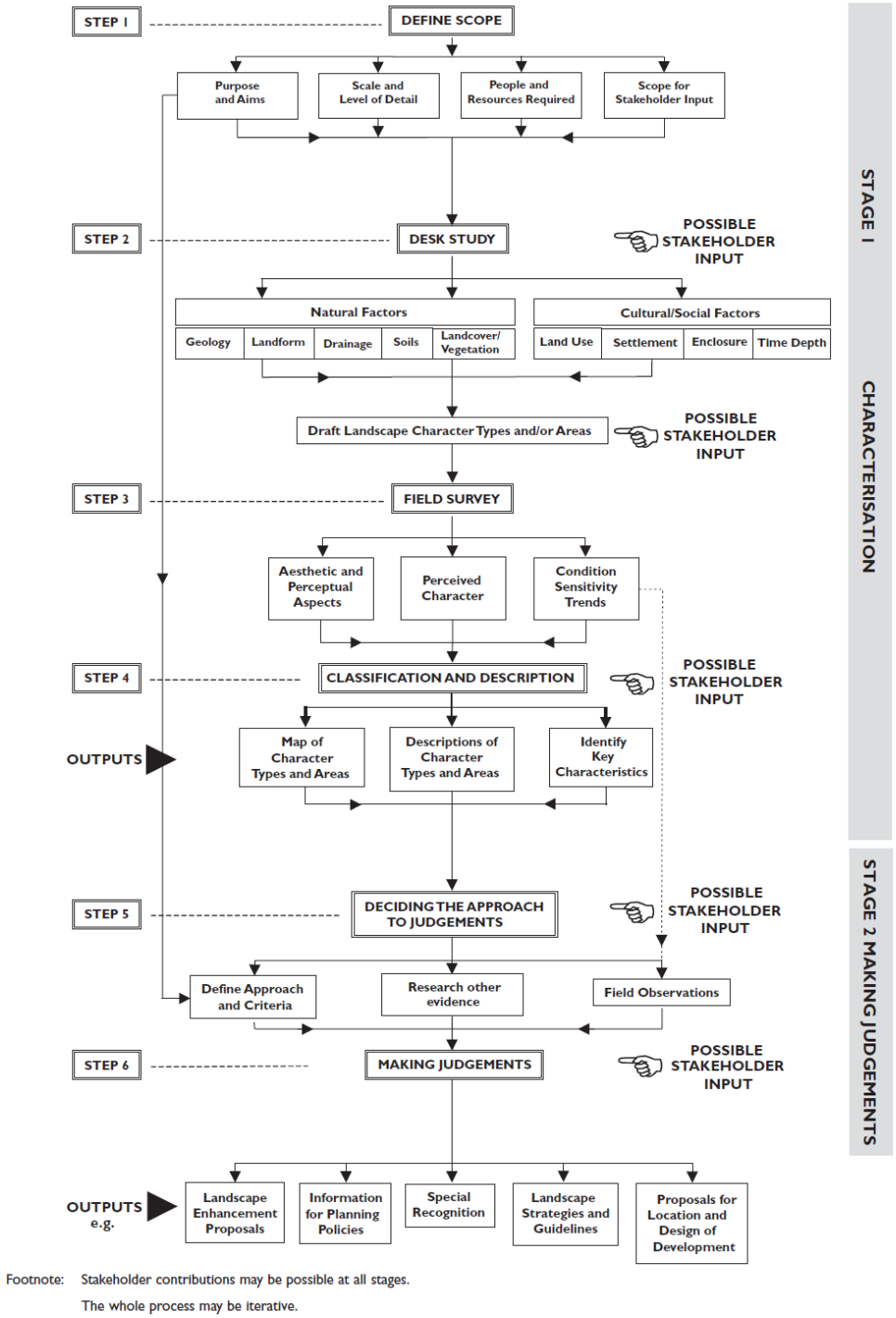
In contrast with the classification process, the description of landscape character does not require the grouping of objects into categories but results in the identification of landscape character types[12] (Countryside Commission for Scotland, 1988). The stage of making judgements puts the emphasis on aesthetic and perceptual aspects of landscape. The group of aesthetic factors comprises: balance and proportion,

[11] ‘A distinct, recognizable and consistent pattern of elements in the landscape that makes one landscape different from another’(Countryside Commission for Scotland, 1988)

[12] Landscape character types are defined as ‘distinct types of landscape, relatively homogeneous in character’ (Countryside Commission for Scotland, 1988)

scale, enclosure, texture, color, diversity, unity, and a form. Perceptual aspects take into account a sense of wilderness, a sense of security, the quality of light and perceptions of beauty or scenic attractiveness.

Figure (2.5) Flow diagram of Landscape Character Assessment methodology (Swanwick, 2002)



Footnote: Stakeholder contributions may be possible at all stages.
The whole process may be iterative.

2.2.3 Indicators for landscape assessment

As Wascher (2004) stresses, although landscape character can be an object of evaluation, character should not to be confused with the quality of a landscape, which is mainly dependent on the functions that have been assigned to it, e.g. aesthetic, recreational, economic and ecological. The study of landscape character should hence be considered as the necessary prerequisite for identifying state or quality indicators for landscapes, as well as the most relevant pressure indicators that affect this state. Assessments with different objectives (such as landscape transformations, the effects of landscape policies and plans, the relationship between a project and its context) require the selection of different indicators.

For the purpose of this research project, several studies on the use of landscape indicators measuring important landscape attributes on the basis of their research purposes have been studied as well as significant studies that suggest complete frameworks of indicators.

The indicator is a parameter associated with an environmental phenomenon, which can provide information on the characteristics of the event in its global form (OECD, 2003 in Cassatella and Peano, 2011). Its purpose is to indicate the state, or the variation in the state, of a phenomenon which cannot be measured directly. As Cassatella and Peano (2011) stress, data do not constitute an indicator by themselves, they can only be used as indicators when linked to a phenomenon other than that measured.

Vallega (2008) distinguishes three main functions of the indicators:
-Recognition function (monitoring and measuring conditions and processes)
-Evaluation function (judgement of the value on the conditions/processes and on the human action in relation to these)
-Orientation function (supplying indications on how human action should be implemented)

In political and planning context, assessment and monitoring, two procedures that require the use of indicators, have been introduced with the European directives such as Environmental Impact Assessment (Directive 85/337/EEC, EEC 1985) for intervention projects, and Strategic Environmental Assessment (Directive 2001/42/EEC, EC 2001) for plans and programs with an effect on the environment and therefore for all territorial and landscape plans. In these assessment systems, the landscape is considered one of the environmental components subject to possible impacts. Indeed, quantitative landscape assessment has recently been included in the field of analysis of territorial transformations, and is based on environmental indicators deriving from the most consolidated and structured models are used (DEFRA 2009; Eurostat 1999, 2009;

International Institute for Sustainable Development 1999; UNCSD 2001, 2007; World Bank 2008, in Cassatella and Peano, 2011). One consolidated instrument is the system of environmental indicators known as the DPSIR model (Driving forces, Pressures, State, Impacts and Responses), established by the Organization for Economic Cooperation and Development in the early 1990s (OECD 1993), and acknowledged by the European Environment Agency (EEA 1995).

Therefore, due to the complexity of the landscape concept and the short tradition in the quantification of its qualities, simplified landscape assessment models have been developed. With these models the ecological and aesthetic quality of the landscape is usually estimated using indicators of landscape structure (landscape metrics or indexes) or environmental indicators.

Indicators of landscape structure (Landscape metrics or indexes), developed to describe and measure in a quantitative manner the structural properties of landscapes, were used in many scientific areas from the ‘50s to today, but software capable to facilitate their calculation (such as FRAGSTATS software by McGarigal and Marks, 1995) appeared with the use of GIS in the late ‘70s. GIS have enabled geographers and ecologists of the landscape to quantify the structure of landscape, its heterogeneity, fragmentation and other properties. Landscape metrics are widely used in recent years and have the advantage of being applicable in any geographical context. They can be applied to large scale focusing on land cover and uses through remote sensing and statistical methods and to small scale focusing on attributes that describe structural aspects of landscapes such as typology, diversity/coherence, naturalness, man-made objects (architecture, stone walls, etc.) as well as patterns, lines and points. The possibilities for making meaningful quantitative analysis of spatial patterns however depend upon the availability of geographical data, preferentially as maps. Many landscape metrics remain abstract and are difficult to understand and to interpret. The method used for defining land units and describing their characteristics significantly determines the values of the landscape metrics obtained.

The analysis of landscape structures is most consequently performed in countries that are undertaking ‘Landscape Character Assessments’ and where national landscape typologies as references for indicator assessments and interpretation are being developed. Landscape Character Assessments based on landscape typologies take a more region-specific approach than pure structure analytical techniques. (Wascher, 2004)

However, considering that most of the European experiences come from Northern Europe, ecological aspects have already been examined sufficiently, while the historical and cultural aspects remain unsatisfactory, but still very central to the evaluation of

Mediterranean landscapes (Cassatella and Peano, 2011). The types of indicators used in various international studies emphasize how the landscape is identified and evaluated especially with regard to its ecological dimension, visual perceptual, and land uses, while limited are the attempts of measuring economic aspects of the landscapes and there is an obvious lack of methods for the analysis of historical and cultural values.

Table(2.2) Landscape attributes and indicators used in various studies of landscape assessment

Coeterier J.F. (1996)	**Tveit et al. (2006)**	**Van Eetvelde V., Antrop M. (2009)**	**Antrop M., Sevenant M. (2009)**	**De Vries et al. (2013)**
Dominant attributes in the perception and evaluation of Dutch landscape	Key concepts of visual landscape character	Indicators for assessing changing landscape character of cultural landscapes in Flanders (Belgium)	Cognitive attributes and aesthetic preferences in assessment and differentiation of landscapes	Measuring the attractiveness of Dutch landscapes: Identifying national hotspots of highly valued places using Google Maps
Unity	Naturalness	Proportion of landscape character type	Varied	Green
Maintenance	Disturbance	Number of patches	Vast	Quiet
Spaciousness	Imageability	Mean patch area	Coherent	Natural
Naturalness	Historicity	Patch density	Human-influenced	Presence of water
Use	Stewardship	Mean shape index	Well-maintained	Open
Development in time	Coherence	Patch richness	Quite and silent	Recreation
Sensory qualities	Visual scale	Landscape heterogeneity	Attractive vegetation	Silence
	Complexity	Openness	Unspoiled	Variation
			Familiar	Non-urban
			Inviting to visit	Personal
			Of historical importance	Historical
			Valuable for conservation	Ecological
			Homogeneous	Cohesion
			Bearing a lot of functions	Economical
			Accessible	
			Typical	

Among the various studies that suggest a framework of indicators for landscape assessment, the study entitled "Indicadors de paisatge. Reptes i perspectives" of the Landscape Observatory of Catalonia (Nogué et al. 2009) provides some interesting examples about landscape assessment with use of social, economic and ecological indicators (applied in Catalonia, Andalusia, the Netherlands, Italy and Great Britain). The landscape indicator is defined as a quantitative or qualitative element, which can be used to assess and monitor the evolution and state, public satisfaction, and the effectiveness of public and private initiatives for the improvement of the same. Ten indicators which constitute a basic proposal for Catalonia have been defined. This

proposal is unavoidably generic given the incredibly high level of landscape diversity in Catalonia. Besides, a reduced list of indicators has been chosen in order to guarantee their effectiveness and to link very closely landscape indicators with objectives of landscape quality defined for Catalonia as a whole:

1. Transformation of landscape: analysis of changes in the natural and cultural characteristics of landscape which alter its value or its appearance.
2. Landscape diversity: evolution of the richness of landscape configurations.
3. Landscape fragmentation: the result of a process of breaking and splitting into pieces the continuity of a landscape and its coherence.
4. Economic value of the landscape: the capacity of a landscape to convert its features into productive resources of diverse economic value.
5. Knowledge of the landscape: the level of recognition and interaction with the landscape which a given population experiences.
6. Landscape satisfaction: the level of satisfaction or dissatisfaction with their landscape of the population living in a given area.
7. Landscape sociability: makes it possible to ascertain social relations in its widest sense in relation to the landscape and generated by the landscape.
8. Landscape and communication: approximation to the communicative dimension of the landscape.
9. Public and private action in the field of conservation: monitoring public policies and private actions

The study "Indicatori per il paesaggio" (Vallega 2008), with an analysis of the conceptual settings on the characteristics and the role of landscape indicators, includes 9 groups of indicators applicable at sub-national level and associated with the issue of sustainability and themes treated in the European Landscape Convention:

1. Biological quality
2. Environmental quality
3. Urban quality
4. Tangible culture
5. Intangible culture
6. Aesthetic quality
7. Institutional actions
8. Education
9. Social communication

Lastly, Cassatella and Peano (2011), with their study entitled “Landscape indicators. Assessing and monitoring landscape quality” provide a thorough overview on

landscape indicators which includes five aspects of the landscape at a regional and local scale: economic, ecological, historical and cultural, perceptual (visual and social), and land uses. Even though, the suggested framework of indicators has been made with reference to a specific territory, the Region of Piedmont, due to its effort to considerer the less examined landscape aspects as well, such as historical values and the issue of social perception, constitutes one of the most valuable and complete frameworks in landscape assessment existing in recent literature.

Figure (2.6) Categories of landscape Indicators (Cassatella and Peano, 2011)

2.2.4 A land-cover based approach to assess landscape capacity to provide ecosystem services

Considering the strong relationship between tourism and nature and the prevailing dependence of recreational value on the ecological aspects of tourism landscapes, the assessment of ecosystem services may also be valuable in formulating a general framework for tourism landscape analysis and evaluation. With this purpose, in this research project, several concepts and methodologies have been studied and analyzed focusing on a land-cover approach that can be integrated with other analyses of tourism landscape.

The concept of ecosystem services is increasingly drawing attention among scientists and decision makers as the societal dependence on ecological life support systems becomes more and more broadly acknowledged (Daily, 1997; de Groot et al., 2002 in Gómez-Baggethun et. al, 2009). Within this utilitarian framing of ecosystem services, defined as "the benefits humans obtain from nature" (MA, 2005), the Millennium Ecosystem Assessment[13] introduces ecosystem services into the policy agenda explicitly highlighting the importance of biodiversity conservation and the beneficial ecosystem functions as services for society. Ecosystem services consist of provisioning services (e.g. food, fresh water), regulating services (e.g. flood or erosion protection), cultural services (e.g. tourism, cultural heritage) and supporting services (e.g. nutrient cycles).

Besides the explicit link between the concept of ecosystem and landscape in the field of landscape ecology, denoted by defining landscape as "a spatial pattern of abiotic, biotic and anthropogenic components which form a functional entity and serve as human's environment" (Leser, 1997 in Bastian, 2001), there is a general acknowledgement that landscapes contain important functions which provide numerous goods and services to society (Helming and Wiggering 2003, Brandt and Vejre 2004, HainesYoung and Potschin 2004, de Groot 2006, Gimona and Van der Horst 2007, Willemen et al. 2008 as mentioned in Müller et al. 2010).

Consequently, a new scientific interested has been developed around the study of ecosystem services at the landscape scale. The major topics deal with the identification and quantification of ecosystem services and their relationship with landscape functions, the development of modelling approaches to study the spatio-temporal dynamics of ecosystems at the landscape scale as well as their application in decision making and management (Müller et al. 2010).

Nevertheless, although the abundance of models for assessing ecosystem services in ecological terms, there is a lack of conceptual and methodological link of ecosystem services and cultural landscape research (Schaich et. al, 2010), a link that apparently could be further explored through the concept of cultural services. Cultural ecosystem services refer to the immaterial benefits people can obtain from ecosystem services through spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences (MA, 2005, p.40). Due to the difficulty in defining attributes and

[13] The Millennium Ecosystem Assessment (MA) was called for by the United Nations Secretary-General Kofi Annan in 2000. Initiated in 2001, the objective of the MA was to assess the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being. The MA has involved the work of more than 1,360 experts worldwide. Their findings, contained in five technical volumes and six synthesis reports, provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide (such as clean water, food, forest products, flood control, and natural resources) and the options to restore, conserve or enhance the sustainable use of ecosystems. Source: http://www.millenniumassessment.org/

capturing the intangible nature of cultural ecosystem services, within the recently developed methodological frameworks for assessing ecosystem services, cultural services have been mostly neglected.

Indeed, so far, the Millennium Ecosystem Assessment (MA) has been able to measure only three cultural services (spiritual and religious values, aesthetic values, recreation and ecotourism). The remaining cultural services (cultural diversity, knowledge systems, educational values, inspiration, social relations, sense of place, and cultural heritage values) could not be assessed due to the lack of available information, as well due to the fact that these services are highly place-specific. For this reason these frameworks are considered as involving a high risk of guiding a biased landscape management and planning, accentuating the need for a further clarification of the concept of ecosystem services by distinguishing between services exclusively referring to ecological aspects and their benefits referring to cultural and amenity values (Boyd and Banzhaf 2006, Fisher 2009, as mentioned in Schaich et. al, 2010).

In literature there are various approaches to ecosystem services assessment that are designed for specific purposes and scientific interest. Potschin and Haines-Young (2012) make a distinction of three Ecosystem assessment approaches: a habitat-based approach made on the basis of stock and condition of components of biodiversity, a systems or process-based approach based on structural and functional relationships that determine service output and a place-based approach according to which services are assessed as bundle across units that have strong social relevance or resonance.

In addition, as regards the habitat-based approaches, in literature there is a further distinction that differentiates monetary approaches, which use methods to estimate the economic value (Costanza et al., 1997) of ecosystems services (such as cost-benefit analyses, contingent valuations or willingness to pay assessments) from land cover based approaches, which consider spatial patterns of land use and climatic conditions. Although monetary approaches are useful attempts for assessing ecosystem services their results are often considered unsatisfactory due to the economic focus and the lack of appropriate pricing methods (Ludwig, 2000; Spangenberg and Settele, 2010 as mentioned in Burkhard et. al, 2012).

In contrast to monetary approaches and due to the spatial properties of ecosystem services, a land cover based approach would provide decision makers with useful aggregated information concerning the explicit quantification and spatial distribution of ecosystem services. Moreover, the provision of ecosystem services is strictly related to the land cover defined “as the biophysical state of Earth’s surface and immediate subsurface” (Turner et al., 1990). Land cover, indeed, refers to the type of vegetation

that covers the land surface, other aspects of the physical environment, such as soils, biodiversity, surfaces, and groundwater, as well as to human structures, such as buildings or pavement (Briassoulis, 2003) that all determine the provision of ecosystem services in a certain area. It should be mentioned however, that although land cover and land use[14] are two interrelated[15] terms, they are not identical. Land cover denotes the physical, chemical, or biological categorization of the terrestrial surface (such as, grassland, forest or concrete) whereas land use refers to purposes associated with that cover (raising cattle, recreation, urban living).

However, there are land classification systems based on mixed nomenclatures of land cover and use such as the Land Cover classification of the European CORINE project (EEA 1994). Both land use and land cover classes represent analytical units, which allow establishing a first quantitative link between human activities, environmental impacts and its geographical (spatial) dimension.

In addition to the quantification and spatial distribution of ecosystem services, the visual representation of information relating to ecosystem services in maps, is generally considered as a facilitating factor in the decision making process and especially at local level (Daily and Matson 2008, as mentioned in Burkhard et. al, 2012). Indeed, recently several advanced ecosystem service mapping approaches have been developed and applied at different spatial scales in the attempt to offer an insight into the status of an ecosystem service and its disparities between supply (ecosystem service provision) and demand (human needs and desired level of provision).

In this view Burkhard B. et al. (2009) suggest a methodological framework with which besides exploring the potential ecosystem service provision of the different land cover units, attempts to combine expert judgements with quantitative data to assess landscapes' capacities to provide ecosystem services. Although, this approach is relatively new, general and subject to methodological and theoretical improvements, it constitutes a base for assessment and a useful tool for the quantification and spatial modelling of multiple ecosystem services in different landscapes across Europe, since

[14] Land use, according to Meyer and Turner involves both the manner in which the biophysical attributes of the land are manipulated and the intent underlying that manipulation – the purpose for which land is used. According to FAO, land use concerns the function or purpose for which land is used by the population; it can be defined as "the human activities that are directly related to land, making use of its resources or having an impact on them" (Briassoulis, 2003).

[15] A single land use may correspond to a single land cover, and a single system of use may involve the maintenance of several distinct covers (farming systems combine cultivated land, improved pasture and settlements) (Briassoulis, 2003).

the land cover classes of the European CORINE project (EEA 1994)[16] are used as input data for assessment.

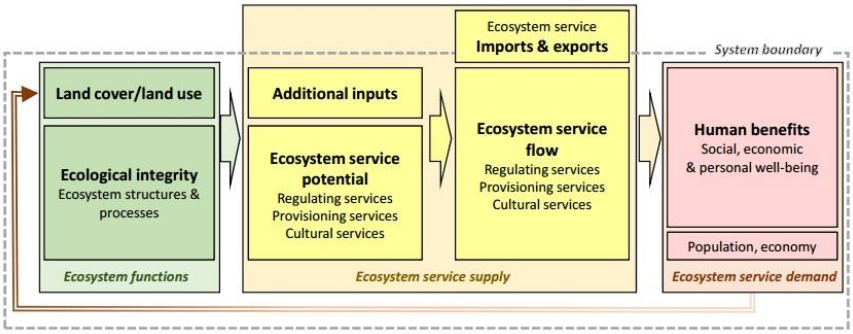


Figure (2.7) Conceptual model showing relations of ecosystem function, services and benefits (Burkhard et. al, 2014)

For an appropriate assessment of ecosystem services, however, additional data concerning the description of structures and processes relevant for the long-term functionality and self-organizing capacity of ecosystems should be integrated along with CORINE data. Necessary data concerning structures relate to numbers and characteristics of biotic diversity (e.g. species) and abiotic heterogeneity (physical habitat components), while processes refer to ecosystem energy budgets (e.g. biomass production), matter budgets (nutrient storage and loss) and water budgets. Nevertheless, data relating to the above aspects are often difficult or even impossible to obtain and even though several indicators have been elaborated, due to their calculation difficulty most assessments are based on model calculations rather than on data acquired from monitoring (Jorgensen and Nielsen, 2012 in Burkhard et al. 2012).

Thus, the main assumption of this approach is that every part of a given habitat type is of equal value with regard to its capacity to provide ecosystem services. Burkhard et al. (2009) as expert ecologists define different hypothetical values linking different land cover types with ecosystem service supply capacities and demands for ecosystem services allowing experts to do a first estimation; in subsequent analysis,

[16] The objective of the European Environment Agency (EEA) is to provide policy makers and the interested public with targeted, timely and relevant environmental information in order to support sustainable development. Regarding land cover, EEA aims to provide those responsible for and interested in European policy on the environment with qualitative and quantitative land cover information which is consistent and comparable across the continent. As part of the EEA mandate, the CORINE Land Cover (CLC) database initiated by the European Commission (EC) in 1985 over consistent geo-referenced land cover information considered as a key requirement for integrated environmental assessment by national and European policies. The standard approach to producing Corine land cover is based on computer assisted visual interpretation of the ortho-rectified satellite images according to the agreed Corine land cover methodology providing a vector database at scale 1:100.000 with a minimum mapping unit of 25 ha. The standard CLC nomenclature includes forty-four classes in three hierarchical levels. Each country produces the national database contributing specific regional knowledge and building a national land cover mapping.

however, these hypothetical values can be replaced by data from monitoring, measurements, computer-based modeling, targeted interviews or statistics.

The framework is mainly established on the concept of ecological integrity[17] as it constitutes the fundamental ecological property for the supply[18] of regulating, provisioning and cultural ecosystem services (Müller and Burkhard, 2007). Indeed, ecological integrity can be altered by land use and related land cover modifications, increasing or decreasing supplies of ecosystem services, on which human societies depend. The authors suggest a matrix linking 7 ecological integrity indicators and 22 ecosystem services (on the x-axis) to 44 land cover types (on the y-axis). The selection of ecosystem services is based on a combination of different ecosystem service lists provided in recent literature.

At the intersections of the matrix, the different land cover types' capacities to support ecological integrity or to provide particular services were assessed qualitatively on a scale consisting of: 0=no relevant capacity of the particular land cover type to support the selected ecological integrity component or to supply the selected ecosystem service, 1= low relevant capacity, 2=relevant capacity, 3=medium relevant capacity, 4= high relevant capacity, 5= very high relevant capacity.

The matrix values are based on experience from different case studies in different European regions and have to be considered as hypotheses of possible capacities of ecosystem service provision (Burkhard et al., 2009)

[17] Ecological integrity means the preservation against non-specific ecological risks that are general disturbances of the self-organizing capacity of ecological systems. Therefore, ecological integrity is a prerequisite for providing ecosystem goods and services to humans as it supports and preserves those processes and structures which are essential for the ecological ability for self-organization of ecosystems. It is mainly based on variables of energy and matter budgets and structural features of whole ecosystems (Müller and Burkhard, 2007).

[18] Supply of ecosystem services refers to the capacity of a particular area to provide a specific bundle of ecosystem goods and services within a given time period. Here capacity refers to the generation of the actually used set of natural resources and services. Thus, it is not similar to the potential supply of ecosystem services in a certain ecosystem.
Demand for ecosystem services is the sum of all ecosystem (Burkhard et al., 2012)

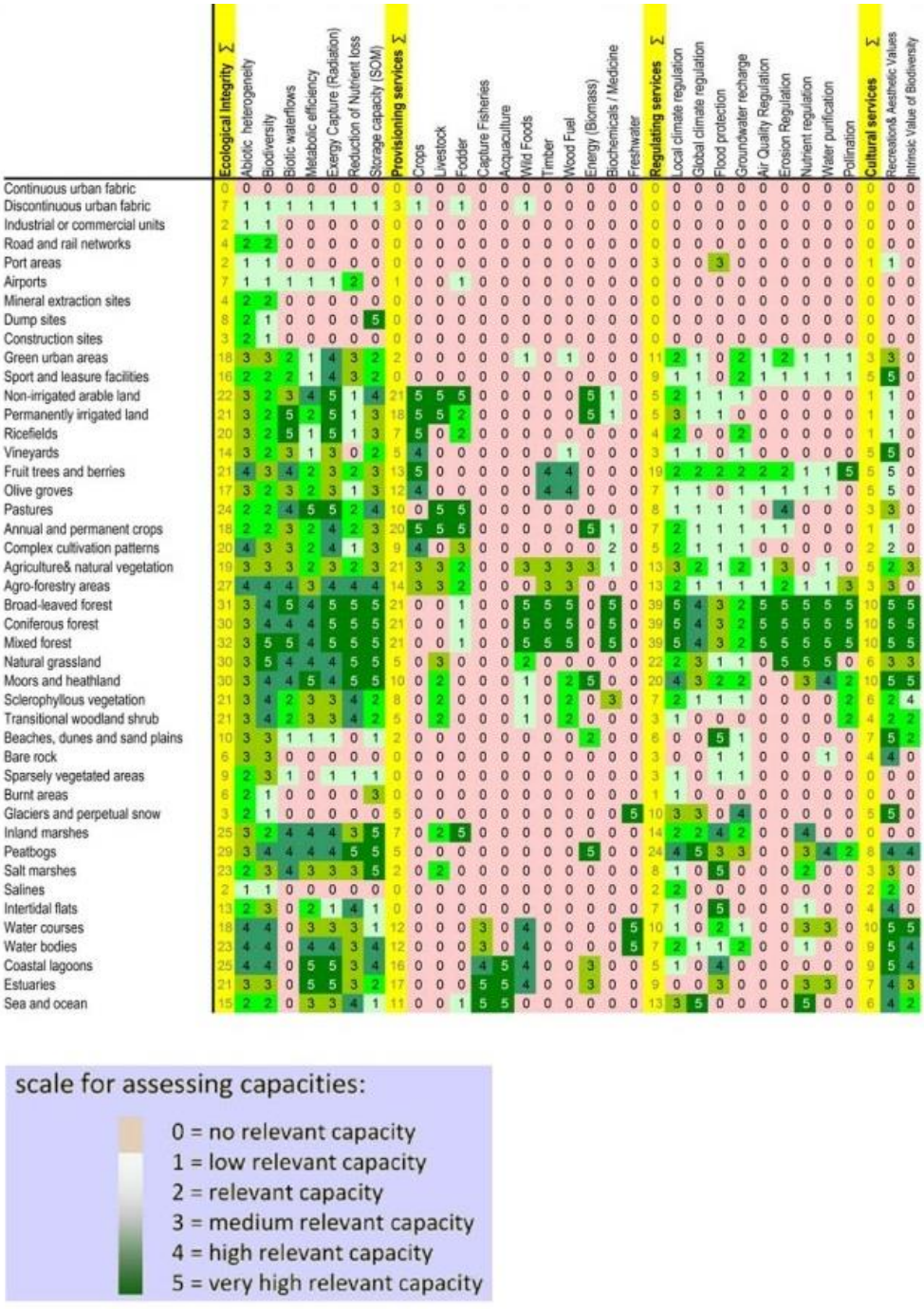


Figure (2.8) Matrix for the assessment of the different land cover types' capacities to provide selected ecosystem goods and services (Burkhard et al., 2012)

2.3 Tourism destination

In my attempt of conceptualizing the tourism landscape, the term "Tourism destination" has been considered an important term that needed to be clarified and analyzed, in order to define methodological references that could contribute in an integrated analysis and evaluation of the tourism landscape. From a literature overview including tourism geography, tourism planning and management, and tourism impact studies, the most useful definitions and methodologies have been selected and displayed in the following paragraphs.

2.3.1 Defining tourism destination

The tourism sector is one of the largest and fastest growing sectors of the global economy. Due to the multidisciplinary nature of tourism research, definitional complications and overlapping meanings arise among concepts, such as tourism industry, travel, hospitality and leisure. The World Tourism Organization defines tourism as "the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited" (WTO, 2004). In the past century however, the concept of tourism has evolved drastically and its definitions have become more and more holistic in the passage of time, in the attempt to express the complexity of the phenomenon, as well as its relational and systemic dimension. Therefore, tourism can also be expressed as "the total of the phenomena and relationships arising from the communication among tourists, suppliers, entrepreneurs and governors of hosting territory, in the process of attraction and hospitality of tourists and other visitors" (Theodoropoulou, 2006).

In this systemic view, Mill and Morisson (1985) identify four major interconnected components of tourism system, including the market (tourists), travel (transportation), destination (attractions, facilities and services), and marketing (information and promotion). These five components have strong spatial and functional links, manifesting the characteristics of tourism system and working within a large physical, cultural, social, economic, political and technological environment. As most tourism destination are the places where most tourism activities take place, they form a pillar in any modelling of the tourism "system" (Leiper, 1990) and it has even been suggested that destinations have emerged as "the fundamental unit of analysis in tourism" (WTO, 2002).

However, there are different ways of approaching the concept of "tourism destination". The conventional perspective emphasizes its geographical dimension,

defining a tourism destination as a certain geographical area that offers a dynamic agglomeration of attractions and services that satisfy the changing tourism demands and create the experience which tourists ask for when coming to that place. For instance, Jensen, Hansen and Metz' (1993) define a tourist destination as a geographical area, which contains landscape and cultural characteristics and which is in the position to offer a tourism product, which means a broad wave of facilities in transport, accommodation, food and at least one outstanding activity or experience. Therefore, destinations are places that attract visitors for a temporary stay, and range from continents to countries, to states and provinces, to cities, to villages, to purpose built resort areas (Pike, 2004).

Similarly, World Tourism Organization (UNWTO) defines a local tourism destination as "a physical space in which a visitor spends at least one overnight. It includes tourism products such as support services and attractions, and tourism resources within one day´s return travel time. It has physical and administrative boundaries defining its management, images and perceptions defining its market competitiveness. Local tourism destinations incorporate various stakeholders often including a host community, and can nest and network to form larger destinations". This definition however implies that a destination is more than a physical matter and cannot be disconnected from the concept of the territory, as tourism phenomenon is produced by the human activities on the Earth's surface. As Dematteis (1985) claims, the "land" becomes "territory" when it is a medium of communication and object of production, exchange, and cooperation.

Instead, the sociological perspective establishes and describes destinations as narratives without specific geographical boundaries, highlighting their intangible dimension and the role of the interaction among different actors, resources and elements in creating the space where tourism activities take place.

A tourist's overall experience in a destination is composed hence, of tangible and intangible elements that are perceived and assessed globally and simultaneously. The basic elements on which the attractiveness of a destination depends, are not merely the natural, historical, cultural or recreational attractions (the must-see places and must-do activities) that often constitute tourists' travel motivations (pull forces), but also other characteristics such as amenities, accessibility, image, prices, as well as human resources (tourism operators and the hosting community who condition the tourism experience and satisfy tourists' needs on the basis of their professionalism and hospitality).

Additionally, destinations undergo changes to satisfying tourists' needs but must also respond to the needs of the local community which inevitably develops its own

perceptions. Hence, in a more holistic view, Ringer (1998), by defining destinations as "cultural landscapes of tourism", stresses that "the destination of the tourist and the inhabited landscape of local culture are now inseparable to a greater degree" (Inglold 1994 in Ringer, 1998), recognizing that the peculiarities of both place and people contribute to physical and social present-day processes. In this view, the cultural landscape is an integral part of a destination, and has a significant effect on the tourism experience.

As Leader-Elliot (2005) claims, "cultural landscapes are the raw material from which destinations are constructed, and within which visitor experiences and memories are created."

2.3.2 Destination life cycle

The increasing demand of international tourists for holidays has resulted in a rapidly increase of the number of tourist destinations. To explain destinations development the life cycle approach has been widely adopted. According to Butler (1980), destinations pass through a predictable sequence of six stages. These stages are: exploration, involvement, development, consolidation, stagnation and decline or rejuvenation. In each life cycle stage there are changes in the morphology, the types of tourists visitation, and residents' attitudes towards tourism. Indeed, according to Stanley Plog's (1974) psychographic typology of destination visitation, each stage of destination life cycle is associated with a certain typology of tourists.

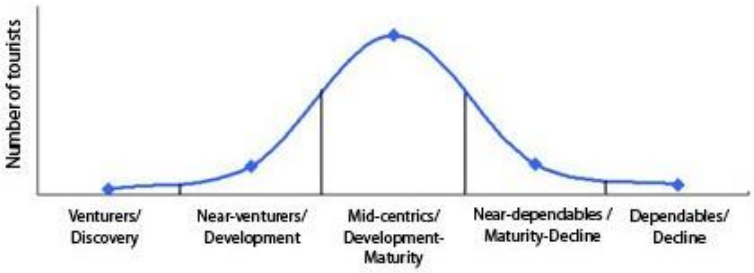


Figure (2.9) Evolution of destination life cycle (Plog, 1974)

At the first stage called exploration or discovery, the establishment of tourism begins for the first time onto a new territory. The practices involved are characterized by improvisation and are accessible to a minority of tourists who get integrated with the territory which they are visiting and with its surroundings. During this stage, the destination is little known and visited by the first venturers in search of new

discoveries and unexplored areas. Through word-of-mouth, the area begins to attract more tourists.

At the next three stages, tourism grows spectacularly and very quickly. New tourist facilities are designed and implemented to accommodate the growing number of mid-centric tourists attracted by the services provided by the new tourism infrastructures.

At the stage of stagnation, the saturation of the destination is reached. The quality of tourism offer falls, tourism demand levels off, and the environmental degradation of the tourist destination begins to be obvious and worrying. The centrics now stop coming and the near-dependables start to frequent the area.

At the stage of decline, which represents the current state of the mature tourist destinations (such as, coastal areas developed for mass tourism in the 50`s and 60`s). The problems which were sensed in the stagnation stage now manifest themselves clearly. The destination now only attracts dependables, who prefer to visit and revisit well-established known destinations. Though often more loyal, this clientele spends less, stays a shorter time and is less active. The destination becomes less lucrative and its market gets smaller even though arrivals keep rising. The destination must then try to differentiate itself and reposition itself in the market. Therefore, the mature destinations can opt for various solutions:

1. Continued decline, due to the passivity of the public and private agents, which force the model until there is no longer any solution. The traditional clients' needs are no longer met as before and entrepreneurs make poor investments for the improvement of existing facilities and the competitors steal customers to the destination.

2. Stabilization, during which destination experiences an untraditional tourism market, stabilizing an otherwise anticipated decline in the number of visitors.

3. Renewal due to a radical change of mentality, leading to the adoption of measures which even entail a new tourism model, based on sustainable criteria and the integration of tourism with the territory, the economy and the local population.

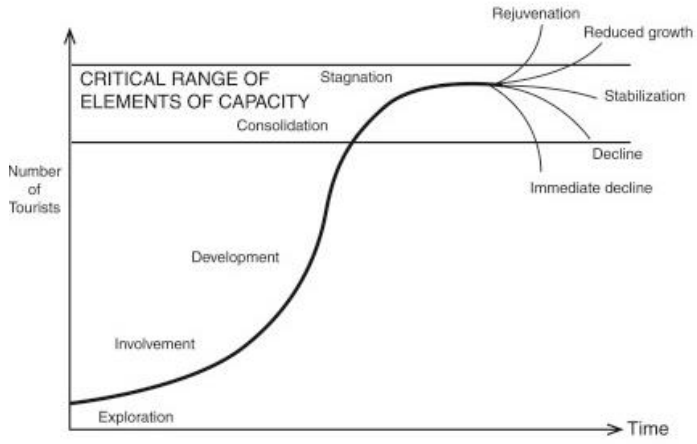


Figure (2.10) Evolution of destination life cycle (Butler, 1980)

2.3.3 Destination planning and management

Many public policies for tourism, principally aim at providing the essential conditions for tourism growth (such as infrastructures, training, promotion, regulation of services, etc.) and often, tourism planners merely focus on destination developments without paying attention to preserving the attributes that attract travelers to the destination in the first place (Kotler et al., 2006). Destination marketing[19], even though is a management process and an integral part of developing and retaining a particular location's popularity, especially during the early developing stage of a tourism destination, is not sufficient in the preservation of destination attractiveness. As tourism destinations grow and mature there is increasing concern with managing the impacts of tourism (Coccossis and Mexa, 2004).

Tourism often provokes significant and multiple impacts on the environment, social and economic structures and dynamics, as well as on culture and lifestyles. These impacts can be positive or negative, and may affect the lives of the local communities as well as the tourists' experiences and perceptions of the destination. However, not all of the impacts attributed to tourism are due to tourism alone. There are often important indirect or induced impacts of other broader transformations and processes (such as globalization, mass culture, modernization, etc.), which may be triggered by tourism, as a fast-growing activity with multiple linkages.

[19] As mentioned in Pike (2004), Wahab et al. offered the following definition of tourism destination marketing: "the management process through which the National Tourist Organizations and/or tourist enterprises identify their selected tourists, actual and potential, communicate with them to ascertain and influence their wishes, needs, motivations, likes and dislikes, on local, regional, national and international levels, and to formulate and adapt their tourist products accordingly in view of achieving optimal tourist satisfaction thereby fulfilling their objectives."

Direct impacts can be those caused directly by the tourist activities within a destination (such as, the increase in traffic, waste, crime, financial revenue etc.). Indirect impacts instead can be consequential to the transformation processes that the destination undergoes in order to meet the needs of tourists (such as, land speculation, deforestation, revival of traditions, increase of income, etc.), while induced impacts are due to the general development that tourism along with other global processes has brought to the destination (such as, the loss of biodiversity, aesthetic qualities, the cultural identity of the local population, the abandonment of other economic activities such as agriculture, etc.)

Managing tourism destinations is an important part of controlling tourism's impacts. Destination management can include land use planning, business permits and zoning controls, environmental and other regulations, business association initiatives, and a host of other techniques to shape the development and daily operation of tourism-related activities (Coccossis and Mexa, 2004).

Although tourism can also evolve without planning, the sustainability of a destination depends on the suitability of the type and scale of tourism in relation to a specific destination. Effective destination management hence, relies on an iterative and continual planning process that integrates tourism into a community's social, economic and environmental aspirations (STCRC, Australia's Sustainable Tourism Cooperative Research Centre).

In tourism literature, the need for developing mechanisms and strategies towards tourism sustainable development is stressed quite often, as globally, but especially across Europe, pressures on tourism destinations are expected to increase. Nevertheless, there is little experience on the ground of managing destinations with use of appropriate and established tools and methods. However, sustainability, even if it is difficult to achieve, may constitute the guide in searching for solutions that aim to balance the conflicting relationships developed in tourism destinations.

2.3.4 Tourism carrying capacity

In this research project, Tourism Carrying Capacity (TCC) has been studied, as it is thought to offer concepts and assessment methodologies particularly useful in tourism destination planning and management. In tourism planning, carrying capacity is often interpreted as the maximum acceptable level of tourism development in an area. From a general point of view, tourism carrying capacity is "the maximum number of people that may visit a tourism destination at the same time without causing destruction of the

physical, economic and sociocultural environment and an unacceptable decrease in the quality of visit or satisfaction" (WTO, 1981). In ecological terms, carrying capacity can be defined as "the maximum number of visitors that can be accommodated by a given destination under conditions of maximum stress" and in economic terms, "as the maximum number of visitors that can be accommodated at a constant quality of their experience" (Canestrelli and Costa , 1991, p.296 in Coccossis and Mexa, 2004).

Tourism carrying capacity can be also defined as "the maximum use of any site without causing negative effects on the resources, reducing visitor satisfaction, or exerting adverse impact upon the society, economy and culture of the area" (McIntyre, 1993, p.23 in Coccossis and Mexa, 2004). Therefore, the notion of social carrying capacity is often associated with the concept of crowding and its effects on local community and tourist/visit (dis)satisfaction. In order to define perceived crowding, many theoretical models (such as expectancy theory, stimulus-overload theory and social interference theory) have been developed (Lee and Graefe, 2003). From these models, social psychological factors result as significant influencing factors on the tourists' perception of crowding than the actual level of density or the number of visitors encountered. Similarly, the characteristics of the local community, its values, activities and behavior as well as destination management itself may all influence the perception of crowding. Hence, carrying capacity needs to be determined both in ecological terms and human values, incorporating the visitors' and local community's experiences.

It becomes evident therefore that carrying capacity methodology has three basic dimensions: physical-ecological, socio-demographic and political-economic which have different weights (or importance) in different destinations. The difference stems from the type (characteristics/particularities) of the destination[20], the type(s) of tourism development and the tourism/environment relationship.

However, due to the various definitions of tourism carrying capacity (TCC) from which none is universally accepted, there is no unique, standard procedure for assessing tourism carrying capacity (Saveriades, 2000). Furthermore, developing a quantitative methodology for measuring carrying capacity in various sites, satisfying different management needs is considered a "mission impossible" (Kun, 2002 in Coccossis and Mexa, 2004). There is a general acknowledgment thus, that carrying capacity cannot be about absolute, constant and universal limits, reducible to single numbers and cannot be a scientifically objective concept, as sustainability is not a universal, value-free

[20] Types of destinations in carrying capacity methodology include: coastal areas, islands, protected areas, rural areas, mountain resorts, historical settlements and towns

objective criterion. Carrying capacity should be considered as an ongoing process within a planning process for tourism development. Visitors' expectations and satisfaction levels need to be incorporated and balanced over long-term conservation goals, while gains and losses from applying TCC may not always be possible to identify.

According to the conceptual framework described by Shelby and Heberlein (1986)[21], the process of defining TCC includes two parts:

-1st part: A descriptive process with which the tourism destination is described in terms of physical, ecological, social, political and economic aspects. In this part, important issues concern the limiting factors of the destination that cannot be easily managed, other limiting factors easier to manipulate by managers, as well as the type of most significant impacts that determine the type of carrying capacity (ecological, social, etc.).

Specifically, on the basis of the main dimensions of development/environment interface, following a systemic analysis, the impacts of tourism in a destination can be analyzed as following:

1. Physical Ecological Component:

-Analysis of general ecological and physical characteristics of the destination
-Definition of relationships with the adjacent/neighboring areas

2. Socio-Demographic Component:

-Analysis of general demographic and social characteristics of the destination
-Analysis of cultural patterns and social relations.
-Definition of the relationship with the broader system

3. Political-Economic Component:

-Analysis of general political and economic characteristics of the destination (such as state/structure of the economy, political, decision-making process, organizational aspects, regulatory/institutional context, public, private investments for the area)
-Definition of the relationship with the broader system

4. Tourism development:

-Analysis of tourist supply and demand.
-Exploration of future trends, prospects for tourism development, potential tourist demand, emerging types of activities.

[21] Shelby Bo., Heberlein T.A., (1986) Carrying capacity in Recreation Settings. Oregon State University Press

-Definition of the type of tourism development (such as mass or alternative types of tourism development such as agro-tourism, cultural, religious, etc.)
-Definition of the level of tourist activity (with data on tourist arrivals, overnight stays, etc.)
-Identification of patterns of tourist behavior (The level of use of various facilities, visitor densities, length of stay, activities at the destination and levels of tourist satisfaction)
-Identification of the characteristics of visitors (such as age, sex, income, motivations, expectations, ethnic origins, etc.)
-Identification of spatial patterns of tourism development, (such as dense concentrated or dispersed developments, etc.)
-Identification and classification of tourist attractions
-Analysis of tourist spatial and temporal (seasonality) flows (such as duration of stay for key tourist attractions, favorite tourist routes etc.)
-Definition of the profile of the area in terms of its key characteristics.
-Analysis of tourist revenues.
-Analysis of current policy in relation to tourism development.
-Analysis of national and local strategies for tourism development.
-Analysis of strategies of key actors in the tourism sector.

-2nd part: An evaluative part with which it is described how a destination should be managed and the level of acceptable impacts. This part first identifies the desirable type of development, and then defines objectives and strategies for tourism development. On the basis of these objectives, tourism Carrying Capacity can be defined.

However, total TCC does not necessarily have to take the form of unique numerical value, resulting from a “calculation” of the various TCC for each component. At this stage having selected the desired option it would be possible to identify the final key factors and therefore the thresholds and indicators to be considered. The implementation of TCC can be assisted, guided and monitored with a coherent set of indicators that are defined through a dynamic process. The implementation of total carrying capacity follows three steps: the elaboration of TCC policy measures, the selection of final list of indicators for the constraints and bottlenecks identified, and the definition of thresholds- standard.

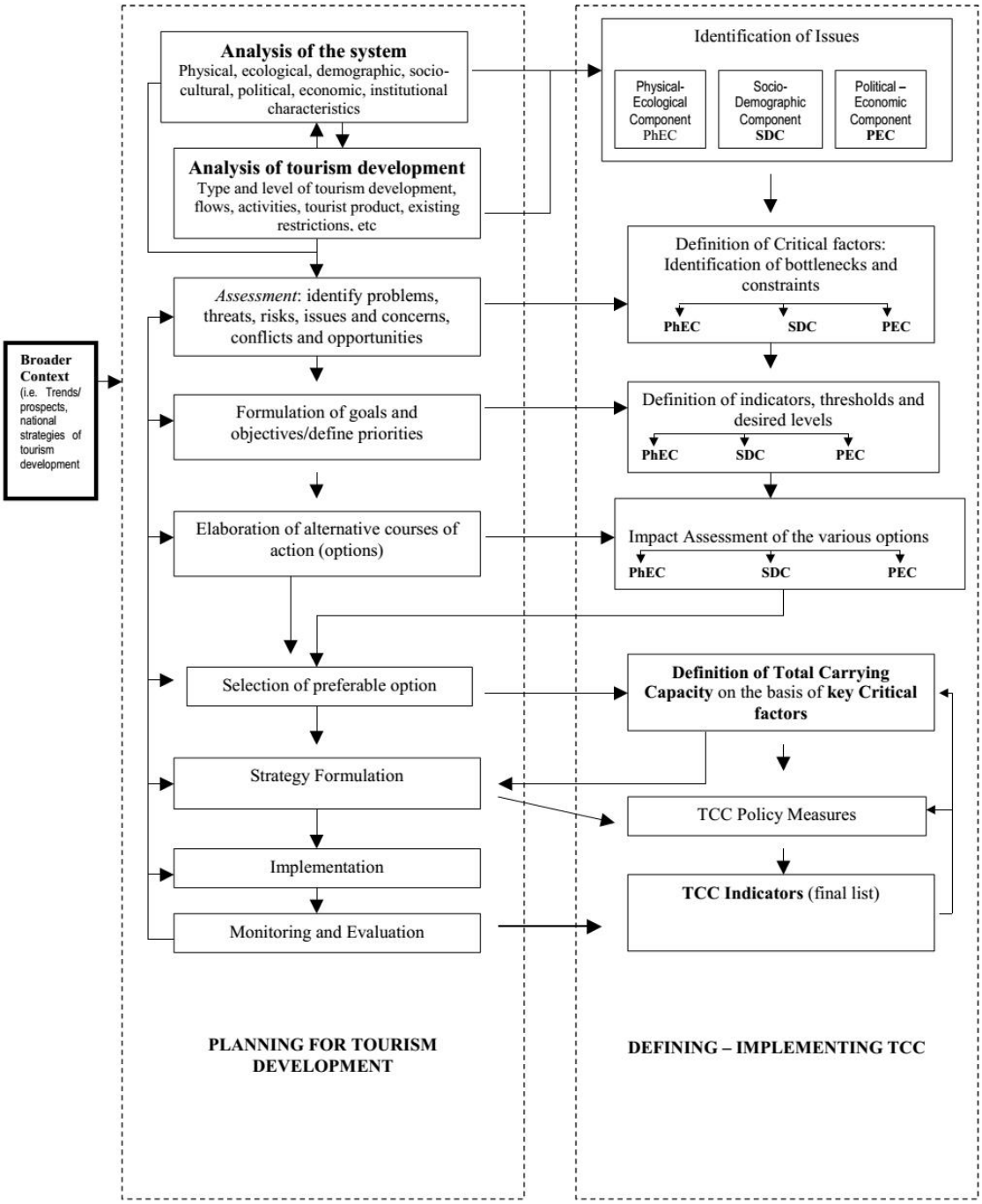


Figure (2.11) The main steps of a process which could be used to define (and implement) TCC (Coccossis et al., 2001)

2.3.5 Tourism indicators

Indicators provide significant opportunities for enabling managers to confront increasing pressures from tourism development, as well as for defining and implementing Tourism Carrying Capacity (TCC). Although it is difficult to estimate or model overall Carrying capacity, the use of indicators as a way to identify and define TCC limits is a simpler and more flexible approach compared to the analytical process (see figure..) discussed in the previous paragraph (Coccossis et al, 2001). However, just as in the analytical process, the use of indicators also requires the existence or the elaboration of a specific strategy for tourism development, in order to examine whether the measurements respect the defined goals and the sensitivity of the site under study. Core sets of indicators, reflecting pressures and state of key factors of a tourism destination, have been used in several studies as a way to monitor the state of the destination and identify the violation of tourism carrying capacity limits. On the basis of TCC methodology suggested by Coccossis et al. (2001), three types of indicators and their thematic areas are defined reflecting on the components of TCC: Physical-ecological, Socio-demographic and Political economic.

Table(2.3) Types of indicators used in TCC (Coccossis et al, 2001)

	Types of indicators used in TCC		
	Physical-ecological	**Socio-demographic**	**Political-economic**
Thematic areas	Natural environment and biodiversity Air Quality Noise Pollution Energy Water Waste Cultural heritage Tourist infrastructure Land Landscape Transport and mobility	Demography Tourist flows Employment Social behavior Health and safety Psychological issues	Tourism earnings and Investments Employment Public expenditure and Revenue Policy for tourism development

Although there are different types of indicators, each with different utility to decision-makers, the most directly useful are considered those that help to predict problems. In any destination, the best indicators for implementing TCC are those which respond to the key factors of the destination and can provide information which can help clarify issues and measure responses. Selecting the right indicators reduces the wide

range of potential information to a smaller set of useable and meaningful measures of those factors important to the decision-maker. Furthermore, not every destination has the same data sources and availability of data. For instance, while some destinations have managed entry points where those who enter are routinely counted (and in some cases classified as to local or foreign, student or elder etc.) many destinations do not have this easy means of documentation. Therefore, data sources and availability are important and restrictive factors in the selection of indicators.

For the purpose of my research project, several studies have been studied assessing TCC for Greek insular destinations. Lagos and Diakomichalis (2011) applied the Carrying Capacity methodology on the island of Kos (Dodecanese, GR) selecting a framework of indicators on the basis of the characteristics of the destination as well as on statistical data availability. Similarly, the study of Tselentis et al. (2006), applied TCC for the islands of Kalymnos, Kos and Rhodes (Dodecanese, GR), selecting data on population, employment, tourist development (bed capacity, closed hotels, tourist arrivals, seasonal population), beach impact factor, environmentally protected areas, threatened species and garbage and waste management.

Table(2.4) Baseline indicators for assessing TCC in Kos island (Lagos and Diakomichalis, 2011)

Baseline indicators for assessing TCC		
Tourism Function (Defert)	**Tf(1)=(B/P) * 100**	B=total number of beds
Tourism Density	**Tf(2)=B *100/ (P * S)**	P=total population of the area
	Tf(2)= (N *100/ (S*365)	S=surface of the area in Km2
	Tf(2)= (N * 1000/ (P *365)	N=total number of overnight stays
Tourism Intensity	**Tf(3)=(A/P) * 1OO**	A=number of arrivals
	Tf(3)= (K/P)	K=beds
Economically active population/beds	**Tf(4)= (EP/ K)**	EP= economically active population
Tolerable tourism population	**Tf(5)= (ATα/P)**	ATα= number of tourists at the peak day
Overnight stays	**Tf(6)= (N /P)**	Nα= overnight stays of foreign tourists
Tourism infiltration	**Tf(7)= (Nα *100) / (P *360)**	Nη=overnight stays of domestic tourists
	Tf(8)= (Nη *100) / (P *360)	AT= number of foreign tourists
Tourism attractiveness	**Tf(9)= (AT/HT)**	HT = number of domestic tourists
Tourism concentration	**Tf(10)=B/Sh**	Sh=surface of the area in ha
Tourism pressure	**Tf(11)=Tourists/Km2**	
	Tf(11)=Tourists/meter of shore	L=number of beds
Utilization of accommodation capacity	**U=(P/G)*100**	g=number of beds which are available per year
	G=L*g	G=number of available beds

Nevertheless, Tourism Carrying Capacity indicators aim at describing merely key factors and significant problems of a specific destination. In contrast, sustainable tourism indicators aim at describing the general relationship between tourism and the environment, the effects of environmental factors on tourism, the impacts of the tourism industry on the environment and the responses required for promoting and safeguarding a more sustainable development of tourism and recreational activities. However, sustainable tourism indicators, as well as sustainability indicators which provide even broader overview on the state of the destination in respect to sustainability, are linked with the definition and implementation of TCC.

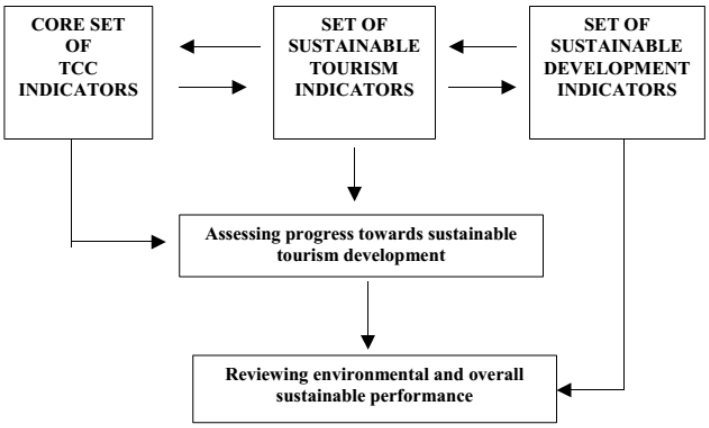


Figure (2.12) Relationships among the different sets of indicators (Coccossis et al., 2001)

UNWTO has been promoting the use of sustainable tourism indicators since the early 1990s, as essential instruments for policy-making, planning and management processes at destinations. Indeed, the publication entitled "Indicators of Sustainable Development for Tourism Destinations: A Guidebook" (UNWTO, 2004), is designed to bring practical assistance to tourism and destination managers, and to encourage them to use indicators as a building block for sustainable tourism in their destinations. This guidebook offers a considerable number of quantitative and qualitative/normative indicators for the assessment and monitoring of 13 general issues of destinations, from which several baseline issues are distinguished.

<u>General issues for assessment and monitoring suggested by UNWTO:</u>

1. Wellbeing of Host Communities
2. Sustaining Cultural Assets
3. Community Participation in Tourism
4. Tourist Satisfaction
5. Health and Safety
6. Capturing Economic Benefits from Tourism

7. Protection of Valuable Natural Assets
8. Managing Scarce Natural Resources
9. Limiting Impacts of Tourism Activity
10. Controlling Tourist Activities and Levels
11. Destination Planning and Control
12. Designing Products and Services
13. Sustainability of Tourism Operations and Services

Types of indicators suggested by UNWTO:

-Early warning indicators
-Indicators of stresses on the system
-Measures of the current state of industry
-Measures of impacts on the biophysical and socio-economic environments
-Measures of management effort
-Measures of management effect, results or performance

Within this framework of sustainable tourism indicators, both individual indicators and derived composite indices are recommended because of their different capabilities to serve the needs of decision-makers. TCC (also referred as site stress index) is considered a derived index along with "destination attractivity index" based on measures such as landscape variety, cultural variety, uniqueness, level of maintenance, level of unrest/hostility/security, ease of access, etc. Specifically, derived indices are thought to be of great importance in identifying problems and areas needing attention, particularly as regards smaller regions and localities. Ideally, such indices are a form of early warning which would cause decision-makers to look to other indicators and more specific information regarding the specific sites. These indices however need to be set up as agreed consensus indices, and their content and weighting (if any) require agreement as they are necessarily subjective. As the matter of fact, the determination of TCC is often negotiated by the stakeholders. To date, tourists themselves are rarely present to advocate their interests at destinations during the planning process. Their interests enter the debate via tourism organizations or enterprises who are advocates (UNWTO, 2004). Local planners may have access to indicators which reflect the needs or desires of different tourist segments, through market research, exit questionnaires and other feedback which can provide clarity.

In conclusion, indicators are essential, but not sufficient for managing tourism development. Tourism managers are typically faced with large quantities of data and information about multiple concerns, in a language or format which they little understand. Above all, indicators need to be useful tools and the reason for their

existence is their contribution to avoiding risks, or taking calculated risks with more complete knowledge of likely outcomes.

Table (2.5) Baseline issues and indicators suggested by UNWTO (2004)

Baseline issues	Baseline indicators
Local satisfaction with tourism	♦ Local satisfaction level with tourism (Questionnaire)
Effects of tourism on communities	♦ Ratio of tourists to locals (average and peak period/days) ♦ % who believes that tourism has helped bring new services or infrastructure. (questionnaire-based) ♦ Number and capacity of social services available to the community (% which are attributable to tourism)
Sustaining tourist satisfaction	♦ Level of satisfaction by visitors (questionnaire-based) ♦ Perception of value for money (questionnaire-based) ♦ Percentage of return visitors
Tourism seasonality	♦ Tourist arrivals by month or quarter (distribution throughout the year) ♦ Occupancy rates for licensed (official)accommodation by month (peak periods relative to low season) and % of all occupancy in peak quarter or month) ♦ % of business establishments open all year ♦ Number and % of tourist industry jobs which are permanent or full-year (compared to temporary jobs)
Economic benefits of tourism	♦ Number of local people (and ratio of men to women) employed in tourism (also ratio of tourism employment to total employment) ♦ Revenues generated by tourism as % of total revenues generated in the community
Energy management	♦ Per capita consumption of energy from all sources (overall, and by tourist sector – per person day) ♦ Percentage of businesses participating in energy conservation programs, or applying energy saving policy and techniques ♦ % of energy consumption from renewable resources (at destinations, establishments)
Water availability and conservation	♦ Water use: (total volume consumed and litres per tourist per day) ♦ Water saving (% reduced, recaptured or recycled)
Drinking water quality	♦ Percentage of tourism establishments with water treated to international potable standards ♦ Frequency of water-borne diseases: number/percentage of visitors reporting water-borne illnesses during their stay
Sewage treatment	♦ Percentage of sewage from site receiving treatment ♦ Percentage of tourism establishments (or accommodation) on treatment system(s)
Solid waste management	♦ Waste volume produced by the destination (tonnes) (by month) ♦ Volume of waste recycled (m3) / Total volume of waste (m3) (specify by different types) ♦ Quantity of waste strewn in public areas (garbage counts)
Development control	♦ Existence of a land use or development planning process, including tourism ♦ % of area subject to control (density, design, etc.)
Controlling use intensity	♦ Total number of tourist arrivals (mean, monthly, peak periods) ♦ Number of tourists per square metre of the site (e.g., at beaches, attractions), per square kilometre of the destination, - mean number/peak period average

2.4 Destination image

2.4.1 Defining destination image

The meanings attributed to the concept of "image" are as numerous as the contexts and disciplinary fields in which it has been utilized. In behavioral geography, the definition of image relates to the holistic representation of an object which comprises of knowledge, emotion, associated expression, belief and values, while in psychological studies the concept of image is associated with mere visual representations. Nonetheless, in tourism research the conceptualization and measurement of "destination image" mainly aims at linking tourist's perceptions and evaluations of a tourist place to tourist's behavior, and consequently at acquiring information useful for destination planning, management and/or marketing purposes. Indeed, in tourism research, previous studies[22] have demonstrated that the image of a tourism destination, considered as a mental picture formed by the characteristics that define the destination in its various dimensions, is an important construct to predict travelers' behavior (Mayo, 1973; Goodrich, 1978; Scott et al., 1978; Long and Evans, 1983; Reibstein et al, 1980; Bagozzi, 1982, Court and Lupton, 1997; as cited in Baloglu, 2000). Specifically, destination images influence tourists' travel decision-making, cognition and behavior at a destination, as well as satisfaction levels and recollection of the experience (Jenkins, 1999).

Nevertheless, even though many researchers in tourism studies make frequent usage of the term "destination image"[23], as Echtner and Ritchie (2003) claim, there is a lack

[22] From these studies, some important conclusions regard: the positive correlation between image and behavioural intention, the mediation of the affect in the relationship between perceptions and behaviour, and that cognition can also directly influence behavioural intention (without the mediation of affect). Mayo (1973) and Hunt (1974) were the first tourism scholars to point out that a more favourable image of a destination would result in increased visitation to that destination. Goodrich (1978) demonstrated a positive correlation between preference and perceptions. Reibstein et al (1980) examined the direction of causality between perceptions (beliefs), affect and behaviour regarding the choices of transportation modes. The analysis revealed that the relationship between perceptions and behaviour is mediated by affect. Bagozzi (1982) examined the casual relations among cognition, affect, intention and behaviour and demonstrated that although the affect mediates the relationship between cognition and behavioural intention, cognition can also directly influence behavioural intention.

[23] A destination image is `the expression of all objective knowledge, impressions, prejudice, imaginations, and emotional thoughts an individual or group might have of a particular place' (Lawson and Baud Bovy, 1977, as cited in Jenkins, 1999). Image of place, often termed destination image in the tourism literature, is formed through three agents or collective sources of image. These agents generally conform to personal organic; destination generated induced; and experienced real agents. Organic images are those that are formed through general life experiences, not specific to tourism. Sources of organic images include movies, newspaper reports, the internet, television, magazines, and personal sources, such as friends and family. Induced images are tourism specific and usually denoted by an active search for information regarding a possible destination. Sources of induced images include travel and tourism advertising, brochures, the internet, television, magazines, newspaper reports, and travel agents. Real images are those formed through experience of the destination. Gatner (1993) suggested that the difference between induced and organic images is the amount of control destinations have over what is being presented.

of a satisfactory definition[24] due to the different ways of approaching the concept of "tourism destination", which also has given rise to great heterogeneity in its measurement. According to their survey on the major destination image measurement studies, image is frequently described as simply *"perceptions of an area"* or as *"the sum of beliefs, ideas and impressions of a place that a person has of a destination"* (Crompton, 1979, p.18), without a clear indication of whether this image is considered as an *"attribute-based component" with measurable characteristics* (such as scenery, attractions, accommodation facilities, price levels) or as *"holistic component" with unique and psychological characteristics* (such as friendliness, safety, atmosphere). In this view, measuring destination image, in the specific field of tourism research, means analyzing people's[25] perceptions and evaluations of a tourist place as a whole and/or as a set of attributes in order to link the outcome to tourist's behavior or attitudes.

Due to the perceptual dimension and imageability of the landscape, in the formation of destination image, the role of the landscape is generally acknowledged (Macagno, et al. 2010). However, destination images are often constructed by tourism marketers and institutions on globally recognizable landscape attributes considered to be "extraordinary" for the attraction of great numbers of tourists thought to be prompted by quite homogeneous motivations for tourism experience. As Minca (2010) affirms, those globally established qualities and characteristics assigned to landscapes produce and reproduce an imaginary dimension that is successful on the mass tourist market. Indeed, as Chrenka and Ira (2011) state, place promotion became an influential tool in shaping mental image of tourism destinations and their landscapes, affecting tourists' spatial behavior and preference about certain types of landscapes. However, tourism, through the changes that brings to landscape character in order to make it correspond to a global imaginary dimension, frequently leads to loss of the destination's authenticity and values.

Instead, the approaches that rely on themes of cultural landscape as an integral part of destinations may constitute the starting point for linking the tourist place or activity to various expressions of meaning (Knudsen et.al 2008) going beyond the representations of landscapes in tourism marketing imagery. This connection might be revealed through the exploration of people's landscape perceptions of tourist places. However, although general studies on landscape perceptions and preferences represent some well-established traditions, especially in the field of human geography and

[24] Mazanec and Schweiger (1981) describe image as a "widely employed...vaguely defined" construct;

[25] In most definitions, image relates to the individual, while few other definitions acknowledge that images can be shared by groups of people (Jenkins, 1999).

environmental psychology, only very few studies on how people perceive and prefer the landscapes as places of both leisure and everyday life have been conducted (Chrenka and Ira, 2011). As regards destination planning, identifying natural and cultural key-elements of landscapes should help tourism planners to differentiate tourism destinations more effectively through the creation of appropriate destination images which reflect local values and meanings. 'those destination images that differentiate one region or product from the next must be based on a strong appreciation of distinct natural and cultural elements, which cannot be replicated elsewhere'

Furthermore, even though "Tourists tour, consume, and represent landscapes, places and cultures that have been produced, presented and represented by tourism marketing" (Morgan 2004:173), the image tourists develop being on-site and surrounded by the landscape might be completely different from the image projected by institutions. In this case, landscape physical characteristics, due to their immediate visual and experiential impact, may constitute one of the most direct influencing factor for the formation of on-site destination image and people's ultimate attitudes towards a destination (such as tourist loyalty and willingness to return to that place).

2.4.2 The cognitive and affective component of destination image

In tourism literature, several studies suggest that the image construct incorporates two distinct but interrelated components: the "cognitive" which refers to beliefs and knowledge about an object and "affective" which refers to feelings about an object (Burgess, 1978; Holbrook, 1978; Ward and Russel, 1981; Zimmer and Golden, 1988; Walmsley and Jekins, 1993; Gartner, 1993; Baloglu and Brinberg, 1997). Hence, the cognitive perception of a destination's image is how people (tourists/residents) would describe the physical attributes of an area and the affective is *"the interpretation of the cognitive perceptions by the individual into feelings of like or dislike"* (Vaughan and Edwards, 1999, p.3 as cited in Andriotis, 2007).

Hence, from a cognitive point of view, tourist destination image is assessed on a set of attributes that correspond to the resources or attractions that a destination provides to tourists, such as scenery to be seen, activities to take part in, and experiences to remember (Stabler, 1995). In other words, the attractions provide the motivations and the magnetism necessary to persuade an individual to visit a determined place (Alhemoud & Armstrong, 1996). From a theoretical point of view, the literature shows consensus about the cognitive component being an antecedent of the affective component and about people's evaluative responses stemming from their knowledge of the objects (Holbrook, 1978; Russel & Pratt, 1980; Anand, Holbrook, & Stephens, 1988; Stern

& Krakover, 1993, as cited in Beerli et al., 2004). Therefore, these two components (cognitive and affective) are interrelated in the sense that affective evaluations are formed as a function of the cognitive evaluations (Lynch, 1960; Burgess, 1978; Holbrook, 1978; Reibstein et al., 1980; Russel and Pratt, 1980; Anand et al., 1988; Gartner, 1993; Stern and Krakover, 1993), as it is believed that some minimal knowledge is necessary for the formation of affect[26] (Ortony et al. 1988; Woodside and Lysonski, 1989; Gartner, 1993).

Additionally, the combination of these two components of image give rise to an attitude, in other words an overall, or compound, image that refers to the positive, or negative, evaluation of the tourism destination. Therefore, tourists' attitude toward a destination is a function of their belief about the destination and the implicit evaluative responses associated with their belief (Hsu et al. 2010).

Besides tourism references, in the geographic literature and environmental psychology, many findings also support the notion that environments and places have both cognitive and affective images (Lynch, 1960; Burgess, 1978; Russel and Pratt, 1980; Russel et al. 1981; Hanyu, 1993; as cited in Baloglu, 2000). Specifically, Tuan (1979), by considering landscape as an image, he defines it as *"a construct of the mind and of feeling",* while Lynch (1960) defines *"environmental images"* as *"the result of a two-way process between the observer and his environment",* recognizing the particular role of the observer's purposes in the formation of the environmental images through the selection of what is seen/perceived[27]:

> "The environment suggests distinctions and relations, and the observer – with great adaptability and in the light of his own purposes – selects, organizes, and endows with meaning what he sees. The image so developed now limits and emphasizes what is seen, while the image itself is being tested against the filtered perceptual input in a constant interacting process. Thus the image of a given reality may vary significantly between different observers".

Additionally, Appleton (1996) emphasizes the role of image as an intermediate stage between environment and human behavior:

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[26] *"We should also make clear that our claim that emotions always involve some degree of cognition is not the same as asserting that the contribution of cognition is necessarily conscious. To say that emotions arise from cognition is to say that they are determined by the structure, content and organization of knowledge representations and processes that operate on them. These representations and processes might sometimes be available to consciousness, but there is no reason to suppose that they necessarily are so."* (Ortony, 1988)

[27] According to Dembo (1960) *"perception is the seeing of qualities".*

> "The basic concept which underlies all studies in environmental perception is that where behavior seems to be influenced by environment that influence does not operate directly, but through an intermediate stage or stages. Behavior, in fact, is influenced by a person's attitudes towards the environment, not as it is, but as he thinks it is. In other words, the image of an environment is what counts, and this image may be distorted in all sorts of ways." Jay Appleton, 1996

2.4.3 Independent variables of image

Across fields and disciplines, numerous researchers suggest that image, in general, depends on both characteristics of physical (external) stimuli and (internal) conditions within the individual, in other words of "stimulus factors" and "personal factors" (Baloglu and McClearly, 1999). Amadeo and Golledge (1975, p.381) have indicated that both the *"extent of our information about a system...."* as well as *"the specific needs and values of the individuals ... will influence our cognitions of the spatial properties of such a system"* (as cited in Baloglu, 2000). Thus, as Moutinho (1987, p.11) claims *"What an individual perceives in many situations is determined not only by the intrinsic nature of the stimulus object ... but also by his or her own system of values and needs determined by the social context".*

Personal factors (motives and values)

According to Gnoth's (1997) theoretical model on motivation and expectation formation, motives and personal characteristics determine a person's disposition that can be represented as a situation of *"need",* which in turn becomes the reason for behaviour in certain situations. Moreover, needs internally generated within a person establish themselves as an urge, setting up a specific *"action tendency that induces a person's perception to scan the environment for objects, situations or events that satisfy what now has become a motive".* This motivation process is assisted by the involvement of situational parameters and the socio-psychological construct of values. If values and evaluations of objects are cognitively dominant, people's expectations are related to the likelihood of an object to produce the desired outcome (Vroom, 1964 as cited in Gnoth, 1997). If values are emotion dominant instead, people's expectations can be described in terms of the amount of hope or fear they contain (Bloch, 1986 as cited in Gnoth, 1997). Therefore, people's felt needs and value system determine attitudes, as well as expectations that *"are tentative (mental or neural) representations of future events or unfinished learning processes",* containing feelings and cognitions that direct perception and behaviour. Hence, the perception of experiences can be expected to differ

according to the amount of cognitions and emotions involved in underlying expectations. According to Gnoth (1997), the overall satisfaction as an emotional response to an experience is more closely related to inner-directed attitudes and values (affective evaluation) than cognitive dominant values and attitudes (cognitive evaluation).

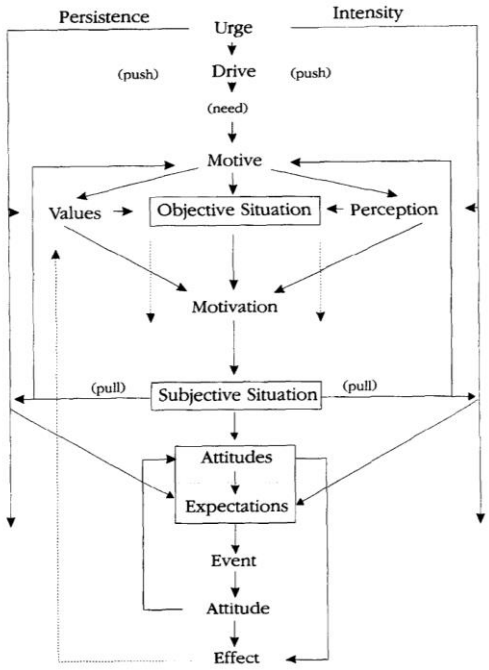


Figure (2.13) The process of Motivation and Expectation Formation (Gnoth, 1997)

In tourism literature, motivations are distinguished in pull and push motivational forces. Pull motivations are external, situational, or cognitive aspects to the tourist that compel the latter to travel to a destination (Yoon and Uysal, 2005). According to McGeeet al. (1996), pull motivations are those that are inspired by a destination's attractiveness (such as beaches, recreation facilities, cultural attractions, entertainment, natural scenery, shopping and parks) and which may stimulate and reinforce inherent push motivations that are emotional and internal aspects of the individual (Yoon and Uysal, 2005). Hence, push motivations are socio-psychological influences which also affect travel decisions such as the choice of a destination. Crompton (1979) developed a conceptual framework on push motivations that included the desire for escape from a perceived mundane environment, rest and relaxation, prestige, regression, health and fitness, adventure and social interaction, enhancement of kinship relationships, exploration and evaluation of self, and excitement.

According to the Leisure Motivation Scale developed by Beard and Ragheb (1983), motivators had been attempted to be classified into four categories:

- Intellectual
- Social
- Complete mastery
- Stimulus avoidance

Stimulus factors for pre-visit image formation (type and variety of information sources)

In the context of tourism and specifically in the pre-visit image formation studies, Gartner (1993) notes that the type and amount of external stimuli (in this case information sources, such as travel agents, books, advertisements, etc.) received before tourist's actual visit may influence the formation of the cognitive image component (knowledge) but not the affective component (feelings).

In this sense the development of the cognitive component of pre-visit destination image is presented as a function of the amount (variety) and type of information sources to which travelers are exposed. In addition, as Holbrook (1978) states, cognition plays an intervening role between information sources and the affective component, while some more recent studies in tourism suggest that also travel information sources can directly influence tourist's behavior without the intervention of cognitive or affective image component. For instance, Baloglu (2008) by testing his hypothesized model (see scheme 2) shows empirically that the affective image component about a destination is only influenced by cognitive evaluations. This confirms that cognitive evaluations serve as intervening variables and mediate the relationship between stimulus factors (variety and type of information sources), personal factors (socio-psychological travel motivations) and affect towards destinations. As mentioned before, Baloglu's study, additionally shows that tourist behavior (in this case visitation intention) is also directly determined (but more slightly) by the defined stimulus and personal factors.

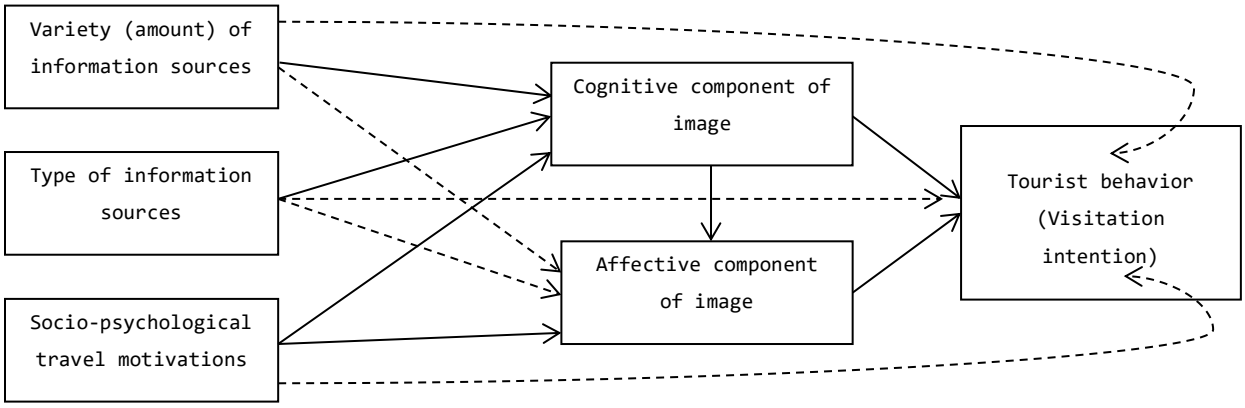


Figure (2.14) A path-Analytical Model of Visitation Intention Involving Information sources, Socio-psychological motivations and Destination Images (Baloglu, 2000)
Straight lines from exogenous to endogenous variables denote the paths (effects) that are hypothesized and tested, while dashed lines denote the paths (effects) that are not hypothesized but tested to examine the overall pattern of the model.

Other studies focusing on post-visit images show that the destination image perceived post-visit influences attitudes such as tourist overall satisfaction and intention to repeat the visit in the future, depending on the destination's capacity to provide experiences that correspond with their needs and fits the image they had of the destination (Chon, 1990; Court & Lupton, 1997; Bigné e, Sanchez, & Sanchez, 2001; Joppe, Martin, & Waalen, 2001 as cited in Beerli et.al, 2004).

For the aims of this research project, these theoretical models presented above serve as basic references for further reflections on the process of the on-site image formation, in which the landscape physical characteristics of the destination as stimulus factors constitute a stronger and more direct influence on people's on-site evaluative perception and attitudes with respect to information sources received pre-visit.

2.4.4 Methodologies in measuring destination image

In tourism literature different techniques for the measurement of a tourist's destination images have been developed in order to investigate what the important aspects of destination image are and how people perceive and evaluate destinations. The two main approaches of measurement are based on structured and unstructured methodologies.

In a structured (attribute based) methodology, several image attributes (or "constructs") are specified and incorporated into a standardized instrument (such as

Likert type scales), facilitating the codification and the analysis of the results with sophisticated statistical techniques. The destination is rated by the respondent on each of the attributes included in the measure and an overall "image profile" is derived from these ratings (Ferber, 1974 as cited in Echtner and Ritchie, 2003). This rating is called "evaluative perception". Therefore, in such methodology the respondent is usually asked to think about a destination in terms of attributes and not in terms of holistic impressions. The completeness of these structured methodologies depends on the procedures used to elicit the various attributes of image (McDougall & Fry, 1974, as cited in Echtner and Ritchie, 2003). Nevertheless, as destination image has numerous and diverse attribute components, it is considered necessary to conduct extensive research to ensure that all have been included (Hooley, Shipley & Krieger, 1988). According to Echtner and Ritchie (2003) the most complete measurements of image would address both the functional and psychological characteristics of a destination, and as tourism has to do with going somewhere unique or at least different to one's everyday surroundings (Jenkins, 1999), besides the common functional attributes comparable for most destinations, unique functional attributes of each destination should be considered as well.

Among several studies measuring destination image the attributes measured most commonly were scenery/natural attractions, friendliness/hospitality/receptiveness, costs/price levels, climate, tourist sites/activities, nightlife/entertainment and sports facilities and activities (Echtner and Ritchie, 1991). However, as *"the destination of the tourist and the inhabited landscape of local culture are now inseparable to a greater degree"* (Ringer, 2008) more general aspects of destinations are now introduced in several recent studies. For instance, Beerli and Martìn (2004) classified a number of tourist destination attractions and attributes developed in literature into nine dimensions: natural resources; general infrastructure; tourism infrastructure, tourism leisure and recreation; culture, history and art; political and economic factors, natural environment; social environment; and the atmosphere of the place.

Besides the evaluative perception, in measuring destination image, the respondent could be asked to rate the importance of each attribute (or construct) to himself or herself. As Jenkins (1999) points out, this is another important aspect of the rating process that is called "construct preference". The combination of the two ratings (evaluative perception and construct preference) enables the researchers to assign weights and individuate which are the aspects of image that are considered important by

people. These two types of measurements could be combined into a single measure called "attitude" using the value-expectancy model (Fishbein, 1963 as cited in Jenkins, 1999)[28].

In contrast, using unstructured methodologies to measure image, the respondent is not provided with a specified set of attributes of image and is allowed to freely describe his/her holistic impressions about a destination by answering to open ended survey questions. The data collected from the sample of respondents are analysed through content analysis and various sorting and categorisation techniques in order to determine the holistic components of image and specifically unique features and auras. However, due to the qualitative nature of the data, statistical analyses of the results are not facilitated and the level of detail depends on the verbal and/or writing skills of the individuals used in the study, their willingness to provide multiple responses and their knowledge base of the destination (McDougall & Fry, 1974 as cited in Jenkins, 1999).

2.5 Tourism landscape conceptualization

2.5.1. Landscape and tourism

As results from the literature review illustrated in the previous paragraphs, "Landscape" and "Tourism" constitute two multidimensional concepts for which many different research approaches deriving from a broad range of disciplines (Spatial Planning, Landscape Ecology, Environmental Psychology, Tourism Sciences, Cultural Geography, Anthropology, etc.) can be employed in the attempt to identify and explore their interrelationships.

In tourism sciences, the role of landscape is generally acknowledged and particularly in the formation of destination image, tourism destination choice (Macagno, et al. 2010) as well as in the construction of tourist imaginaries which play an important role in tourists' experience of travelling (Minca, 2007). As a matter of fact, many discourses on the relationship developed between landscape and tourism focus on the exploitation of the imageability of the landscape by tourism industry for destination promotion purposes, as well as on tourists' persisting demand for new tourism landscape

[28] According to Fishbein, an individual's attitude towards a destination is equal to his strength of belief about (or preference for) each attribute of a destination multiplied by the importance or salience that he or she assigns to that attribute. Thus, in calculating a person's attitude towards a destination, the results of the two rating scales are multiplied together.

experiences in emerging destinations (Terkenli, 2008). In tourism planning practices, landscape often constitutes a key issue for increasing the economic value of an area by investing in the conservation of what are considered to be its "institutional values"; the landscape, in this view, is a potential activator of processes of capitalization (Magnaghi 2012; Dematteis, Governa 2005). Therefore, in these approaches for which human activities is the main interest of research or practice, landscape is considered as a marketable resource for tourism development.

In the field of Environmental Sciences instead, on the basis of the different conceptualizations of human-landscape relationships (Zube, 1987), various approaches for analyzing landscape and tourism relationships can be distinguished. The main focus of these approaches is the landscape, while their distinction lies on the way humans are considered to be related to it. According to the most common approach the landscape is considered as an environmental component with a great scenic value which is subject to tourism impacts. Therefore, tourism development is considered as a driving force and people involved in tourism as agents of landscape change. This approach aims at verifying the effects of a specific tourism development or tourist activity on the landscape.

In tourism geography, due to the widely acknowledged and highlighted emotional and experiential character of the landscape which differentiates it from other spatial units of analysis, the landscape is considered as "a most significant and appropriate geographical medium in the study of the relationships that develop between tourists and visited place" (Terkenli, 2008). The landscape hence becomes a source of information and people involved in tourism, receivers and processors of that information related to landscape. The relationship between landscape and tourism is explored through the investigation of tourists' perceptions and/or preferences on the features, qualities or changes of landscapes principally for management purposes. Tourists' perceptions can be investigated through research on aesthetic landscape experience, on a more active and participative experience that can lead to the attribution of meaning and value, or through a phenomenomenological approach focusing on sensory experiences.

From a political point of view, the statements of the European Landscape Convention concerning the additional role of the landscape in policy making and awakening of public participation, lead to the consideration that the landscape, in addition to being a tourism resource with a great life value for local communities (Leader-Elliott, 2005), may constitute an arena for debate and action (Fairclough, Sarlöv Herlin, 2009). Tourism destinations in this view are considered as "landscape laboratories of tourism" (LANDSCAPE LAB, EU LIFE Environment project) where knowledge of the

current state and vision of the future development can be spread, providing a useful support in the decision-making process, as well as a prediction tool of the success of tourism planning and management.

2.5.2. Towards a Tourism landscape definition

From the overall literature review, it becomes evident that the definitions that one could give to the notion of "tourism landscape" are as numerous as the contexts in which it could be used. Indeed, the lack of attempts of giving a clear definition of the "tourism landscape" is noticeable.

The most frequent reference to tourism landscapes is made in regard to areas characterized by an intense tourism development that dominates its morphological and functional aspects. Furthermore, tourism landscapes are associated with places as merely constructed for tourist consumption, as fake sceneries with seasonal duration; as a spectacle offering "a series of instantaneous visions which will not regain any reality until they are displayed again upon the tourists' return" (Augè, 1997 as cited in Terkenli and d'Hautessere, 2006). Instead, the contiguous notion of "landscapes of tourism" is used in relation to landscapes providing the necessary conditions to attract tourists and encourage tourism development. However, what distinguishes the tourism landscape from tourism place or tourism space is that the landscape is not only the result of tourism and other human activities on land surface; landscape only exists with the presence of an observer.

Therefore, in this project, the notion of tourism landscape incorporates the physiognomy of the space delineating a tourism destination, intended as a combination of natural and cultural elements and values, the consequences of tourism activity and other interrelated processes within this space and its broader territory, as well as the images that tourists form during their active and participative experience within it.

Therefore, the pathway I followed to structure my theoretical and methodological framework for tourism landscape analysis and evaluation has essentially been based on the following statement: "As a focus of research, the tourism landscape requires contextual interpretation and cannot be detached from questions of positionality and from its historical and socio-cultural context, - its relationship with an observer." (Terkenli, 2008)

With this delineation, the approach of my research project is positioned among those studies that recognize the tourism landscape as an empirical manifestation of territoriality, attempting to associate it with the contextual factors and processes

that continuously affect it and as much as possible without preconceptions about neither special aesthetic qualities nor the unauthentic character of a place only destined for tourist consumption. In my view, even though the discovery of conflicting aspects in the tourism landscape (such as socio-economic versus ecological values), which is probably the result of a more complex and integrated analysis, may not facilitate the suggestion of clear indications for tourism landscape planning and management, understanding that the tourism landscape can be analyzed, experienced and evaluated in multiple ways, is an extremely important prerequisite in a transparent and unbiased decision making process.

2.5.3 Towards a framework for tourism landscape analysis and evaluation

In order to respond to the need for an interdisciplinary study on the relationship between tourism and the landscape and to the need for a more coherent planning and management characterized by broader landscape awareness, the suggested framework is constructed upon the three concepts analyzed in my literature review: tourism destination, landscape and destination image.

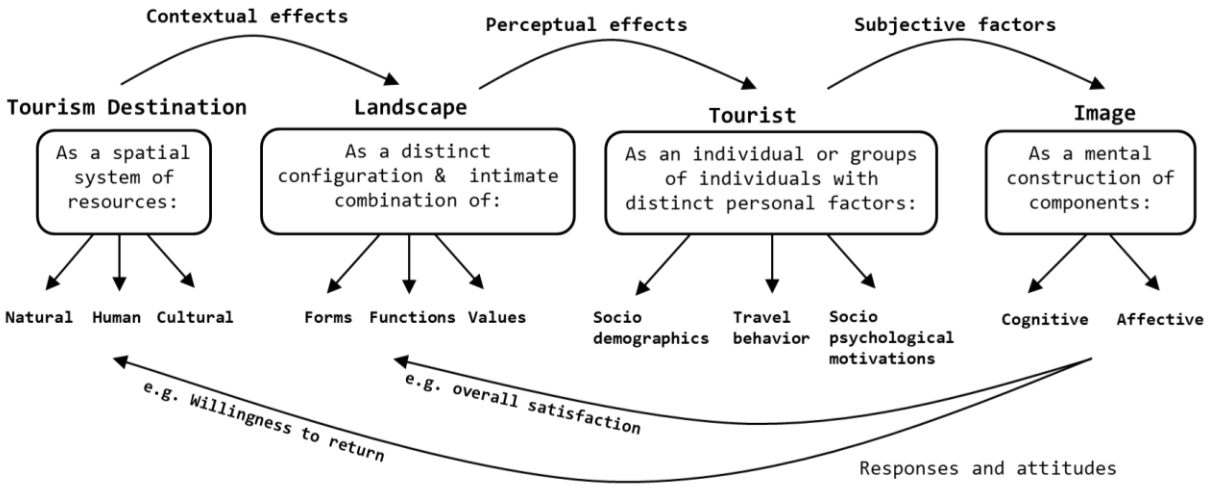


Figure (2.15) Theoretical framework suggested by this study

First step: Tourism destination

Studying the tourist destination on a territorial scale (Rhodes island), as a spatial system of resources would provide a better understanding on what are the dynamics and driving forces that influence the physiognomic profile of the landscape. This step of research includes a descriptive process with which the tourism destination is described in terms of tourism development, physical, ecological, social and economic

aspects using both qualitative and quantitative data. The analysis of key factors of the destination is made with use of indicators that can provide information useful in measuring impacts. The indicators are selected from the frameworks of carrying capacity methodology and sustainable tourism indicators on the basis of data availability and on their suitability in the geographical context of the case study.

Second step: Landscape character

Once, the contextual factors are distinguished, in a local scale (Lindos area), the physiognomic profile of the landscape as a distinct configuration of forms, functions and local values needs to be analyzed. This step includes a descriptive process which focuses on the natural and cultural nature of the landscape by analyzing several key aspects of its distinct character (such as geomorphology, land uses, vegetation, historical sites, etc.) and how contextual factors have affected it. Principally, this step of research makes reference to the landscape character assessment methodology, even though does not follow the entire characterization process but just the description and mapping (through GIS) of landscape with reference to the characteristics that combine to make it distinctive. Both qualitative and quantitative data are used. As regards the assessment of ecological aspects, this step adopts a land cover based approach, following the methodological framework suggested by Burkhard et al. (2009). Due to the lack of quantitative data concerning the description of structures and processes relevant for the long-term functionality and self-organizing capacity of ecosystems, the hypothetical values of the experts for each Corine land cover class are accepted and utilized in order to do a first estimation of the tourism landscape capacities to provide ecosystem services.

Third step: Image

Image, as a mental construction that consists of cognitive and affective components, is a concept often used in tourism sciences, as well as spatial sciences and geography. In the field of tourism marketing, most of the studies focus on the external image formation of destinations (the promoted image by institutions/marketers and the tourists' pre-visit image) and how these images influence tourists' destination choice. In this study instead, the aim is to identify what are the prevailing images of tourists as they result from their own immediate experience with the tourism landscape and how these images affect the attitude of tourists about the landscape and the tourism destination. However, the concept of the image is closely related to the observer's subjectivity that perceives the tourist landscape, so the framework was necessarily developed including the fourth object of the analysis: the tourist. The tourist is understood as an individual or group of people who share different personal factors such

as socio-demographic characteristics, travel behavior and socio-psychological motivations, assuming that these subjective factors influence the images formed during their travel experience.

Figure (2.16) Variables of analysis and evaluation

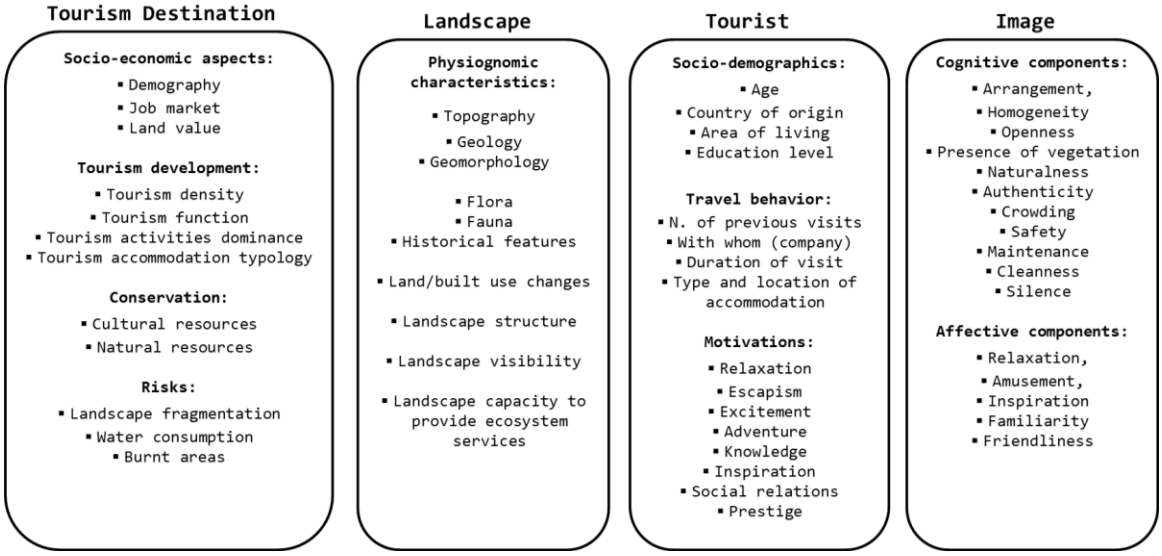
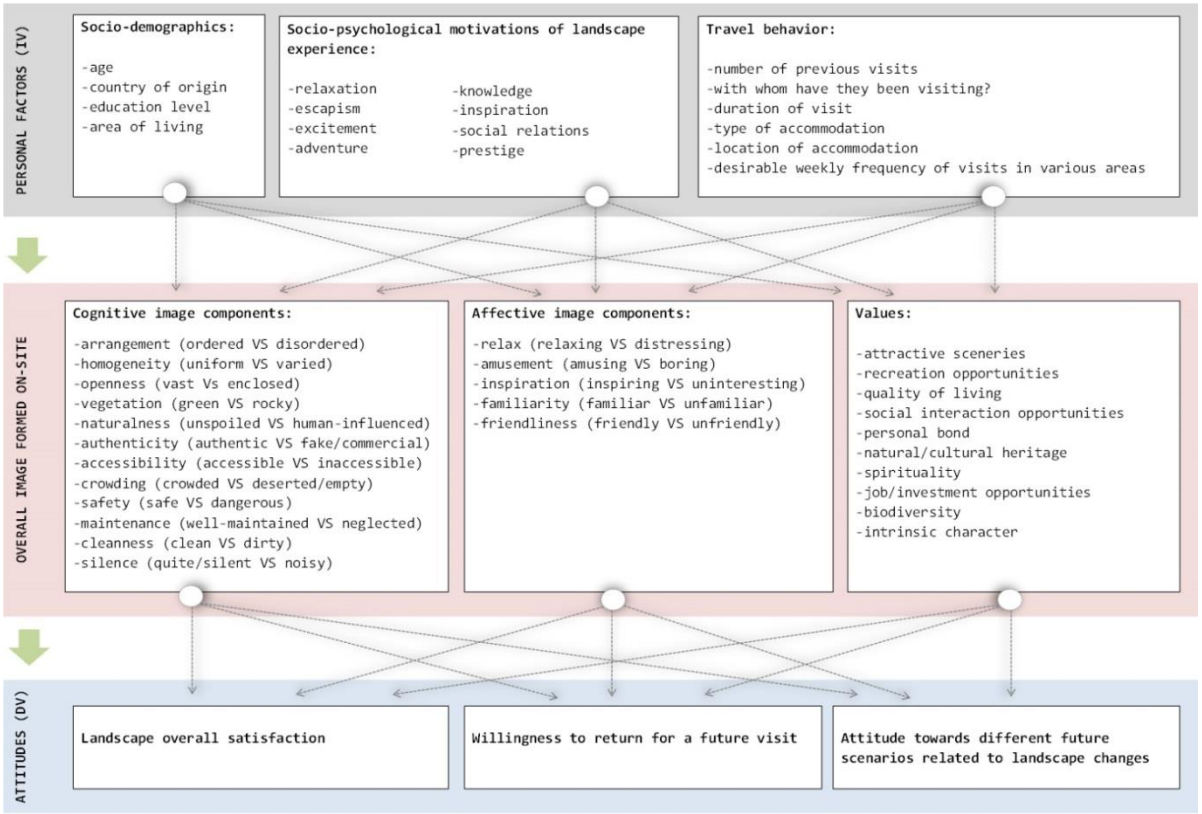


Figure (2.17) Variables included in the questionnaire



Specifically this step of research aims at exploring the relationships among personal factors (as subjective independent variables), people's evaluative perception (cognitive and affective image, and landscape values as intervening variables) and attitudes (as dependent variables).

Independent variables such as socio-demographics, socio-psychological motivations of landscape experience, behaviour are therefore individuated as personal factors influencing cognitive and affective evaluations and acknowledged landscape values.

Socio-demographics variables, as conventional individual characteristics (such as age, education, income, gender, occupation, and marital status) are generally recognized as antecedents to cognitive process and included in most image formation and destination models as they are thought to influence perceptions of objects, products and destinations (Friedmann and Lessig 1986; Stabler 1990; Um and Crompton 1990; Woodside and Lysonski 1989, as cited in Baloglu et. al, 1999). However, the variables of age and education appear to be major determinants of image (Baloglu et. al, 1999). In addition, in landscape research, the body of literature on individual differences in landscape perception and preference grew exponentially, investigating a broad range of individual characteristics and mostly those related to socio-cultural, socio-demographic, and socio-economic factors (Sevenant, et. al, 2010).

Socio-psychological motivations as personal factors are included in image formation models as a major influence guiding the development of destination images (Stabler, 1990; Um and Crompton, 1990 as cited in Baloglu, 2000). Stabler (1990) presents socio-psychological travel motivations such as physical, status, social contact, cultural, intellectual, escape and relaxation, as the most important construct impinging on the destination images. Nevertheless, whether socio-psychological motivations influence affective or cognitive component of image remains a controversial issue among scholars. Several tourism scholars suggest that motivations are related to the affective component of image, as an individual's affective image toward a destination is, to a great extent, influenced by his/her motivations or benefits sought from the travel experience (Gartner, 1993). In this study motivations for landscape experience are considered as influencing both cognitive and affective evaluation. The selection of the variables is based on push factors according to Crompton's (1979) conceptual framework.

Behaviours as personal factors are included in the framework to better understand individual's motivations and the locations of places and activities that are related to them. As Ryan (2010) states, *"behind observed behaviours can lie a multitude of different motivations"*. As the same motive can give rise to different behaviours, the

same activity can be motivated by different reasons. In this study, travel behavior variables concern the frequency and duration of the visit as well as other characteristics such as the type and location of accommodation and the desirable frequency of visit for various sites.

Cognitive image has included variables both from landscape assessment methodologies (such as homogeneity, openness, naturalness etc.) as well as from destination image measurement methodologies based on attributes (such as accessibility, crowding, safety, etc.). Affective image has included destination's affective attributes (such as relaxation, friendliness, familiarity etc.), while as acknowledged landscape values have been used those suggested by Raymond and Brown (2006).

Attitudes are related to a person's thoughts and feelings which cannot be easily observed. Chris Fill defines attitudes as, "Attitudes are learned through past experiences and serve as a link between thoughts and behavior". This makes attitudes a hypothetical characteristic which determines whether people like or dislike things and therefore how they behave towards them (Oxford index – online). Attitudes are therefore favorable or unfavorable dispositions to an object, person, institution, or event. In this study the interest is about tourists' attitudes towards the landscape (overall satisfaction and concern about future changes) as well as towards the destination (willingness to return).

All these variables, constituted the basis for the construction of a questionnaire and the implementation of a field survey from which data collected were put statistically in relation with each other in order to detect cause and effect relationships among them.

The final outcomes of the three steps described above, besides useful information concerning the specific tourism landscape of the case study, provide general conclusions about the validity of the theoretical and methodological assumptions of this framework.

Chapter 3.
Contextual factors of the case study

Introduction

This chapter analyzes and describes the contextual factors that generate and affect the tourism landscape of the delimited geographical area adopted as a case study: "Lindos area" located in the south-eastern coast of the island of Rhodes (Dodecanese, Greece). Specifically, this research step aims at analyzing the geographical and territorial context in which Lindos area belongs, in order to better understand and explain its physiognomic profile in the following chapter. After a brief introduction in the general characteristics of the Aegean islands, as cultural landscapes and tourism destinations, this chapter focuses on the island of Rhodes which is described in terms of tourism development, physical, ecological, historical and socio-economic aspects. A particular attention has been given to emerging key factors and impacts of the tourism development. The analysis scale used for the description and mapping of the phenomena includes the whole municipality of the island of Rhodes. However, for the comparative description of the spatial dynamics and on the basis of the available scale of collected data, the island is subdivided in its administrative local departments and communities. In this study, "Lindos area" makes reference to the local community of Lindos, which along with the communities of Lardos, Pylona, Laerma and Kalathos form the local department of Lindos. The name of Lindos is due to the presence of the homonymous settlement present in the area and which, in the ancient times, was one of the first three city-states established on Rhodes (after 1000BC), including the settlement and its valuable cultivated countryside.

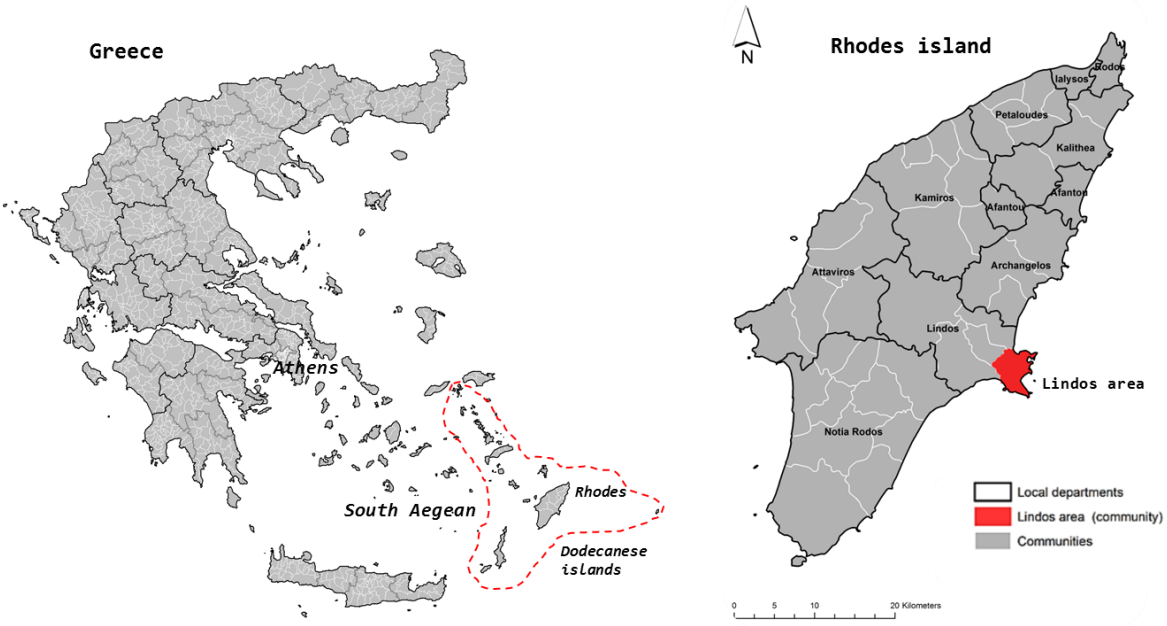
The analysis was based both on qualitative and quantitative data from available secondary sources (historical literature, databases and expert's reports), as well as derived information from techniques, such as the application of indicators reflecting pressures and state of key factors of the island of Rhodes, remote sensing through GIS, and statistical analysis. The indicators, as illustrated in table (3.1), have been selected on the basis of data availability and on their suitability in the geographical context of the case study both from the field of tourism studies and landscape research. For the interpretation of the outcomes, data are represented in thematic maps.

Table (3.1) List of indicators used in this step of research

Issue	Indicator	Formula	Description	Scale of reference
Demographic change	Decennial growth rate(%)	D.G.R. = {P(t2) –P(t1)}/P(t2)*100	The exponential rate of growth of population from year t1 to t2, expressed as a percentage	National, regional, local
Job market	Employment rate (%)	Emp.R. = employed people*100/total labor force	The percentage of the labor force (population of working age from 15 to 64 years) that is employed.	National, regional, local
	Unemployment rate (%)	Unemp.R. = unemployed people*100/total labor force	The percentage of the labor force that is unemployed but actively seeking employment and willing to work.	National, regional, local
	Tourism labor force (%)	T.L.F. = employed people in tourism*100/total labor force	The percentage of the labor force that is employed in accommodation and food activities.	Regional
Tourism	Tourism density (n/km^2)	T.D. = B *100/(P * S) where B=total number of beds, P=total population of the area and S=surface of the area in Km^2	Density of tourism activities with respect to the number of the local population	Local
	Tourism function (Defert's Index)	T.F. = N*(100/P) where N=total number of beds, P=total population of the area	The importance of tourism in a regional/local economy	Local
	Tourism activities dominance	T.A.D = {n(a)+n(en)}*100/N(e) where n(a)= number of accommodations N(en)=number of recreation activities and N(e)= total number of economic activities	The percentage of the economic activities that are related to tourism and recreation within the total number of economic activities	Local
	Accommodation typology	T(1)= n(t1)*100/N Where n(t1)=number of accommodations of typology 1, N=total numbers of accommodations	The percentage of the total number of accommodation that belongs to each typology	Local
Land value	Initial price of land ($euro/m^2$)	Price determined by the Greek authorities	The initial price of land or zone price is the basic price of land which is used for the calculation of Tax Assessed Value along with other criteria such as	Local
Cultural landscape protection	Listed monuments	L.M. = n(m1)*100/N Where n(m1)= Number of listed monuments of typology 1, N=total numbers of listed monuments	The percentage of the total number of listed monuments and sites protected by the Greek legislation up to 2012 that belongs to each typology	Local
	Listed conservation areas	Number of traditional settlements	The presence of settlements declared as traditional and protected by the Greek legislation	Local
Natural landscape protection	Natural Protected areas coverage	N.P.A= A(p)*100/S where A(p)=total protected area, S=total surface of the territory	The percentage of total protected areas within the total surface of the territory	Local
	Burnt areas	B.A.= A(b)*100/S where A(b)=total burnt area, S=total surface of the territory	The percentage of total burnt areas within the total surface of the territory	Local
	Burnt protected areas	B.P.A= A(bp)*100/A(p) Where A(bp) = burnt protected areas, A(p)= total protected area	The percentage of protected areas that have been burnt	Local
	Wastewater effluent (m^3/day)	W.E.= (P*120+B*300)/1000 Where P=total population, B=total beds	The volume of sewage produced by domestic and recreational activities per day	Local
	Swimming pools	S.P= n(p)/S Where n(p)= number of pools, S surface of the area	Density of swimming pools with respect to the surface of the area	Local
Landscape Fragmentation	Patch density	PD=n/a Where n=number of patches, a=Area	The number of patches within the entire reference unit on a per area basis (100 ha)	Local
Landscape Diversity	Shannon's Diversity Index (SDI)	$H = \sum_{i=1}^{m} -(P_i * \ln P_i)$ where m=number of patch types P_i= proportion of area covered by patch type (land cover class)	Landscape diversity based on richness (composition) and evenness(distribution) of land cover classes	Local
Landscape Complexity	Area Weighted Mean Patch Fractal Dimension (AWMPFD)	$P \approx \sqrt{A}^{D}$ where P=perimeter of a parch, A=related area, D=fractal dimension	The degree of complexity of the landscape by weighting patches according to their size	Local

The main examined secondary data sources have been scientific publications, the database of the Hellenic Statistical Authority (ELSTAT), the archive of the headquarters of the Hellenic Tourism Organization (EOT) in Rhodes, the Regional Development Agency of Dodecanese (ANDO), the Odysseus database of the Hellenic Ministry of Culture and Sports, the catalogue of listed monuments and conservation areas of the Hellenic Ministry of Culture and Tourism, the archive of the Forest Department of Dodecanese, the Fire Monitoring Service of the National Observatory of Athens (NOA), the Filotis database for the natural environment of Greece (provided by the National Technical University of Athens), the database of open public geospatial information of Greece (provided by the institute for the management of information systems), the database of European Environment Agency (EEA), and the Redlist database of The International Union for Conservation of Nature and Natural Resources (IUCN).

Figure (3.1) Geographical setting of the case study



3.1 The Aegean tourism landscape

3.1.1 The Aegean Landscape characteristics

The Aegean Sea, an arm of the eastern Mediterranean basin, extends from continental Greece on the west to the coasts of the Anatolian peninsula (Asia Minor) on the east, while the island of Crete marks its boundary on the south. The Aegean sea is

distinguished by numerous small and large islands that can be arranged into several groups.[29] The island of Rhodes is the capital of one of the various insular complexes of the Aegean Sea, known as Dodecanese.

Generally, the Aegean islands, due to their geographical position at the junction of two continents (Europe, Asia) and in close proximity to a third (Africa), are marked by high biodiversity and are subjects to volcanic activity and frequent earthquakes[30]. Additionally, the insularity of the Aegean is linked with problems such as limited availability of water, isolation and vulnerable ecosystems particularly exposed to natural phenomena. Indeed, the Dodecanese islands, except of the two largest islands (Rhodes and Kos), are deforested and have poor drainage (Avlonitis et al, 2002). Rivers do not exist, although there is plenty of water in streams and brooks. Moreover, many of the Dodecanese islands are volcanic and therefore have significant amounts of mineral resources.

However, this particular geographic location of the Aegean islands also contributed to the formation of unique natural and cultural characteristics, thanks to which the Aegean, as a distinguished region, has constituted a source of inspiration for Art and literature and has been acknowledged as the cradle of Western civilization. According to Terkenli (2005, pp.223-224), "the Aegean landscape may be regarded as a cultural image, a visible and symbolic expression of human – environment relationships formed over a historical period of millennia over a geographical territory". Consequently, "the Aegean" besides its evident association with the sea and the notion of insularity, is associated with meanings such as communication, cultural interaction, goods traffic, people movements, innovation, spirituality as well as romanticism. Particularly, the romantic element of the Aegean has been emphasized and projected outwards, especially during the 70's, through the association of the Aegean islands with the idyllic world of the Greek mythological gods, which is distant from the requirements of modern life (Goltsiou, 2005).

Relationships between the unique natural and cultural characteristics of the Aegean islands can be found in the work of Odysseas Elytis (Nobel Prize for Literature in 1979), known as the poet of the Aegean. In his work (such as Orientations, 1939, and

[29] The Thracian sea (e.g. Thasos, Samothraki, Limnos), the East Aegean (e.g. Lesvos, Chios, Ikaria, Samos), the Northern Sporades (e.g. Alonissos, Skiathos, Skopelos and Skyros), the Cyclades (e.g. Melos, Paros, Naxos, Thera and other), the Saronic islands (e.g. Salamis, Aegina, Poros, Hydra, Spetses), the Dodecanese29 (e.g. Rhodes, Kos, Kalymnos, Patmos and other), and lastly Crete and associated small islands.

[30] The eastern Mediterranean basin is one of the world's most intense seismic zones where large destructive earthquakes occur with frequency. The geological instability and the resulting earthquakes are caused by the active grinding of the Anatolian plate wedged against the continental plates of Africa, Eurasia and Arabia. As these larger tectonic plates grind against the Anatolian plate, Asia Minor and Greece move, smashing closer together in some places and drawing apart in other regions. (Increasing seismic activities in Aegean Sea, Greece, article published in http://thewatchers.adorraeli.com, January 28, 2012)

Sun the First, 1943) he celebrated the Aegean islands as ideal places of sensual enjoyment and moral purity. Moreover, Elytis believed that natural elements bear a certain *ethos*[31] that varies according to the geographical and cultural context within they are represented: some elements of the Aegean islands, such as a bare mountain may convey simplicity, fragrant herbs may convey innocence, a drop of water in the Aegean sea may express transparence and cleanliness, lime experienced in the whitewashed houses may express purification, while the sun and derivative elements (light, fire, heat) appear as essential elements of the poet's existential pursuit (Pourgouris, 2011).

Therefore, the Aegean landscape is generally characterized by luminosity, which highlights the landscape elements such as the distinctive Aegean architecture represented by white monolithic figures. Due to the intense light, the openings of the traditional houses (often single-chambered) of the Aegean are small, sometimes oblong and appropriately orientated in order to capture the fresh wind during summer. The intense light and the orientation of the strong winds also affect the morphology of the coastal settlements which are often protected by a densely built urban web and organic road network. In almost all the islands, due to the lack of extensive fertile valleys, the landscape is marked by the dry stone terraces, which allow cultivation on steep slopes. Another distinctive characteristic of the Aegean landscape as well as of other Greek coastal locations can be detected in the presence of "the element across the sea" (Hadjimichalis, 2011), which expresses the ability to observe something else beyond the sea, such as the distant coast/peninsula of the same or another island, or small rocks/islets. Luminosity and atmospheric transparency (due to low humidity and strong winds) contribute to the increased visibility of elements existing in a long distance across the sea. The most frequent visibility is around 40-60Km and when regards mountainous figures exceeds the distance of 70Km (Hadjimichalis, 2011). Visual fragmentation due to geomorphologic configuration and the presence of small-scale landscape features are common characteristics of the Aegean landscape as well.

Nevertheless, the Aegean islands are also characterized by "enormous topical variability" (Terkenli, 2001, p.203). In the variability of the Aegean landscape the local history and the activities of the local populations play a significant role. Indeed, the Dodecanese islands, although the geological[32] and climatic similarities with the other groups of the Aegean islands, they have certain distinguished features principally due to their own particular history characterized by alternation of various conquerors that managed the islands in different ways according to their cultural

[31] Ethos, according to Oxford dictionary, is defined as the characteristic spirit of a culture, era, or community as manifested in its attitudes and aspirations

[32] Some northern Dodecanese islands have been subjects to intense geological changes due to volcanic activity manifested by the crater at the top of Nisyros and its complex volcanic rocks.

origins and needs of the different eras, importing different architectural styles and determining the shape, the size and the configuration of land parcels and road networks[33].

Variability is also manifested by differentiations in ground quality, coastal configurations, climatic conditions, and vegetation (Goltsiou, 2005). The climate in the Aegean islands varies from one area to another, and the temperature considerably fluctuates and the intensity of wind changes from the coast to the mainland. The vegetation which is normally low varies from the flourishing plains to the rocky and dry areas. The most characteristic plant species of dry areas are phrygana as well as olive and wild olive trees, pistacia, carob trees, and fig trees. The thyme, savory, oregano, sage, lavender along with prickly burnet and amaranth are important elements of endemic vegetation and due to their characteristic perfume, affect the overall perception of the landscape (Hadzimichalis, 2011). In less dry areas, scherophyllous (holm oaks and shrubs) and coniferous vegetation (pines) are typical. Non endemic species are citrus fruits in irrigated lowlands, palm trees in accommodation facilities, eucalyptus trees along the streets and prickly pears on rocky slopes (Gkoltsiou, 2005).

3.1.2 Tourism development in the islands of the Aegean

In the eyes of tourists, the Aegean landscape is a place with warm, sunny climate and calm, hospitable inhabitants. However, each Aegean island differs from the others both in the extent and form of tourism development, creating different types of tourism landscapes. Dodecanese islands and Cyclades are characterized by an intense and varied tourism development, while other islands have known a medium development or they are now settling the establishment of tourism activities. In the two largest islands of Dodecanese (Rhodes, Kos), in Crete, in some islands of the Cyclades (Mykonos, Santorini) and some of Sporades (Skiathos), mass tourism led to the establishment of luxury foreign ownership hotels as well as cheap accommodations owned by the locals. In smaller islands, due to the particular configuration of the landscape, as well as the limited socio-economic development, there are small tourist establishments which are mostly preferred by “back-pack tourists” (e.g. Ios). In the islands whose economy does not entirely depend on tourism (e.g. islands of the northeastern Aegean), the tourism development consists of domestic tourism and holiday dwellings (Goltsiou, 2005).

[33] Specifically rural roads are valuable irregular linear elements of the Greek landscape creating meanders which follow the contour lines of the soil relief and surface runoffs with ecological economy (Hadzimichalis, 2011).

Four patterns of tourism development can be distinguished in the Greek islands generally (Zaharatos, Tsartas, 2000):

1. Development heavily characterized by infrastructure and services for organized and individual mass tourism demand,
2. Development in which tourist infrastructure and services are gathered in specific clusters (settlements or regions) which either have tourist resources or organized infrastructure.
3. Development in which tourism constitutes a structured production activity and a special feature of the island's overall development, without affecting or competing with the other production sectors
4. Development in which different types of infrastructure and services co-exist and are addressed to different types of demand

Goltsiou (2005) individuates three main reasons explaining the diversity in the tourism development in the Aegean islands. The first reason concerns the uneven development of general and specific infrastructures and services (such as supply of drinking water, electricity transport network, tourism accommodations, recreational services, etc.) among the islands. The availability of infrastructures and services along with tourism attractions and favorable climatic conditions, constitute ensuring factors for tourism development and determine the tourism offer of each island. The second reason regards the pursued tourism policy, which has often promoted the islands already equipped with some infrastructures, trying to adjust them to different demand requirements (especially those of international demand) encouraging the uneven tourism development and aiming at increasing the number of tourists' arrivals at minimum cost. The third reason regards the role of tour operators, who decisively affect tourist flows and destination choices within a number of destinations offering the same product. Along with the above reasons, the lack of programming and planning in the islands is another important factor which has contributed in shaping the Aegean tourism landscape.

However, although the landscape has always been a significant element for the Greek tourism industry which initially promoted the planning of tourism facilities able to capture the meaning of Hellenism, the last 3 decades the landscape has become a new field providing possibilities for its full reconstruction (Trova, 2008). Indeed, by the 50's, the Greek state hesitantly started to promote tourism development in the Aegean islands with small hotel units harmoniously integrated in the insular landscape. After the 80's however, tourist facilities formed new decontextualized environments with tropical characteristics and free of any typical feature of the Aegean landscape. During the 80's and 90's, this phenomenon only characterized the organized facilities of large

hotel complexes, but the last decade it appears to be an established landscaping mechanism using a standard design vocabulary (Trova, 2008).

Consequently, today the Aegean landscape run the risk of becoming a theatre stage (Goltsiou, 2005), where resources, infrastructures and services are all aiming at satisfy tourist needs, without offering the locals feasible solutions. Furthermore, as the "imported" landscape elements do not relate with the Aegean landscape, tourism entails the risk of a gradually growing sense of alienation for the locals and "loss of the sense of home" (Terkenli, 2005 p.223). Typical examples are the modern or "pseudo-traditional" hotels and private villas built in protected settlements, or the traditional buildings transformed into tourist establishments (restaurants, bars, discos, folk art shops), which are usually accompanied by signboards written in foreign languages.

In conclusion, although in the Aegean tourism has contributed to the increase in economic fundamentals (employment, income, investments, and production), as well as in the immigration restraint, due to the high seasonality tourism does not have much positive impact on locals' life quality. Amongst the negative effects are the drug trafficking, the commercialization of human relations among the locals and the formation of a "touristized" youth (Coccossis and Tsartas 2001; Goltsiou, 2005). Environmental pollution (waste disposal, water and sound pollution) along with the shrinking of agricultural activity and productivity and the modifications in agricultural structure, are also some serious problems due to tourism dominance in the land uses of the Aegean islands.

3.2 The island of Rhodes

3.2.1 Geographical and historical context

Rhodes is the capital of the Dodecanese islands and historically famous for the Colossus, the statue of the god Helios, one of the Seven Wonders of the World. Rhodes, with an area of approx. 1400 kms², is the fourth largest Greek island, located[34] at the Southeastern edge of the Aegean laying approximately 17,7 Km from the Turkish coast. Today, the whole island of Rhodes constitutes a municipality, however before the

[34] The geographical location of Rhodes stretches between twenty-eight degrees (between 27°40' and 28°20') of longitude from Greenwich and thirty-six degrees (between 35°50' and 36°30') of latitude.

“Kalikratis” administrative reform (2011), the island was divided into ten municipalities, actually known as local departments, including the town of Rhodes (Rodos), Archangelos, Attaviros, Afantou, Ialissos, Kalithea, Kamiros, Lindos, Petaloudes, and South Rhodes (Notia Rodos).

Geography

The island has a long and almost triangular shape, with the major axis oriented NE-SW. Its dimension between the two extremes is around 80 kilometers in length and 38 kilometers in width (between Cape Lardos and Cape Armenistis). Its geography is characterized by a mountain range which extends longitudinally, and divides the island into two parts with slightly different climatic conditions. The east coast is warm with moderate winds and mostly flat, while the west coast is the most ventilated with rocky projections and headlands. Along the east coast, sandy beaches extend, occasionally interrupted by short promontories. The natural areas (forests and wetlands) cover 75% of the island's surface, the agricultural areas cover 20%, and the urban areas including infrastructures cover 5% (Coccossis, 2001). Rhodes, despite the presence of some fertile plains and valleys near the coast, is one of the most mountainous islands of the Aegean sea. However, the mountains of the island are not particularly high, with the exception of Mount Attaviros which reaches 1,215 meters above sea level. Mount Profitis Ilias (Prophet Elias), reaches a maximum height of 800 meters and rises at north-east of Mount Attaviros. It is covered with pine forests that in the past hosted a large number of deer (dama dama) characteristic animals of the island, while its name is due to the homonymous church present on its summit. Other noteworthy mountains of the island include Mount Acramita (Monolithos), M. Filerimos, and Monte Smith. All other verdant heights have small plateaus. The most remarkable capes of the island include the north extremity of the island where the town of Rhodes rises (its Italian name is *“La punta della Sabbia”,* while its Turkish name is “Cum Burnu”), Cape Prassonisi positioned at the southern extremity of the island, Cape San Emilianos in Lindos, Cape Lardos, Cape Vodi in Kalithea, Cape St. Minas in Kamiros, and cape Armenistis in Monolithos.

The geological structure of the island is quite complex, however it is predominantly formed by calcareous rocks. The strong permeability of the limestone terrain along with scarce rainfall, allows the formation only of temporary streams and frequent karst features (Desio et al., 1936). The temporary streams, having a predominant direction from SE to NW, constitute the main typology of wetlands present on the island. Rhodes has 20 areas of natural wetlands from which 17 are temporary streams

that during summer preserve water only in proximity of their sources. On Rhodes there are also 5 areas of artificial wetlands (Katsadorakis, Paragkamian, 2007).

Climatic conditions

Rhodes enjoys a typical Mediterranean climate with hot, dry summers and mild winters with a little bit of rainfall. Over the course of a year, the temperature typically varies between 10°C and 30°C, rarely dropping below 7°C or rising above 33°C. On average, August is the hottest month of the year, when the average temperature is 27°C, whilst January and February are the coldest months, when the average temperature is 12°C. The majority of precipitation falls between November and March, with June, July and August remaining entirely bone dry. The island's 300 days of sunshine per year and warm average sea temperatures have helped make it a popular tourism destination. Temperatures can reach a maximum of 40°C in summer, but only if there is a sirocco wind blowing in from the Sahara Desert in North Africa. When this occurs, temperatures usually rise 10°C higher than normally, visibility is seriously reduced and the air feels very dry. In contrast, the Meltemi the dry north wind of the Aegean sea helps keeping the island relatively cool. This wind prevails between May and October. However, it's strongest between July and September, when its cooling qualities are most needed. The coastal areas are the parts of the island which receive the most benefit from the wind.

Table (3.2) Annual climatological summary of Rhodes island

Weather station of Rhodes island Latitude (28,07), longitude (36,23), High (35)												
Month	Hours of sunshine	Barometric pressure	Mean air temperature	Absolute max. temperature	Absolute min. temperature	Relative humidity	Average cloudiness	Rainfall	Wind direction	Solar radiation on a horizontal level	Diffuse solar radiation on a horizontal level.	Wind speed
	h	mm Hg	°C	°C	°C	%	8	mm				m/sec
1	**135,7**	**1015,7**	**11,9**	**22**	**-4**	**70,1**	**4,3**	**149,6**	**NW**	**54,91**	**25,44**	**3,4**
2	**142**	**1014,8**	**12,1**	**22**	**-2,2**	**69,1**	**4,2**	**105,7**	**NW**	**65,56**	**29,69**	**3,6**
3	**206**	**1013,4**	**13,6**	**27,4**	**0,2**	**68,7**	**3,9**	**75,6**	**W**	**104,72**	**41,92**	**4**
4	**246,7**	**1012**	**16,6**	**30,6**	**5,2**	**66,5**	**3,5**	**27,8**	**W**	**128,61**	**48,22**	**4,4**
5	**314,5**	**1011,7**	**20,5**	**34,8**	**5**	**64,4**	**2,7**	**18,6**	**W**	**164,72**	**49,08**	**4,2**
6	**355,5**	**1009,8**	**24,7**	**37,4**	**12,6**	**58,5**	**1,1**	**2,3**	**W**	**183,06**	**42,17**	**5,7**
7	**387,1**	**1006,9**	**26,9**	**40**	**14,6**	**57,6**	**0,3**	**0,4**	**W**	**184,17**	**45,94**	**6,1**
8	**373,3**	**1007,5**	**27,1**	**42**	**17**	**59,9**	**0,3**	**0,2**	**W**	**176,11**	**39,36**	**5,7**
9	**313,6**	**1011,4**	**24,6**	**36,6**	**10,6**	**61,4**	**0,8**	**5,8**	**W**	**140,28**	**32,75**	**4,6**
10	**239,6**	**1014,7**	**20,8**	**33,2**	**7,2**	**67,5**	**2,4**	**65,5**	**W**	**99,72**	**31,36**	**3**
11	**184,4**	**1016,4**	**16,5**	**28,4**	**2,4**	**71,4**	**3,5**	**94,1**	**W**	**65,83**	**23,58**	**3,2**
12	**142,1**	**1015,8**	**13,4**	**22,8**	**1,2**	**72,4**	**4,2**	**157,4**	**NW**	**51,11**	**22,39**	**3,4**
Total	**3041**									**1418,80**	**431,92**	

Data source: http://penteli.meteo.gr/stations/rhodes/

Biological quality

Despite the difficulty of finding cumulative and precise data on biological quality of the island of Rhodes, various scientific publications and expert's reports have been studied in order to concentrate and compare data. From the comparison results that the exact number of species existing on Rhodes and those endangered remains approximate. However, information on flora and fauna provided by the publications and MEDECOS 2004 (the 10th International Conference devoted to the Mediterranean climate ecosystems and organized by ISOMED, the International Society of Mediterranean Ecologists held in Rhodes)[35] has been particularly useful both as regards the typology of habitats and their quality.

Due to high levels of sunlight and moisture, the island of Rhodes has rich flora, a great part of which belongs to the type of the Mediterranean flora (2/3 according to Desio, 1936). However, the island has a relatively high degree of endemism considering its size and closeness to the mainland. According to Hadjigeorgiou and Zervas (2010), totally 186 plant species (almost 13,8% of the total number of plant species) on the island of Rhodes have been declared important (endemic, endangered or under protection). Characteristic endemic endangered species of the island (IUCN) is the rare Asyneuma giganteum that blooms once a year on very steep and inaccessible rocks (Profitis Ilias Mt, Attavyros Mt, Akramytis Mt), and whose population is decreasing due to the limited area of its expansion (Rhodes, Halki, Karpathos) and grazing. In the same area, other importan endemic species can be found such as the rhodian peony (Paeonia clusii ssp. rhodia), named flaskanoura by the locals, the endangered at world level Komper's orchid (Comperia comperiana) and the rhodian cyclamen (Cyclamen rhodium) and the rare rhodian fritillary (Fritillaria rhodia).

Table (3.3) An estimate of the number of plant species on the island of Rhodes

Typology of plant species	**Number**
Total registered species	1351
Rhodes endemic species (RE)	8
Endemic species of the Aegean (DE)	13
Common endemic species of Minor Asia and Rhodes (SE)	64

Data sources: NGO, Association for the environmental safeguard of Rhodes, http://www.ecorodos.gr and Carlström (1987)

The vegetation of the island of Rhodes is characterized by thermo-Mediterranean sclerophyllous shrub (maquis)[36] and conifer forest. Rhodes is among the few Aegean

[35] INCOMME website: http://www.incomme.org – Medecos 2004 data: http://www.uaeco.edu.gr/medecos/index.htm

[36] The sclerophyllous and deciduous oak forest, Quercus coccifera and Q. ithaburensis ssp. macrolepis, which reputedly was once abundant in the Aegean, is today represented by remnants, at rocky slopes and streams,

islands with extended Pinus brutia (Aegean pine) forest and one of the two islands (along with Crete) with Cupressus sempervirens (cypress) forest. The pine alone occupies large areas at the northern and central part of Rhodes, from sea level to 600 m. Mixed pine and cypress forests occur mainly from 100-450 m and sometimes at higher altitudes. Pure cypress forest extends from 250-800 m but it is predominantly found on calcareous rocky slopes at higher altitudes and typically stems the steep peaks of Mount Prophet Elias and Mount Attaviros. Large fires (and subsequent grazing at some areas) have reduced the forest cover. On the large burned forest areas between Mount Prophet Elias, Psinthos and South of Emponas, the re-establishing vegetation is characterised by phrygana[37] and by thick shrub[38]. Besides burnt forest areas, phrygana occur throughout the island, mostly in grazed areas[39], as well as in abandoned cultivations[40]. The coastal phrygana are characterized by endemic species[41] of the South Aegean islands and Southwest Turkey. An exceptional feature of the vegetation is the woodland of Liquidambar orientalis[42], a tree endemic to Rhodes and SW Turkey. Sand beaches are formed all around Rhodes, but the northeast and northwest coasts are under heavy pressure by tourism development. In contrast, the sand dune systems of the southwest and southeast coasts from Apolakkia bay (17 km) to the area of Iennadion, are actually less threaten by tourism development, nevertheless they could be possibly threaten in the future. Low topographic dunes and also dome dunes comprise one of the most extended and well developed systems of the Aegean even though their width has been much reduced due to cultivations. Some of the noteworthy elements of the sand dune flora are Lycium sweinfurthii, a Mediterranean shrub rather rare and scattered in the Aegean and surprisingly abundant in Apolakkia dunes; Consolida arenaria, a vulnerable species endemic to the dunes of S. Rhodes and threatened by tourism development; Ipomoea imperati, rare in Greece; Hypecoum procumbens ssp. atropunctatum, endemic to the East Aegean and West Turkey.

Fauna is also diverse on the island of Rhodes. Among the most known species should be mentioned the Rhodian fallow deer (dama dama), hares, foxes, badgers and stone martens (Desio et al., 1936). The Platoni (Dama dama), a small deer, is the largest mammal to live freely on the island and is the contemporary representative of the deer

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sometimes among cultivations. Low maquis with Pistacia lentiscus (lentisc) appear as small thickets at coastal sites or among cultivations or as more extended formations mainly in burned forest. (Medecos, 2004)

[37] Genista acanthoclada, Lithodora hispidula, Cistus salviifolius, Cistus parviflorus. (Medecos, 2004)

[38] Arbutus unedo and Arbutus andrachne. (Medecos, 2004)

[39] Usually dominated by Genista acanthoclada, Cistus spp. and Lithodora hispidula, an East Mediterranean species occurring only in the E Aegean and the Cretan area in Europe. (Medecos, 2004)

[40] Salvia fruticosa, Euphorbia acanthothamnos, Sarcopoterium spinosum. (Medecos, 2004)

[41] Coridothymus capitatus, Helichrysum conglobatum and Carlina tragacanthifolia. (Medecos, 2004)

[42] It is found along streams or at wet planes, chiefly on ultramafic substrates, one of the best riparian populations growing along with Platanus orientalis (oriental plane) in Butterfly Valley (Petaloudes). (Medecos, 2004)

of the Pleistocene period. Its presence on Rhodes is estimated very old, according to findings from the Neolithic settlement of Kalythies. According to Papachristodoulou et.al (2007), poaching and forest fires have caused an important decrease in numbers of deer in Rhodes over recent years, making it one of the most endangered vertebrates in Greece. Moreover, certain beaches on Rhodes are important egg-laying sites for the Caretta Caretta turtle, while to the west of the island, in a small valley near the village Petaloudes, a large number of butterflies (Callimorpha quadripunctaria) can be witnessed during the warmest months. Untypical for an island is the case of an endemic species of fresh water fish, the teeny fish Ladigesocypris ghigii. The caves of the island constitute a perfect shelter for the rare bat species (Rhinolophus ferrum-equinum and R. blasii). The Mediterranean monk seal Monachus monachus has been reported to occur at cape Armenistis and in Apolakkias bay. Reptiles are widespread on the island of Rhodes. A faunistic specialty of the island is the presence of Blanus strauchi, the unique representative of Amphisbaenia (Reptiles) in Greece, as well as the lizards of Rhodes (Lacerta oertzeni, European distribution in the islands of Rhodes and Ikaria) which can still be seen on the walls of the Medieval City of Rodos. Other important species: Laudakia stellio, Cryptopodion kotshyi, Hyla arborea, Mauremys caspica. Lastly, there are numerous species of birds so far recognized, such as the bearded vulture, ravens, crows, wild ducks, cranes, herons, pigeons, partridges, etc. (Desio et al., 1936).

Protected natural areas

Since 1937, Greece has started to identify natural areas of specific ecological importance (forests, wetlands etc.) and place them under special protection. In Greece natural areas are identified as protected areas either according to existing national legislation, or through international conventions and international or European initiatives (such as Natura 2000 network). In many cases the same area is listed both in national, European and International level. At national level, the categories of protected areas according to the Greek legislation are illustrated in table (3.3). The protection of the natural environment which derives from international conventions, ratified by the country, and from Greece's participation in international organizations such as the Council of Europe and UNESCO includes the following categories of areas:

-Wetlands of international importance according to the Ramsar Convention
-World Heritage Sites (UNESCO)
-Biosphere Reserves (UNESCO, Man and Biosphere)
-Specially Protected Areas according to the Barcelona Convention
-Biogenetic Reserves (Council of Europe)
-Eurodiploma Sites (Council of Europe)

Table (3.4) Categories of protected areas at national level

Category of protected areas	Greek Law
National Woodland Parks	Law No. 996/71
National Parks	Law No. 1650/86
Aesthetic Forests	Law No. 996/71
Natural Monuments and Landmarks	Law No. 996/71
Wildlife Refuges	Law No 177/75 as amended by Law No 2637/98
Controlled hunting Areas	Law No. 177/75, as amended by Law No. 2637/98
Game Breeding Stations	Law No. 177/75, as amended by Law No. 2637/98
Nature Reserve Areas	Law No. 1650/86
Absolute Nature Reserve Areas	Law No. 1650/86
Protected Forests	Law No. 86/1969
Protected significant natural formations and landscapes	Law No. 1650/86
Ecodevelopment Areas	La No. 1650/86

Data source: Greek biotope/wetland center, http://www.ekby.gr/

A great part of the Greek territory has also been included in the European Ecological Network Natura 2000 sites[43]. The surface area that belongs to the network in Greece, excluding overlaps, is approximately 3.4 million hectares and occupies 21% of the territory. These areas include the National Parks, the Wetlands of International Importance under the Ramsar Convention, as well as other important areas such as Aesthetic Forests and Natural Monuments and Landmarks.

Under the Greek legislation, most of the protected areas of the island of Rhodes belong to the category of wildlife refuges[44] and one area to the category of natural monument: The natural cypress forest of Emponas (135 ha) which mainly consists of centuries old trees and has a special value as biogenetic reserve. The forest, as many of the wildlife refuges, overlaps with the protected areas Natura 2000, under the European directives. Rhodes hosts two "Natura 2000" sites (habitat directive), with a total surface area of 39,110 ha. These sites include the pine forested Akramytis, the Armenistis peninsular, Atavyros, the marine zone (Karavola – Ormos Glyfada), Prophetis Helias, Epta Piges, and the Butterflies valley. These sites are hosting 26 important plant species, 5 mammal species, 4 reptiles and 2 invertebrates declared "endangered" and put under protection status, through EU Directives 79/409 and 92/43 (Hadjigeorgiou and Zervas, 2010).

[43] Greece includes at its National List 163 Special Protection Areas (SPAs) according to Directive 79/409/EEC and 239 Sites of Community Importance (SCIs) according to Directive 92/43/EEC.

[44] Wildlife Refuges are areas covering the basic needs of wild animals, such as food, water and privacy. These areas constitute a network of protected areas, where the laws for hunting play an important role in the preservation of wild fauna. The number of refuges and hunting prohibitions, as well as the changes in boundaries and sizes of these areas are set each year.

In addition, three Natura 2000 areas under the bird directive exist on Rhodes for which the main threats concern the frequent forest fires occurring on the island, the existing wind farms at Attaviros mountain which are likely to have negative impact to passage birds and breeding raptors, the abandonment of grazing and traditional rural activities which is considered to have negative impacts to biodiversity and to the raptors of the area. Furthermore, within these sites, wetlands and dunes are facing degradation due to tourism development. All the protected areas as illustrated in figure (3.2), cover a significant amount (42%) of the total surface of the island (without overlaps).

Table (3.5) Wildlife refuges on the island of Rhodes

Site of wildlife refuge	Geographical area	Area (ha)
Filerimos	Ialysos	190
Theologos	Petaloudes	45
Kremasti, Paradisi	Petaloudes	183
Mega Dasos, Ano Kalamonas	Kalithea, Petaloudes, Kamiros, Afantou	3945,2
Psalidi	Kalithea - Afantou	1074,5508
Panagia Tsambika Psili	Archangelos	92,0931
Kolymbia	Afantou	304,3025
Chorti, Keschinto, Stafylia	Lindos	650
Akramitis	Attaviros	1200
Gaidouras, Marmara, Trifoniatissa, Alones, Troulla	Lindos	3400
Fragma (The area of the dam)	Notia Rodos	430,5
Prasonissi	Notia Rodos	150
Prophet Helias	Kamiros	3000
Agios Ioannis	Notia Rodos	900
Pano Giallos, Limnari, Karavolas	Notia Rodos	580
Katarti	Attaviros	135
Vagies	Archangelos	93
TOTAL AREA		**16.372,65**

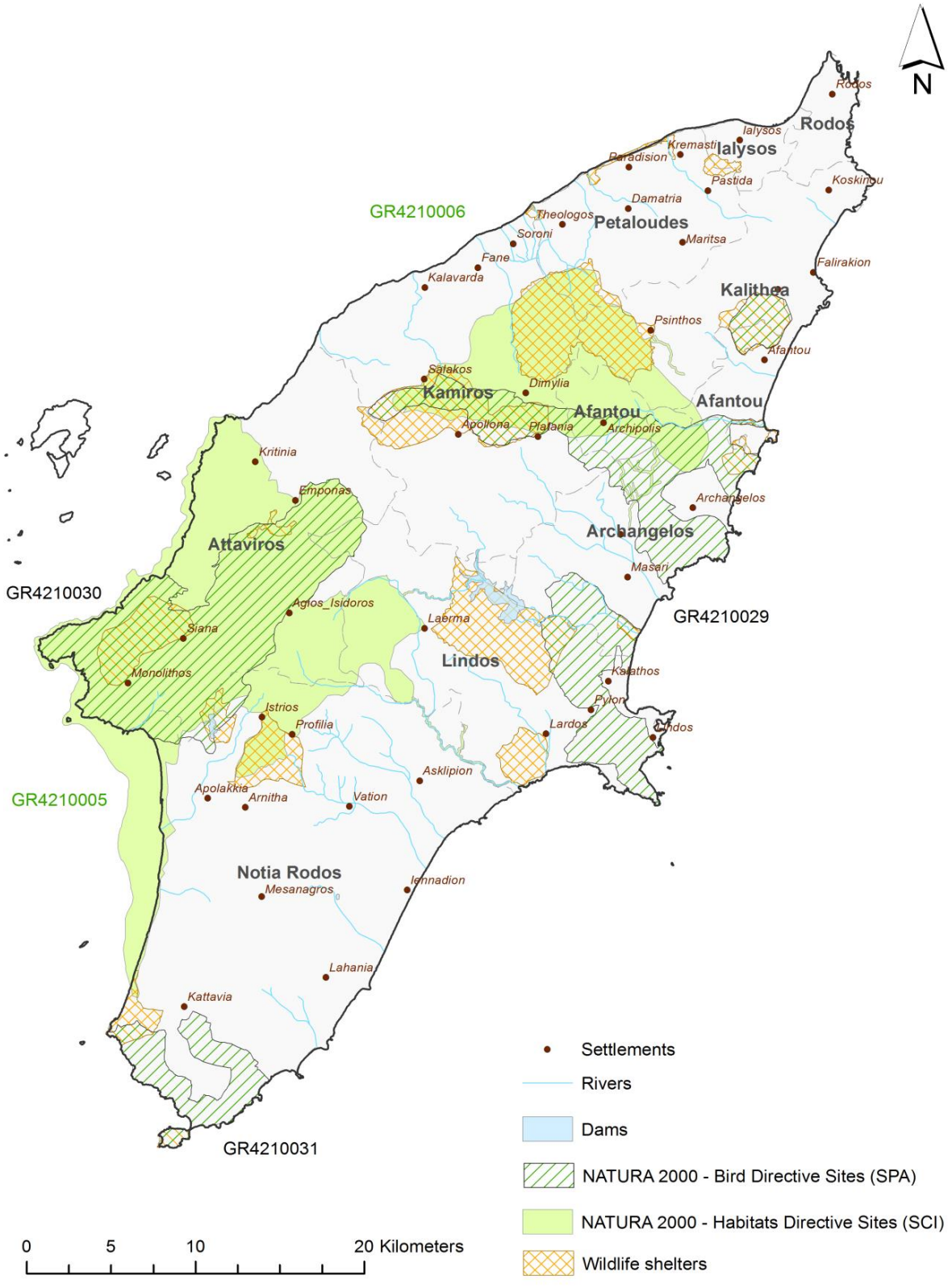
Data source: Directory Office – Forest Management of the Region Dodecanese, Rhodes

Table (3.6) Natura 2000 sites on the island of Rhodes

Region Code	Area (ha)	Listed Species	Flora	Fauna	Type	Species richness (Listed species/area)
Bird directive						
GR4210029	20636.0180	164	0	164	All birds	0,008
GR4210030	13103.1700	144	0	144	All birds	0,01
GR4210031	4457.3349	131	0	131	All birds	0,03
Habitat directive						
GR4210006	11414.2580	35	20	15	1fish, 1invertebrate, 8mammals, 20plants, 1 reptile	0,003
GR4210005	27696.2160	36	16	20	1amphibian, 1fish, 1invertebrate, 5mammals, 16 plants, 12 reptiles	0,001

Data source: Natura2000.eea.europa.eu, data elaboration: C. Geronta

Figure (3.2) Protected natural areas of the island of Rhodes



(Map elaboration: C. Geronta)

Protected cultural sites and features

Rhodes owes its fame to a very long history (the first settlements date from the late Neolithic period 4000 BC), characterized by a continuous alternation of conquerors. Originally settled by Greek populations, Rhodes passed under Romans, Venetians, Genoese, until it has become a possession of the knights of St. John of Jerusalem. In 1522, Rhodes was conquered by the Ottomans who kept the island in their possession until the conquest of Dodecanese islands by the Italians in 1912. The reunification of Rhodes along with the other islands of the Dodecanese with Greece occurs on March 7th, 1948. Natural phenomena (such as earthquakes) and the continuous alternation of conquerors of different origins transformed Rhodes into a rich and multilayered cultural landscape which undergoes a process of a continuous redefinition of its identity through the conservation and elimination of elements belonging to past images and events.

Table (3.7) Chronology of important historical events on the island of Rhodes

Year/time period	Historical events
1700 BC	Early Mycenaean times in Rhodes
1100 BC	The invasion of the Dorians and the foundation of three city-states (Lindos-Ialissos-Kamiros)
408 BC	The foundation of the town Rhodes according to the Hippodameian system
334 BC	Alexander the Great conquered Rhodes
304 BC	Hellenistic period (construction of the Colossus)
227 BC	The first destructive earthquake (destruction of the Colossus)
164 BC	The Roman period
155 AD	The second destructive earthquake
395 - 1309 AD	The Byzantine period (Alternation of Venetian and Genoese dominance)
1309 - 1522 AD	The period of the Knights of St John
1522 - 1912 AD	The Ottoman period
1912 - 1945 AD	The Italian period
1948 AD - today	The modern Hellenic period

Data source: Papachristodolou (1972), data elaboration C. Geronta

According to the list[45] of declared archaeological sites and monuments of Greece, on the island of Rhodes, the majority of listed monuments and sites considered of national historical or architectural interest are distributed in the city of Rhodes. Three quarter of these features belong to the category of urban buildings. The second area which hosts a great number of listed monuments and sites is Lindos where, a great concentration of archeological sites, urban buildings and churches exists. In the area of Archangelos, the majority of listed monuments concern religious features and fortifications that date back to the era of Knights, while on the southern part of island (Notia Rodos) among the listed monuments, rural features are those prevailing.

[45] The list, prepared and published by the Directorate of National Monuments Record of the Ministry of Culture and Sport since 1993, is continuously updated and brings together the declarations that protect monuments, archaeological sites and historic places in Greece, from 1921 until today. Currently more than 11,500 declarations are registered. These have been published up to 2012, and protected more than 19,000 monuments and sites of all periods.

Furthermore, the protection of traditional settlements as part of the Greek cultural heritage was enabled in 1978 with the enactment of "Traditional Settlements Protection Act". Traditional Settlements are mostly small villages (less than 500 inhabitants), with special architectural characteristics, distinct urban form and unique social and historical features, which vary according to local geographical conditions and building traditions. In Greece, since 1978, traditional settlements distributed in insular and continental Greece number almost one thousand and the majority of them are located in the coastal and mountainous parts of the country (Pouzoukidou and Papageorgiou, 2013). On Rhodes, there are 15 traditional settlements, the majority of which are distributed on the southern part of the island.

Table (3.8) Number of listed monuments and historical sites by typology on the island of Rhodes

	Archeological	Urban building /complex	Religious	Industrial	Rural	Fortification	natural	Total
Afantou	0	0	0	0	1	0	0	1
Archangelos	1	1	29	0	0	4	0	35
Attaviros	5	2	1	0	0	1	0	9
Ialysos	5	3	6	0	2	6	0	22
Kalithea	0	2	3	0	1	0	3	9
Kamiros	2	6	0	1	4	0	0	13
Lindos	15	38	13	0	0	1	3	70
Notia Rodos	6	2	2	1	6	1	0	18
Petaloudes	3	5	3	0	2	1	1	15
Rodos	2	358	46	3	63	6	4	482
RHODES ISLAND	39	417	103	5	79	20	11	674

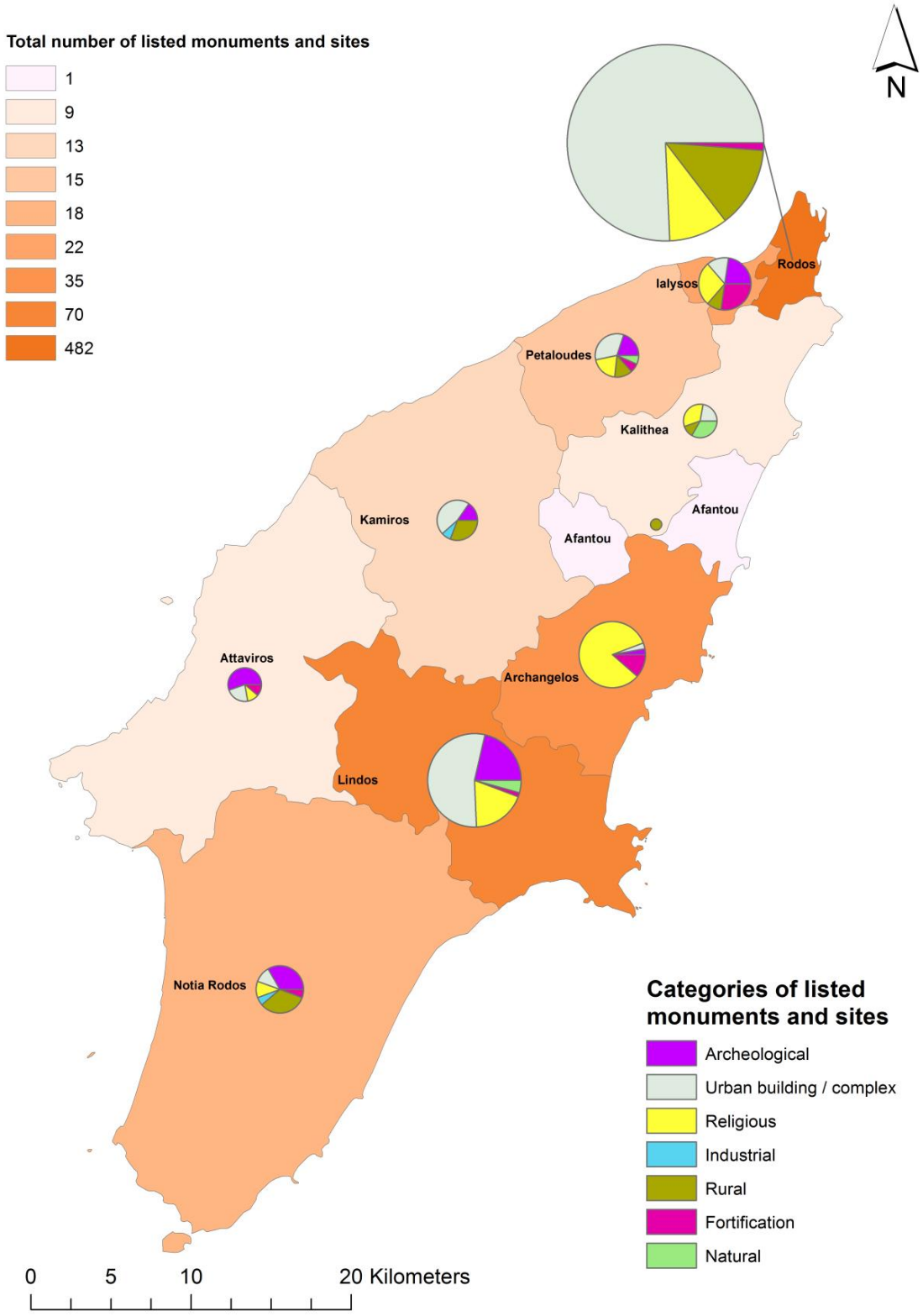
Data source: http://listedmonuments.culture.gr/ (Data elaboration: C. Geronta)

Table(3.9) Number of traditional settlements on the island of Rhodes (13/11/1978 declaration)

	Number	Name
Afantou	0	
Archangelos	0	
Attaviros	2	Lakkion, Siana
Ialysos	0	
Kalithea	2	Psinthos, Koskinou
Kamiros	1	Profitis Elias
Lindos	2	Lindos, Pefki
Notia Rodos	6	Arnitha, Asklipion, Kattavia, Kiotari, Mesanagros, Profilia
Petaloudes	2	Epano Kalamon, Vagies
Rodos	0	
RHODES ISLAND	15	

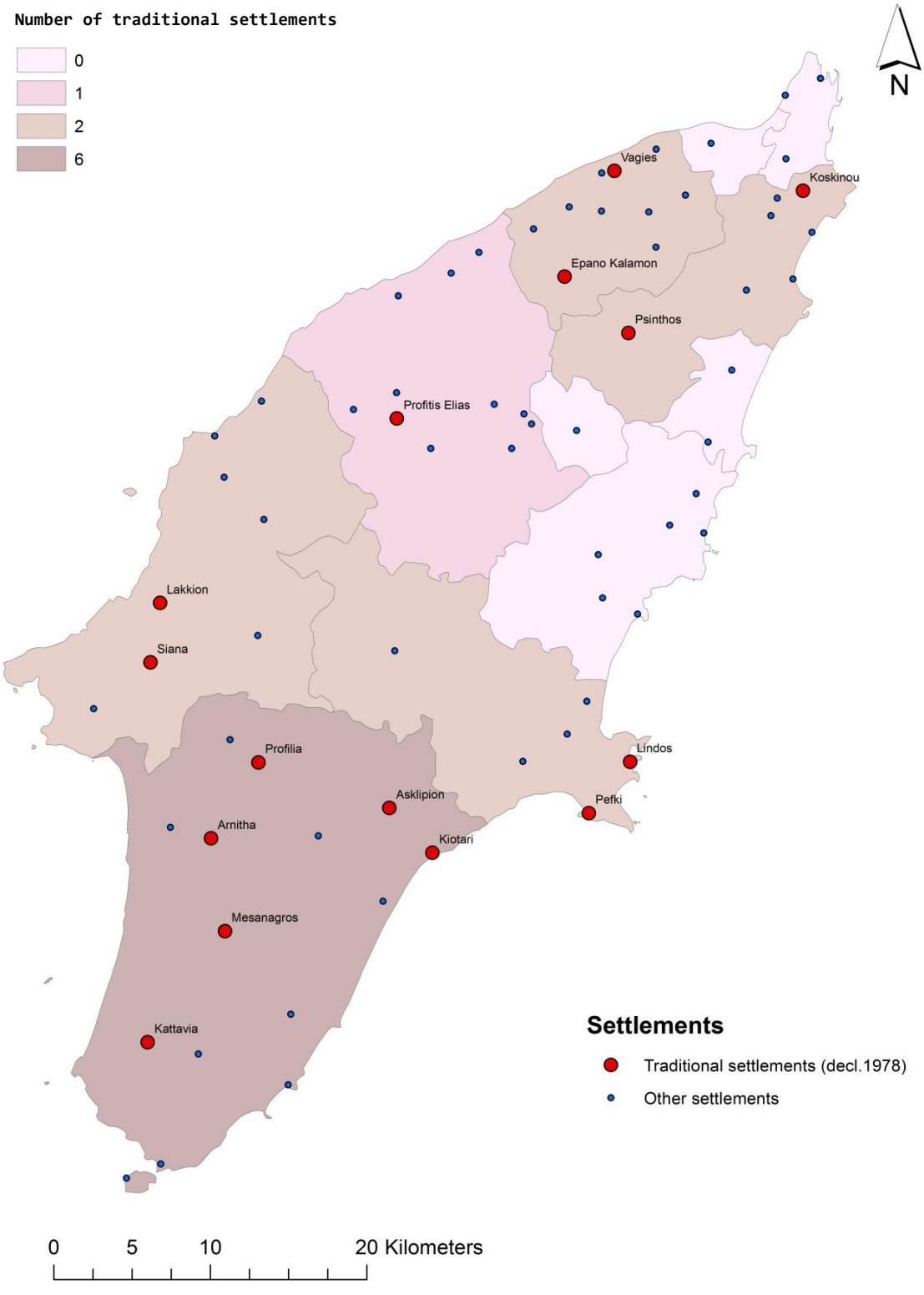
Data source: http://listedmonuments.culture.gr/ (Data elaboration: C. Geronta)

Figure (3.3) Number and categories of listed monuments and sites



(Map elaboration: C. Geronta)

Figure (3.4) Distribution and number of traditional settlements for each local department



(Map elaboration C. Geronta)

3.2.2 The foundations of tourism development

A. Tourism Planning during the fascist regime in the Dodecanese:

In 1912, when the Dodecanese islands passed under the Italian rule, the island of Rhodes already possessed the raw material (natural and cultural features) in order to establish a tourism industry and ensure a secure tourism development. So the Italian policy in the Dodecanese, and particularly on the island of Rhodes, followed the same policy promoted at a national level: the development and expansion of seaside resorts and tourist centers which led to the urbanization of almost all the Italian coasts (such as Sabaudia, Rimini etc.). During this period, tourism starts to be perceived as an industry and hence it is accordingly promoted and organized. In fact, the results of the Italian government's initiatives as regards the tourism sector on Rhodes have been unveiled as the most durable and cost effective compared to all the other initiatives taken in those years (such as in banking, agriculture etc.). Italians have prepared Rhodes for the advent of mass tourism after World War II, when Rhodes was to become one of the main centers of the Mediterranean tourism and vacation industry would become the main source of income and employment of the island (Doumanis N., 1997). Nevertheless, according to Elena Dean Papani (1979) the fact that many scholars recognize Italy as the “godmother” of tourism industry in Rhodes, is relatively true, since even before the arrival of the Italians, a form of consolidated tourism existed which consisted mainly in the arrival of wealthy tourists from Egypt. These were Egyptians of Greek origin who used to come to Rhodes on holiday during the summer, before the Italian occupation, to spend the summer months in their homeland and staying in dwellings of their own property mostly in private villas. However, the tourism offer of the island before the arrival of the Italians, which included some tourism facilities and infrastructures, (such as hotels, tourist establishments, tourist paths, organized and guided trips, transport and communication routes, etc.) was poor and in some cases nonexistent. Indeed, before the arrival of the Italians, the hotels in Rhodes were few, rarely visited and poorly managed, the roads and the transportation were obsolete and inconvenient. There was no form of tourism promotion and tourism had not created any positive impact in employment. The tour operators were few and not very professional (Aloi, 2007). This situation describes a state of backwardness derived from many years of Turkish administration which was indifferent in regards to the territorial and tourism development.

On each of these weaknesses of the tourism offer of the island of Rhodes, the Italians then intervened, modifying and replacing the existing structures in a modern and dynamic way. As Martinoli and Perotti (1999, p.47, note 50) note, "In contrast with the interventions in agriculture, investments in tourism sector have all proved too

forward-looking, as it has become the sector in which the subsequent development of the islands has channeled until today, with profound repercussions on the transformation of the territory." The reasons that prompted the Italian governors to focus considerable energy on developing tourism, are mostly related to the issue of the reconstruction of a new national identity, through the exploitation of their new possessions as were the islands of the Dodecanese. Fascist Italy sought to acquire prestige in the international arena, transforming the islands into “monuments of Italian modernity” (Doumanis, 1997 p.21) and tourism sector could provide the opportunity to show the world the results obtained. The tourism development initiated by Governor Mario Lago therefore fell within the broader project for the diffusion of the image of Rhodes, as well as the multiple abilities of the Italian government. Rhodes, besides a source of economic well-being, it was regarded as an exceptional weapon for seduction of the Italian and foreign public opinion (Martinoli and Perotti, 1999). The Italian Government sought to achieve the publicity of its power employing considerable resources and maintaining high aesthetic quality standards on its works. From the field interviews conducted by Doumanis (1997), it seems that this goal had been reached. The respondents in addition to glorify the Italian constructions, also extolled their qualities (Aloi, 2007). "…All people here loved to watch these things. Tourists, especially the Greeks, used to come here to take pictures… Every Friday a boat full of tourists used to pass…they loved our city…" (Doumanis, 1997, p.188).

The Italian project for tourism development on Rhodes has followed some well-established methods:

- The improvement of the tourism attractions (local natural and cultural resources) existing on the island (territorial marketing), trying to bring them closer to international tourist flows through new maritime and aerial connections,
- the creation of an efficient road network and the construction of modern hotel infrastructure and recreational establishments (innovation marketing)

At first, this project was supported by an intense action of propaganda aiming at diffusing the news that the Dodecanese islands of the Aegean had become Italian territory, spreading the beauties of the islands in Italy and abroad, but also the achievements of the Italian government in other sectors such as agriculture. In a second phase, the intention has been to show what the Italians were capable to do concerning the transformation of the territory, trying to increase the number of tourist arrivals in order to justify the costs payed for the transformation of the island of Rhodes into a luxury tourism destination for wealthy vacationers (Aloi, 2007).

The objectives of the Italian project for Rhodes are reflected in the program of Governor Mario Lago published on “Messagero di Rodi” in July 1923:

1) to fix the port, in order to facilitate traffic making it convenient and prompt;

2) to boost housing construction in order to make the town (of Rhodes) suitable to its new requests, and to develop hotel industry and all other industries related to the movement of foreigners;

3) make (Rhodes) a basis for the irradiation of the Italian culture and civilization in the East Mediterranean, as well as all our banking and industrial institutions that until then were depended on Constantinople and Alexandria or Smyrna. (Ciacci, 1991)

The strategies for the exploitation of resources:

As mentioned, Rhodes had all the potential to become one of the capitals of tourism in the Mediterranean, considering the mild climate of the island throughout the year, by the presence of the sea, the mountains, the thermal springs of Kallithea, the traces of different civilizations etc. These features allowed a diversification of the tourism offer that can be summarized in the following list:

- Cultural Tourism
- Seaside tourism
- Mountain tourism
- Wellness tourism
- Business tourism

The first resources that were exploited were those preexisting, especially those natural. The insular character of Rhodes allowed the development of seaside tourism which thanks to mild climate could last from May until almost the end of November. At high temperatures, mountain tourism could offer the advantage of the fresh air blowing in locations of hills and mountains of the island. Wellness tourism was designed and achieved thanks to the exploitation of Kalithea thermal springs. Cultural tourism which could offer a seasonal extension of tourism on Rhodes, has been developed thanks to the presence of archeological and other historical monuments present on the island and which have been deliberately restored by Italians architects. However, in order to raise these forms of tourism to the European standards, the improvement of the existing structures was necessary as well as the creation of new ones. Consequently, the Italian government on Rhodes focused on the construction of new hotels and general infrastructure, the restoration of monuments (such as the fortifications of the medieval city of Rhodes and that of the Acropolis of Lindos), on the improvement of roads and means of transport, as

well as on the improvement of hospitality through the involvement of specialized tour operators. However, the characteristics and the objectives of the tourism development initiated by the Italians were completely different from those resulting in the following years (Papani Dean, 1979; Aloi, 2007).

B. The effects of the Italian strategy on the island of Rhodes:

B.1. Image exploitation for tourism purposes

Among all the signs and memories left in the Dodecanese by the various administrations belonging to different historical eras, the Italian government on Rhodes decided to mainly focus on those left by the knights of St. John, due to a symbolic dimension allowing the connection of the Italian domination in the Aegean with the defense and dissemination of Catholicism in the eastern lands (Martinoli and Perotti, 1999). For the creation of the new image of Rhodes, captivating symbols picked from its natural and cultural heritage, as well as from its mythological background, have been selected based on their effectiveness in stimulating the imagination and in assisting the potential expectations of tourists, without paying much attention to historical validity (Martinoli and Perotti, 1999). As a consequence, the introduction of deer (dama dama) a species that inhabited the forests of Rhodes from ancient times, has been attributed to the Knights and along with the rose, a plant which was not originally on the island, have become the principle symbols of the island. Once the transformation of the new image of the island has started, the next decision concerned the diffusion of the image of a landscape in which "ancient" and "modern" elements harmoniously coexisted (Aloi, 2007). In fact, beyond the medieval fortifications of the Knights, the new Italian city has been designed in accordance with new concepts such as the garden city movement, the promenade of the French Riviera, and the one of the bathing establishments of Rimini. Beyond the image of the medieval and modern city of Rhodes, also its oriental footprint (Islamic cityscape with bazars and minarets) has been exploited for tourism purposes. However, during the management of the second Italian governor Casare Maria De Vecchi, the new Italian buildings with oriental decorative elements (such as the “Grande albergo delle Rose”, designed by the architect Florestano di Fausto) have undergone an “architectural purification” revealing the principles of rationalism with which they have been designed. Besides the city of Rhodes, all the villages of the island with their traditional Aegean architecture have been completely neglected from the image construction process of Rhodes probably because they were considered to have less strong visible impact.

B.2. Urbanization due to construction of large infrastructures and transportation network specifically for tourism purposes

In 1925, the Italian government started the construction of hotels able to particularly address the needs of an elite clientele mostly. The majority of the tourism infrastructures were erected in the city of Rhodes, but also on Mount Prophet Elias, in the coastal settlement of Ialyssos and in that one of Kallithea. The first investment of the Italian government in hospitality sector, concerned the construction of the hotel "Grande Albergo delle Rose" in a privileged location in the city of Rhodes directly on the north beach (Punta della Sabbia). The hotel has been defined as the best hotel in the eastern Mediterranean and a special destination for luxury tourism. Many of the clients of the hotel originated from Italy, used to arrive by seaplanes provided by the regime. In the same period, another large hotel was built, known as "Albergo del Cervo", located, in a panoramic position on the slopes of Mount Prophet Elias and within its rich pine and cypress forest. The location was accessible by a road specifically constructed. In 1931 however, the hotel could not satisfy the numerous requests of tourists anymore and hence an outbuilding was then constructed about 100 meters away, the Hotel "Albergo della Cerva", which for the same reason later, in 1936, was expanded with a new wing (Aloi, 2007). In order to promote tourism development and economic growth a transportation network was also absolutely necessary. Before the Italian occupation, there were only 30 km of road in a poor state of conservation. In 1929, the road network reached 300 km, while in 1933, on Rhodes there were 700 km of available roads (Aloi, 2007). The main roads were on the coast connecting the city of Rhodes with the southern villages, and later were joined by other traversal roads, allowing people to drive all around the island. With the progress of road network, the automobile movement has also developed. While in 1923, in the Dodecanese islands the number of cars could hardly reach a dozen, in 1936, only on the island of Rhodes there were 400 cars, 300 of which were private and public cars for tourism. In addition, a massive economic intervention and engineering has been carried out by the Italian government, in order to make more efficient the harbors of the island.

B.3. Exploitation of natural resources

In the same years, in order to make Rhodes a competitive destination in the market of elite tourism, tourism offer has been expanded with recreational establishments attractive to specific new market niches. Rhodes, under the Italian rule, had to become a hospitable place for sportsmen, such as golfers, tennis players, cyclists and motorcyclists. The letters of the Governors manifest the need to diversify the tourism offer in order not to annoy the tourists (Aloi, 2007). Within this project of tourism

offer renewal, a golf camp has been created, as well as a reserve for the repopulation of deer in the forests of Mount Prophet Elias destined for hunting. The government also created several parks such as the Rodini Park on the outskirts of the city of Rhodes, with streams, lakes and flowering vegetation, in addition to what is now called "Valley of the Butterflies", a project which allowed tourists to visit one of the rarest habitats in Europe for the concentration of millions of butterflies during the months of July and August. Other parks have been created in some sections of the abandoned Muslim cemeteries after agreements with the Muslim community (Alberone garden). Lastly, for the promotion of wellness tourism, the waters of the thermal Springs of Kallithea have been systematically studied with detailed analyzes. After discovering the important properties of the thermal waters, a tourist establishment in futuristic style and inspired by Turkish hammam has been constructed with the possibility to accommodate a great number of tourists. The project was commissioned to the architect Pietro Lombardi, and under the control of the government it was managed by a private company.

B.4. Exploitation of local crafts and traditions for tourism purposes.

Since, most of the tourist flows of that period were orientated towards unique attractions, the Italian government also manifested an interest in the handicraft industry and the local traditions of the island were reconsidered in view of potential tourism exploitation. In fact, among the cultural attractions of the island, traditional crafts and folklore played at that time a significant role. Manufactures of carpets and pottery that reproduced both oriental designs and original designs from the local culture of Rhodes (such as the Lindian carpet) have been established. In these establishments the majority of workers were women and from the various establishments on the island (Kremasti, Kallithea, Afandou and Archangelos) could weekly sent large amounts of finished work to the city where the carpets were washed and shipped to Italy and the rest of Europe. In 1940, the production was about 40,000 kg per year. The production of ceramics of Lindos, were dedicated to the company I.C.A.R.O. (Artistic Ceramics Industry Oriental Rhodium) which reproduced the most famous features with elegant design and vivid colors. Special attention was also given to local traditions such as folk dance, the singular feminine customs, religious ceremonies, festivals etc.

3.2.3 The booming of tourism development

The island of Rhodes started to follow a common evolution with the rest of the Greek territory after 1948, when all the Dodecanese islands were reunited again with Greece.

Tourism sector in Greece during the first post-war period (1950-1966) was characterized by small size tourism enterprises, lack of methods for management and promotion of the tourism product, as well as lack of appropriately qualified human resources. Tourism, in Greece, has been promoted in the 70's and 80's through an organized policy which has been called Economic Plan for the Development of Greece and which therefore had as a main objective the economic growth of the state. Despite several attempts of the Greek government to enrich the Greek tourism product, investing in alternative forms of tourism, the model mostly promoted at a national level was mass tourism. The reasons were the lack of general infrastructures (harbors, marinas, airports, spas etc.) that would allow the development of alternative forms of tourism and the low quality of offered services due to unprofessional staff.

The first actions for the tourism promotion of the island of Rhodes and other tourism destinations of Greece, were the votes of special decrees for hotels (1966-1970) that allowed the construction of large and multi-storey hotels with construction coefficients higher (more than double) with respect those prevailing. In the same time period at the planning level, the plan of the architect Doxiadis allowed a further tourism development on Rhodes and encouraged urban sprawl in unspoiled since then areas. The Doxiadis' plan mainly included the following interventions:

-The creation of new residential districts in the city of Rhodes (the ancient necropolis areas) to respond to the needs of a growing population,
-The delimitation of archaeological sites for conservation purposes,
-The identification of areas exclusively dedicated to tourism development with criteria based on the microclimate of the coasts (the high temperatures on the East coast and the fresh wind on the west coast).

The new identified tourism areas are linearly arranged along the coasts and along the main roads that lead from the city of Rhodes to the south to other tourism attractions such as Lindos. This intervention follows a general trend of tourism model in the Greek islands, which concerns the development of tourism infrastructure and services gathered in specific -spatially- clusters which either have tourist resources or organized infrastructure (Zaharatos, Tsartas, 2000). However the most critical aspect of the Doxiadis' plan was the uneven development between the north and south part of the island, as evidently this plan did not provide any kind of tourism planning, or suggestions for enhancement of the cultural and natural resources of the southern territory for tourism purposes. Therefore, many tourism accommodations have been constructed within the north triangle of the island with the majority of them

distributed in the city of Rhodes and in the new tourism areas deliberately designed such as the tourism areas of Ialyssos, Kallithea, Faliraki, etc.

After the '90s, with the passage of time, the expansion of tourism on the southeast coast of Rhodes was inevitable. Due to the lack of planning characterizing more than three decades, many illegal constructions started to prevail on the coastal landscape. However, in contrast to the frenetic rhythm of tourism development in the 60's until 80's, during the last decade, the rhythm of tourism growth has evidently slowed down and this is a sign for many researchers and local stakeholders as well, that the island of Rhodes is now going through its saturation phase as a tourism destination.

As in many Greek tourism destinations, on Rhodes the need for innovation of its tourism product has been emerged. To respond to this need for innovation in tourism, ιν 2009 Greece has created a new spatial plan for sustainable tourism development, whose main purpose was the provision of guidelines, rules and criteria for planning, organization and development of the Greek territory and its tourism infrastructure, as well as the formulation of a realistic program of activities for the following years (2009-2024). Among the most important objectives of this plan were: the improvement of the competitiveness of the Greek tourism product, the protection of natural resources, the provision of policy support for regional development, and the formation of a framework of clearer guidelines for institutions and companies involved in tourism planning. Nevertheless, although the main axis that supports the content of this plan is the preservation and enhancement of natural and cultural resources, which constitute the fundamental conditions for the survival and competitiveness of the tourism industry, from the beginning of its publication several critical issues could be observed, including:

-The zoning of the territory into different types of tourism development was very homogeneous and generic, underlining the lack of appropriate studies on the carrying capacity of the various existing and potential destinations.

-The promotion of very large tourism infrastructure, also distributed within Natura 2000 protected areas, in proximity of declared traditional settlements, as well as in small islands facing water scarcity and lack of human resources.

Even though in 2013 the plan has been elaborated on the basis of more sustainable criteria (such as the geomorphology and ecological sensitivity of the different areas), according to the Greek newspaper Kathimerini[46], this plan has been canceled in 2015 by

[46] Article entitled (in Greek), "Ακύρωση χωροταξικού για τουρισμό από ΣτΕ", published 14/10/2015 http://www.kathimerini.gr/834717/article/epikairothta/ellada/akyrwsh-xwrota3ikoy-gia-toyrismo-apo-ste

the Assembly of the Council of State. The plan has been considered a highly controversial piece of legislation, leading to negative views among the various stakeholders, and especially due to the lack of social participation for the approval of the plan and strong reactions from various environmental groups (such as WWF Greece), as well as associations and municipalities (Lipsi and Kimolos).

Moreover, the continuous restructuring and limitation of the services of the Greek Tourism Organization (EOT) and the recent abolition of its regional offices in 2014, render the ministry of "Economy, Development and Tourism" the only institution responsible for tourism planning and implementation of tourism policy. Furthermore, due to the Greek economic crisis, the weakening of the decisional power of the local administration on local affairs leads to generalized solutions applied for the whole country. Besides several initiatives with main concern the regulation of the permissions and operations of tourism businesses, any other general national or regional plan for tourism has not been formulated yet. Consequently, during the last years, tourism development on Rhodes and in many other Greek destinations evolves without any specific plan, and appropriate control and monitoring of the tourism activities and infrastructures.

3.2.4 Spatial dynamics of tourism development on Rhodes and their consequences in Lindos

This paragraph aims at describing the spatial dynamics generated by the tourism development on Rhodes, as well as some general dynamics of the island, whose effects on the landscape character of Lindos area are described in the next chapter. For the quantification of the phenomena, the indicators illustrated in table (3.1) are applied employing collected data from secondary data sources, as well as primary data collected from remote sensing techniques with the aid of GIS. Although the difficulty related to the variability of the available spatial scales of data, the analysis of socioeconomic aspects, such as job and real estate market, aims at acquiring information relative to the socio-economic performance of the island of Rhodes and explore eventual spatial relationships with the characteristics of tourism development.

Demographic change

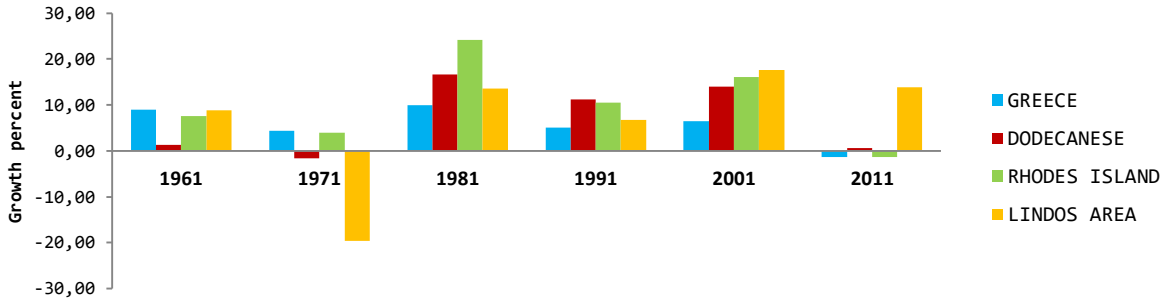
Demographic change has been studied calculating the decennial population growth rate at a municipality, regional and national level. Data show that generally, from the 1970's to the 2000's, a significant population growth can be observed at every spatial scale of reference. Particularly from 1971 to 1981, the decennial population growth rate

shows a sharp increase. During these years, the population of Dodecanese increased by 16,5%, while the total population of Rhodes by 24%, and specifically the local department of Lindos by 13,5%. This phenomenon can be explained by the fact that in Greece, emigration which had started in the mid-1940's and increased dramatically in the 1950's and even more in the 1960's, came into an end (Kokot, et al. 2004). As a matter of fact, on Rhodes island, from 1969 to 1972, emigration (principally to Australia) decreased by around 41% (ELSTAT).

Similarly, from 1981 to 2001, the population continued to increase even though with a minor growth rate. The rapid growth of the population on Rhodes, besides emigration decline, is also due to the sharp increase of leisure activities that attracted people from other Greek regions and minor islands of Dodecanese to move to the island of Rhodes in search of job opportunities in tourism sector. According to Coccossis and Constantoglou (2005)[47], the Greek coastal areas and islands concentrate a large part of national population (38%) and economic activity which is mainly based on tourism. Therefore, the concentration of 90% of tourism and leisure activities along the Greek coast and islands has led to an increased urbanization and number of inhabitants in these areas.

However during the last decade (2001-2011), we can observe a radical decrease in the rate of population growth. The number of people in Greece and on the island of Rhodes has even been diminished, while that one of Dodecanese has remained quite steady. In contrast, the number of inhabitants in Lindos area has continued to increase with a rate of almost 14%.

Figure (3.5) Population Growth rate (decennial)



[47] "The Greek coastal areas and islands concentrate a large part of national population and economic activity" (Coccossis and Konstantoglou, 2005). "Almost 38% of the Greek population and 90% of tourism and leisure activities is located along the coast both of the mainland and the islands, leading to an increased urbanization of the coast (Coccossis and Mexa, 2002a; Coccossis and Mexa, 1997)" (Coccossis and Konstantoglou, 2005).

The population change has been studied also comparing the population trends among the 10 local departments of Rhodes. The results show that from 1961 to 1971, the effects of the emigration of the inhabitants of Rhodes are evident. Almost all local departments show a significant decrease in their population number and especially the populations in the mountainous areas of the island. However, the city of Rhodes (+15%) and the northwest departments of Ialyssos (9%) and Petaloudes (7,5%) show a moderate increase (see figure 3.10).

As emigration declines in the following years, data show that from 1971 to 1981, a rapid increase in the number of inhabitants of all the local departments is observed. The most sharp increase occurred in the north triangle of the island and specifically in the local departments of Ialysos (49,7%), Kalithea (41,2%) and Afantou (34,8%). This sharp increase denotes the first period of intense tourism development on the island of Rhodes (see figure 3.11).

From 1981 to 1991, an intense decrease occurred in the number of inhabitants living in the southern part of the island (municipality of Notia Rodos -54,7%) as well as in mountainous areas located on the west (Attaviros -32,7%, Kamiros -6,8%). These areas underwent a significant depopulation, as the tourism development in the north triangle of the island encouraged internal migration from the southern local departments principally, towards the city of Rhodes (+14,52%) and other northern departments in search of employment opportunities. This is the incidental effect of the Doxiadis' master plan for the tourism development on Rhodes, which generated a disproportionate development on the territory of the island. The Doxiadis' master plan, besides encouraging urban sprawl in the suburbs of Rhodos city with the creation of new residential areas for satisfying the needs of the growing population, (especially the populations from minor Dodecanese islands), concentrated the tourism development exclusively along the coasts of the north triangle of the island. The lack of enhancement of the cultural and natural resources of the southern communities and especially those in the hinterland and in the mountainous areas of the island, created socio-economic marginalization (see figure 3.12).

From 1991 to 2001, although with a minor rate percent (-9,1%), the preceding trend of depopulation continued only in the mountainous area of the municipality of Attaviros. In contrast, the Southern part of the island underwent a very sharp increase of 37,5% in the number of its inhabitants. During these years, tourism development started to expand in the southern part of the island but almost exclusively near the eastern coast. This trend denotes the second period of intense tourism development that this time also included the southern part of the island. The same increasing trend also occurred in the

municipalities of Ialysos (31,1%) and Kalithea (37,7%) that during the preceding decade (1981-1991) presented an almost steady trend in the number of the inhabitants (see figure 3.13).

The opposite trend, with respect that one manifested in the 70's occurred during the years from 2001 to 2011. A decreasing trend in the number of inhabitants can be noticed as regards the north triangle of the island, principally concerning the city of Rhodes (-8,8%) and Kalithea (-4,1%). A slight decreasing trend is also manifested in the municipalities of Kamiros (-3,3%) and Archangelos (-1,5%). In contrast, the population of the southern municipalities continued to increase, denoting the different phases of tourism development between south and north. On the south, with respect to the previous decade, the population of the municipality of Notia Rodos continued to increase with a little lower growth rate (3,62%), while the municipality of Lindos manifested one of the highest growth rates that reaches almost 14% (see figure 3.14).

Considering that during these years the total population of the island of Rhodes is maintained quite steady, one may suppose that a new phenomenon of internal migration is manifested towards the two opposite poles of north-west and south-east coast. The development of a higher number of tourism accommodations on the south and especially the massive construction of second homes, has probably contributed significantly to the emergence of this phenomenon.

Tourism development

Applying several indicators from tourism carrying capacity, such as Defert's tourism function index, with the most recent available data and considering the relationship between the local population and number of offered beds, one can notice that Lindos is the local department where tourism activities have the highest importance for the local economy. However, the impact of tourism in the local economy of Lindos is even greater than the one indicated by Defert's index, if we also consider the large number of day visitors that are excluded in the formula of the index[48] (see figure 3.16). Instead the indicator of tourism density which also considers the size of the area of reference shows that the local department of Lindos has less tourism density with respect to other smaller departments. This is quite problematic as the distribution of tourism accommodations is not homogeneous within the total area of each department. In Lindos as in many other departments the tourism accommodations are developed near the

[48] Although the Defert's index works fairly well as a measure for holiday resorts, it seriously underestimates the impact of tourism in major cities with a large resident population, or in historic towns that attract large number of day visitors.

coast, while the rest of the continental territory nearly lacks tourism accommodations. This manifest a general problem related to the available scale of secondary data usually making reference to large administrative areas.

However, the dominance of recreational activities in Lindos is evident as they reach 61% of its total economic activities (see table 3.19 and figure 3.17). However, generally the highest number of recreational activities is distributed in the city of Rhodes and Kallithea. Furthermore, the typology of accommodations in Lindos is primarily based on apartments and rooms to let, and that can explain the high number of accommodation structures in the area, as well as the dominance of recreational activities. Lindos is the fourth department as regards the typology of hotel units on the island. Hotels are mainly distributed in the city of Rhodes, Ialyssos, and Kalithea, which are the first areas that have known tourism development on the island (see table 3.20).

Job market

The outcomes from the application indicators related to job market show that the unemployment rate at national and regional scale (Greece, South Aegean and Dodecanese islands) has been sharply increased from 1991 to 2011. Indeed, in 2011 Greece presents the second highest unemployment rate (18,8%) in Europe following Spain (see figure 3.6).

Even though from 1971 to 1991 the number of people employed in tourism in the Region of South Aegean increased by five times[49], after 1991 tourism labor force has been only fluctuating between a maximum of 28,6% in 1991 to a minimum of 16,7% in 2001 (see table 3.15). Furthermore, from 2008 to 2010, a decreasing trend is observed concerning the percentage of Greek tourism employees within the total tourism labor force of the South Aegean Region. In contrast, the percentages of tourism employees from countries outside Europe, show a significant increase from 2,7% in 2008 to 18,5% in 2010. This might manifest an effect of the Greek economic crisis to tourism enterprises, which prefer to hire young foreign people as apprentices with lower salaries than local people. Indeed, this trend has provoked the reaction of the National federation of employees in food and tourism sector[50].

Moreover, employment seasonality, which characterizes tourism activities, inevitably causes an increase in the total percentage of unemployment rate. As a matter

[49] Data Source: Regional Operational Programme of the South Aegean Region (in Greek) http://www.ogeeka-dimitra.org.gr/enimerosi/pep_naigaio/pep_naigaio_katastasi.htm

[50] A written protest of the national federation of tourism employees concerning the issue of labor relationships in tourism is published on its official website: http://www.poeeyte.gr/rapt/files/diafora/theseis_poeeyte_pros%20yp.%20ergasias.pdf

of fact, if we consider the high tourism function and dominance of tourism activities in Lindos, we can explain the reason why in 2001, Lindos presents the highest rate of unemployment among the local departments of the island of Rhodes, which amounts to 40%.

Land prices

Another aspect that has been attempted to analyze in order to understand the socio-economic performance of the island and its eventual relationship with tourism development is the land prices. For this aspect the main assumption is that the real estate market value depends on extrinsic qualities (such as the vicinity of services and town centers, accessibility, the quality of the landscape and air, tourism and commercial attractiveness etc.) as well as on intrinsic qualities of a property (such as surface area, state of repair, age, etc.). The collected data concerned the zone prices for real estate for the major cities of the island, as well as the initial price for lands located outside city plans and settlements (see table 3.22, 3.23). These two prices are usually much lower than the final purchase price, but they constitute fundamental data for the assessment of the tax value of a land in Greece, along with other coefficients (such as the coefficient of commercial use). Therefore, as one can observe on the elaborated map (figure 3.20), the highest initial prices for land are distributed in the city of Rhodes as well as along the northeast and northwest coast of the island. Lindos area (community) is the second highest in initial prices for land on the island, while on the mountainous areas and all southern part of the island the prices are much lower even along the coasts.

Second homes

Second homes constitute a tourism product which is based on a free real estate market activity and is subject to the regulations of the relevant legislation. Second homes are frequently used as a means of promoting alternative tourism (residential tourism). However, second homes are intended both as temporary accommodations for locals and foreigners for holiday purposes and as permanent houses especially for retired foreigners (retirement home). Greece has a considerable demand on second homes, and their purchase increases in recent years especially by foreign buyers[51] whose the purchase decision depends on criteria such as the geographic area, climatic conditions, accessibility, recreational opportunities, general infrastructures and real estate prices. According to Minatsi (2010), on the basis of collected data from the revenue

[51] According to relevant data of the Bank of Greece, from 2013 to 2014 there was an increase of 48,8% in the inflow capital concerning the acquisition of holiday homes in Greece by foreigners (from 168 million euro to 250 million euro). Data source: Article published in Kathimerini on 28/06/2015 http://www.kathimerini.gr/821202/article/oikonomia/real-estate/anydria-sthn-agora-e3oxikhs-katoikias

service of Rhodes, from 2003 to 2008, 1.102 houses has been purchased from foreign buyers originated mainly from England (70%) and Italy (10%). Furthermore, according to a recent legislation (4254/2014) relative to the rental of houses by foreign people in Greece, a house rent for more than one month is not considered a tourism accommodation and therefore foreign people who desire to rent a house for a longer period should request the permission of the local authorities. Data show that for the same time period, from 2003 to 2008, 150 permissions have been authorized by the Prefecture of Dodecanese for the rental of houses by foreign people (Minatsi, 2010). As shown in figure (3.21), Lindos is the local department for which the majority of permissions (30%) have been authorized, along with the south department of Notia Rodos (23,3%).

Swimming pools

The typology of the second homes offered as an alternative tourism product on Rhodes is mostly based on a single or two-storey house equipped with spacious yard and at least one swimming pool. The massive construction of second homes, along with the high number of tourism accommodations also equipped with Olympic-size swimming pools surrounded by exotic vegetation, explains the high concentration of swimming pools along the coasts of the island. The remote sensing analysis specifically conducted for the quantification of the swimming pools on the island of Rhodes (see figure 3.23), shows that today on the island there are around 2000 swimming pools and one of the biggest water parks of Europe (Faliraki water park in Kallithea), all distributed along the coasts. This result shows that the swimming pool has become a fundamental component of the tourism landscape on Rhodes and manifests the uncontrolled and continuous adaptation of the territory to mass tourist preferences. Lindos has the highest concentration of swimming pools (421).

Figure (3.6) Segments of the orthophoto of Rhodes illustrating the arrangement of swimming pools along the east coast. Faliraki water park is shown in the second section.

Water exploitation

The massive production of swimming pools reflects one of the most significant environmental threats for the island of Rhodes due to uncontrollable tourism development: water exploitation. During the last decades, the increasing needs for water due to mass tourism and rapid population growth has significantly affected the quality of underground water resources of the island (Coccossis and Tsartas, 2001). On Rhodes due to the lack of surface water, urban water supply is obtained from ground water resources which most of them do not need treatment to meet sanitation requirements. However, through drilling which sometimes is done legally and sometimes illegally, the water is continuously pumped at greater depths. Furthermore, Rhodes supplies fresh water at other arid islands, the demand of which increases with progressive tendency. The arbitrary pumping of water for irrigation needs[52] which is a common practice, along with the uncontrolled use of water by the inhabitants during the dry months, compounds the current difficult situation.

Nevertheless, tourism is the major cause of the overexploitation of water on Rhodes, especially in summer, due to the uncontrolled use of water by the bathers on the beaches, the use of water for swimming pools, the everyday washing of thousands of rental cars and several buses, and the constantly increasing number and size of cruise ships that fill the harbor with the numerous requirements of thousands of passengers.

Since the 1990's the problem was already known. As a matter of fact, in the 1996, the report on the final results of the coastal area management programme (CAMP) for the island of Rhodes (CAMP/RHODES) provides an estimation of wastewater effluent produced by domestic and recreational uses on Rhodes which amounts to 30.586 m^3 per day. Based on the new available data on population and number of beds and considering that local population produces 120lt of wastewater per capita per day and tourists 300lt, the wastewater effluent for the year 2011 has been calculated. The results show that, from 1991 to 2011, wastewater effluent has been increased by 24%. Specifically at the central-eastern local departments (Afantou, Archangelos and Lindos) wastewater effluent is estimated to have been increased by 47,6%.

In order to meet the long-term region water supply needs, between the local departments of Lindos and Archangelos a new project including the Gadouras dam with reservoir capacity around 65 hm^3 and appurtenant works construction (such as the water mains to the town of Rhodes including a small tunnel and the water treatment plant

[52] Water supply for irrigation is also dependent on groundwater except of the southwest part of the island, where water supply is obtained from the Apolakkia storage dam and reservoir whose capacity is $8x10^6$ m^3 per year (Manoli et al., 2004).

construction) has been nearly implemented. The construction of the dam has inevitably provoked a visible transformation of the landscape and it is expected to affect ecological functions and biodiversity, as changes in vegetation may place at risk the birds and animals that depend on it.

Burnt areas

On the island of Rhodes the forest fires are a very frequent phenomenon whose real causes can hardly be identified. At the most cases, this process is related to human activities as result of carelessness in the use of fire or as an attempt of further urbanization and exploitation of land (malicious arson are not undertaken in the winter but in hot dry days and days with strong winds). As population movement becomes more intense in the countryside (due to tourism, agricultural activities, hunting etc.), the incidents of forest fires increase drastically. The garbage dumps and energy pillars are frequently the places where the ignition or expansion of an existing fire takes place, entailing the risk of a rapid spread of fire due to changing climatic conditions (fluctuation of humidity, strong winds, high temperatures etc.). Forest fires, besides the obvious negative impact on the environmental quality of a tourism destination, in a tourism landscape evaluation it is a phenomenon which should be studied due to the proximity of the damaged sites to the recreational areas.

This study considered the largest fires of the last 20 years (1981, 1987, 1992 and 2008). With remote sensing on landsat satellite images of the island of Rhodes the extent of the burnt areas has been calculated for each forest fire. The outcomes show that totally these major forest fires burnt 26% of the territory of the island and 26,3% of protected natural areas.

The local department of Lindos has been seriously affected by the fires and especially of that one in 2008. The protected areas of Lindos have been damaged by 63%. Specifically, in 2008, the total burned area amounts to 10,445 hectares, including 5,370 hectares of forest (51,4%), 1,516 hectares of agricultural land(14,5%), and 3,553 bushes and lawns (34,1%).

Table (3.10) Burnt areas coverage

Forest fire year	Total burnt area (ha)
2008	10445
2013	3779
1987	12115
1992	8825
Total	35494

Landscape metrics

As mentioned in chapter 2, landscape metrics describe and measure in a quantitative manner the structural properties of landscapes. In order to make a first estimation of the effect of tourism development on the landscape structure of the island of Rhodes, three fundamental structural properties have been measured using landscape metrics. Based on Corine 2000 land cover, which is the only available and most recent cartographic material providing information about the land cover of Rhodes[53], I calculated with the aid of GIS (Patch analyst tool), three indexes of landscape ecology for each local community of the island: Patch density (PD), Shannon's Diversity index(SDI) and Area Weighted Mean Patch Fractal Dimension (AWMPFD).

Each local community is considered a unit of landscape while the various land cover classes represent the patch types. On the basis of the size, distribution and shape of the various landscape units and patches, the three indexes have provided quantitative information about the level of fragmentation, diversity and complexity of each local community.

The outcomes as illustrated in thematic maps (figure 3.25, 3.26 and 3.27), show that the urbanization that took place in the north triangle of the island due to tourism development has provoked a greater fragmentation of the landscape, which entails greater environmental risks with respect to the southern areas.

From the calculation of the other two indexes, one can make an assessment on the variety and the morphological complexity of the different land use classes that are present in each community. The maps show that communities along the coast, and especially along the north-east coast, are characterized by greater diversity in land uses but morphologically less complex.

The local community of Lindos (Lindos area) with respect to other communities presents lower fragmentation, and it is fairly homogeneous and morphologically simple. However, it should be mentioned that on Corine 2000 scale, the sparse constructions characterizing the Greek landscape[54] and which contribute to landscape fragmentation are not distinguished. Therefore, in order to make a more appropriate estimation of landscape structural properties, detailed and updated cartographic material on land cover or land uses should be available.

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[53] At the time of the execution of my research project, Greece has not provided yet any recent Corine land cover map besides Corine 2000. In addition, the municipality of Rhodes lacks any cartographic material related to land uses.

[54] The sparse constructions are a result of the Greek legislation that allows constructions in an area of 40 ha and due to the lack of control of the illegal constructions

Table(3.11) Population

	1951	1961	1971	1981	1991	2001	2011
Afantou	3309	3140	2823	4329	6106	6665	6911
Archangelos	4625	4784	4594	6.241	7015	7731	7615
Attaviros	4065	4099	3183	3517	2651	2429	2433
Ialysos	2822	3162	3485	6.926	6967	10111	11331
Kalithea	3306	3479	3447	5.864	6076	9749	9364
Kamiros	3989	4297	3702	4725	4426	4878	4720
Lindos	**2472**	**2711**	**2267**	**2621**	**2811**	**3411**	**3957**
Notia Rodos	3963	3836	3172	3316	2144	3432	3561
Petaloudes	6115	6327	6836	8388	10436	11842	14962
Rodos city	24280	28119	33100	40.624	47527	55086	50636
RHODES ISLAND	59.087	63.954	66.609	87.833	98.181	117.007	115.490
DODECANESE	121.480	123.021	121.017	145.071	163.476	190.071	191.272
GREECE	7.632.801	8.388.533	8.768.641	9.740.417	10.259.900	10.964.020	10.815.197

Data source: Hellenic Statistical Authority (ELSTAT) and Regional Development Agency of Dodecanese (ANDO)
Data elaboration: Chrysafina Geronta

Table(3.12) Decennial Population Growth rate (%)

	1961	1971	1981	1991	2001	2011
Afantou	-5,4	-11,2	34,8	29,1	8,4	3,6
Archangelos	3,3	-4,1	26,4	11,0	9,3	-1,5
Attaviros	0,8	-28,8	9,5	-32,7	-9,1	0,2
Ialysos	10,8	9,3	49,7	0,6	31,1	10,8
Kalithea	5,0	-0,9	41,2	3,5	37,7	-4,1
Kamiros	7,2	-16,1	21,7	-6,8	9,3	-3,3
Lindos	**8,8**	**-19,6**	**13,5**	**6,8**	**17,6**	**13,8**
Notia Rodos	-3,3	-20,9	4,3	-54,7	37,5	3,6
Petaloudes	3,4	7,4	18,5	19,6	11,9	20,9
Rodos city	13,7	15,0	18,5	14,5	13,7	-8,8
RHODES ISLAND	7,61	3,99	24,16	10,54	16,09	-1,31
DODECANESE	1,25	-1,66	16,58	11,26	13,99	0,63
GREECE	9,01	4,33	9,98	5,06	6,42	-1,38

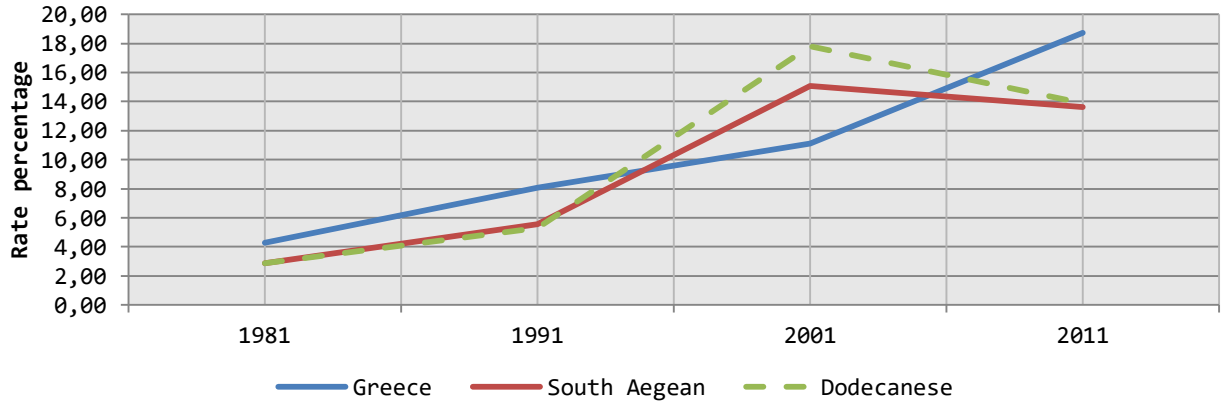
Data Calculation: Chrysafina Geronta

Table(3.13)Employment and Unemployment Rate (1981-2011)

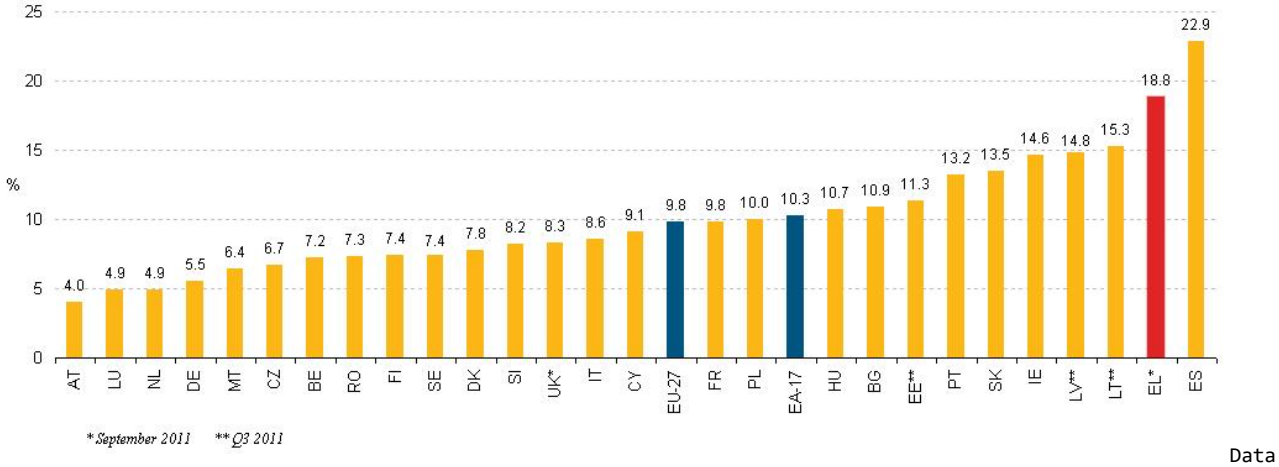
		Greece	South Aegean	Dodecanese
1981	Employment Rate	92,98	97,14	97,15
	Unemployment Rate	4,27	2,86	2,85
1991	Employment Rate	77,39	71,01	71,01
	Unemployment Rate	8,09	5,57	5,28
2001	Employment Rate	88,88	84,94	82,19
	Unemployment Rate	11,12	15,06	17,81
2011	Employment Rate	81,27	86,38	86,12
	Unemployment Rate	18,73	13,62	13,88

Data source: Hellenic Statistical Authority (ELSTAT) and Regional Development Agency of Dodecanese (ANDO)
Data elaboration: Chrysafina Geronta

Figure(3.7) Graphic representation of unemployment rate (%)



Figure(3.8)Unemployment rate in Europe (2011)



Data

Source: Eurostat

Table (3.14)Employment data on Rhodes island (for the year 2001)

	Primary sector	Secondary sector	Tertiary sector	No statement	Total number of employees	Labor force	Unemployed	Unemployment rate (%)
Afantou	81	275	1288	175	1819	2895	1076	37%
Archangelos	192	571	1708	154	2625	3228	603	19%
Attaviros	549	159	295	12	1015	1128	113	10%
Ialysos	99	642	2763	307	3811	4602	791	17%
Kalithea	94	595	2111	192	2992	4130	1138	28%
Kamiros	230	413	959	22	1624	2115	491	23%
Lindos	59	193	544	22	818	1357	539	40%
Notia Rodos	309	163	698	48	1218	1347	129	10%
Petaloudes	168	871	2972	179	4190	5282	1092	21%
Rodos	298	3661	16594	1235	21788	25837	4049	16%
RHODES ISLAND	2079	7543	29932	2346	41900	51921	10021	19%

Data source: Hellenic Statistical Authority (ELSTAT)- computerized information (Prokopiou D.,2006)

Table (3.15) Tourism labor force in the South Aegean Region

	South Aegean Region		
	Number of people employed in tourism services	Total number of employed people	Tourism labor force
2011	28.948	120.950	23,93 %
2001	17.813	106.845	16,67 %
1991	25.506	89.320	28,56 %
1981	23.400*	74.936	31,23 %

Data source: Hellenic Statistical Authority (ELSTAT) Data elaboration: Chrysafina Geronta
* estimated number on basis of the annual average growth rate (9.18%) of the number of people employed in tourism from 1981 to 1997 in the South Aegean Region. REGIONAL OPERATIONAL PROGRAMME of the SOUTH AEGEAN Region. Source: http://www.ogeeka-dimitra.org.gr/enimerosi/pep_naigaio/pep_naigaio_katastasi.htm

Table(3.16) Region of origin of tourism employees in the South Aegean region (time period of reference 2005-2010)

	South Aegean Region Number of employees in tourism services (accommodations/restaurants)											
	3rd semester 2005		3rd semester 2006		3rd semester 2007		3rd semester 2008		3rd semester 2009		3rd semester 2010	
	Employees	*%*	*Employees*	*%*	*Employees*	*%*	*Employees*	*%*	*Employees*	*%*	*Employees*	*%*
Greek	24058	93,9	20525	87,0	29616	97,4	17201	95,5	14424	85,3	8168	78,9
Other European countries	176	0,7	776	3,3	367	1,2	311	1,7	557	3,3	268	2,6
Other countries	1398	5,5	2282	9,7	426	1,4	495	2,7	1938	11,5	1911	18,5
Total number	**25632**	100,0	23583	100,0	30409	100,0	18007	100,0	16919	100,0	**10347**	100,0

Data source: Hellenic Statistical Authority (ELSTAT) Data elaboration: Chrysafina Geronta

Table(3.17) Tourism density

	Area (km^2)	Population 2011	Number of hotel beds	Number of other type beds	Total number of beds	Tourism Density
Afantou	51	6911	6477	1413	7890	2,239
Archangelos	116	7615	964	862	1826	0,207
Attaviros	232	2433	42	11	53	0,009
Ialysos	16	11331	17038	907	17945	9,898
Kalithea	109	9364	18153	5712	23865	2,338
Kamiros	212	4720	84	169	253	0,025
Lindos	179	3957	7723	3919	11642	1,644
Notia Rodos	382	3561	4040	517	4557	0,335
Petaloudes	89	14962	3226	801	4027	0,302
Rodos	20	50636	15495	811	16306	1,610
RHODES ISLAND	**1406**	**115490**	**73242**	**15122**	**88364**	0,054

Data Source: EOT (headquarters of Rhodes) Data elaboration: Chrysafina Geronta

Table(3.18) Tourism function

	Population 2011	Total number of beds	Tourism function	Ratio
Afantou	6911	7890	114,17	N>P
Archangelos	7615	1826	23,98	
Attaviros	2433	53	2,18	
Ialysos	11331	17945	158,37	N>P
Kalithea	9364	23865	254,86	N>P
Kamiros	4720	253	5,36	
Lindos	3957	11642	294,21	N>P
Notia Rodos	3561	4557	127,97	N>P
Petaloudes	14962	4027	26,91	
Rodos	50636	16306	32,20	
RHODES ISLAND	**115490**	**88364**	**76,51**	

Data Source: EOT (headquarters of Rhodes) Data elaboration: Chrysafina Geronta

Table(3.19) Tourism activities dominance for the year 2005

	Number of accommodation and food activities	Number of recreational, cultural and athletic activities	Total number of economic activities	Tourism activities dominance (%)
Afantou	183	26	507	41,22
Archangelos	177	36	469	45,42
Attaviros	60	2	146	42,47
Ialysos	220	33	733	34,52
Kalithea	350	59	811	50,43
Kamiros	51	3	152	35,53
Lindos	298	48	564	61,35
Notia Rodos	124	16	269	52,04
Petaloudes	194	18	724	29,28
Rodos	949	131	5524	19,55
RHODES ISLAND	**2606**	**372**	**9899**	**30,08**

Data Source: http://geodata.gov.gr/ Data elaboration: Chrysafina Geronta

Table(3.20) Number and typology of accommodations

	Hotel units	Hotel beds	Other type units	Other type beds	Other type (rental) rooms	Apartments
Afantou	45	6477	87	690	1413	249
Archangelos	17	964	67	386	862	101
Attaviros	20	42	1	5	11	0
Ialysos	90	17038	47	401	907	234
Kalithea	76	18153	262	2659	5712	1398
Kamiros	3	84	9	76	169	11
Lindos	60	7723	283	1882	3919	719
Notia Rodos	23	4040	37	251	517	89
Petaloudes	34	3226	47	381	801	158
Rodos	134	15495	35	379	811	104
RHODES ISLAND	502	73242	875	7110	15122	3063

Data Source: EOT (headquarters of Rhodes) Data elaboration: Chrysafina Geronta

Table(3.21) Percentage of each accommodation typology

	Hotel units %	Other type units %	Other type (rental) rooms %	Apartments %
Afantou	2,51	4,85	78,76	13,88
Archangelos	1,62	6,40	82,33	9,65
Attaviros	62,50	3,13	34,38	0,00
Ialysos	7,04	3,68	70,97	18,31
Kalithea	1,02	3,52	76,69	18,77
Kamiros	1,56	4,69	88,02	5,73
Lindos	1,20	5,68	78,68	14,43
Notia Rodos	3,45	5,56	77,63	13,36
Petaloudes	3,27	4,52	77,02	15,19
Rodos	12,36	3,23	74,82	9,59
RHODES ISLAND	2,57	4,47	77,30	15,66

Data Source: EOT (headquarters of Rhodes) Data elaboration: Chrysafina Geronta

Table (3.22) Minimum and maximum zone prices for real estate properties in the major cities (2007)

City	Min. zone price	Max. zone price
Archangelos	600	700
Afantou	650	800
Ialyssos	800	1800
Ixia	750	1450
Rodos	1000	2750

Data source: Ministry of economy (http://www.gsis.gr/gsis/info/gsis_site/Services/Polites/Antikeimenikes.html)

Table(3.23)Initial price for determining land value outside city plans and settlements (2008)

Local department	Community	INITIAL Price for land (EURO/M^2)	Local department	Community	INITIAL Price of land (EURO/M^2)
ARCHANGELOS	Archangelos	40,00	**NOTIA RODOS**	Apollakia	20,00
	Malona	30,00		Arnitha	15,00
	Massari	30,00		Asklipion	30,00
ATTAVIROS	Agios Isidoros	15,00		Vation	15,00
	Empona	20,00		Ienadion	30,00
	Kritinia	20,00		Istrios	15,00
	Monolithos	15,00		Kattavia	20,00
	Sianna	15,00		Lahania	20,00
AFANTOU	Afantou	50,00		Mesanagros	15,00
	Archipoli	20,00		Profilia	15,00
IALISSOS	Ialysos	70,00	**PETALOUDES**	Damatria	30,00
KALITHEA	Kalithies	50,00		Theologos	40,00
	Koskinou	70,00		Kremasti	50,00
	Psinthos	20,00		Maritsa	30,00
KAMIROS	Apollona	20,00		Padadisi	50,00
	Dimilia	20,00		Pastida	40,00
	Kalavarda	20,00	**LINDOS**	Kalathos	30,00
	Platania	20,00		Laerma	20,00
	Salakos	25,00		Lardos	40,00
	Soroni	20,00		**Lindos**	**80,00**
	Fanes	20,00		Pylona	20,00
RODOS	RODOS	100,00			

Data source: Ministry of economy (http://www.gsis.gr/gsis/info/gsis_site/Services/Polites/Antikeimenikes.html)

Table (3.24) Calculation of wastewater effluent from domestic and recreation uses (1991-2011)

Geographical Units	1991			2011					
	Sum of population	Sum of beds	Effluent m3/d	Sum of population	%	Sum of beds	%	Effluent m3/d	%
Rodos, Ialysos, Kalithea	55960	49928	**21.694**	71331	21,5%	58116	14,1	**25.995**	16,5
Petaloudes	10637	2686	**2.082**	14962	28,9%	4027	33,3	**3.004**	30,7
Kamiros	5122	200	**675**	4720	-8,5%	253	21	**642**	-5,1
Attaviros	3584	12	**434**	2433	-47,3%	53	77,4	**308**	-41
Afantou, Archangelos, Lindos	18423	7697	**4.520**	18483	0,3%	21358	64	**8.625**	47,6
Notia Rodos	4455	2155	**1.181**	3561	-25,1%	4557	52,7	**1.794**	34,2
TOTAL (RHODES)	98181	62678	**30.586**	115490	15%	88364	29,1	**40.368**	**24,2**

Data source for the year 1991: UNEP(1996), Data elaboration and calculation for the year 2011: C. Geronta

Figure (3.9) Growth rate (1951-1961)

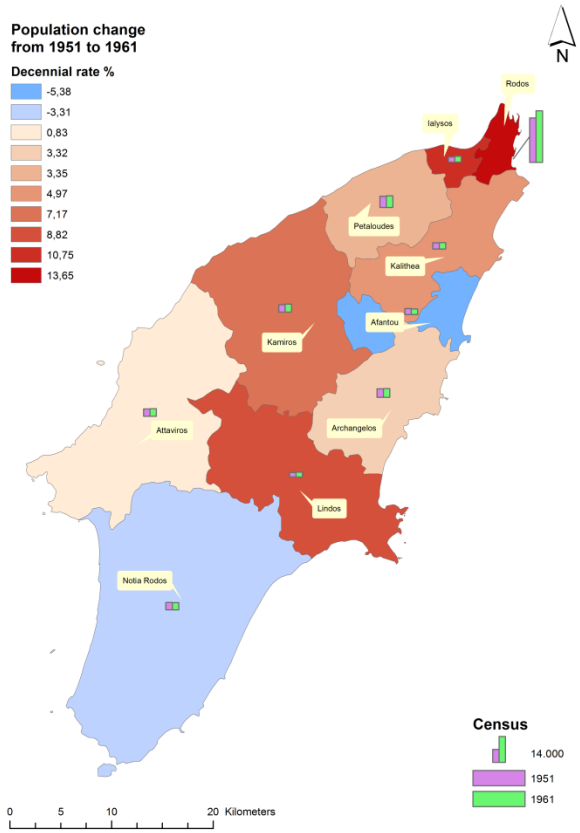


Figure (3.10) Growth rate (1961-1971)

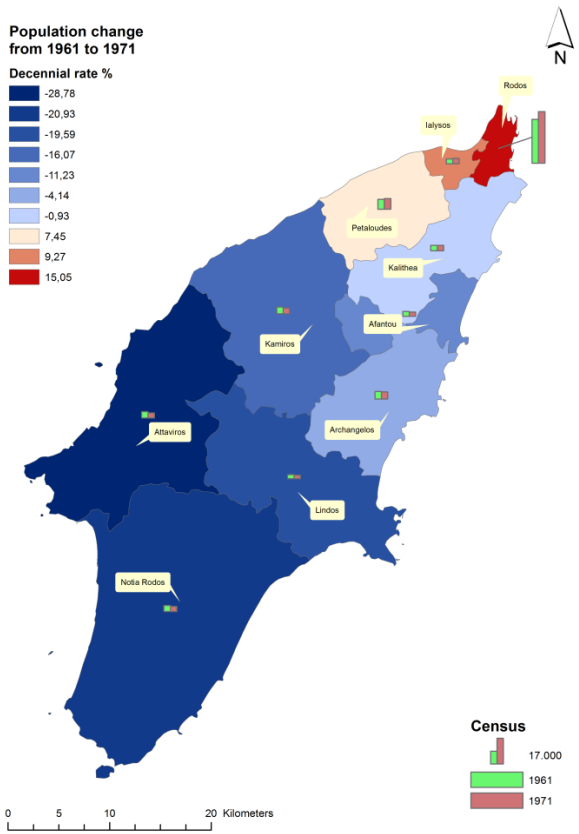
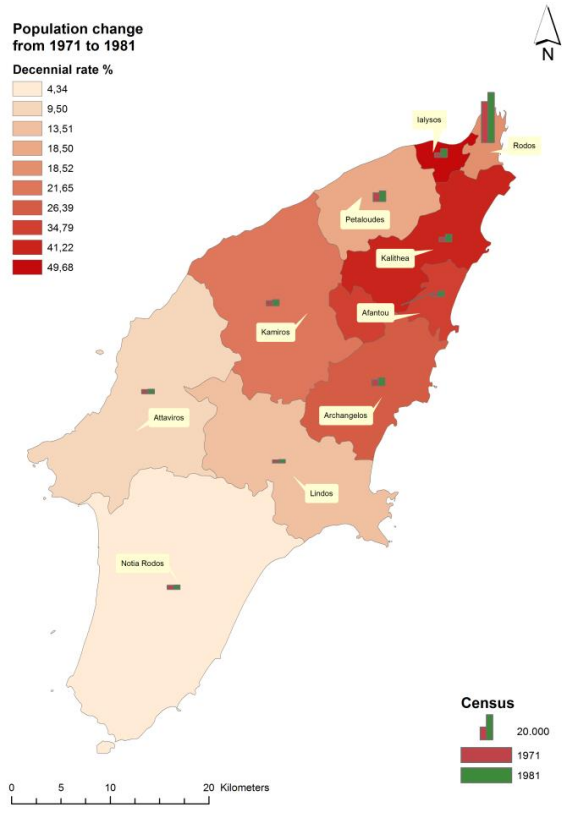


Figure (3.11) Growth rate (1971-1981)



Maps elaboration: C. Geronta

Figure (3.12) Growth rate (1981-1991)

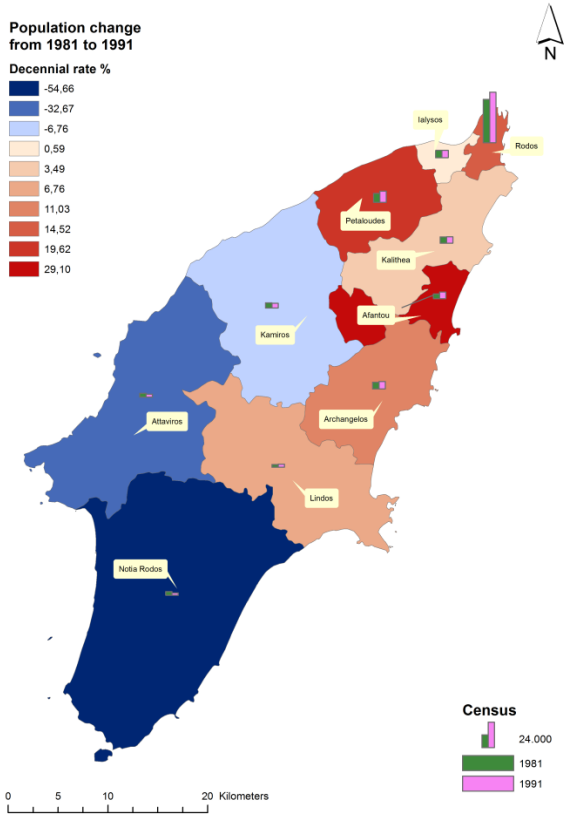


Figure (3.13) Growth rate (1991-2001)

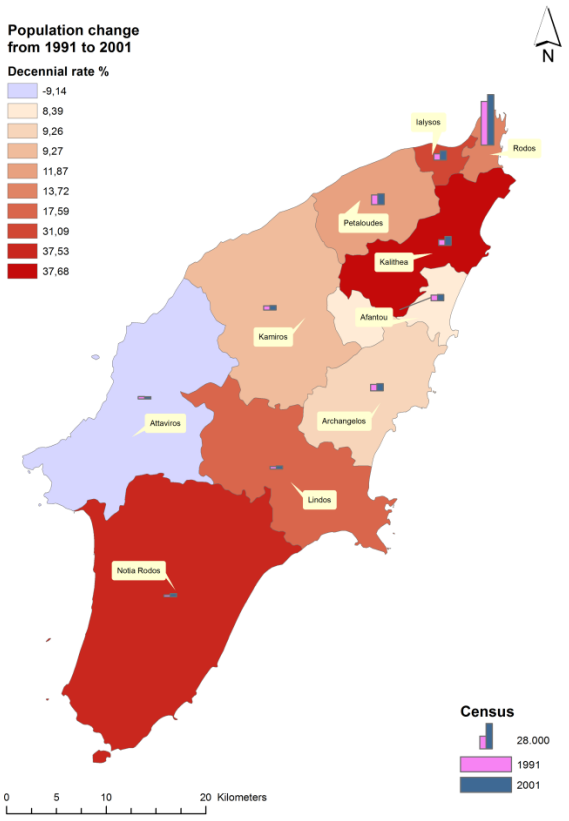
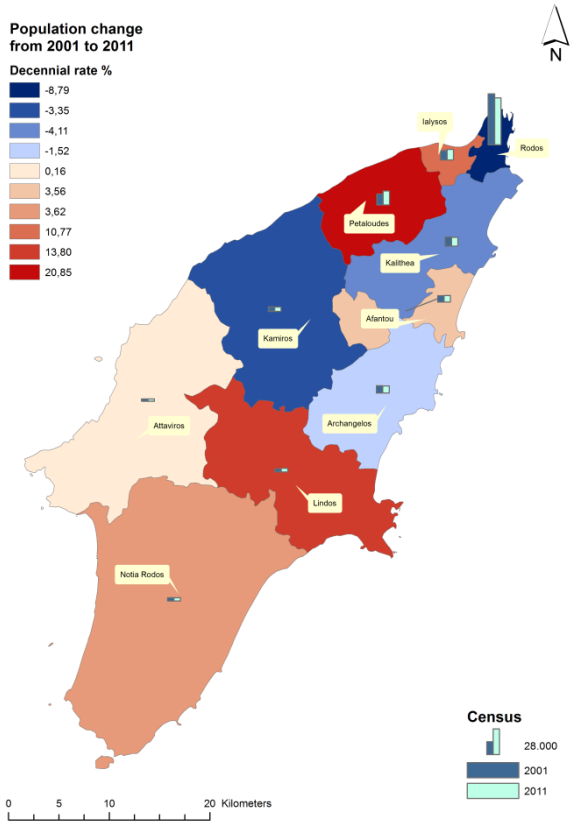


Figure (3.14) Growth rate (2001-2011)



Maps elaboration: C. Geronta

Figure (3.15) Tourism density

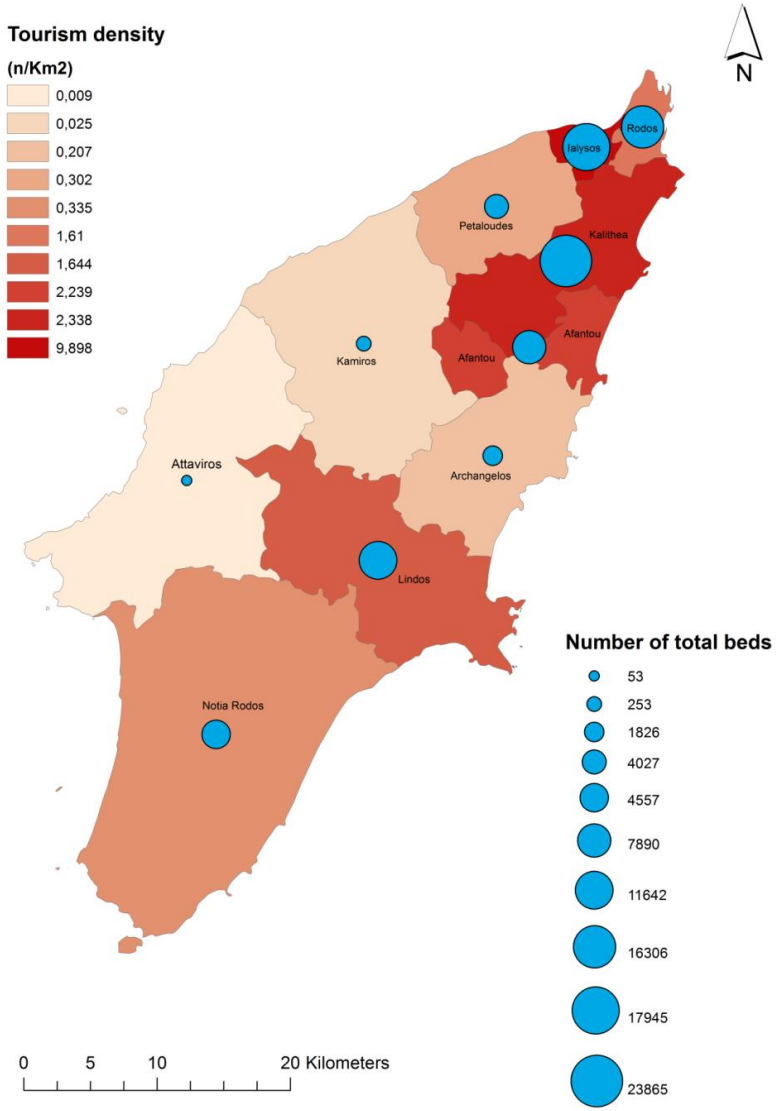
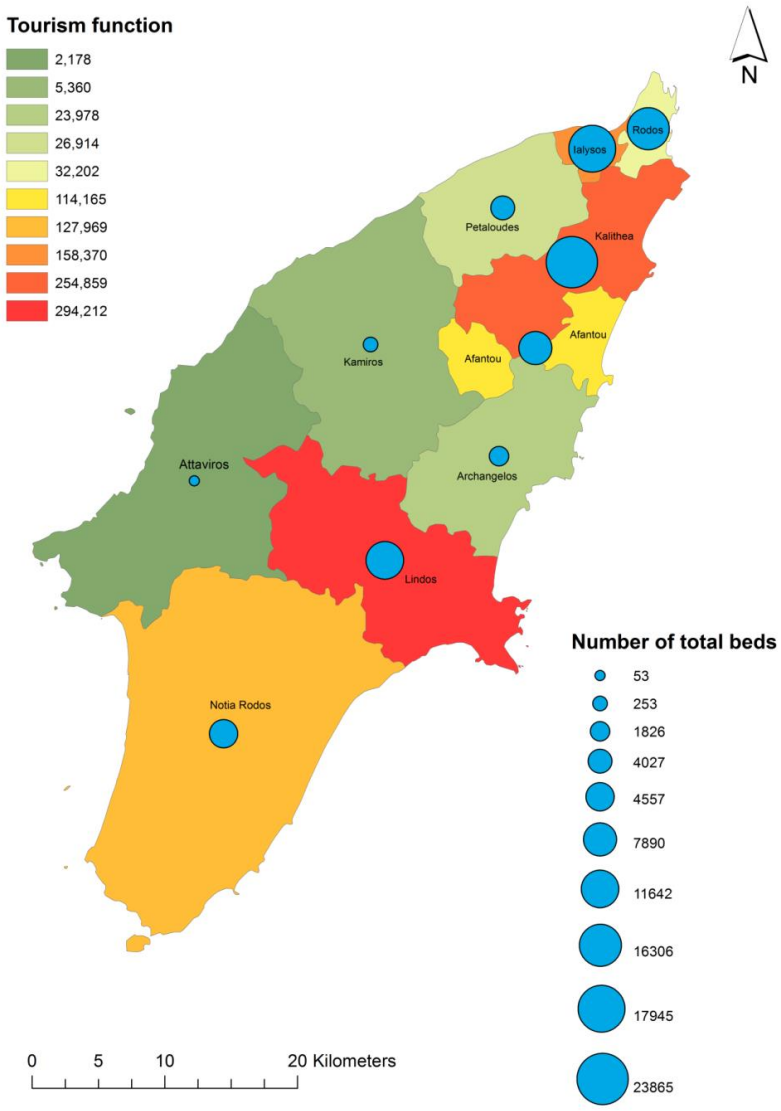


Figure (3.16) Tourism function



Maps elaboration: C. Geronta

Figure (3.17) Tourism dominance in economic activities (2005)

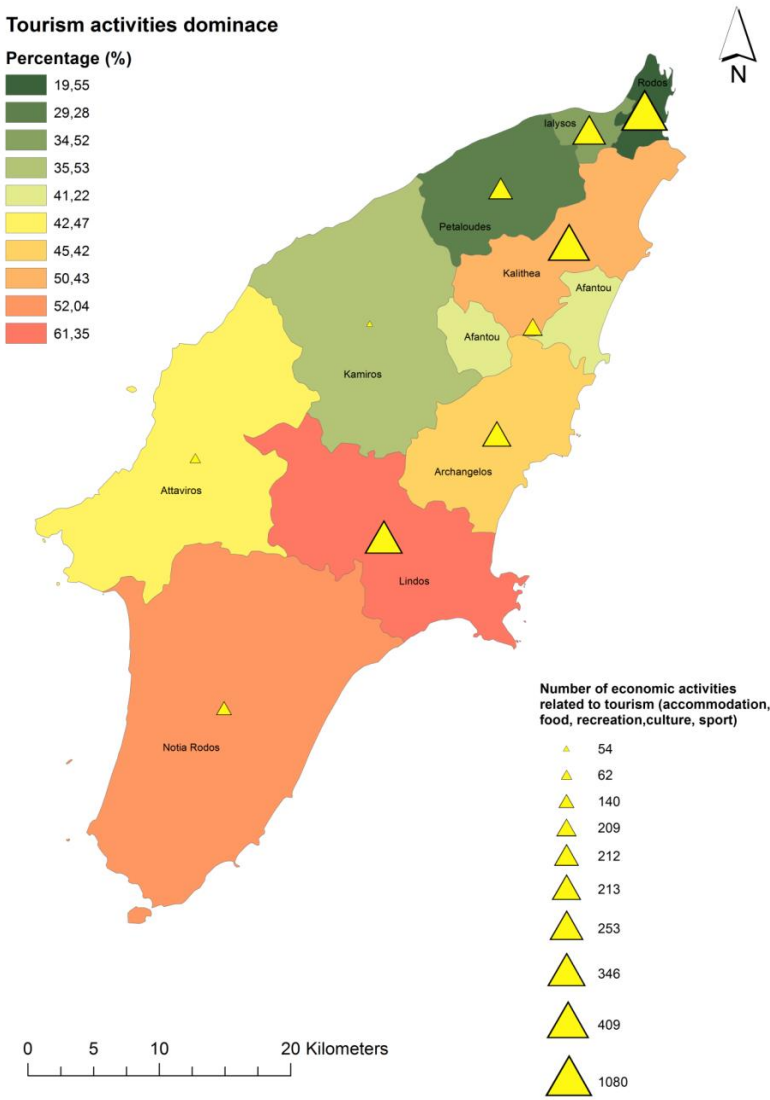
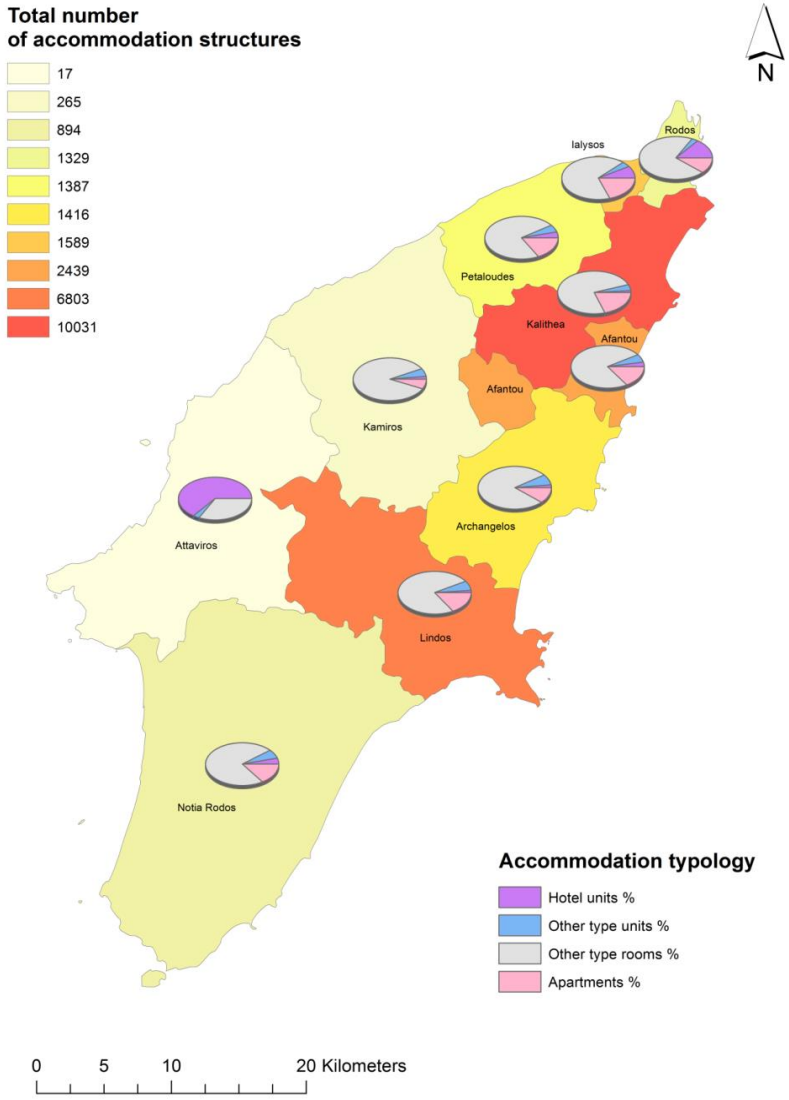


Figure (3.18) Accommodation typology



Maps elaboration: C. Geronta

Figure (3.19) Unemployment rate for the year 2001

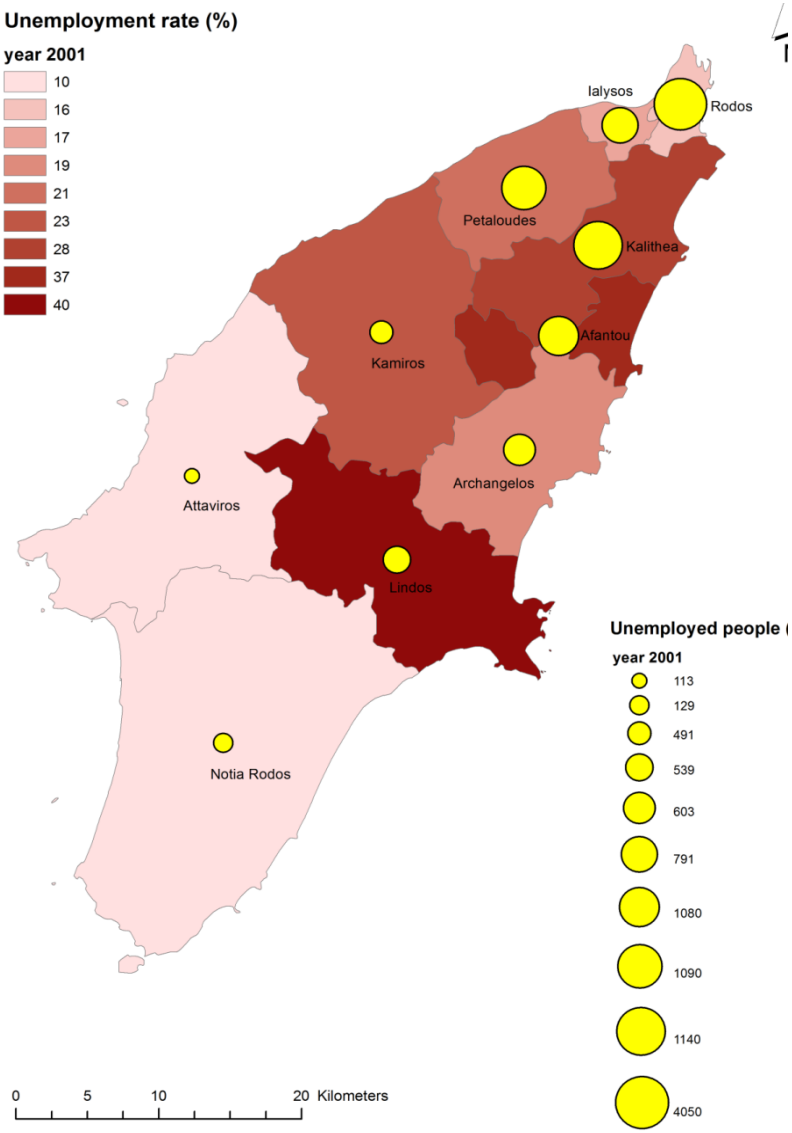
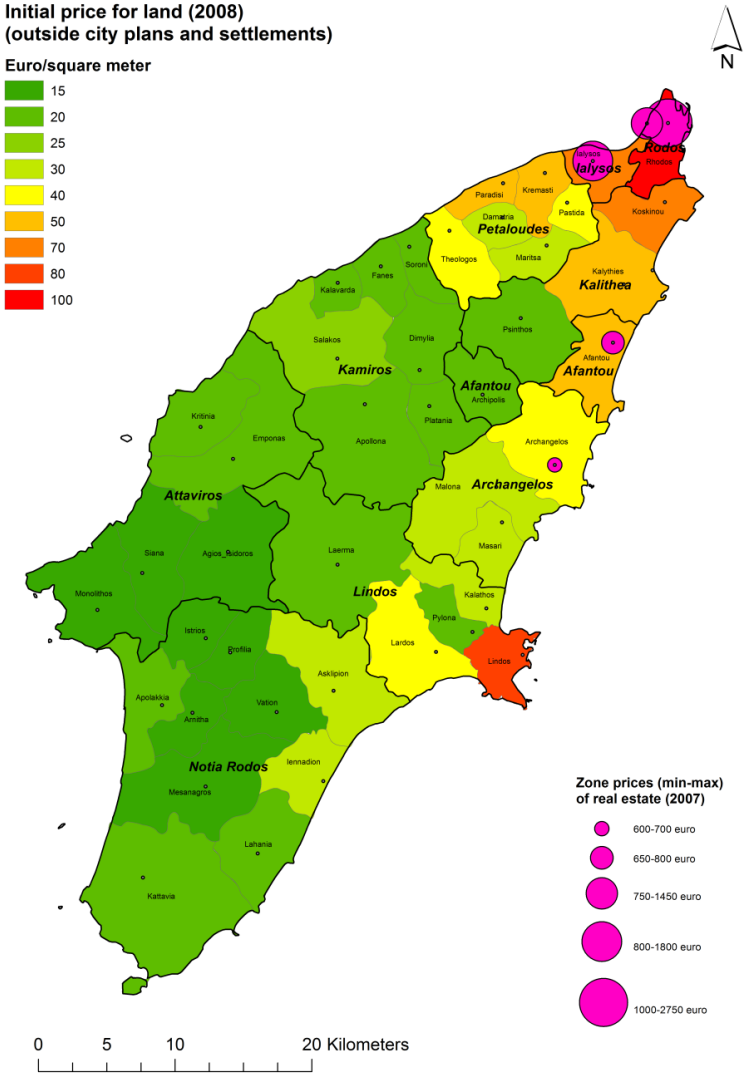
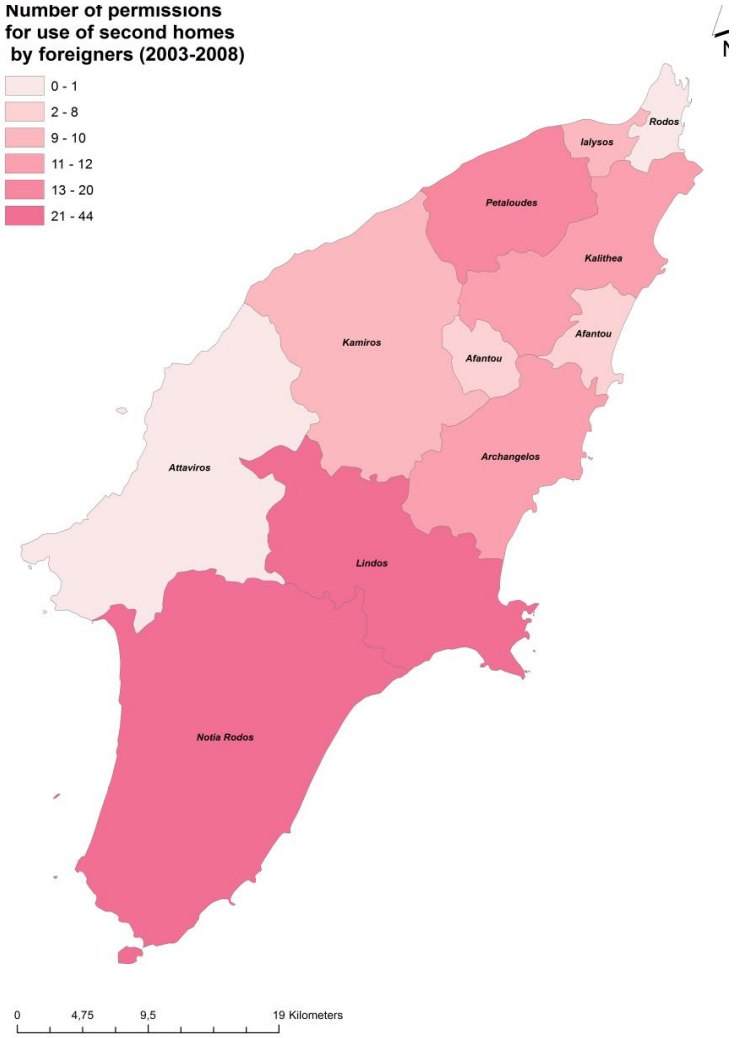


Figure (3.20) Initial price for land and zone prices



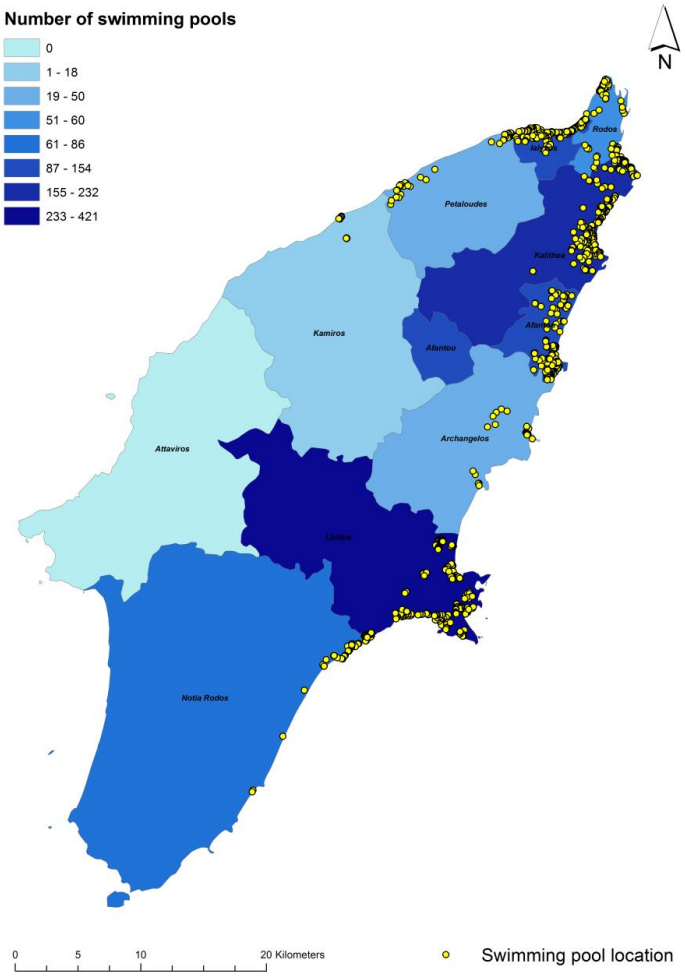
Maps elaboration: C. Geronta

Figure (3.21) Number of permissions for use of second homes by foreigners.



Data source: Minatsi (2010), map elaboration C. Geronta

Figure (3.22) Distribution and number of swimming pools



Data obtained by remote sensing - map elaboration: C. Geronta

Figure (3.23) Burnt areas coverage

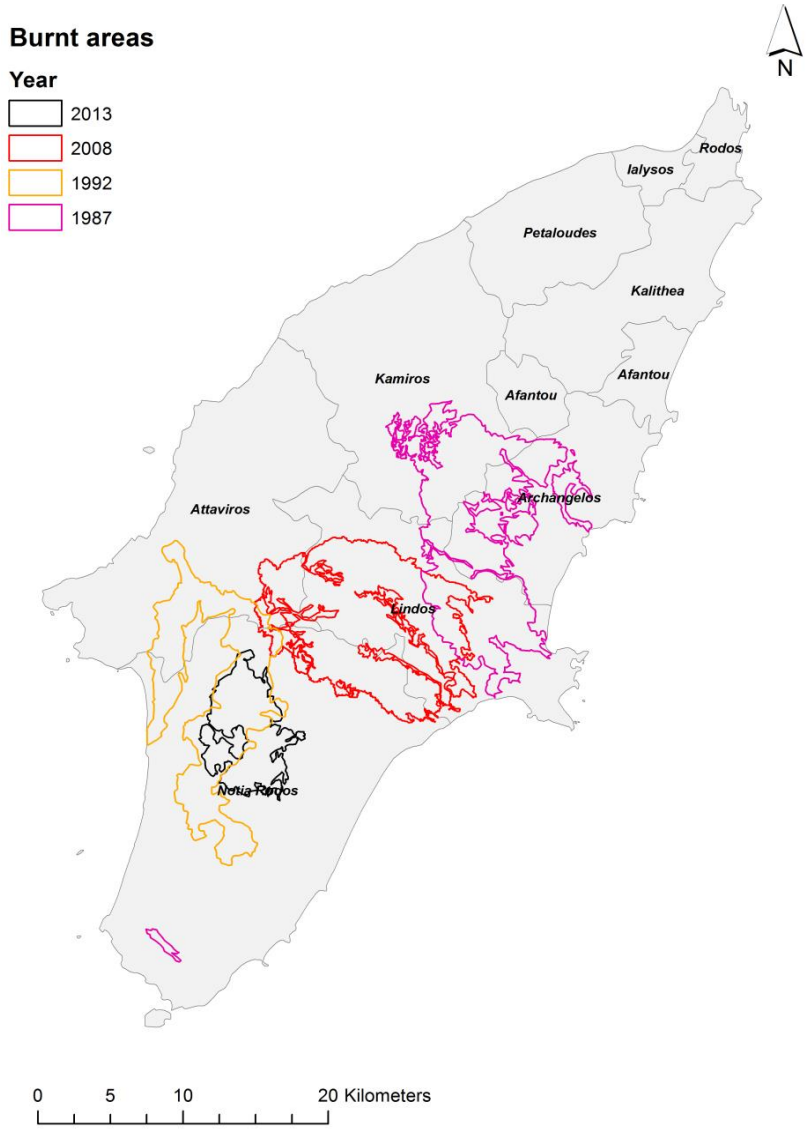
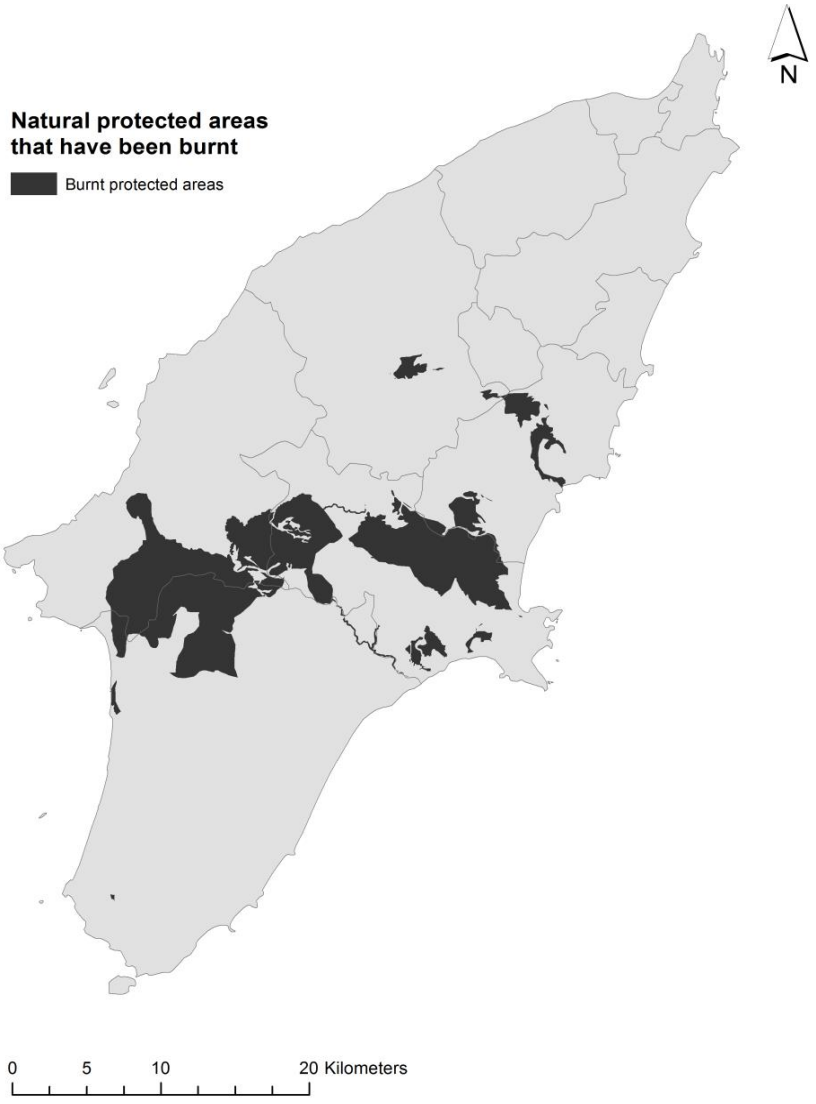


Figure (3.24) Burnt protected areas coverage



Data obtained by remote sensing (Landsat interpretation) and GIS operations - Maps elaboration: C. Geronta

Landscape metrics

Figure (3.25) Landscape fragmentation

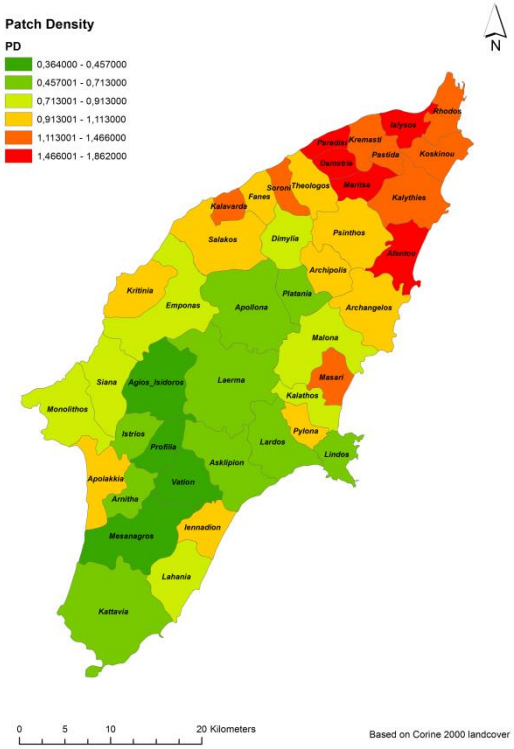


Figure (3.26) Landscape diversity

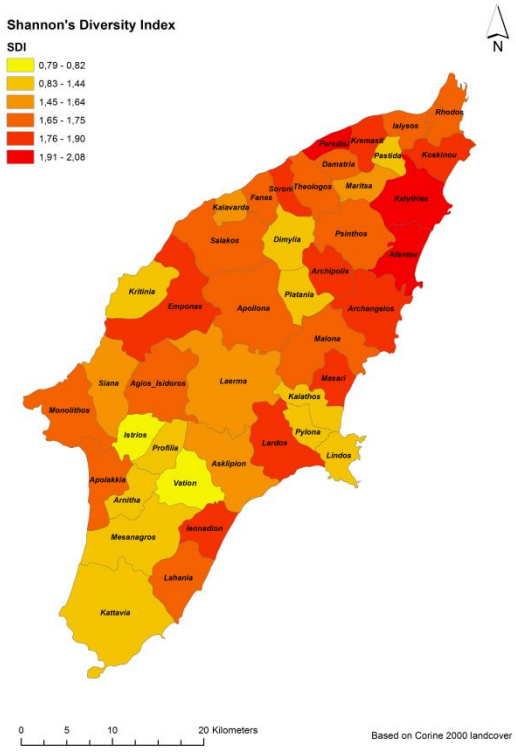
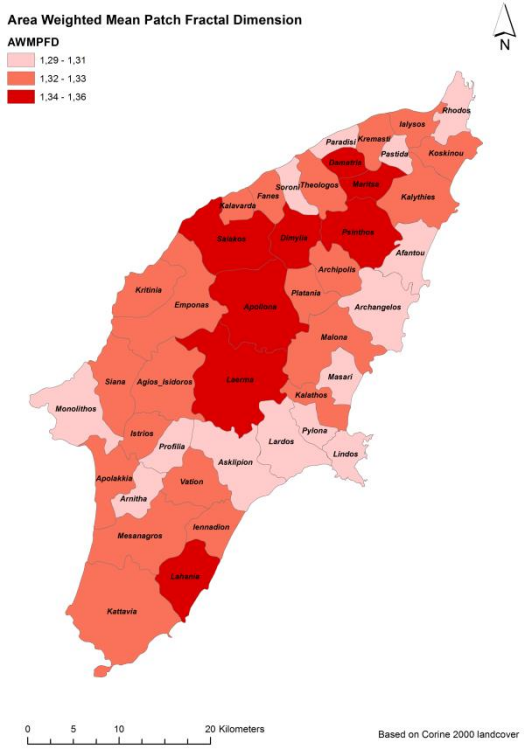


Figure (3.27) Landscape complexity



Data obtained by landscape metrics calculation on GIS (Patch analyst tool) based on Corine 2000 land cover – Maps elaboration: C. Geronta

3.3 Discussion

This chapter focused on the analysis of the contextual factors of the case study with a multi-scale approach in order to better understand and subsequently interpret the local conditions and current physiognomic profile of Lindos area on the southeast coast of the island of Rhodes.

Starting from the Aegean tourism landscape, the analysis show that Lindos area makes part of a region with unique natural and cultural characteristics (such as a biodiversity with a great number of endemic species, high luminosity, mild climatic conditions, distinctive Aegean architecture, unique social and historical features etc.) that contributed to a substantial tourism development, as well as to the formation of a distinctive cultural image.

Nevertheless, the Aegean islands are also characterized by a great variability due to local history and human activities. Concerning tourism development, the distinction between the island of Rhodes and other Aegean islands has its roots in the Italian occupation of the Dodecanese islands (1912-1946). The Italians were the first to define a strategy for the tourism development of the island of Rhodes, improving attractions and creating tourism infrastructures which prepared Rhodes for the advent of mass tourism. Indeed, after the reunification of the Dodecanese islands with Greece (1948), due to the already established infrastructures and increased popularity of Rhodes as a tourism destination, mass tourism was successfully promoted. Nevertheless, the first planning strategies in the 60’s, but most of all the lack of them which characterized the following years, have provoked significant spatial incoherence in the island of Rhodes between its north and south territory.

From the analysis of quantitative data and comparing several spatial dynamics of the local departments of the island, the outcomes show that the department of Lindos is distinguished for many aspects. First of all, during the last decade (2001-2011), the population of Lindos has been significantly increased (14%), in contrast with Greece and the whole island of Rhodes whose population has even been diminished. Second, the socioeconomic function of Lindos is the most highly depended on tourism. The numerous accommodations and other tourism activities (restaurants, tourist shops, etc.) in Lindos manifest the dominance of recreational activities within the total number of economic activities in the area. However, as employment seasonality of tourism activities increases unemployment rate, Lindos presents the highest rate of unemployment on Rhodes which amounts to 40% (data of year 2001). The socio-economic performance of Lindos is

further influenced by the real estate market. This is reflected on the higher defined initial prices for land of Lindos with respect to other communities, as well as on the second homes real estate market mainly addressed to foreign buyers and tenants. Besides the socio-economic aspects, also the ecological performance of Lindos is one of the most affected due to general processes of development and poor natural resources management on the island of Rhodes, such as water exploitation and forest fires. Therefore, as tourism development and other general processes has already intervened into the ecological integrity of the area, the study of landscape structural properties should be facilitated with the preparation of appropriate updated and detailed cartographic material which was not available until the time of the execution of my research project.

Chapter 4.
The landscape character of Lindos area

Introduction

Following the analysis of the spatial dynamics occurring on the territory of the island of Rhodes, the objective of this step of research is to provide information about the particular landscape character of Lindos area and to verify the contextual effects of these dynamics on landscape scale, focusing on a smaller geographical unit.

Therefore, this chapter firstly compiles the initial findings of an expert-based analysis of Lindos area, intended as a complex socio-economic ecosystem (Wascher, 2004) with a distinct configuration and local conditions, through a study of key landscape character elements, including land form, vegetation, land cover, built uses, ecological and cultural features, and visibility conditions. As a second step, the contextual effects of the spatial dynamics (such as natural processes, policies, demography, economy, and tourism development) on the landscape are described. The findings are thought to be useful both in offering some guidance for tourism landscape planning and management in Lindos area, as well as in exploring possible existing or missing linkages between the physical landscape and tourists' images analyzed in the next chapter.

The main reason for which I have chosen to analyze the landscape character of Lindos area is that Lindos is one of the typical traditional coastal landscapes of the Aegean islands about which we know scientifically very little. Research interests and admiration about traditional contexts are mostly orientated towards the narration of traditional settlements through poetry or ethnography, rather than through a holistic scientific analysis (Bouras, 1992). Lindos is also the case where the paradox between the changeless image of the "morphologically" protected traditional settlement (according to the Greek law, 1960)[55] and the effective and unavoidable landscape character transition due to tourism development takes place. This paradox, reflecting the question of the awareness about what is valuable and useful to preserve in the landscape and especially in the context of tourism destinations, has been considered particularly interesting in choosing Lindos area as case study. Therefore, this study

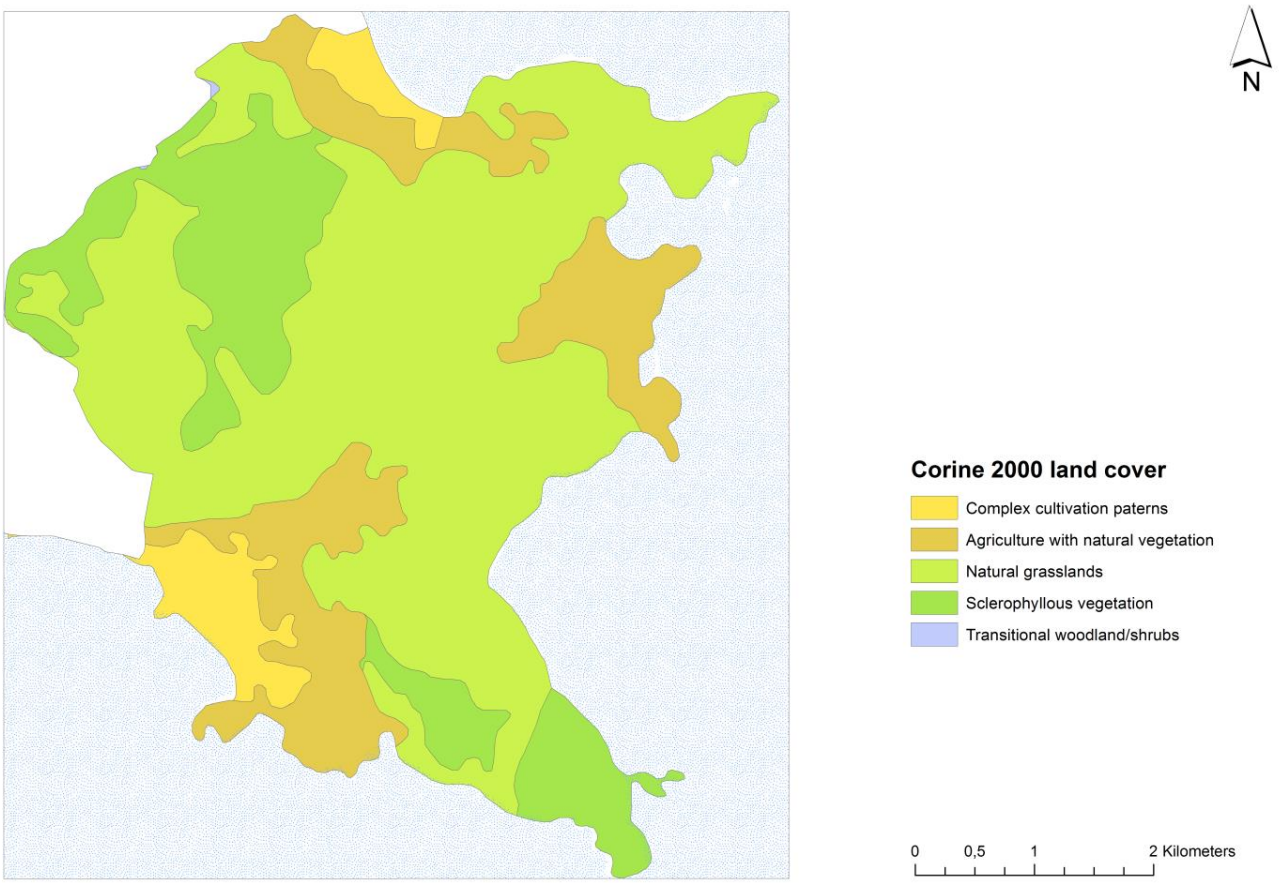
[55] According to the no. 94262/5720 / 12.28.1959 decision of the Ministry of National Education and Religious Affairs, published in 24Fek , Volume II , 01.22.1960

may also provide a deepening of knowledge on the landscape character typology of the Aegean coastal landscapes in which Lindos area belongs.

For the purpose of this study secondary qualitative and quantitative data from scientific literature and experts' reports, related to soils, flora, fauna, and archeological features of Lindos area, have been collected and subsequently elaborated and represented in thematic maps and tables.

However, an obstructive data deficiency has been noted concerning landscape ecological and visual aspects which mostly depend on land cover, uses and relief. Specifically, the only available cartographic material for Lindos related to land cover or uses was Corine land cover 2000, which is very generic, outdated and did not result particularly useful in the analysis of Lindos area at the landscape scale.

Figure (4.1) Corine land cover 2000 map covering Lindos area



Data source: European Environment Agency (EEA)

For this reason, the acquisition of primary data has been considered indispensable in order to broaden the spectrum of the landscape features to analyze. This objective

has been obtained by the mapping of the area with the aid of Geographical Information Systems (GIS) using updated data both from remote sensing techniques and fieldwork.

The cartographic materials used as input into GIS have been: the topographical map of the island of Rhodes (1972) in 1:50.000 scale provided by the Hellenic Military Geographical Service, a cadastral map of Lindos village in 1:1000 provided by the technical office of the municipality of Rhodes, the geological map of the island of Rhodes provided by the consortium of aquatic ecosystems of the Aegean (Κ/Ξ ΥΔΑΤΟΣΥΣΤΗΜΑΤΩΝ ΑΙΓΑΙΟΥ), a high resolution (ground resolution 1 meter) orthophoto of Lindos area obtained by a WMS Map Server file ("ΚΤΗΜΑΤΟLOGIO BASEMAP") provided by the National Cadastre and Mapping Agency of Greece, and the Corine land cover 2000 map of Greece provided by the European Environment Agency (EEA).

Table (4.1) Collected cartographic materials

Data	Source
Corine2000 land cover map	European Environment Agency (EEA)
Geological map of the island of Rhodes (2005)	Consortium of aquatic ecosystems of the Aegean
Topographical map of the island of Rhodes (1972) in 1:50.000 scale	Hellenic Military Geographical Service
Orthophoto of Lindos area (2009)	National Cadastre and Mapping Agency of Greece
Cadastral map of Lindos village	Technical office of the municipality of Rhodes (Headquarters of Pylona)

4.1 Methods for primary data collection

This paragraph analytically explains the various processes carried out for the application of expert-based techniques for the preparation of digital cartographic base maps, indispensable for the acquisition of primary data related to specific landscape features of Lindos area (such as relief, vegetation, land and built uses etc.), as well as for the implementation of further integrative analyses (such as visibility conditions and landscape capacity to provide ecosystem services). Specifically, this paragraph focus on the creation of a detailed and updated land cover map (according to Corine land cover classes – level 3) and the creation of a Digital Elevation Model (DEM) of Lindos area.

It is noteworthy to mention that these digital cartographic base maps report information originated from a circular process of data acquisition and verification through remote sensing techniques (GIS) and fieldwork. Specifically, for this step of

research, the adoption of a “ground truth” approach, consisting in verification of image interpretation by direct observation of the ground, has been revealed very significant. Therefore, for the classification of each landscape feature represented on each map layer, data from remote sensing have been integrated with data collected in the field through photographic material and direct observation.

4.1.1 Creating a detailed and updated land cover map of Lindos area

Although the identification of specific land cover classes by remote sensing data seems to be quite problematic (Malinverni et.al 2010, Nielsen, 2014) due to spectral heterogeneity, especially concerning the artificial cover (buildings, roads, etc.), the availability of remote imagery with high spatial resolution in combination with data obtained from a systematic field photography and reclassification processes, could provide a thematic map with satisfactory accuracy.

For this reason, as a basis for the production of the land cover map of Lindos area, an orthophoto of high resolution[56] (ground resolution 1 meter) covering the area of interest has been used, while the verification of the interpretation for each land cover class, has conducted through photographic material as shown it table (4.2).

In the following box, the main processes of the production of the final outcome of Lindos land cover map are described, including the illustration of the various layers maps produced at each methodological step.

[56] In REMOTE SENSING terminology 'the Spatial Resolution is the smallest area (spatial unit) on the ground over which the radiometric signal captured by a sensor is integrated'. The size of that unit depends on the characteristics of the sensor and the altitude of the platform. In discussions of statisticians and remote sensing specialist, this term is sometimes confused with 'observation unit' or 'Mapping unit'.

Box 1: Methodological steps for the creation of a land cover map of Lindos area

Step 1. The orthophoto of Lindos area has been imported into GIS software ArcMap 10, through WMS Map Server file (named "KTHMATOLOGIO BASEMAP") and has been georeferenced in the Hellenic Geodetic Reference System 1987 (HGRS87).

Step 2. With the aid of the Unsupervised classification tool a classified map has been created a large number of land cover classes, many of them representing the same land cover class.

Step 3. A reclassification process has been carried out, assigning the same value to the classes representing the same land cover. At this step all the types of artificial cover are considered as a single class. With this reclassification process, a new classified map has been generated including the following 8 classes: natural vegetation, natural grasslands, bare rock, beaches, olive groves, agricultural fields, humanized open areas (urban open areas without significant amount of vegetation including courtyards, uncultivated areas, fallows, etc.) and artificial surfaces (built areas and primary road network). (see figure 4.2)

Step 4. In order to create new separated classes for artificial cover, a new vector file (polygons) has been created, through conventional visual photo interpretation integrated with data from fieldwork (direct observation and registration of uses on a printed map). Afterwards, the vector file has been converted to a new raster file including different values for each artificial cover: residential, tourism infrastructures, commercial/recreational uses, religious areas, archeological areas, and road network. (see figure 4.3)

Step 5. With the aid of Raster calculator tool (Spatial analyst), an OVER operation has been carried out, creating a unique raster file with information from the two previous raster files resulting from step 3 and 4. From this process, a new classified map has been generated including the following 14 land cover classes: natural vegetation, natural grasslands, humanized open areas, bare rock, beaches, olive groves, agricultural fields, residential, tourism infrastructures, commercial/recreational uses, religious areas, archeological areas, and road network. (see figure 4.4)

Step 6. As with the unsupervised classification tool, further classification of natural vegetation was not possible, Corine 2000 land cover classes (see figure 4.1) have been used as a guideline (sclerophyllous vegetation and natural grasslands). However, integrating photographic data, it has also been possible to individuate the areas covered by coniferous vegetation and those by bare rock which after some generalization processes (shrink, expand etc.) have been digitalized manually in vector mode. (see figure 4.5)

Step 7. Lastly, the final land cover map of Lindos area has been created by digitalizing in vector mode the classes as resulted from the overlap of the two previous layers (steps 5 and 6). The artificial areas have been aggregated on the basis of their dominant uses (i.e. tourism accommodations and their yards were aggregated into a class "leisure facilities", agricultural fields with scattered buildings into "complex cultivation patterns"). (see figure 4.6)

Figure (4.2) The result of the first classification process (step 3)

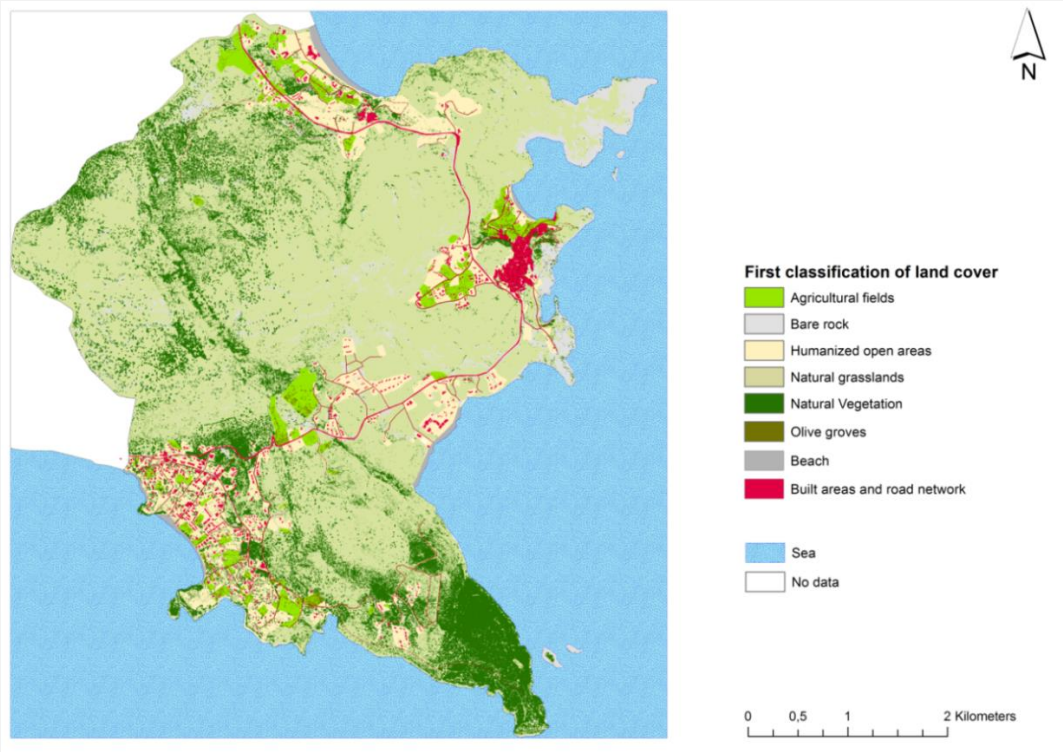


Figure (4.3) The result of the classification of the artificial cover (step 4)

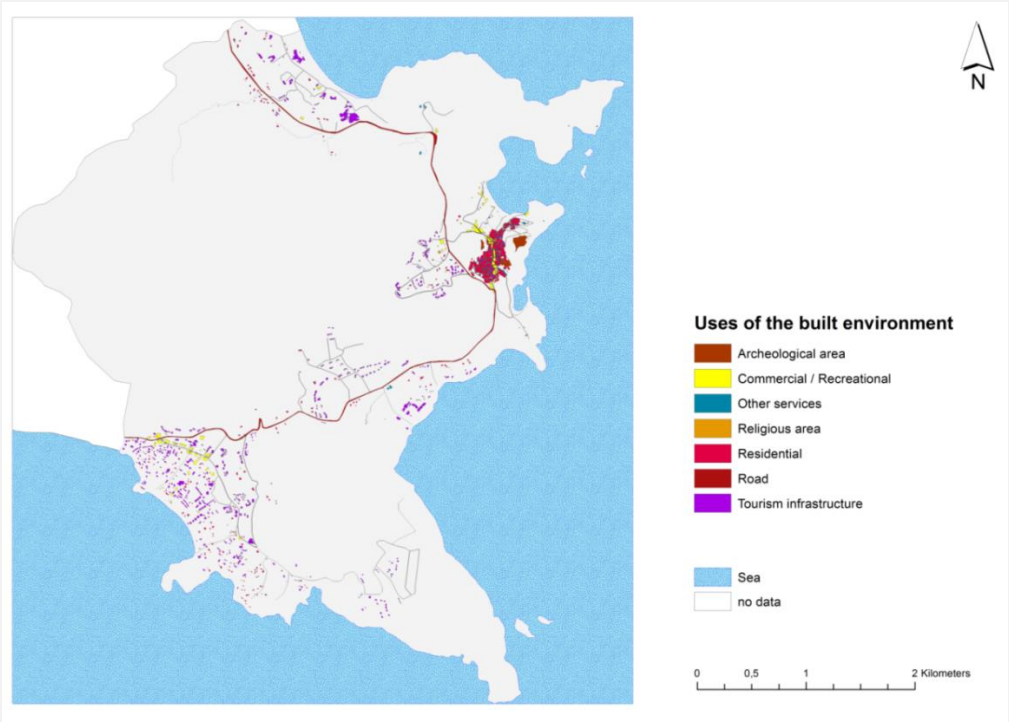


Figure (4.4) The result of the OVER operation (step 5)

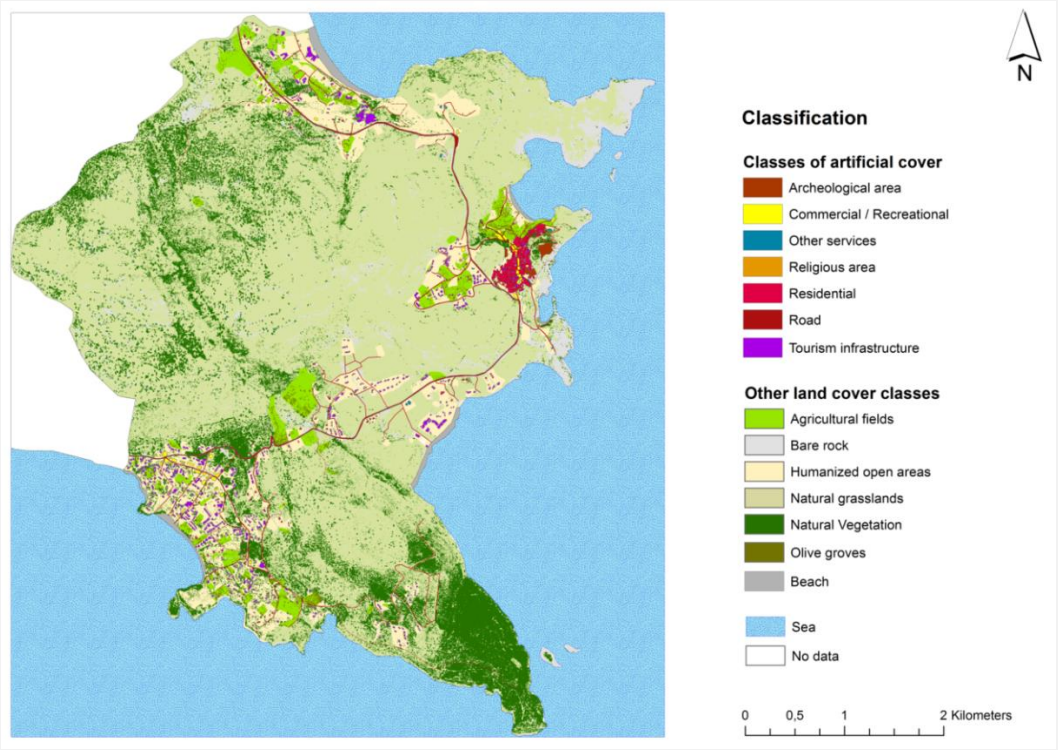
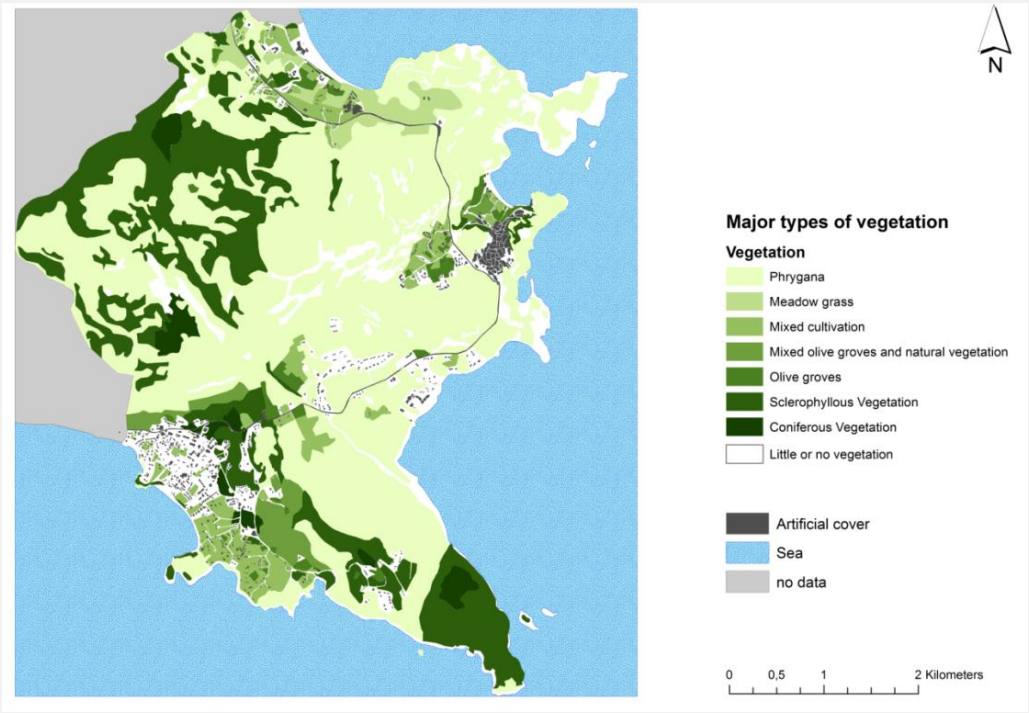
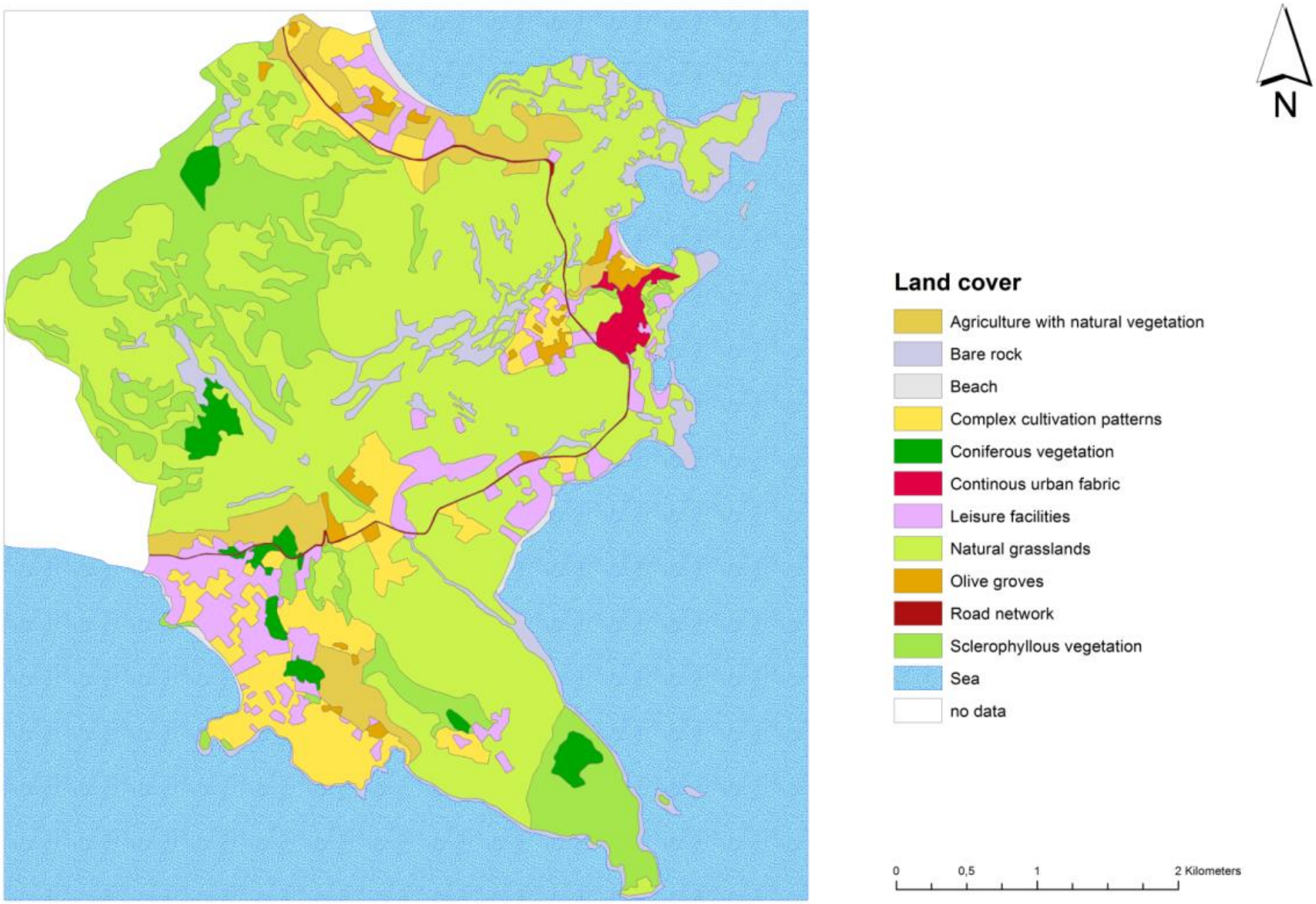


Figure (4.5) The result of the further classification of vegetation (step 5)



Figure(4.6) Updated and detailed Land cover map of Lindos area based on Corine land cover classes (map elaboration: C.Geronta)



Table(4.2) Verification of the interpretation of each Corine land cover class through photographic data

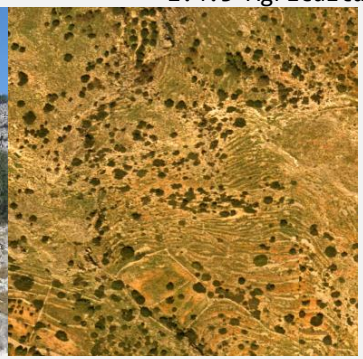
Major Land Cover Patterns

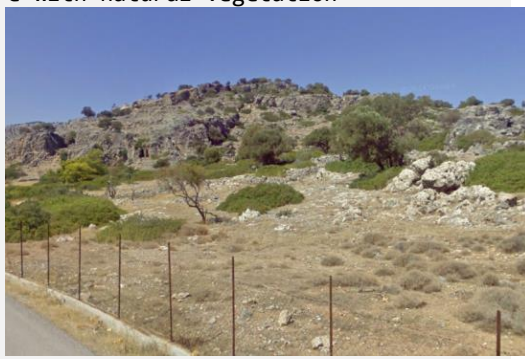
3.1.2 Coniferous vegetation

3.3.2 Bare rock

3.2.3 Sclerophyllous vegetation

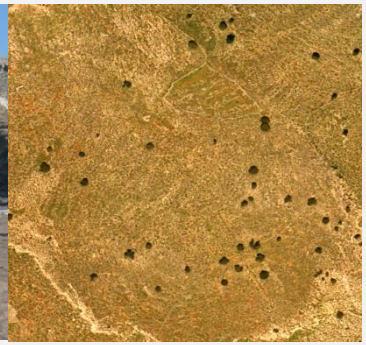
2.4.3 Agriculture with natural vegetation





3.3.1 Beaches

3.2.1 Natural grasslands



1.2.2. Road network

2.2.3 Olive groves

2.4.2 Complex cultivation patterns

1.4.2 Leisure facilities

1.1.1 Continuous urban fabric

1.4.2 Leisure facilities

4.1.2 Creating a Digital Elevation Model of Lindos area

A digital elevation model (DEM) provides a useful information basis for many geographic applications, such as, topographic studies, geomorphologic studies, and landscape analysis with geographic information systems (GIS). The objective of this methodological step is to create a detailed topographic surface including the artificial features (built uses) and topographical artefacts in the form of a DEM, visualizing the current topography of Lindos area.

For the creation of a DEM of Lindos area, the topographical map of the island of Rhodes (1972) in 1:50.000 scale has been introduced into GIS software ArcMap 10 and has been georeferenced in the Hellenic Geodetic Reference System 1987 (HGRS87).

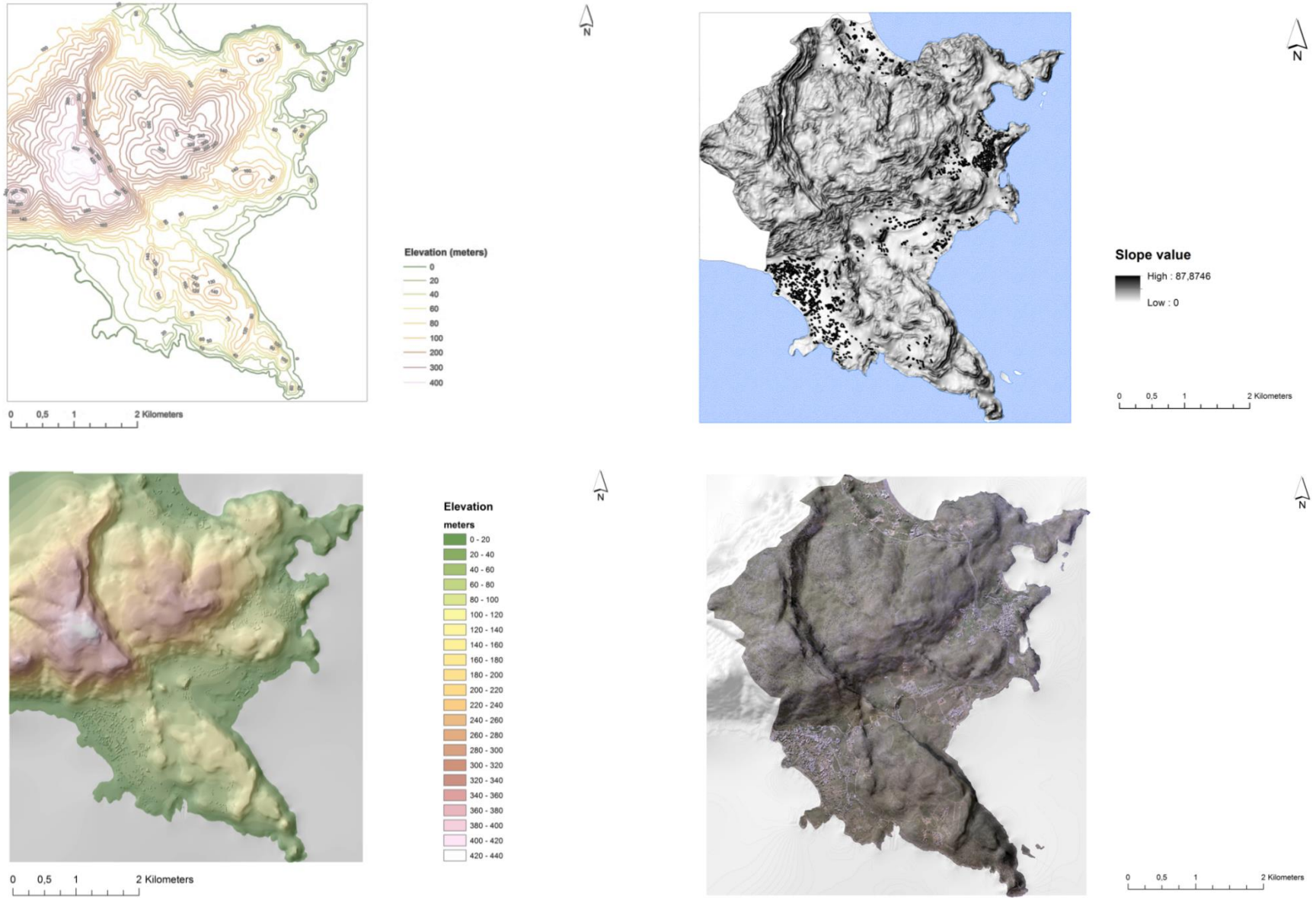
The contour lines have been digitalized manually in vector mode (lines) assigning an elevation value for each feature accordingly to the topographic map, creating several feature classes.

With the aid of the Create Tin tool, a triangulated irregular network (TIN) surface has been generated and consequently converted into a grid-based (raster) Digital Elevation Model using TIN to DEM tool. The DEM is generally considered a much more convenient format for analysis of spatially continuous data and can be used in mathematical calculations.

In order to add the elevation values of the features representing buildings into DEM, a new raster has been created from the layer map of built uses, using as classification values the heights of the buildings as following: 3 meters for single-storey buildings, 6 meters for two-storey buildings (residential buildings, second homes, and commercial buildings), 9 meters for three-storey buildings (large tourism accommodations), 12 meters for the fortification of the Acropolis (approximately).

The values of the DEM and the new raster reporting the elevation values of the buildings have been summed with the aid of the Raster calculator tool. The final outcome consisted of a DEM which in consequence has been manipulated with different tools of 3D spatial analyst producing maps that are easier to interpret than the original DEM. These tools are the hillshade tool, which creates a shade-effect based on the input parameters that are entered in the tool and the slope tool which describes the slope for each raster cell in degrees based on the elevation at each point.

Figure (4.7) Various layer maps for studying the topography of Lindos area (map elaboration: C.Geronta)

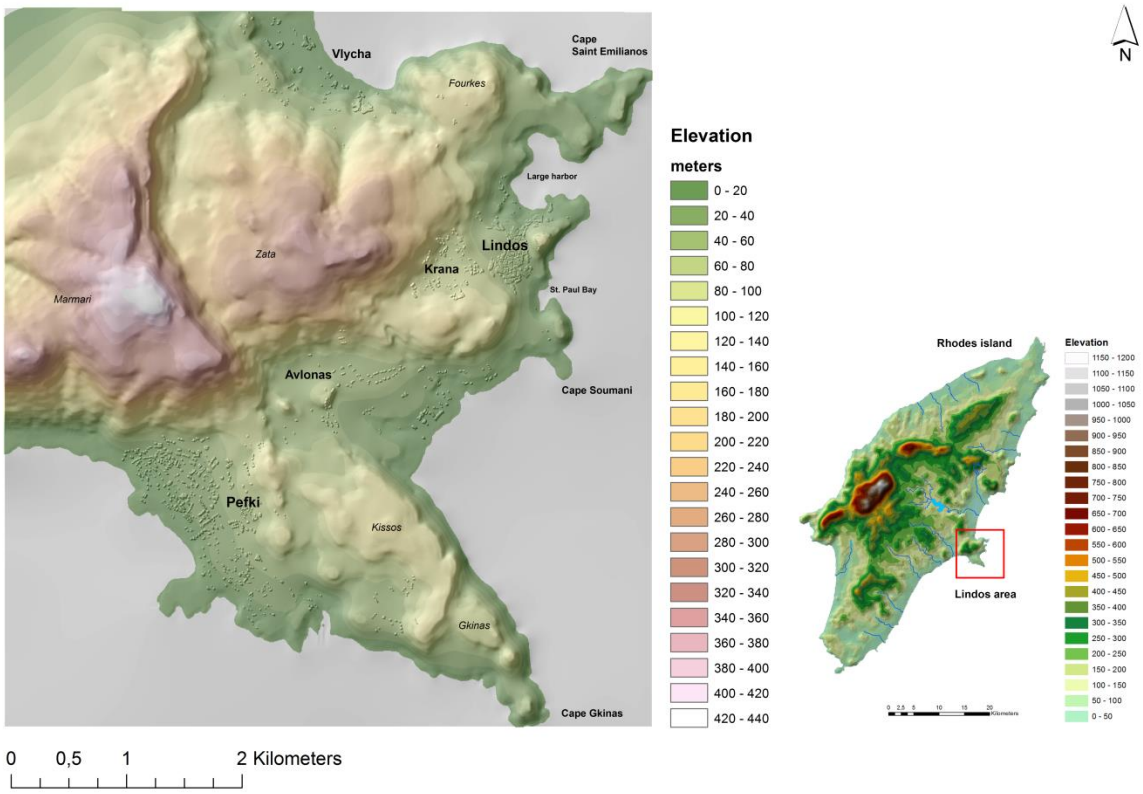


4.2 Physiognomic characteristics of Lindos area

4.2.1 Topography

The island of Rhodes is located on the convergence margin between the African and the European lithospheric plates. This position is responsible for complex geomorphology, lithostratigraphy, neotectonic processes and variability of geotectonical properties. Especially, the topography of Rhodes is extremely variable due to its geotectonic position and the resulting intense geodynamic processes. High mountain areas are found at the central, north and south part of the island and extend from east to west even though the island is elongated along an northeast striking axis. The structure of mountainous areas is governed by fault tectonics. Topographic changes are so abrupt that large morphologic discontinuities are common along major fault zones.

Figure (4.8) Digital elevation model of Lindos area (map elaboration: C.Geronta)



Lindos is a semi-mountainous area along the southeastern coast of the island of Rhodes. Its highest elevetion reaches 440 meters above the sea level. A great part of the surface of the area consists of uplands, between 200-440 meters, while the populated

areas are mostly located on lowlands consisting of some relatively narrow plains near the shore line which do not exceed 120m of elevation.

In Lindos, there are four main nucleus of populated areas. At the norheast coast, the traditional settlement of Lindos is built in a short distance from the sea and organized towards the large natural harbor which today is known as Lindos Bay. Closely to Lindos village, in the plain known as Krana between two hills, there is a nucleus of recent developments of tourism accommodations (studios, appartments and second homes) mixed with agricultural fields and pastures. On the south coast of Lindos area, there is the most expanded populated area, named Pefki village, which includes many tourism accommodations and leisure facilities, as well as vast areas of agricultural fields and natural vegetation. In the area between Lindos and Pefki village, known as Avlonas, there is another nucleus of second-homes which is developed along the coast as well as on the hillside. Along the north coast, the location of Vlycha includes mainly tourism accommodations (hotels and second homes) and sparse agricultural fields with a significant percentage of natural vegetation.

4.2.2 Geology

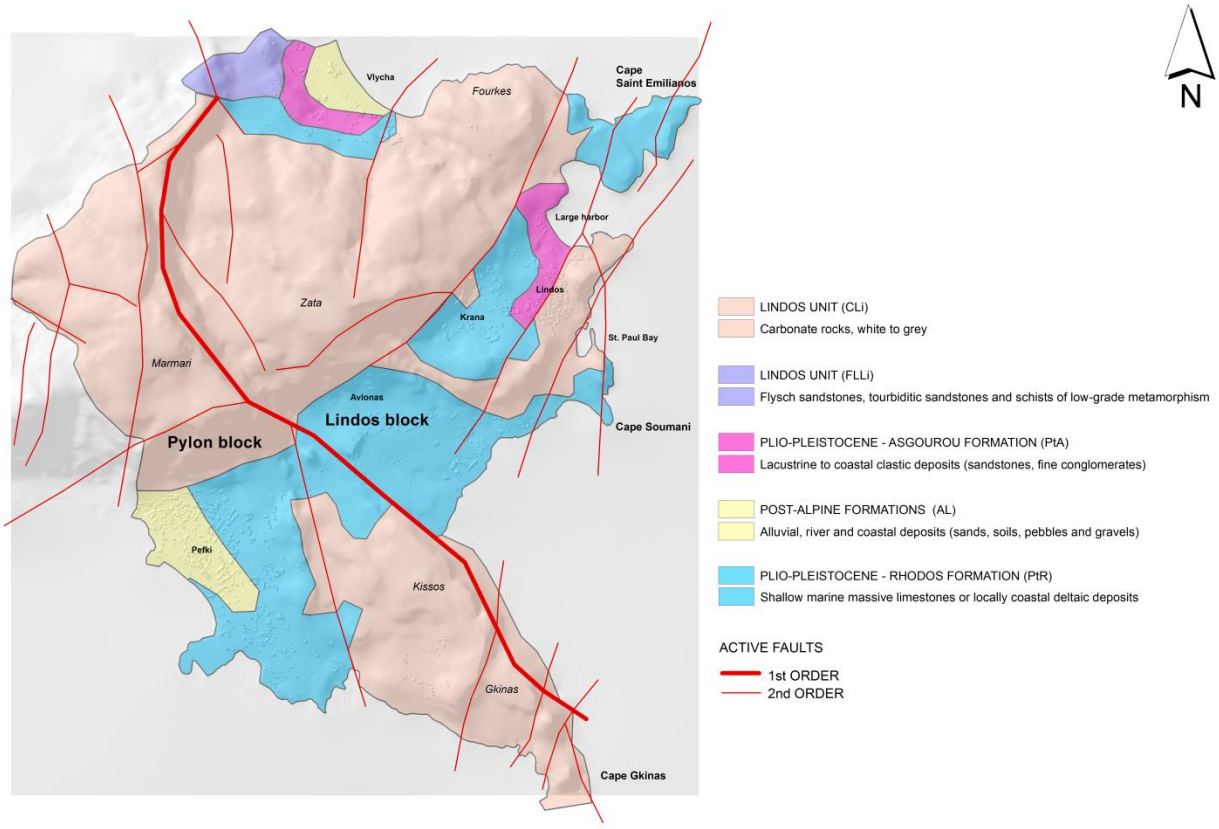
From a geological point of view, Lindos area is characterized mainly by the presence of the homonymous metamorphosed “Lindos” unit which is the lower alpine geotectonic unit of Rhodes island (Mutti et al 1970, Meulekkamp et al 1972, Lekkas et al 1993). Its calcareous formations are represented by white to grey marbles (Cretaceous to Upper Eocene marbles) while its clastic sediments are represented by the flysch formation (U. Eocene – L. Olicogene) consisting of alternations of sandstone, tourbiditic sandstone and schist which represent low grade metamorphic rocks.

The post-alpine sediments of the area (“Asgourou” formation, “Rhodos” formation and recent alluvial and coastal deposits), consisting of river fluvial, brackish and marine water deposits of Pliocene-Pleistocene age, overlay but they do not conform with the metamorphic basement. The “Asgourou” formation (U. Pliocene –L. Pleistocene, Mutti et al 1970), is the lowermost post-alpine formation in the area which overlies unconformably the alpine basement. It consists of marly lacustrine deposits, alternations of conglomerate and sandstone (which represent delta, marine or brackish sediments) and bioclastic limestone. The “Rhodos” formation overlies unconformably both the “Asgourou” formation and the “Lindos” unit formations. Essentially it consists of bioclastic limestone of Pleistocene age, while in certain locations transitional layers may occur at the base of this formation, consisting of alternations of brownish

sandstone, yellow marl and calcareous horizons reaching just a few meters in total thickness.

The recent Holoccene deposits are represented by alluvial formations (loose material of various size), coastal deposits (sand and gravel), torrential deposits (mainly coarse-grained and angular material, pebbles and less often gravels), talus screes (lose angular material of various size) and human-made deposits that can be found at several sites of archeological interest.

Figure (4.9) Geologic units of Lindos area and faults (map elaboration: C.Geronta)



4.2.3 Geomorphology

The intense morphological relief of Lindos area is largely due to the very intense neotectonic processes and especially to the activity of significant faults and fault zones that have been created and reactivated in the recent geological times and which according to all evidence are still active. As a matter of fact, Lindos area exhibits a quite length of coastline, which is moreover intersected by a great number of active faults and fault zones.

The most important neotectonic macrostructure over Lindos area correspond with a first order listric neotectonic fault, trending to the SSE-NNW direction. This kilometric scale fault zone separates the subsiding “Lindos fault block” to the east from the uplifting “Pylon fault-block” to the west and it has been activated during the last century. Second order faults have been also recognized within Lindos area and the adjacent area.

The fault zones activity influences significantly the land-forming process of planation surfaces and terraces, since they intersect and vertically displace them, thus complicating their correlation. The two main planation surfaces that can be observed in the major area of Lindos village, are developed on the sediments of the “Asgourou” formation and more especially on the top of the conglomerate and sandstone horizons following their dip direction. The most important morphological features in the major area of Lindos, such as the steep slopes of the Acropolis of Lindos, the plateau of Ancient Tomb, the St. Paul’s Bay, the steep slopes of the eastern coast and many others are associated with the presence of active faults. These faults can create minor o major morphological discontinuities, depending on the magnitude of vertical displacement. The influence of the tectonic structure (such as the direction of the bedding, orientation of the main faults and fault zones, etc.) is furthermore important in the development of the hydrographic network.

The coast of Lindos area and especially its steep slopes and promontories concentrate a great amount of wave energy that along with the characteristics of its lithology (solubility and tectonic stress of the limestone) contributes to the facilitation of the erosive action of the sea. Therefore, the coast is characterized by horizontal partition with small peninsulas, islets, typical landforms created by marine erosion, cliffs, caves, as well as shore lines which correspond to former sea levels. The rugged coastline starts from the contact of limestone with the overlying marly formation southeast of Pefki village and through the Cape Gkina arrives on the south side of the bay St. Nicholas, where a fault brings together limestone with marls. From the cape Soumani to St. Paul Bay (which is the result of tectonic fault), the coast of limestone is characterized by high cliffs, a great sea depth and paleo shorelines. The part of the coast that extends from the northern part of St.Paul Bay to the south of Lindos village is also characterized by high vertical cliffs that descend directly to the sea of great depth. The rock consisting of fragmented and karstified limestone receives intense wave energy that formulated caves and arched formations. There is also presence of paleo shorelines that reach up to a height of 2,5 meters that certify the recent uplifting of the area (Pirazzoli et al., 1982). Beyond Lindos village, the coast of limestone cliffs continues with the same morphology to the cape Saint Emilianos.

Figure (4.10) View of the major geomorphologic features of Lindos area

a.

b.

c.

In the first two photos (a) and (b) sections of the first order fault subsiding “Lindos fault block” from the uplifting “Pylon fault-block” are illustrated, while the third photo (c) displays the fault planation surfaces in proximity of Lindos village.

d. 

f. 

g. 

h. 

i. 

In photos (d) and (f): Small islets with paleoshorlines

In photos (g) and (h): The coast of limestone near St. Paul Bay, characterized by high cliffs, a great sea depth and paleo shorelines.

In photo (i): fragmented and karstified limestone formulating caves and arches

4.2.4 Flora

Lindos area is mostly covered by a vegetation mosaic consisting of phrygana (with typical species such as Corydothymus capitatus, Sarcopoterium spinosum, Origanum sp, Asphodelus sp and Phlomis fruticosa), sclerophyllous plants (such as Quercus coccifera, Pistacia lentiscus, Arbutus unedo and others), and coniferous vegetation (Pinus brutia).

The dry summer in conjunction with the late winter rains and the few rains in spring, is the cause of predominance of sclerophyllous vegetation species in the area, as well as other bushy shrubs such as Cistus spp., Salvia spp. (Theodoridis N., 2008). In contrast, coniferous vegetation can be mostly distinguished on the south of Lindos area adjacent to Pefki village (indeed the name of the village in Greek means “Pines”).

Nevertheless, phrygana is the dominate vegetation type of Lindos area. Phrygana[57] are cushion-forming sclerophyllous and thorny formations (shrubs), typical of the eastern therm-mediterranean region (mild winters and hot summers, high evapo-transpiration) where they occupy considerable areas in coastal districts and occasionally occur inland. The plant growing season starts with the winter rains. In spring they are green with flowers mostly of yellow color. In contrast, during summer, the small plants shed most or all of their leaves to minimize water consumption, and phrygana become brown-colored and dead-like, changing significantly the overall perception of the landscape. (see figure 4.11)

In the area there are also sparse agricultural fields over the few fertile valleys next to the settlements and along the shore line. These fields are characterized by mixed fruit-bearing orchards, olive groves and others by mixed cultivations and a significant percentage of natural vegetation. (see figure 4.12)

[57] http://www.bio-e.org/lib/phrygana-vegetation-southern-greece

Figure (4.11) The view on Lindos village during winter and summer

Figure (4.12) agricultural fields characterized by mixed fruit-bearing orchards and olive groves

Figure (4.13) Habitat of Lindos area (Typical species of natural grasslands and vegetation)

Natural grasslands

Phrygana

Corydothymus capitatus
(Greek name: θυμάρι)

Sarcopoterium spinosum
(Greek name: αστοιβή)

Origanum sp
(Greek name: ρίγανη)

Asphodelus sp
(Greek name: ασφόδελος)

Phlomis fruticosa
(Greek name: ασφάκα)

Natural vegetation

Sclerophyllous vegetation

Quercus coccifera
(Greek name: πουρνάρι)

Pistacia lentiscus
(Greek name: σχίνος)

Arbutus unedo
(Greek name: κουμαριά)

Coniferous vegetation

Pinus brutia (Greek name: τραχεία πεύκη)

4.2.5 Fauna

Lindos area belongs to the Natura 2000 habitat (GR4210029) and it is an important area mainly for breeding raptors and species of open arid areas, as well as of seabirds. Priority species include: Phalacrocorax aristotelis, Buteo rufinus, Hieraaetus fasciatus, Falco biarmicus, Falco peregrinus and Emberiza caesia. Especially, the area is considered to be of high importance for passage raptors (Circus spp., Falco vespertinus, etc) and passerines. Besides bird species, Platycleis intermedia microniseos is an important invertebrate that can be found in Lindos area as well. In 2010, even though the adjustment of the Greek law about the environmental protection (1986) to the directives of the European Union, offers, several measures of protection, management and prohibitions (articles 5,6 and 7), there are still no specific plans for the protected area in Lindos and generally for the Natura 2000 areas on Rhodes.

Figure (4.14) Important species of Lindos area

Phalacrocorax aristotelis

Buteo rufinus

Hieraaetus fasciatus

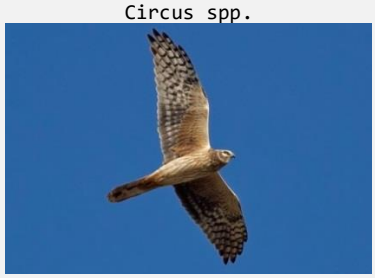
Falco biarmicus

Falco peregrinus

Emberiza caesia

Falco vespertinus

Circus spp.

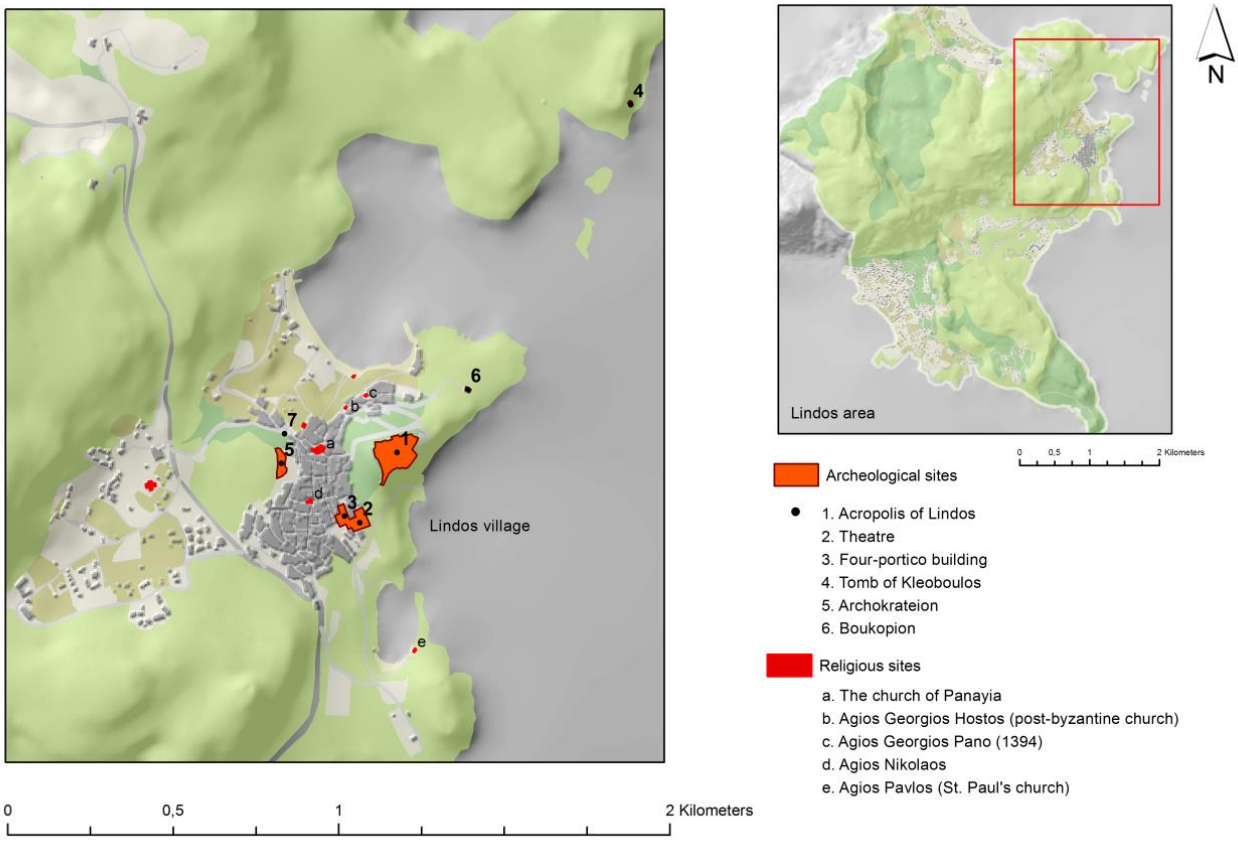


Platycleis intermedia microniseos

4.2.6 Historical features

Lindos area includes archeological sites and monuments (churches, historical residential buildings, fortifications and natural historical sites) of a great heritage value and most of them are concentrated over the area occupied by the ancient city of Lindos. Historically, the ancient city of Lindos was developed according to the urban model[58] of the 8th century BC, on a hill in a short distance from the sea, which during these ancient times was under the control of its inhabitants.

Figure (4.15) Map of the archeological and religious sites of Lindos (Map elaboration: C. Geronta)



The houses were gradually built on the slope of the hill and on the surrounding plains without fortification, adapted to the natural slope of the land, and therefore it must have had an irregular urban web which was only offering few flat spaces. Indeed, the urban web of Lindos village is clearly defined by the relief of the land and appears to have remained unchanged from the Geometric era until today at least in the central

[58] The ancient village of Lindos was built on the same basic principles of ancient cities developed gradually and usually in concentric circles without fortification. The core area of the ancient cities was the fortified Acropolis which at an early stage coincided with the city.

part of the settlement. Its most distinct characteristic is the relationship between the main roads and the position of the two hills which enclose the settlement. In addition, the way that the roads are organized on the hillside, gives the impression that the road system in the central part of the village follows the natural flow of streams. This ensures proper drainage of water, avoiding flooding in case of heavy rain. The rest of the roads follow the natural contours of the landscape and cross lengthwise the settlement. The central functions of the city were probably located throughout the zone near the big harbor which today is occupied by cultivated fields.

The springs on the hillside supplied water for the few and valuable farmlands adjacent to the city. On the agricultural areas there were not buildings and thus, the ancient urban landscape of Lindos was clearly distinguished from the fields and pastures of the broader area.

The Acropolis of Lindos, the main core of the city built on a steep rock, occupies the smooth outcropping soil, which is naturally fortified without being inaccessible, in the center of the peninsula and which dominates the two natural harbors (the large in the northwest and the small seashore in southeast). The Acropolis had the character of a fortress which controlled the city and its valuable cultivated countryside. It was also the place where the population could find shelter in a period of risk, a religious center (Temple of Athena) and the seat of the ruler.

Besides the Acropolis, the archeological areas of Lindos include the Necropolis spread over the surroundings of the ancient city of Lindos, the Theater on the southwest side of the hill below the Acropolis, the remains of the Four-portico building which was the extension of the stage of the Theatre, the Boukopion, a place of sacrifices located at Vigli in northeast of the Acropolis, the ancient font at the central square of the city and the adjacent labyrinthine network of aqueducts developed within the permeable rocky hill of Krana.

The complex of the ancient theater and four-portico building is located at the foothills of the Acropolis with a front facing west to a natural ravine which empties into the small harbor. According to a study of historical geography for the analysis of the ancient city of Lindos (Manousou-Ntella K.,2008), in a short distance from the theater and western of the four-portico building, the boundary of the ancient settlement can be found. This boundary was formed partly of natural elements, such as the steep rocks surrounding the theater, as well as the natural ravine going south. Besides, ancient theaters were often established on the outskirts of cities near their fortifications. Indeed, a part of feeble and clumsy irregularly shaped fortification of the 6^{th} -5^{th} century BC, has been revealed at north-west of the theater, and which likely

ends on the foothills of Krana location, enclosing the privileged and very well sheltered plain between the two hills. However, there is no evidence for the location of the ancient fortification at the north-east part of the city and the large harbor. Probably, it followed another natural element, the big brook that was emptying into the large harbor, enclosing the residential part developed along the main road that leads from the harbor to the Acropolis.

The cemeteries of the ancient Lindos (necropolis) were developed on the outskirts of the residential area and along the main accesses to the city, in positions such as Krana, Kampana, Kamaria, Achtarmas and on the peninsula of Kleovoulos. It is noteworthy to mention that the same areas of necropolis were quarries, the places of extraction of building material (limestone) from antiquity to the Italian occupation (Manousou-Ntella K, 2008).

One of the most important monuments of the necropolis is "The Tomb of Kleoboulos", a circular structure with carefully built masonry and a vaulted roof. Besides the reference on Kleoboulos, the tyrant of Lindos, this was the tomb of a wealthy family which in a later period has been transformed into a Christian church as the name of the head land “cape Saint Emilianos” testifies. Another monument of the necropolis is “The Archokrateion” in the locality of Kampana at Krana, also used as a church ("Frangokklesia") during the time of the Knights.

Other historical features of Lindos area are related to the more recent eras of Byzantine period and the time of the Knights (14th -16th century). Likely, at the 10th century, for protection from pirate raids, the settlement of Lindos was limited on the Acropolis, which at that time becomes fortified as a Byzantine fortress. On the hillside, instead, there can be found numerous small churches from Byzantine and Post-Byzantine period (11th-13th century) built by Lindian seamen as offerings to the saints during the wild times of rough seas (such as Ayios Georgios Chostos, Ayios Georgios Pachymachiotis or Pano, Ayios Menas, Ayios Demetrios etc.).

In 1317, the Knights of Saint John significantly strengthened the fortifications of the Acropolis, turning Lindos into a powerful fortified castle (Castle of the Knights of St John) built on the foundations of the older Byzantine fortification. However, for Lindos this time was a period of decline and only after the beginning of 16th century the maritime activities of Lindian people started again with success.

During 16th-17th century, the settlement occupied the area and took the form it has today. During this time the famous "Lindian houses" of the rich ship owners were built, the population has grown and the settlement took an ellipsoid form, with ten rows of

buildings, addressed towards the spacious central square, characterized by oleander, olive and pine trees.

The architecture of Lindian houses is characterized by monolithic cubic volumes with only few small openings and symmetrical facades. The height of the buildings varies between one and two floors and along with the morphologically intense relief of the land generates the characteristic visual movement of the settlement. The typical captain's room usually was on the second floor of the house, from which he could have access to a small terrace with a view on the large harbor of Lindos. Typical features of the Lindian houses are the arched wooden doors that lead from the street to the private courtyard which during the neoclassic period were paved with black and white pebbles laid out in decorative patterns. The main squared room of the house (known as sala), with its high wooden framed ceiling centrally supported by a high gothic shaped arch, as well as the adjacent auxiliary rooms are only accessible from the courtyard.

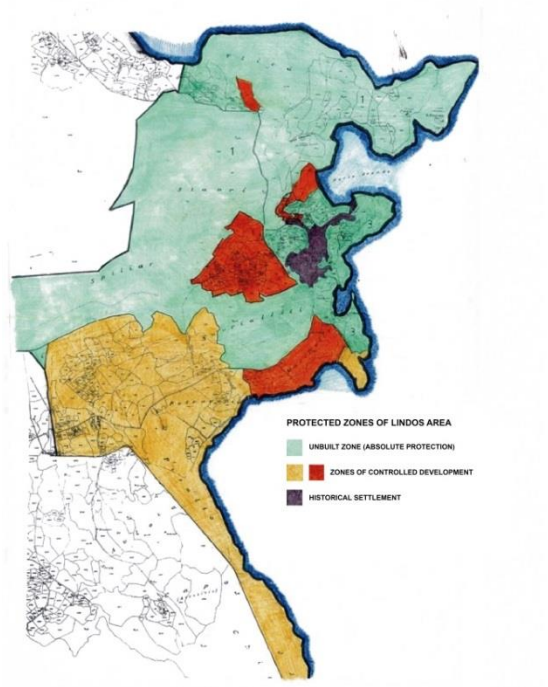
Today, the rich cultural heritage of Lindos is broadly acknowledged. However, awareness about the value of Lindos as a whole has been gradually developed: It started in 1948 with declarations about the conservation of single monuments (mainly churches and residential architecture), and afterwards in 1960 the new declaration concerned the whole settlement of Lindos (intended as an archeological area). In 1981, with the declaration of Lindos as a historical place of special natural beauty, the aesthetic value of Lindos was acknowledged too, as the surroundings of Lindos village (the ancient sites of necropolis) were included in the protected areas. Specifically, the declaration states: "The above declaration has the aim of the protection of the broader environment of the ancient city of Lindos, where historical relics of at least 3.000 years remain and which are interrelated with the natural landscape of unique beauty and globally famous." From this statement one can assume that naturalness is used as an aesthetic criterion rather than ecologic, as well as that Lindos has another underlying value related to its popularity. In 2003, a new delimitation of the protected archeological area of Lindos was declared by a new law including 29 monuments.

Table (4.3) Ministerial decrees for the conservation of the cultural heritage of Lindos

Number of ministerial decree	**Title of declaration**
23085/738/25-8-1948	About listed monuments of Lindos area
94262/5720/28-12-1959	About preserved historical monumental complexes.
15794/19-12-1961	About the characterization of historical monuments and archeological sites
ΥΠΠΕ/ΑΡΧ/Α1/Φ22/5932/170/30-1-1981	About the surrounding environment of Lindos as a historical place of special natural beauty
ΥΠΠΟ/ΓΔΑΠΚ/ΑΡΧ/Α1/Φ43/47922/3359/17-11-2003	Delimitation of the archeological area of Lindos

Data source: http://listedmonuments.culture.gr/

Figure (4.16) Protected zones of Lindos area



Map source: (Manousou-Ntella, 2008)

4.2.7 Land cover and built uses

As results from the land cover map (see figure 4.17), Lindos area, besides the dense nucleus of Lindos village, is characterized by vast areas of natural grasslands covering 50% of its total surface. On the uplands and especially on the peninsula Gkinas there are some natural areas covered by scherophyllous vegetation (16,3% in total) and few delimited areas of coniferous vegetation (2,2%). Coniferous vegetation can be mostly noticed on the north-west hill-sides of several accentuated elevations in the proximity of the village Pefki. Significant surface of Lindos area is covered by complex cultivation patterns (8,7%), consisting of agricultural fields with few small scattered houses mostly distributed along the south coast in the village Pefki. Between complex cultivation patterns and natural vegetation, transitional areas characterized by agricultural fields with significant percentage of natural vegetation can be noticed (5,1%). Olive groves merely cover 1,4% and they are scattered within the larger areas of complex cultivation patterns. The perimeter of the coast and some areas along the major neotectonic faults are covered by little or no vegetation and they essentially constitute bare rocks. Leisure facilities consisting of tourism accommodations and their outside yards cover 6,8% of the area and they are distributed in alternation with complex cultivation patterns in proximity of the beaches. This distribution reveals the gradual transformation of land cover from complex cultivation patterns to leisure

facilities. For each land cover class, landscape metrics, related to fragmentation and complexity, have been calculated with the aid of GIS (patch analyst tool). The results as illustrated in table (4.5) show that the number of patches representing leisure facilities is much higher than the number of patches of other land cover classes and especially in comparison with complex cultivation patterns. Also the mean shape index of patches representing leisure facilities is greater than that one of other classes. This contributes to a greater heterogeneity and complexity of the landscape, where leisure facilities are the dominant cover. This consideration is based on the assumption that increase in the number of types of land cover leads to an increase of entropy and therefore to a highly varied landscape (Antrop and Eetvelde, 2000). The urbanization process, indeed, increases the variety of land uses, and contributes to a more complex, diverse and highly fragmented morphology. As regards the aesthetic quality, the increase in the diversity of the landscape may not create particular visual problems and particularly in a tourist landscape it may be tolerated and expected. However, under different conditions in other landscape types a highly varied landscape creates a visual disharmony and confusion (Gkoltsiou, 2007). Furthermore, data derived from the map of built uses (figure 4.3) show the dominance of tourism accommodations (hotels, apartments, villas) within the total amount of built uses (46,5%).

Figure (4.17) Land cover map of Lindos area with hillshade effect (Map elaboration: C. Geronta)

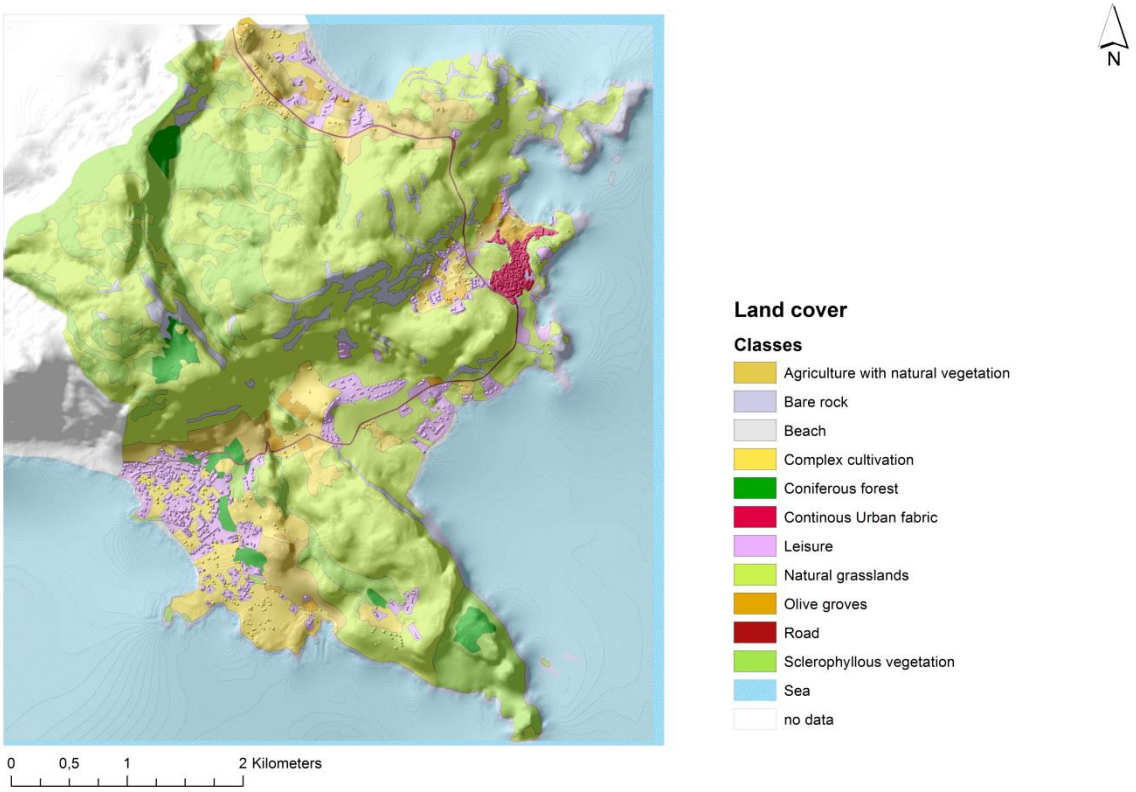


Table (4.4) Coverage of each land cover class in Lindos area

Lindos land cover classes (level 3)		**Area (ha)**	**Coverage (%)**
3.2.1.	Natural grassland	919,9	50,4%
3.2.3	Sclerophyllous vegetation	297,2	16,3%
2.4.2	Complex cultivation patterns	158,3	8,7%
3.3.2	Bare rock	133,4	7,3%
1.4.2	**Leisure facilities**	**123,3**	**6,8%**
2.4.3	Agriculture with natural vegetation	92,9	5,1%
3.1.2	Coniferous forest	40,7	2,2%
2.2.3	Olive groves	24,9	1,4%
1.1.1	Continous Urban fabric	14,6	0,8%
3.3.1.	Beaches, dunes and sand plains	12,1	0,7%
1.2.2	Road network	8,9	0,5%
TOTAL AREA		1826,2	100,0%

Data derived from the elaborated map of land cover (see figure 4.6 and 4.17)

Table (4.5) Landscape fragmentation and complexity indices

Classes	Fragmentation indices		Complexity indices	
	Number of patches	Patch density (per 100ha)	Mean Shape Index (MSI)	Area Weighted Mean Patch Fractal Dimension (AWMPFD)
Natural grassland	13	0,712	2,420	1,456
Sclerophyllous vegetation	35	1,917	2,734	1,387
Complex cultivation patterns	20	1,095	1,993	1,371
Bare rock	48	2,628	2,353	1,470
Leisure facilities	49	**2,683**	**2,493**	1,369
Agriculture with natural vegetation	7	0,383	2,165	1,355
Coniferous forest	11	0,602	1,465	1,304
Olive groves	21	1,150	1,339	1,340
Continous Urban fabric	1	0,055	2,375	1,358
Beaches, dunes and sand plains	7	0,383	2,431	1,438
Road network	2	0,110	11,046	1,687
LANDSCAPE (total area)	217	11,9	2,348	1,345

Data derived from the elaborated map of land cover (see figure 4.6 and 4.17)

Table (4.6) Built uses coverage of Lindos area

Built uses	**Area (ha)**	**Coverage(%)**
Tourism accommodations (hotels, apartments, villas)	15,55	46,5%
Residential	11,19	33,5%
Commercial (shops, restaurants, bars)	4,29	12,8%
Archeological	1,82	5,4%
Other services	0,46	1,4%
Religious (churches)	0,14	0,4%
Total area of built uses	33,46	100,0%

Data derived from the elaborated map of built uses (see figure 4.3)

4.2.8 Visibility

The tectonic faults on the basis of the magnitude of vertical displacement create minor o major morphological discontinuities that significantly affect the visual perception of the area. In particular, these morphological discontinuities affect the extent of the visibility of the area in relation with different points of observation within the road network where people usually move. According to the outcomes of the visibility analysis conducted with the aid of GIS, the extend of land that is visible from at least 3 points of observation, both from the highway and the local network of the settlements, is very limited and principally includes the fault scarps and the steep Lindos limestone slopes which are rocky surfaces with little or no vegetation. The built areas consisting of the 3 main settlements of Lindos area (Lindos, Pefki, Vlycha Bay) with their adjacent agricultural fields and the most recent developed areas of second-homes are much less visible from multiple observation points, as they are located on lowlands in plains that do not exceed 120 meters above the sea level. Lacking the possibility of having a general overview on Lindos area, the landscape of Lindos becomes gradually discovered while people keep moving on the road network, giving them a sense of surprise, especially in the locations where the road intersects a fault, such as the view of the hill of Acropolis when approaching Lindos village after having crossed Vlycha Bay and the view of the long peninsula of Pefki characterized by its high vertical cliff. Therefore, the most visible areas are those mainly with little or no vegetation, while the vegetated areas remain rather hidden in the higher parts of the relief of the area (higher than 100m). However, the presence of vegetation becomes more noticeable in the southern part, next to the settlement of Pefki where there is a major concentration of coniferous trees.

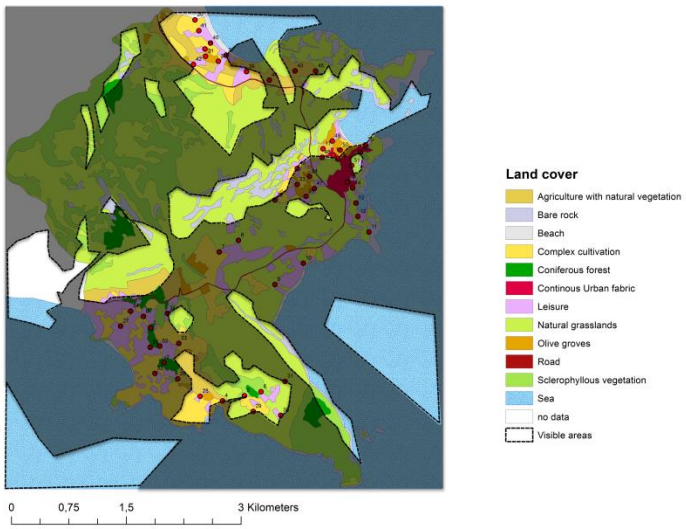
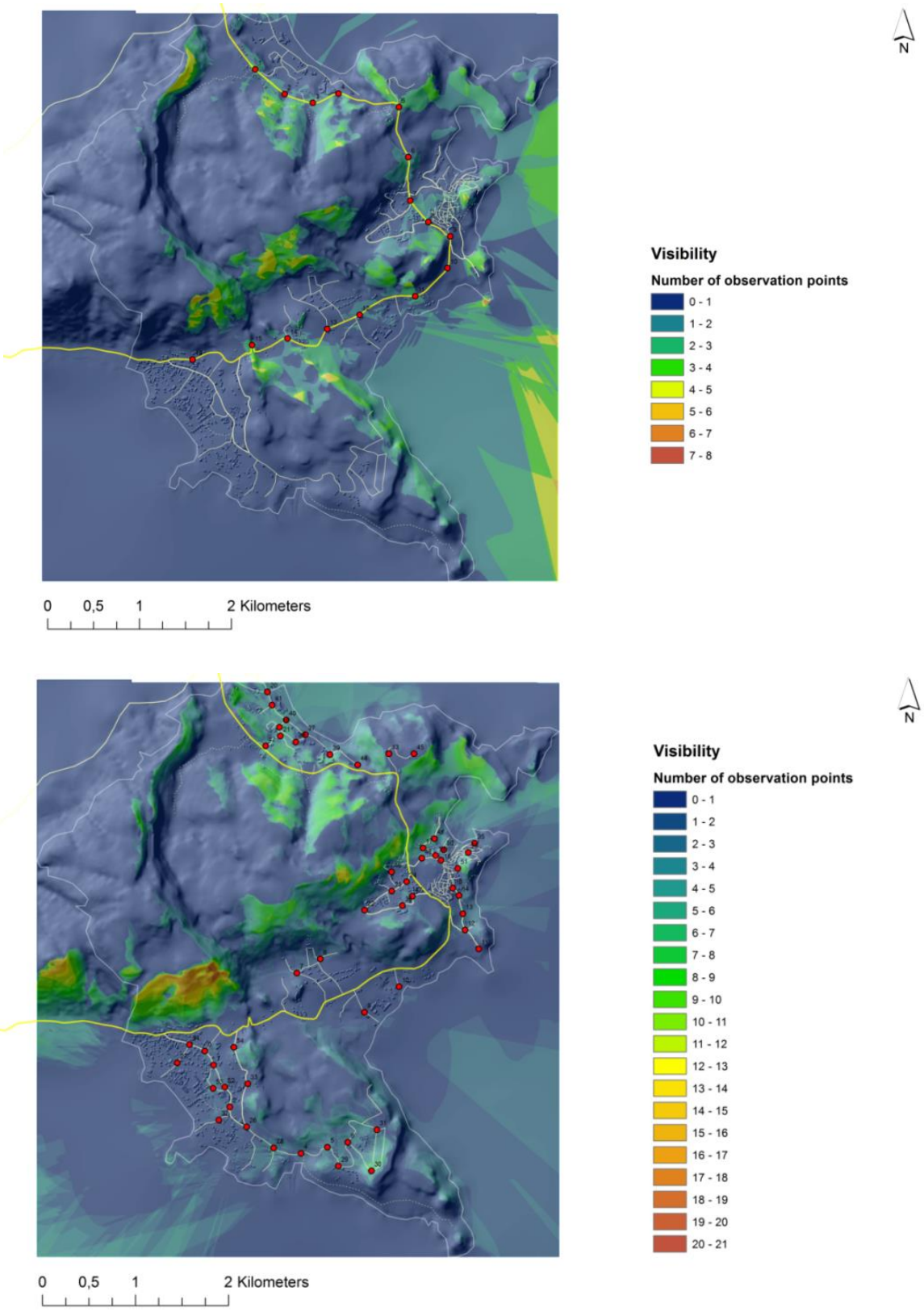


Figure (4.18)
Visible areas in relation to land cover

Figure (4.19) Maps representing the visibility of Lindos area from several observation points



4.2.9 Ecosystem services

The capacity of the landscape of Lindos area to provide several ecosystem services has been assessed following the methodology discussed in chapter 2. Based on the land cover map, for the assessment of each capacity, experts' values have been assigned to each class of land cover of Lindos area. The results are illustrated in four thematic maps (figure 4.21 and 4.22).

The outcomes of this assessment highlight the importance the few valuable areas covered by coniferous vegetation, agricultural fields with a significant amount of natural vegetation, and olive groves in the landscape capacity to provide provisioning services. Coniferous vegetation is important in the capacity of landscape to provide aesthetic and recreational value as well. However, the weakness of this methodology to assess cultural services has been noticed. The assessment of cultural services results less accurate, as the experts' value assigned to artificial cover concerning cultural services is 0 and therefore, in this view the recreational and aesthetic value of Lindos village is denied. However, due to the proximity of built uses to shoreline, regulating services in these areas are less effective entailing erosion risk.

From the assessment of the landscape capacity to provide ecological integrity, the importance of complex cultivation patterns is observed in preservation of ecological corridors between the natural areas and the avoidance of further isolation of the peninsulas which are characterized by high biodiversity. However, the most significant aspect of this analysis concerns the importance of the vast areas of natural grasslands present in Lindos area. Besides the importance of grasslands in terms of the maintenance of biodiversity, several other services and products are provided by grasslands. They play a major role in providing high quality forage for both livestock and wild animals. They support communities of insects with major roles in the ecosystem services of control and pollination, sustain apiculture, and contribute to the prevention of erosion processes, maintenance of the water cycle; they additionally combat the negative impacts from fertilizers and pesticides.

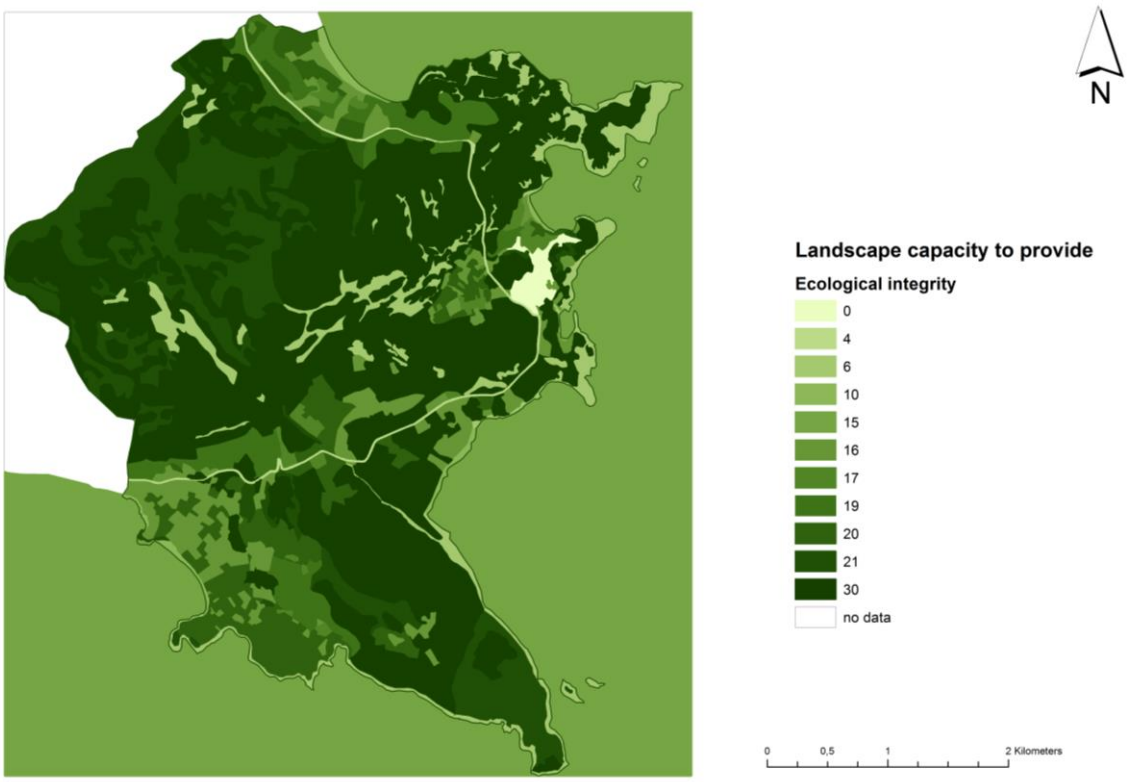
Grazing is an integral biological attribute of grassland ecosystems. Through grazing humans intervene in the evolution of grassland vegetation and quite often are able to benefit from the provision of various ecosystem services. Therefore, grasslands and especially dry grasslands are of paramount importance for Europe as they sustain economies, from the domestic to national levels, societies by providing valuable ecosystem services, like adjusting water balance, and nature (e.g. forming numerous habitat types where exceptional elements of biodiversity flourish).

However, European dry grasslands are rather a neglected land use type although they occupy a significant part of the European continental. In Greece, the majority of grasslands can be considered as dry grasslands in the sense that they are mostly found in dry and poor-nutrient soils areas. The main legal framework concerning grasslands management is based on the Commission Regulations (EU) No 65/2011 and No 1974/2006, the council 92/43/EEC on the conservation of natural habitats and the wild fauna and flora and the EC Directive 79/409 on the conservation of Wild Birds, their latest modifications and their incorporation into the Greek legislation. The law states that farmers can graze their livestock at communal rangelands (Law 1080/1980; Law 1734/1987). This is called “grazing right” and the taxes payment range from 0,20Euros to 0,53Euros per grazing animal (Law 2130/1993).

However, the grazing in Lindos area seems to be in decline. The abandonment of grazing is manifested by neglected drystone walls used as field boundaries, and the use of grasslands for legal and illegal discharges of rubble and garbage without considering the effects on such important plant species for the ecosystem.

Figure (4.20) The neglected state of grasslands in some areas of Lindos

Figure (4.21) Landscape capacity to provide ecological integrity and provisioning services



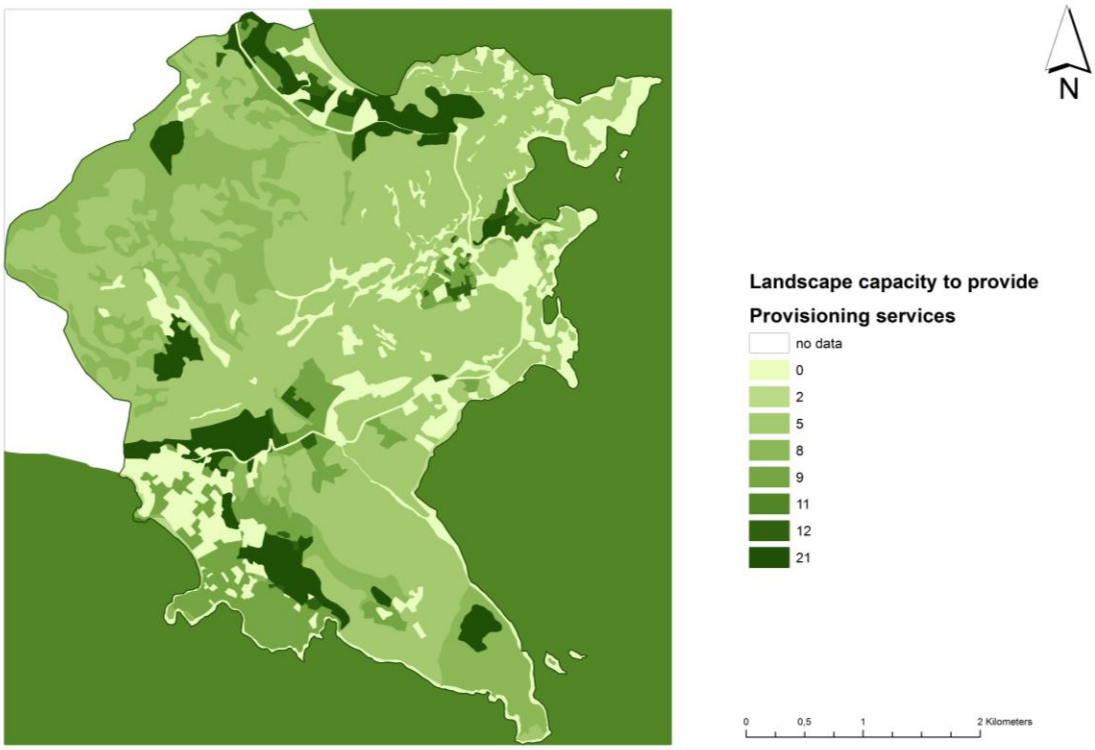
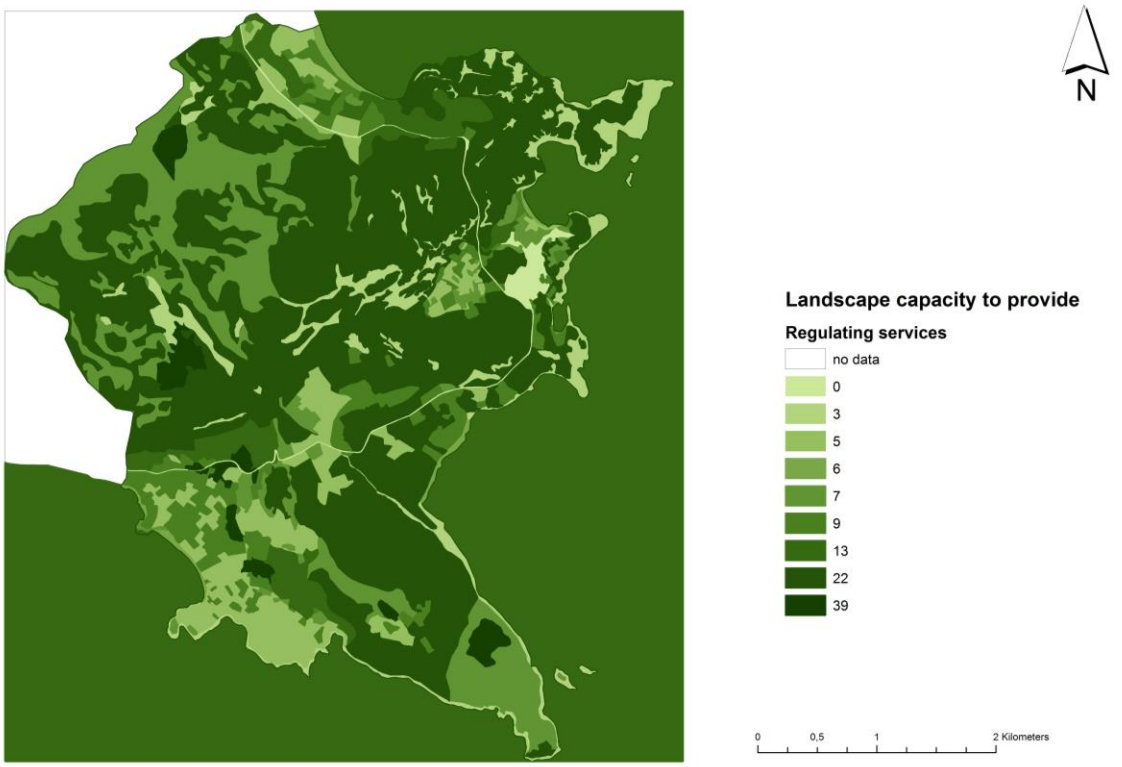
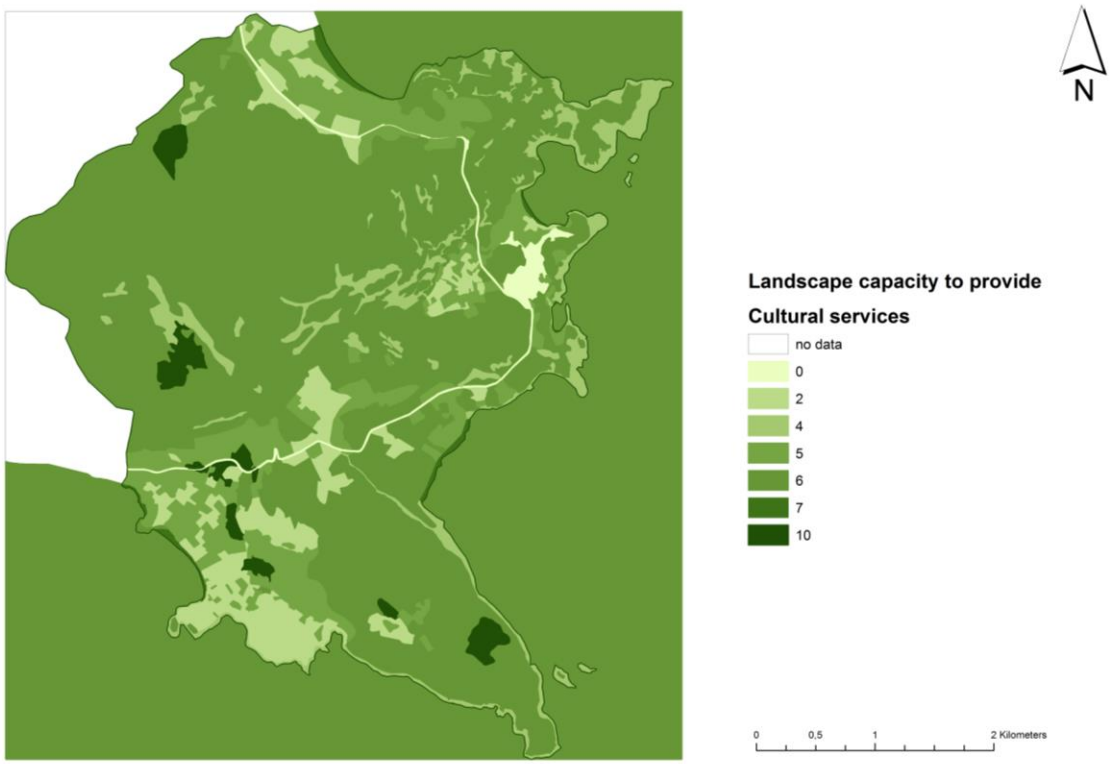


Figure (4.21) Landscape capacity to provide regulating and cultural services





4.3 The effects of the contextual factors on landscape character

As results from the analysis of the spatial dynamics occurring on the territory of the island of Rhodes, after the reunification with Greece and the booming of tourism development after the 60's (chapter 3), several factors (such as the significant demographic increase, the expansion and dominance of tourism activities, the seasonal employment, etc.), have generated critical visible transformations in the landscape of Lindos area. These transformations are mostly related to a rapid development of housing and tourism infrastructures as well as changes in land cover and built uses.

Lindos village however, as a protected traditional settlement has maintained many morphological aspects of the past, due to the regulations and special requirements for new interventions to single buildings, or in urban scale. Indeed, the main purpose of these regulations is the conservation of the shape of the settlement and its surrounding environment as it is presented today. Moreover, the way in which the settlement is built does not allow any further development and expansion.

Figure (4.22) A panoramic view of Lindos village from the area adjacent to the ancient theater

Therefore, the adaptation and integration of new interventions to the existing built environment, which is characterized by a continuous urban web with courtyards, is only possible with use of local construction materials, and always providing a good visibility from different viewpoints to the whole settlement and especially to the Acropolis. The visibility is preserved with the prohibition of permanent structures on the rooftops especially for tourist uses, or additional vertical raising of existing buildings. However, as regards the change of use of private buildings from residential to commercial or recreational, the regulations only concern the configuration of the facades in the tourist shopping center and the control of the systematic use of roofs for the placement of tables and chairs during the tourist season. The responsible office for the approval of each intervention is the Archeological service (4th Ephorate of

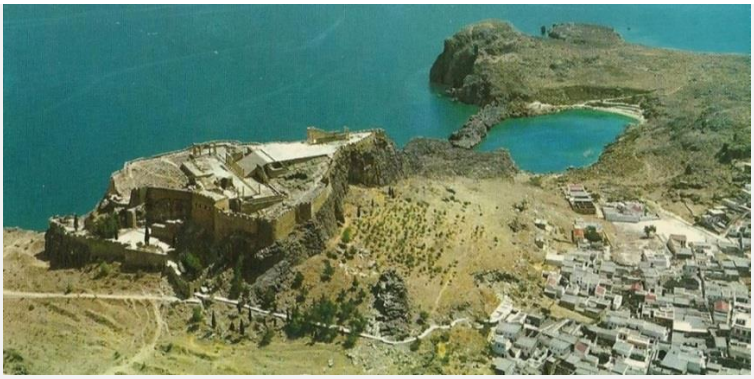
Byzantine Antiquities of the Hellenic Ministry of Culture). Nevertheless, there is not prohibition for changing the use of a building if the project respects the required morphological and functional aspects.

Consequently, as urban uses are not established a priori with an urban plan, a great number of private dwellings of Lindos village have been transformed in shops, restaurants, bars and tourism accommodations which morphologically respect the traditional architecture of Lindos village, but radically transform the character of the settlement. The transformation of the urban character of Lindos started from the beginning of the tourism development in Lindos area in the 60's and 70's, when many of the Lindian houses were restored and transformed by international artists, musicians and writers who were attracted by the originality of the local architecture. It was then that Lindos acquired international fame through several movies filmed on Rhodes (such as the Guns of Navarone, in which the guns are placed on the Acropolis of Lindos).

Figure (4.23) Lindos during the filming of the movie 'The guns of Navarone' (1961)

During this period, as the socio-economic prosperity of the inhabitants of Lindos was rapidly growing, fishing, grazing and agricultural activities have started to diminish and Lindos village has undergone several transformations in order to respond to the modern standards of living and the growing tourism needs: the cobbled streets of the village has been cemented over, urban green has been planted on the hill of Acropolis, historical villas were transformed to tourist shops and bars, on the streets all signs were in English to accommodate tourists from Britain on cheap package deals, the beaches has been equipped with umbrellas, pedal-boats and snack bars and donkeys have turned into transportation means for guiding tourists from the village to the Acropolis.

Figure (4.24) The planting of urban green on the hill of the Acropolis in 1967



Furthermore, besides the urban character of Lindos village, the lack of regulations related to the management of agricultural fields and the increasing need for accessibility for tourism purposes, has led to great transformations of the landscape. The most visible transformations regard the destruction of the terraced fields for the creation of new service areas for transportation (mainly parking lots) and for intensification of the road network. Moreover, the abandonment of agricultural fields is manifested by the fact that they now contain significant amount of natural vegetation and they are used by tourists as parking areas in summer.

Figure (4.25) Lindos before the destruction of terraced fields and today

a. Lindos circa 1930 **b. Lindos today**

c. Agricultural fields used as parking lots in Lindos during summer

Figure (4.27) The new tourism zone (Krana) in the background of Lindos village

The transformation of the landscape in the surroundings of Lindos village is noticeable as well. In Krana location, in a narrow valley opposite Lindos, a new tourism zone has been created during the last two decades. This area includes tourism accommodations based on the typology of studio/apartments hotels equipped with vast yards and swimming pools. Their distribution, however, creates incoherence between the accommodations and the adjacent agricultural fields and pastures. As this zone lacks residential buildings, during the winter is presented completely desert.

Figure (4.28) Pefki village on the south of Lindos area

On the south part of Lindos area, before the 80’s, Pefki village was just a summer agricultural and fishing base with only few houses established merely to satisfy the temporary needs of people living further inlands. Indeed, as result from the land

cover map, today Pefki, over its eastern land, still includes vast areas of complex cultivation patterns, consisting of agricultural fields with scattered small dwellings. After the 80's, however, Pefki underwent a significant urban sprawl due to the expansion of tourism activities in Lindos area. A great number of tourism accommodations, restaurants, bars, and other commercial and recreational buildings were built, as well as new houses for the inhabitants of the historical village of Lindos, who decided to transform their old traditional houses in accommodations, restaurants or tourist shops and move to Pefki in more comfortable dwellings. The name Pefki or Pefkos, which in Greek means "Pine", is due to the presence of coniferous vegetation the extent of which, however, has been reduced, as locals claim, due to the expansion of the buildings and road network. The typology of the tourism accommodations established in Pefki, is principally based on studio/apartment hotels of two or three-storey buildings with ample outside spaces equipped with swimming pools, bars/restaurants and which are often characterized by the local vegetation with addition of exotic plants. Most of the accommodations are local family enterprises and services are offered by the family members themselves.

Figure (4.29) Vlycha bay as viewed from the hill and the amphitheatric tourism accommodations

Vlycha Bay, even though it was an agricultural base as Pefki, today is quite exclusively a recreational area. The first multi-storey hotel was built around 1975

situated a few meters from the sea. Nevertheless, the area has further developed in the 90's and even more after 2005 comprising much larger and more exclusive tourism accommodations amphitheatrically built on the hillside, as well as restaurants and leisure facilities such as swimming pools, sport camps and commercial buildings.

Figure (4.30) The new tourism zone (Avlonas) based on the development of second-homes

As mentioned in chapter 3, during the last decade, second homes are offered as an alternative tourism product on Rhodes, which is based on a free real estate market activity. In the location Avlonas, between Lindos and Pefki village, the massive construction of second-homes started circa 2002, in an area only covered by grasslands and sparse vegetation. The typology of the second homes due to the higher initial price of land with respect to other areas of the island is principally addressed to high-income locals and visitors. This typology of temporary accommodation is mostly based on a single or two-storey house equipped with spacious yard and at least one swimming pool. The houses are distributed, as aggregated nucleuses near the shoreline, as well as in the valley and on the hillside, where the visual impact is greater. In the area there are still many second-homes under construction.

Figure (4.31) The Swimming pool as offered by different types of accommodation

Figure (4.32) The transformation of Lindos village over time

a. Lindos village during Ottoman occupation

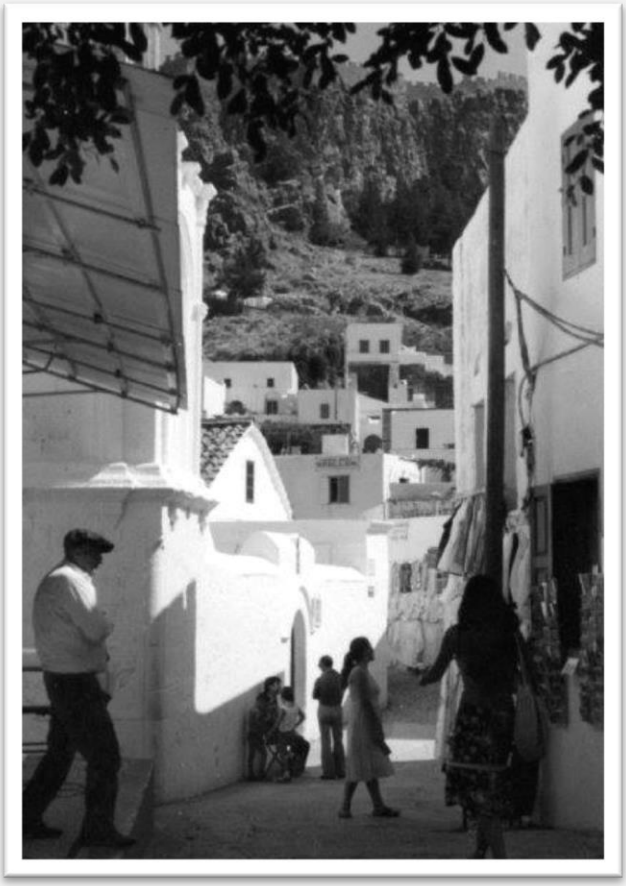
c. Lindos village during the Italian occupation circa 1936

b. Lindos village today

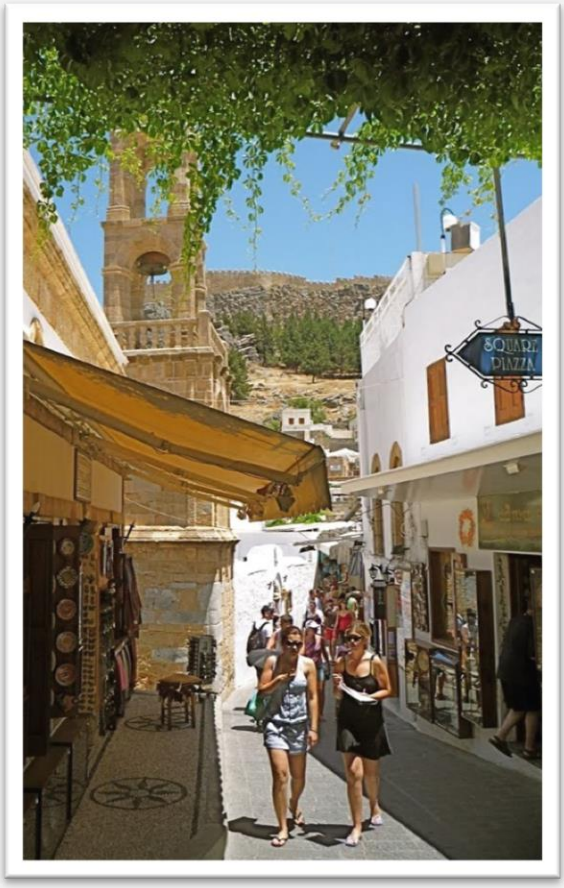
d. Lindos village today

Figure (4.33) Lindos in the 70’s and today: similarities in tourism experience

a. Lindos village circa 1970



b. Lindos village today



c. Tourists in Lindos circa 1970

d. Tourists today heading to the Acropolis

4.4 Discussion

In this chapter, the tourism landscape of Lindos area is described as the result of the combination of its intrinsic characteristics (such as topography, geology, geomorphology, vegetation) and the effects of tourism development and other spatial dynamics of the territory of the island of Rhodes (such as demography, economy, policies), which inevitably have affected the local conditions of the landscape of Lindos.

Topography, Geology, geomorphology and vegetation of Lindos area, as well as the effects of their interrelationships significantly contribute to the formation of the intrinsic character of the landscape of Lindos. From the analysis of these features, it becomes prominent that Lindos is a semi-mountainous area, characterized by the lowermost and relatively autochthonous geological unit of the island of Rhodes (Lindos unit), as well as by an intense morphological relief which has been formulated due to the neotectonic process and especially the activity of significant faults that according to all evidence are still active. The influence of the tectonic structure is furthermore important in the development of the hydrographic network as well as the development of the historical Lindos village.

Indeed, the most important morphological features formulated due to the presence of active faults in Lindos area, are also interestingly associated with archeological and religious sites, such as the steep slopes of the Acropolis of Lindos, the plateau of Ancient Tomb, the St. Paul's Bay, and the church of Prophet Elias on the summit of the hill in Pefki village (formed from the upthrown block of a secondary order fault). Therefore, the geomorphology of Lindos is linked with the concept of accessibility and safety, as the archeological areas are not easily accessible due to the difficult steep streets and paths that lead to them. The morphological discontinuities also significantly affect the visual perception of the area, creating a sense of mystery and surprise in the intersections of roads and faults.

The intrinsic character of Lindos area is also formulated due to the erosive action of the sea. The coast of Lindos area is characterized by horizontal partition with small peninsulas, islets, typical landforms created by marine erosion, cliffs, caves, as well as shore lines which correspond to former sea levels. It is therefore also evident that Lindos area is vulnerable to a series of geological hazards due to tis geotectonic location and the individual geological, geomorphological and geotechnical conditions that characterize it. Various phenomena such as rock falls, landslides, reactivation of active faults, coastline displacements that could occur as a result of

seismic activity, impose a significant threat to Lindos area and must be taken into consideration for future planning and management.

Nevertheless, anthropogenic factors additionally challenge the landscape character of Lindos area. Specifically, one of the most important transitions of landscape character concerns the expansion and transformation of Lindos village and the former agricultural and fishing bases Pefki and Vlycha to principally leisure areas. This transition is manifested by the high percentage of the recreational and commercial uses (shops, restaurants, bars, accommodations etc.) within the total area. In addition, the new tourism zone developed in the last decade, based on the tourism model of exclusive second-homes, constitutes a radical change for the landscape character of Lindos, which gradually lose the links with its particular positionality and culture in order to become an elite tourism landscape. In addition, the seasonal effect of mass tourism on the landscape character is also significant as the stewardship of the landscape in the winter is very feeble with respect to the summer, when the landscape should respond to the higher standards of visitors. Lastly, in the transition of the landscape character, the negligence or gradual abandonment of traditional rural activities plays a significant role. Traces of abandoned drystone walls and terraced fields vanish or become unnoticed within the variety of elements characterizing the tourism landscape of Lindos.

However, as the transition of the landscape character is unavoidable, especially as regards tourism landscapes, the major challenge is to guide transition in such a way in order to preserve qualities and values that would allow a balanced progression of fundamental ecological and socio-economic functions as well as the cultural meanings of the landscape.

Chapter 5.
Unfolding the variety in visitors' images of Lindos

Introduction

This chapter aims at illustrating the results of a quantitative survey, conducted in Lindos area during July 2014, on a sample of 380 international visitors, exploring relationships between their personal characteristics and on-site generated images derived from their evaluative perception on various cognitive and affective components of the tourism landscape of Lindos. At the first part of this chapter, this study focus on the analysis of the visitors' characteristics, while at the second part, the focus is on their images and how these images affect visitors' attitudes.

5.1 Study plan and objectives

This survey constitutes an empirical study applied in Lindos area that aims at testing some of the hypotheses of the theoretical framework of my research (chapter 2), expressed into a conceptual model for tourism landscape evaluation emerged from a thorough literature review.

Primarily, this model aimed to define several personal factors that might have an influence on visitors' on-site generated images[59] of the tourism landscape. These factors are related to socio-demographic characteristics, psychological motivations and patterns of travel behavior. As mentioned in the theoretical framework, visitors' overall image of the tourism landscape derives from their evaluative perception[60] on both cognitive and affective components. Due to the importance of image in predicting tourists' decision-making, behavior and satisfaction levels (Jenkins, 1999), this model additionally aimed at exploring how do these on-site generated images of the tourism landscape affect visitors' attitudes towards the tourism landscape such as their overall satisfaction and willingness to return to the same place for a future visit.

[59] Image is frequently described as simply "perceptions of an area" or as "the sum of beliefs, ideas and impressions of a place that a person has of a destination" (Crompton, 1979, p.18)

[60] Evaluative perception is the rating given by a visitor (as respondent) on each of the cognitive and affective attributes of the tourism landscape. The overall image is derived from these ratings.

Consequently, in this survey, the concept of landscape is used both as a medium through which visitors can externalize the images formed through their own experience, as a sum of beliefs, ideas and impressions of the visited tourist place, and as a mean through which one can identify and better understand convergences and divergences in visitors' images and tourism experiences.

The survey has been addressed to international visitors of Lindos area. The focus on international visitors is primarily due to the fact that the majority of tourists on Rhodes island and by consequence in Lindos area too, are international tourists, most of them originated from England, Germany, Russia, Sweden and Italy. As a matter of fact, for the year 2014, secondary data on tourist arrivals in the national airport of Rhodes (see table 5.1), show that 85% of the total number of arrivals consists of international tourists. Dealing with this circumstance, one may assume that the presence of visitors from different cultural contexts, that also implies different travel behavior and landscape preferences[61], generate different images of the tourism landscape of Lindos.

I have chosen to investigate tourists residing in Lindos area, as well as autonomous visitors accommodated in other locations of Rhodes island, in order to detect differences in images of Lindos associated with different travel behavior. Furthermore, even though a considerable amount of visitors in Lindos area consists of cruise passengers, these visitors have been excluded from the survey as their staying in Lindos area is usually very short (a couple of hours) and their visit is not organized by themselves but guided by tour operators.

Therefore, by exploring and understanding the variety among visitors arising from different individual experiences, psychological motivations and patterns of travel behavior, this empirical study has the scope to go beyond the general focus on consensus of the perceptual landscape preference studies. As mentioned in chapter two, most of these studies assume an interpersonal agreement on preferences about certain types and elements of the landscape (Ulrich, 1983, as mentioned in Buijs 2009), however, besides the possible link between image and preference, it should be mentioned that visitors' general landscape preferences are not the focus of this study, but merely their on-site generated images of the tourism landscape in relation with their personal characteristics and behavior.

[61] Landscape preferences are usually conceived of as predominantly based on precognitive, affective responses to the physical environment, related to feelings of liking or disliking (Korpela et al., 2002, as mentioned in Buijs, 2009)

Table (5.1) Number of arrivals in the national airport of Rhodes

Arrivals	2012	2013	2014
National flights	294.354	306.657	339.775
International flights	1.606.933	1.790.506	1.930.371
General aviation	3.044	3.682	3.089
Total	1.904.331	2.100.845	2.273.235

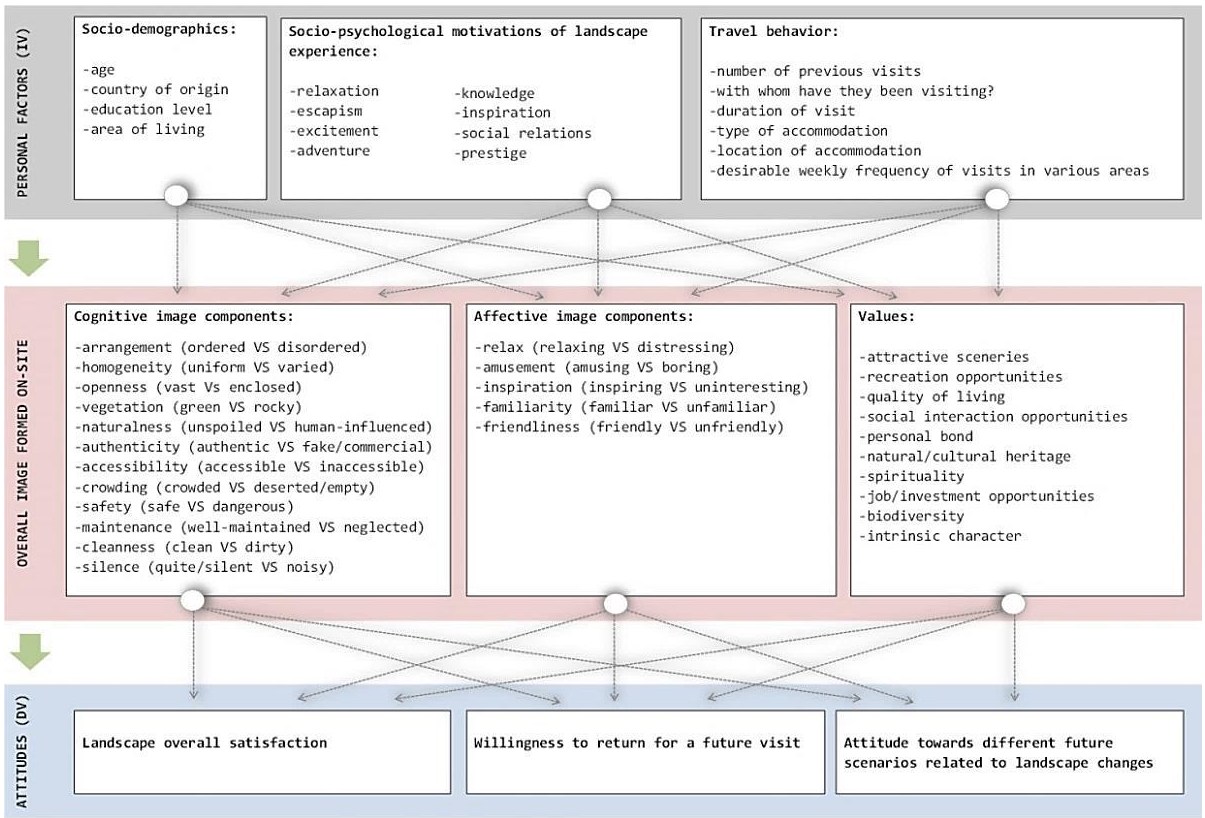
Data Source: civil aviation service of the national airport of Rhodes "Diagoras" (www.ando.gr)

5.2 Methods

Main concepts in the questionnaire

The questionnaire has been structured in three main sections consisting of visitors' personal factors, images formed on-site, and attitudes. As illustrated in the following scheme in figure (5.1), each section has been associated with different categories of variables providing the necessary information to describe different aspects of each section.

Figure (5.1) Main concepts and variables used in the survey questionnaire



The first section consisting of personal factors included variables such as:

- Socio-demographic characteristics (gender, age, country of origin, highest level of completed education and type of area of living),
- Socio-psychological motivations of the landscape experience (relaxation, escapism, excitement, adventure, knowledge, inspiration, social relations, and prestige),
- Travel behavior (number of previous visits, with whom they have been visiting the place, duration of the visit, type and location of accommodation, frequency of visits in different areas).

For measuring the extent to which, each socio-psychological factor represented a motivation for the visitors to experience the tourism landscape, I used a 5-point scale rating from "not at all" to "a great deal". The socio-psychological factors have been defined according to Crompton's (1979) list of push factors that cause tourists to seek activities to reduce their needs (see chapter2).

In the second section, the measurement of visitors' images of the tourism landscape consisted of several 7-point scale ratings according to Osgood semantic differential scale, using pairs of opposite adjectives for the description of cognitive and affective aspects (the values of the two opposite poles were +/-3 and neutral value was 0). The cognitive aspects were related to arrangement, homogeneity, openness, presence of vegetation, naturalness, authenticity, crowding, safety, maintenance, cleanness, and silence. The affective aspects were related to relaxation, amusement, inspiration, familiarity and friendliness. The image components' choice process has been based on the literature review in both fields; tourism management and landscape research (see Chapter2).

In the second section, the questionnaire also focused on several values that visitors may associate with the tourism landscape of Lindos. These values were studied using 10 statements about reasons why Lindos area may be valuable. Each statement represented a landscape value typology adopted from literature, such as that one developed by Gregory Brown (2007; 2012), on the basis of the international consensual values associated with the landscape. Visitors were asked to respond to this question by making reference to their own actual knowledge and experience acquired in Lindos area, and with the aid of a five-point Likert scale, from "totally agree" to "totally disagree".

In order to better understand what are the elements of the tourism landscape that principally compose visitors' images, the visitors have been additionally asked to select those elements that come first in their mind when they think about the landscape

of Lindos. The respondents were provided with a list of elements related to different areas of Lindos characterized by different land uses (beaches, vegetation and agricultural fields, tourism infrastructures, houses and narrow streets of villages, archeological sites streets, hills covered by grasslands etc.)

In the third section consisting of visitors' attitudes, the overall satisfaction of visitors about the tourism landscape of Lindos, as well as their willingness to return were measured using a 7-point scale rating from 0 to 6. Visitors have also been asked about their attitude towards future scenarios related to eventual changes in the tourism landscape.

Sampling design

The selection of an appropriate sample in tourism studies is often quite problematic, as it is very difficult to find available data on the exact amount of tourists visiting a certain area.

For the quantification of the sample for my survey, the only available official number of visitors registered in Lindos was the number of visits in the archeological area of the Acropolis[62] of Lindos, consisting of 100.010 visits during July 2013 (the corresponding month of the previous year during which the survey has been conducted). Therefore, in order to quantify the sample, I considered the number of visits in the archeological area as an indicative population number, as this site constitutes the major attraction for the majority of the tourists visiting Lindos.

With the aid of an on-line sample calculator (nss.gov.au), I defined the size of the sample (383), using a confidence level of 95%, confidence interval 0.05 and population number 100.010.

For the distribution of the questionnaire, I randomly selected the respondents (simple random sampling) in different locations of Lindos area at different time points of the day, during the whole month of July 2014. From 400 distributed and recollected questionnaires, I considered 380 of them valid as fully completed, that is, however, a satisfactory number considering the employable means and the fact that the questionnaire

[62] In July 2012 the amount of visitors of the Acropolis of Lindos was 28,5% fewer than in July 2013, consisting of 77.804 visitors. While in July 2014, visitors were 127.494, showing an increase of 27,5% with respect to 2013.

was personally administrated to each visitor during their visit in Lindos, providing indications and clarifications during completion when it was needed. As Rescoe (1975) cites in Sakaran (2000:296) “sample sizes larger than 50 and less than 500 are appropriate for most research”.

Table (5.2) Number of visits in the archeological area of the Acropolis of Lindos

Number of visits	2012	2013	2014
Acropolis of Lindos	77.804	100.010	127.494

Data source: Hellenic Statistical Authority (www.statistics.gr)

Survey execution

This questionnaire-based survey was conducted during July 2014 in different locations of Lindos area. I personally distributed the questionnaire to approximately 15 visitors per day, first providing them with information about the scope of the survey and secondly asking them about their willingness to fill in the questionnaire. During the completion of the questionnaire I provided indications and clarifications when it was needed. Within Lindos area I chose strategic points to distribute the questionnaire where visitors were mostly available, while waiting in a bus stop, or relaxing in squares, pool bars, outdoor restaurants and cafés, etc. The survey was daily carried out in two time intervals of the day, between 10am to 13pm and between 15pm to 19pm.

The questionnaire was merely provided in English language; however this fact did not constitute a particular obstacle for the implementation of the survey, as the majority of the visitors has demonstrated to possess sufficient skills in English language.

Data analysis

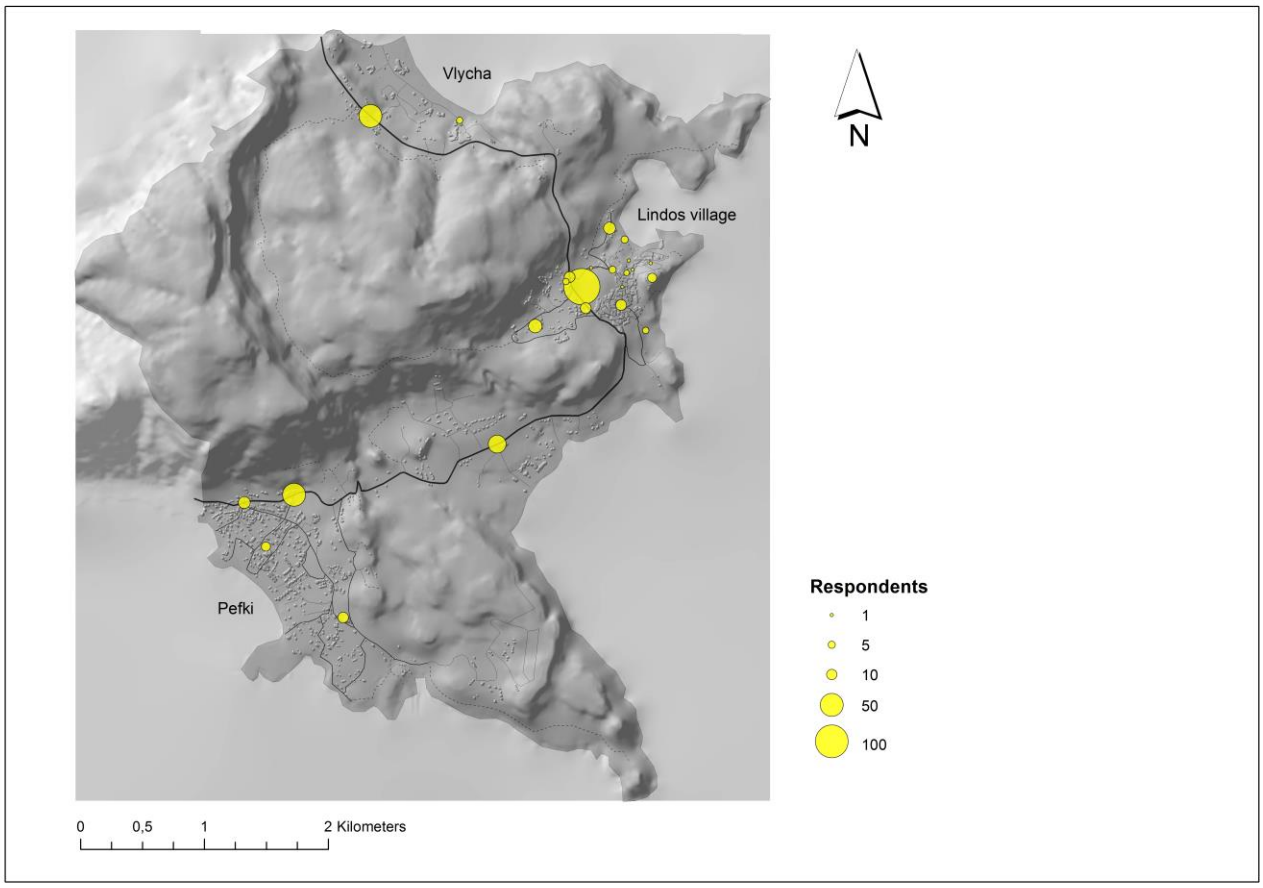
For data analysis, I used both descriptive and multivariate analysis techniques. As a first step, I used descriptive statistics to analyze visitors’ personal factors and explore cultural differences among groups of visitors originated from different regions of origin. As a second step, I used multivariate analysis techniques to distinguish, within the total research population, groups of visitors who share similar patterns of travel behavior and socio-psychological motivation, independently of their cultural background reflected by the region of origin. Cluster analysis groups respondents who are relatively comparable on the selected variables into three or more clusters.

Therefore, the travel behavior variables have been introduced into a two-step hierarchical cluster analysis that generated three groups of visitors with different travel behavior pattern. As regards the socio-psychological motivation variables, first a factor analysis has been conducted in order to identify smaller sets of explanatory composite factors that define the fundamental constructs assumed to underlie the original variables of socio-psychological motivations. Afterwards, a k-means cluster analysis on the 4 distinguished factors has been conducted and generated three different groups of visitors depending on their socio-psychological motivations for tourism landscape experience.

In consequence, in order to detect differences in visitors' evaluative perception on the basis of their sociodemographic variables, travel behavior pattern and socio-psychological motivation pattern, I first calculated the mean scores assigned by each group to each of the landscape component and value. The role of personal factors in diversifying visitors' evaluative perception has been analyzed by calculating the variance in the mean scores assigned by each group of visitors, as well as Cramer's V which is a measure of association that not only tests for significant differences but also indicate the proportion of total variability explained by the independent variable (Buijs,2009).

The third step of analysis consisted of identifying the three prevailing overall images of the tourism landscape of Lindos formed by the total research population. To do so, I first conducted a factor analysis on both cognitive and affective landscape components that revealed 5 underling dimensions in visitors' images. In consequence, a k-mean cluster analysis on the five factors was carried out, generating three clusters that constituted the overall images of visitors. The cluster centers of the three images significantly varied for each factor. The last step of analysis included contingency tables between images and visitors' attitudes, as well as the Pearson correlation coefficient testing the strength of the statistical relationship between the 5 image factors and visitors' attitudes.

Figure (5.2) Spatial distribution of the survey respondents' locations in Lindos area



General socio-demographic characteristics of the research population

The sample consisted of 380 international tourists who independently visited Lindos area in July 2014 and who willingly responded to the survey on tourists' landscape evaluative perception. The sample consisted of 60% women and 40% men. The most frequent range of visitor's age is between 19 and 30 years old (38,5%), and it is noteworthy that 85% of visitors is under 50 years old.

As regards the highest level of education the visitors have completed, data show that 63,1% of visitors have completed a high level of education (University), 32,9% a medium level (secondary, technical, vocational) and only 4% a low level of education (primary school).

Around 70% of visitors, in their country, lives in urban (46%) and suburban areas (25,33%), while only 28,7% lives in different types of rural areas (Peri-urban rural area 16,3%, rural area 9,7%, remote rural area 2,4%).

A great amount of the research population hails from United Kingdom (34,2%), as Lindos area (especially Pefki village) is traditionally one of the most favorite locations for British tourists who choose to spend their vacations on Rhodes island. The second largest group of visitors hails from Italy (12,6%), followed by that one of Germany (8,4%), Netherlands (5,3%), Russia (5,3%) and France (5%). All the respondents' percentages for each country of origin are displayed on the following map (figure 5.3). In order, however, to facilitate further data analyses, the research population has been divided in 8 regions of neighboring countries as showed on table (5.3) and on the map (figure 5.4).

Table (5.3) Socio-demographic characteristics of the research population

		Count	Valid %
Total number	**Respondents**	**380**	**100,0**
Gender	*Female*	228	60,0
	Male	152	40,0
Age	*Under 18 years old*	21	5,6
	19 to 30 years old	145	38,5
	31 to 40 years old	73	19,4
	41 to 50 years old	83	22,0
	51 to 60 years old	42	11,1
	Over 60 years old	13	3,4
Education level	*Low level (primary)*	15	4,0
	Medium level (secondary, technical, vocational)	124	32,9
	High level (university)	238	63,1
Area of living	*Urban area*	173	46,0
	Suburban area	95	25,3
	Rural area	108	28,7
Region of origin	***Region A** (Russia, Lithuania, Ukraine, Poland)*	41	10,8
	***Region B** (Belgium, France, Netherlands)*	44	11,6
	***Region C** (UK, Ireland)*	134	35,4
	***Region D** (Denmark, Finland, Norway, Sweden)*	21	5,5
	***Region E** (Austria, Germany, Switzerland)*	37	9,8
	***Region F** (Czech Rep., Hungary, Romania, Serbia, Slovakia)*	29	7,7
	***Region G** (Italy, Spain)*	52	13,7
	***Region H** (Outside of Europe)*	21	5,5

Figure (5.3) Survey respondents' percentages by country of origin

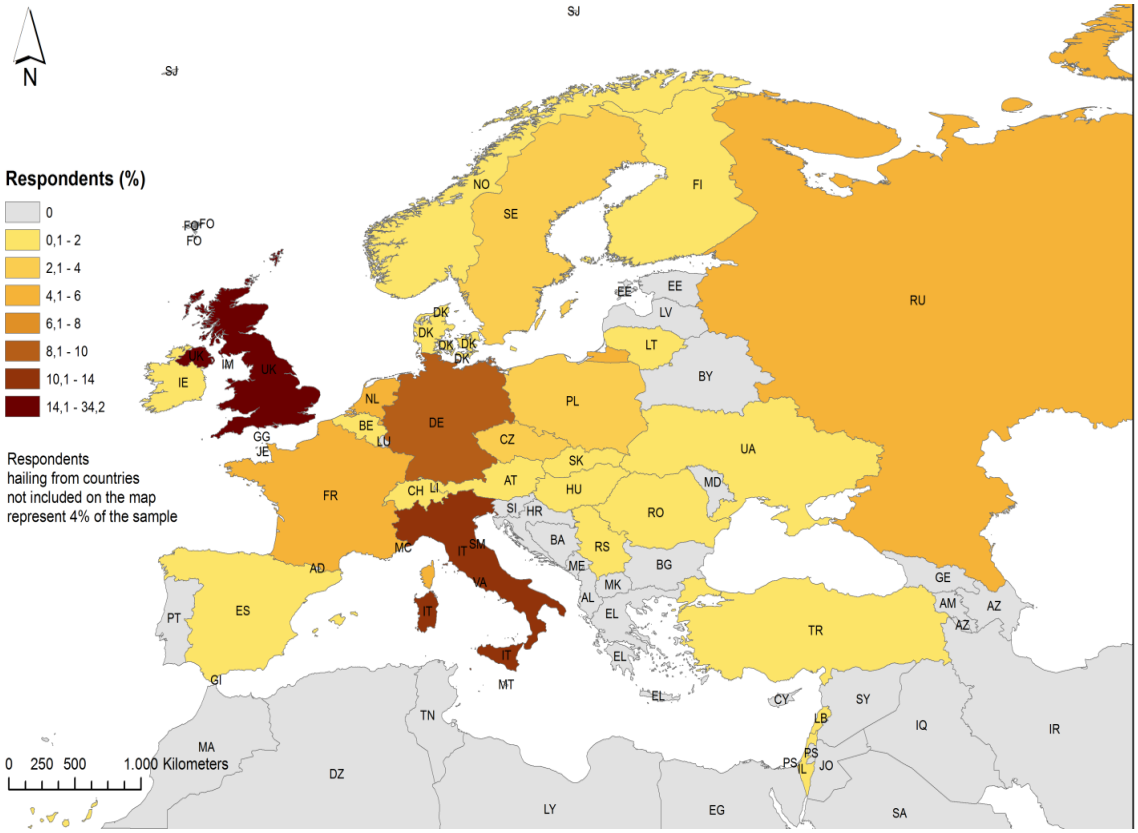
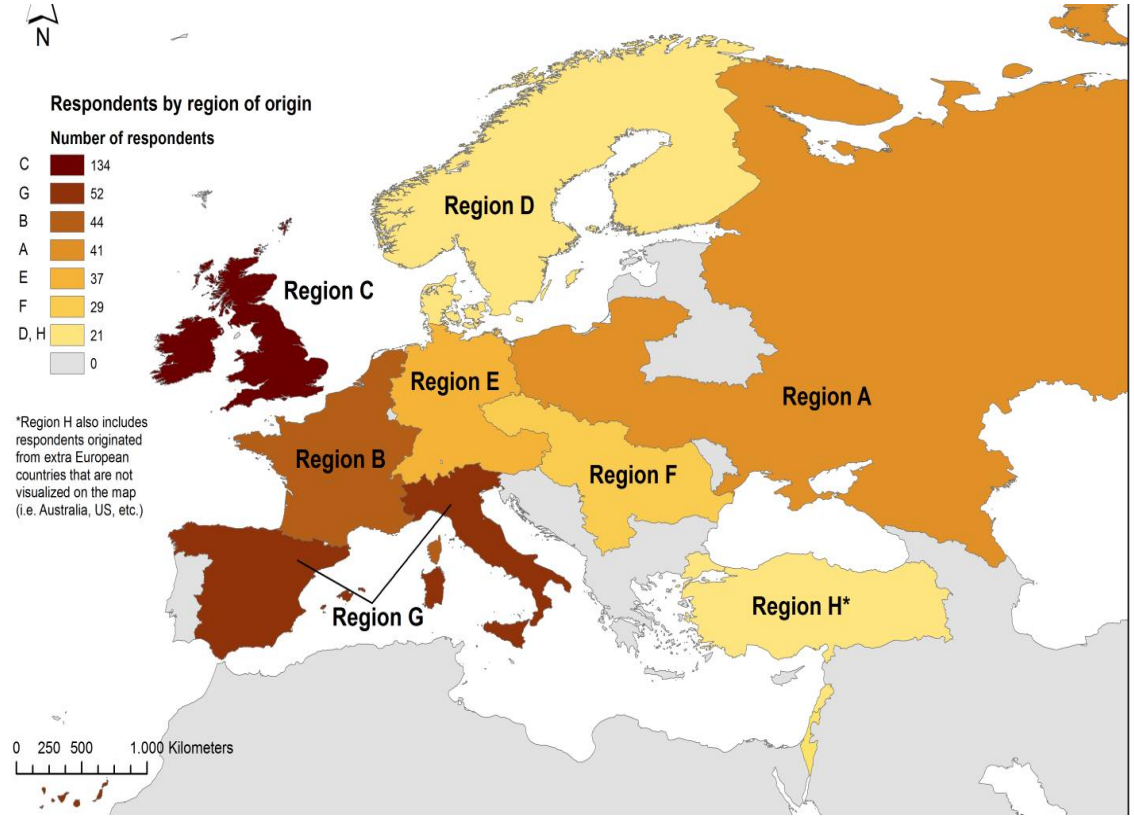


Figure (5.4) Number of respondents by region of origin



5.4 Results

5.4.1 Personal factors and differences among visitors'

Socio-demographic characteristics

Descriptive statistics have been used to analyze the basic features of the sample and to identify similarities and differences among groups of visitors originated from the different regions of neighboring countries. From the analyses on the socio-demographic characteristics of the research population, data illustrated in table (5.4)[63] show that visitors originated from Region C (UK, Ireland) considerably differ from visitors originated from other regions.

The most frequent age range of visitors from Region C, is between 41 and 50 years old, with 55,4% of English visitors being more than 41 years old. This fact is contrasting with data on the distribution of the total research population's age showing that the most frequent age range is between 19 to 30 years old, as well as with data on the average age of visitors from other regions, especially Region A (Russia, Lithuania, Ukraine) and Region F (Czech Republic, Hungary, Romania, Serbia, Slovakia) which is under 30 years old.

Furthermore, the relative frequency of visitors from Region C (UK, Ireland) who have completed a high level of education (university), even though reaches 48,5%, is much smaller than the corresponding relative frequency of visitors from other regions and that one of the total population (63,1%). The regions with the highest frequency of visitors who have completed a high level of education, are Region A (Russia, Lithuania, Ukraine), Region G (Italy, Spain) and Region B (Belgium, France, Netherlands). Moreover, data show a considerable percentage within the total amount of visitors from Region E (Austria, Germany, Switzerland) who have merely completed a low level of education (primary school).

Another clear distinction between visitors from Region C (UK, Ireland) and visitors from other regions, regards the area of their actual living in their country of

[63] Note: The percentages as illustrated in the table (5.4) represent the relative frequencies within the total amount of visitors from each Region of origin that correspond to each sociodemographic variable. Obviously, data relative to the regions with a small amount of visitors, such as Region D and H, are less representative and therefore less significant for drawing conclusions separately for these regions.

origin. One can observe that the percentage of visitors from Region C who live in urban areas is notably the lowest (22,7%) among the other regions. Almost half of them (43,9%) live in rural areas and one third of them (33,3%) in suburban areas. In contrast, one can notice that Region A (Russia, Lithuania, Ukraine) is the Region with the highest relative frequency (87,8%) of visitors who live in urban areas.

Table (5.4) Sociodemographic data of the research population grouped by region of origin

		Region of origin								
		A	B	C	D	E	F	G	H	Sample
	Count	41	44	134	21	37	29	52	21	380
Gender	Female	70,73%	61,36%	55,97%	61,90%	56,76%	55,17%	63,46%	61,90%	59,89%
	Male	29,27%	38,64%	44,03%	38,10%	43,24%	44,83%	36,54%	38,10%	40,11%
	Total	100%	100 %	100%	100%	100%	100%	100%	100%	100%
Range of age	Under 18 years old	2,4%	2,3%	6,1%	4,8%	2,7%	10,3%	3,8%	19,0%	5,6%
	19 to 30 years old	65,9%	43,2%	18,9%	33,3%	51,4%	58,6%	42,3%	42,9%	38,5%
	31 to 40 years old	22,0%	13,6%	19,7%	9,5%	21,6%	17,2%	28,8%	9,5%	19,4%
	41 to 50 years old	9,8%	25,0%	32,6%	33,3%	8,1%	10,3%	17,3%	14,3%	22,0%
	51 to 60 years old	0,0%	13,6%	15,2%	14,3%	13,5%	3,4%	7,7%	14,3%	11,1%
	Over 60 years old	0,0%	2,3%	7,6%	4,8%	2,7%	0,0%	0,0%	0,0%	3,4%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Education level	Low level	2,4%	2,3%	,8%	9,5%	10,8%	6,9%	1,9%	14,3%	4,0%
	Medium level	12,2%	27,3%	50,8%	33,3%	21,6%	31,0%	25,0%	14,3%	32,9%
	High level	85,4%	70,5%	48,5%	57,1%	67,6%	62,1%	73,1%	71,4%	63,1%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100 %
Area of living	Urban area	87,8%	37,2%	22,7%	42,9%	48,6%	62,1%	63,5%	61,9%	46,0%
	Suburban area	7,3%	20,9%	33,3%	33,3%	16,2%	24,1%	25,0%	28,6%	25,3%
	Rural area	4,9%	41,9%	43,9%	23,8%	35,1%	13,8%	11,5%	9,5%	28,7%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Travel behavior

Number of previous visits in Lindos area

At the time of the survey execution in July 2014, more than half of the research population (65,7%), had not visited Lindos area before. Nevertheless, within the amount

of visitors who had previously visited Lindos (130), data show that 10,6% had already visited it 3 times or more. This fact is quite exclusively due to the travel behavior of visitors from Region C (UK, Ireland) who manifest a high level of loyalty in terms of destination choice, as they keep visiting Lindos consecutively for several years. Indeed, 72,5% of visitors who had visited Lindos 3 times or more, hails from Region C. Also, a significant percentage of visitors (38,5%) originated from Region G (Italy, Spain) had visited Lindos before, however most of them just one time (see table…).

With whom had the respondents been visiting Lindos area at the time of the survey execution?

At the time of survey execution, within the overall amount of visitors, 45,3% had been visiting Lindos with family members, while 35,8% with a partner. Only 11,1% had been visiting Lindos with friends and 6,6% had been alone. It is noteworthy, however, that the percentage of visitors from Region C (UK, Ireland) and Region A (Russia, Lithuania, Ukraine) who had been visiting Lindos with family members (C:61,2%, A:51,2%) are much higher than the corresponding percentages of those who had been visiting Lindos with a partner (C:27,6%, A:22,0%). As regards the other regions, one can notice that the majority of visitors had been travelling with a partner instead of family, noticing though that the percentage difference between them is quite slight.

How long had the respondents been visiting Lindos area until the time of the survey execution?

For almost 64% of the research population, the day of participation in the survey was the first day spent in Lindos area. Within this amount of visitors, only 15% (36 visitors) was accommodated within the area of study, the rest 85% of visitors (207) was accommodated in other locations of Rhodes island (see figure 5.5) and visited Lindos in one-day trip (without an overnight stay). As most of the one-day visitors verbally claimed while compiling the questionnaire, after visiting attractions such as the Acropolis, the old village of Lindos and the beaches, they were going to turn back to their accommodation place by public transportation (principally bus) on the afternoon or late evening.

Nevertheless, 36% of the research population (137 visitors), at the time of the survey execution, had already spent more than one day in Lindos. Among them, 72% had spent 2-7 days and 21,4% had spent 8-14 days. Also, there were 9 visitors who had spent more than 15 days, as they were combining work (as hotel employees) and summer vacation.

It is noteworthy that the majority of the visitors who spent more than one day in Lindos (81%, 111 visitors), was accommodated within Lindos area. However, there were 19 visitors who had spent 2-7 days in Lindos, even though they were accommodated in other locations of the island.

The visitors originated from Region C (UK, Ireland) are those whose the majority (54,5%) had spent more than one day in Lindos, as accommodated within the area. A significant percentage of visitors (42,3%) from Region G (Italy, Spain) had spent more than one day in Lindos as well.

In contrast, visitors from other regions, such as Region A (Russia, Lithuania, Ukraine, Poland), Region B (Belgium, France, Netherlands), Region D (Denmark, Finland, Norway, Sweden) and Region E (Austria, Germany, Switzerland), present the highest percentages (A:80,5%, B:79,5%, D:85,7%, E:86,5%) of visitors who had spent only one day.

How many days did the respondents plan to spend in Lindos area?

Generally within the total population, British and Italian visitors are those who planned to spend more days in Lindos area. Specifically, 34,9% of visitors from Region C (UK, Ireland) and 21,2% of visitors from Region G (Italy, Spain) planned to spent more than one week. In contrast, visitors from Region D (Denmark, Finland, Norway, Sweden) and Region E (Austria, Germany, Switzerland), within their regions present the highest percentages of visitors who planned merely an one-day visit in Lindos area.

It is interesting, however, to observe that the visitors originated from the countries of Eastern Europe such as Region A (Russia, Lithuania, Ukraine, Poland) and Region F (Czech Rep., Hungary, Romania, Serbia, Slovakia) present relatively high percentages of long staying in Lindos (more than two weeks). This fact is due to a relatively recent trend manifested in the tourism employment sector of Rhodes island, in which young people from Eastern Europe are hired to work as apprentices in the summer season. Besides the increasing flow of tourists originated from these countries on Rhodes island, which may partially explain the reason why they are hired to work in tourism sector, another reason of hiring young eastern Europeans could be that they, as apprentices, require lower salaries than local people regularly employed in tourism activities. Two of the respondents originated from Poland and Czech Republic verbally stated that concurrently with their work they were able to combine leisure activities, visiting attractions of Lindos during their free time at work.

Which were the respondents' locations of accommodation on Rhodes island?

A significant amount of the research population (40%) consisting of 152 visitors stayed at accommodations located in Lindos area. Among them, 40% (61 visitors) stayed at accommodations of Pefki village, 27% (41 visitors) stayed at accommodations scattered on the surrounding hills of Lindos village, 26% (40 visitors) stayed at accommodations of Lindos village, and 7% (10 visitors) in accommodations of Vlycha.

Approximately 39% of the research population (140 visitors), however, stayed at accommodations of the north-east part of Rhodes island that is the most developed area in terms of tourism offer (Faliraki 13%, Rhodos town 11%, Kalithea 8%, Ixia 2,4%, Ialyssos 1,6%), 12% of the population (42 visitors) stayed at accommodations of the central-east part of Rhodes island (Kolimbia 6,8%, Archangelos 2,6%, Afantou 1,6%) and only 6,4% at accommodations of the southern part (Kiotari 3,9%, Lardos 1,8% and Gennadi 0,3%).

As one can observe on the map (figure 5.6), a great amount of visitors (65,7%) originated from Region C (UK and Ireland) chose to stay at accommodations of Lindos area, especially in Pefki and at accommodations scattered on the surrounding hills of Lindos village. In contrast a considerable amount of visitors coming from Region G (Italy and Spain) preferred accommodations in the old traditional part of Lindos village as well as outside Lindos area at accommodations of the central-east part of Rhodes island. The accommodation locations of the rest of visitors are mainly distributed within the north triangle of Rhodes island.

What was the type of their accommodation?

Most visitors (around 64%) chose a hotel/resort as accommodation for their vacations in Rhodes island. In contrast, around 29% of visitors stayed in apartments/studios and only 3% in traditional Lindian houses. Visitors who stayed in modern private villas were only 5. There were 12 visitors who instead of staying at common accommodation typologies chose to stay at alternative places such as at a local friend's home, boats, or they were backpackers.

One can notice that the majority of visitors who stayed in Lindos area were accommodated in apartments/studios, while the rest of visitors were accommodated in hotels/resorts in the north-east part of the island. This fact conforms with secondary data relative to the island's tourism offer, according to which, hotels/resorts are the predominant typology of accommodation at the north-east part, while in the south-east

part of the island the number of bed in apartments/studios highly exceeds the number of beds in hotels.

In a week, how often would respondents visit various locations of the island of Rhodes?

Looking at visitors' desirable weekly frequency of visits in various locations of the island on table (5.6), one can observe, that the accommodation facilities (such as pools, bars, and sport camps, etc.) are the places that a considerable percentage of visitors would like to visit most frequently. Specifically, in a week, 34,1% of visitors would visit their accommodation facilities every day, noticing, however that there is also a significant percentage of visitors (19,5%) who would not visit them at all.

The tourism locations along the coast of the island received a moderate desirable frequency of visits by the majority of visitors. Approximately half of visitors (49,1%) would visit coastal locations with a frequency of 2 or 3 times a week and 29% of visitors with a frequency of once a week. The percentages of visitors who would visit the coastal locations with the maximum (everyday) as well as minimum (not at all) frequency are very low.

Similarly, the continental part of the island would be visited with a little lower frequency with respect to the coastal locations by most of the visitors. Around half of visitors (47,6%) would visited it only once a week and 22,3 % of them would visited it 2 or 3 times a week. A considerable amount of visitors (23%), however, would not like to visit the continental part of the island at all. Remote locations on the island would be merely visited once week by 40,3% of visitors, however, it is noteworthy that 44,6% of visitors would not visit remote locations at all.

Observing the differences among regions, one can notice that the majority of visitors from Region C (UK and Ireland would visit the accommodation facilities most frequently. Indeed, in a week, half of them would visit them every day. The opposite trend is manifested by the visitors from Region G (Italy, Spain) whose the majority (61%) would not visit them at all and they are more willing to make visits around the island and principally to other costal locations (15,7% of them would visit coastal locations everyday).

Table (5.5) Travel behavior data of the research population grouped by region of origin

		Visitors grouped by region of origin								Sample
		A	B	C	D	E	F	G	H	
	Count	41	44	134	21	37	29	52	21	380
N. previous visits	none	73,2%	72,7%	53,7%	85,7%	75,7%	72,4%	61,5%	76,2%	65,7%
	1 time	22,0%	18,2%	17,9%	4,8%	13,5%	17,2%	30,8%	14,3%	18,7%
	2 times	2,4%	2,3%	6,7%		8,1%	6,9%	5,8%		5,0%
	3 or more	2,4%	6,8%	21,6%	9,5%	2,7%	3,4%	1,9%	9,5%	10,6%
	Total	100%	100 %	100%	100%	100%	100%	100%	100%	100%
With whom they visit the place	Family	51,2%	31,8%	61,2%	33,3%	32,4%	31,0%	25,0%	61,9%	45,1%
	Friends	17,1%	15,9%	2,2%	14,3%	13,5%	20,7%	19,2%	4,8%	11,1%
	Partner	22,0%	40,9%	27,6%	47,6%	48,6%	44,8%	51,9%	19,0%	35,9%
	Alone	9,8%	6,8%	6,7%	4,8%	5,4%	3,4%	3,8%	14,3%	6,6%
	Other		4,5%	1,5%						1,1%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Duration of visit	1 day	80,5%	79,5%	45,5%	85,7%	86,5%	62,1%	57,7%	71,4%	63,9%
	2-7 days	9,8%	18,2%	37,3%	14,3%	13,5%	31,0%	30,8%	19,0%	26,1%
	8-14 days		2,3%	15,7%			6,9%	7,7%	4,8%	7,7%
	more than 15 days	9,8%		1,5%				3,8%	4,8%	2,4%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100 %
Planned duration	one-day visit	73,2%	75%	31,8%	85,7%	78,4%	58,6%	40,4%	73,7%	54,4%
	2-7 days	14,6%	18,2%	33,3%	14,3%	16,2%	31,0%	38,5%	15,8%	26,4%
	8-14 days	2,4%	4,5%	32,6%		5,4%	3,4%	15,4%	5,3%	15,5%
	more than 15 days	9,8%	2,3%	2,3%			6,9%	5,8%	5,3%	3,7%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100 %
Type of accommodation	Hotel	78,0%	84,1%	53,7%	85,7%	86,5%	65,5%	36,5%	57,1%	63,6%
	Apartment	14,6%	11,4%	42,5%	9,5%	10,8%	24,1%	44,2%	28,6%	29,0%
	Lindian house	2,4%		0,7%	4,8%		3,4%	13,5%		2,9%
	Modern villa			3,0%					4,8%	1,3%
	Other	4,9%	4,5%			2,7%	6,9%	5,8%	9,5%	3,2%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Location of accommodation	Lindos v.	7,3%	9,1%	6,0%	4,8%	8,1%	10,3%	30,8%	9,5%	10,6%
	Sur. hills	2,4%	4,5%	26,1%				1,9%	9,5%	10,8%
	Pefki	14,6%	2,3%	33,6%	9,5%	2,7%	6,9%	5,8%	4,8%	16,1%
	Vlycha		2,3%	2,2%		2,7%	3,4%	5,8%	4,8%	2,6%
	Within Lindos area	24,4%	18,2%	67,9%	19%	13,5%	20,7%	44,2%	33,3%	40,6%
	Outside Lindos area	75,6%	81,8%	32,1%	81,0%	86,5%	79,3%	55,8%	66,7%	59,4%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table (5.6) Respondents' desirable weekly frequency of visits in various locations of the island

		Visitors grouped by region of origin								Sample
		A	B	C	D	E	F	G	H	
	Count	41	44	134	21	37	29	52	21	380
Accommodation facilities	Not at all	20,0%	6,8%	5,3%	14,3%	21,6%	27,6%	60,0%	30,0%	19,5%
	Once a week	27,5%	20,5%	5,3%	4,8%	13,5%	24,1%	14,0%	10,0%	13,1%
	2 or 3 times a week	22,5%	20,5%	14,3%	19,0%	18,9%	17,2%	10,0%	20,0%	16,6%
	4 or 5 times a week	10,0%	6,8%	24,1%	28,6%	21,6%	10,3%	6,0%	15,0%	16,6%
	Everyday	20,0%	45,5%	51,1%	33,3%	24,3%	20,7%	10,0%	25,0%	34,2%
	Total	100%	100 %	100%	100%	100%	100%	100%	100%	100%
Coastal locations	Not at all	2,6%	17,1%	6,0%			3,6%			4,6%
	Once a week	23,1%	14,6%	41,8%	28,6%	21,6%	21,4%	17,6%	35,0%	28,8%
	2 or 3 times a week	48,7%	53,7%	44,8%	66,7%	67,6%	50,0%	39,2%	40,0%	49,1%
	4 or 5 times a week	12,8%	7,3%	7,5%	4,8%	5,4%	21,4%	27,5%	15,0%	11,9%
	Everyday	12,8%	7,3%			5,4%	3,6%	15,7%	10,0%	5,7%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Continental part of the island	Not at all	15,4%	29,3%	33,8%	9,5%	18,9%	14,3%	16,0%	5,3%	23,1%
	Once a week	41,0%	31,7%	46,6%	61,9%	59,5%	53,6%	46,0%	57,9%	47,6%
	2 or 3 times a week	30,8%	31,7%	16,5%	28,6%	16,2%	28,6%	24,0%	15,8%	22,3%
	4 or 5 times a week	12,8%	4,9%	3,0%		2,7%	3,6%	6,0%	10,5%	4,9%
	Everyday		2,4%			2,7%		8,0%	10,5%	2,2%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100 %
Remote locations	Not at all	38,5%	61,0%	50,4%	42,9%	35,1%	53,6%	30,0%	30,0%	44,7%
	Once a week	38,5%	24,4%	41,4%	57,1%	48,6%	39,3%	44,0%	25,0%	40,1%
	2 or 3 times a week	15,4%	9,8%	5,3%		13,5%	7,1%	22,0%	30,0%	11,1%
	4 or 5 times a week	7,7%	2,4%	3,0%						2,2%
	Everyday		2,4%			2,7%		4,0%	15,0%	1,9%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure (5.5) Respondents' locations of accommodation on Rhodes island

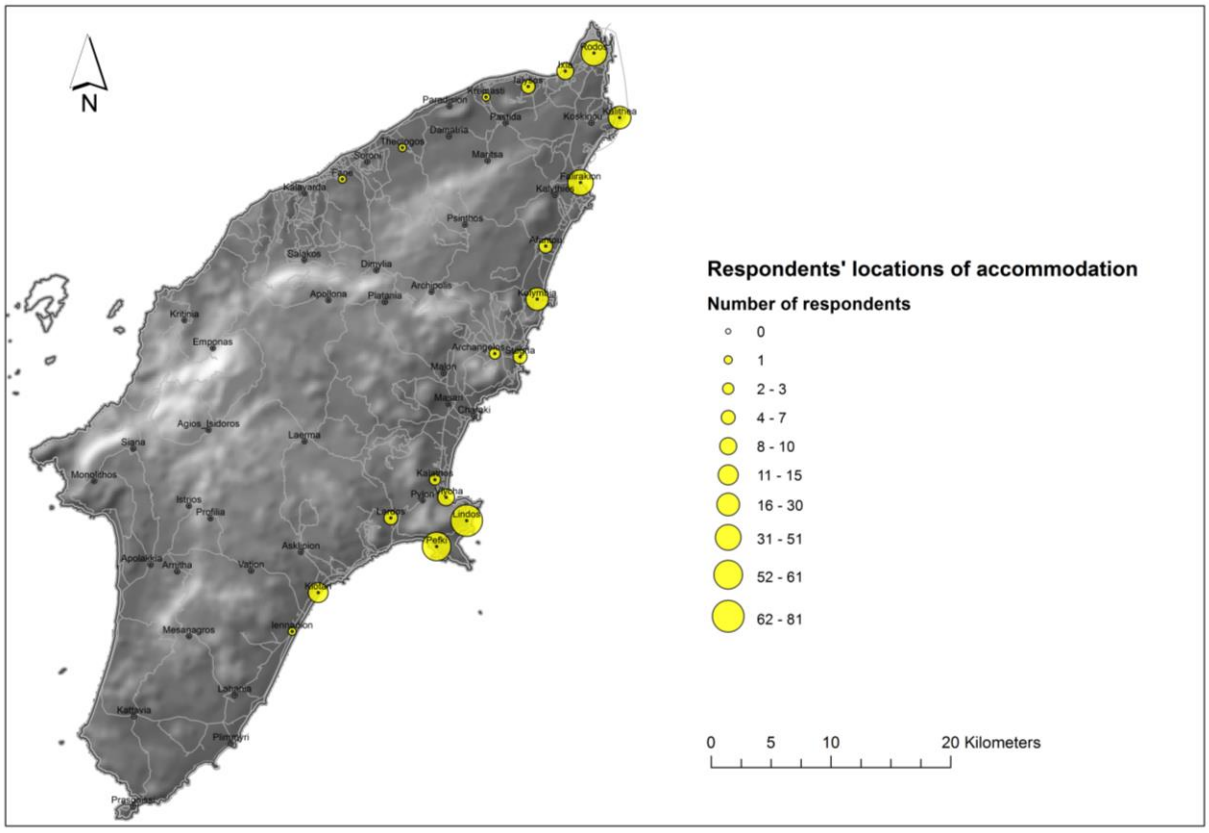
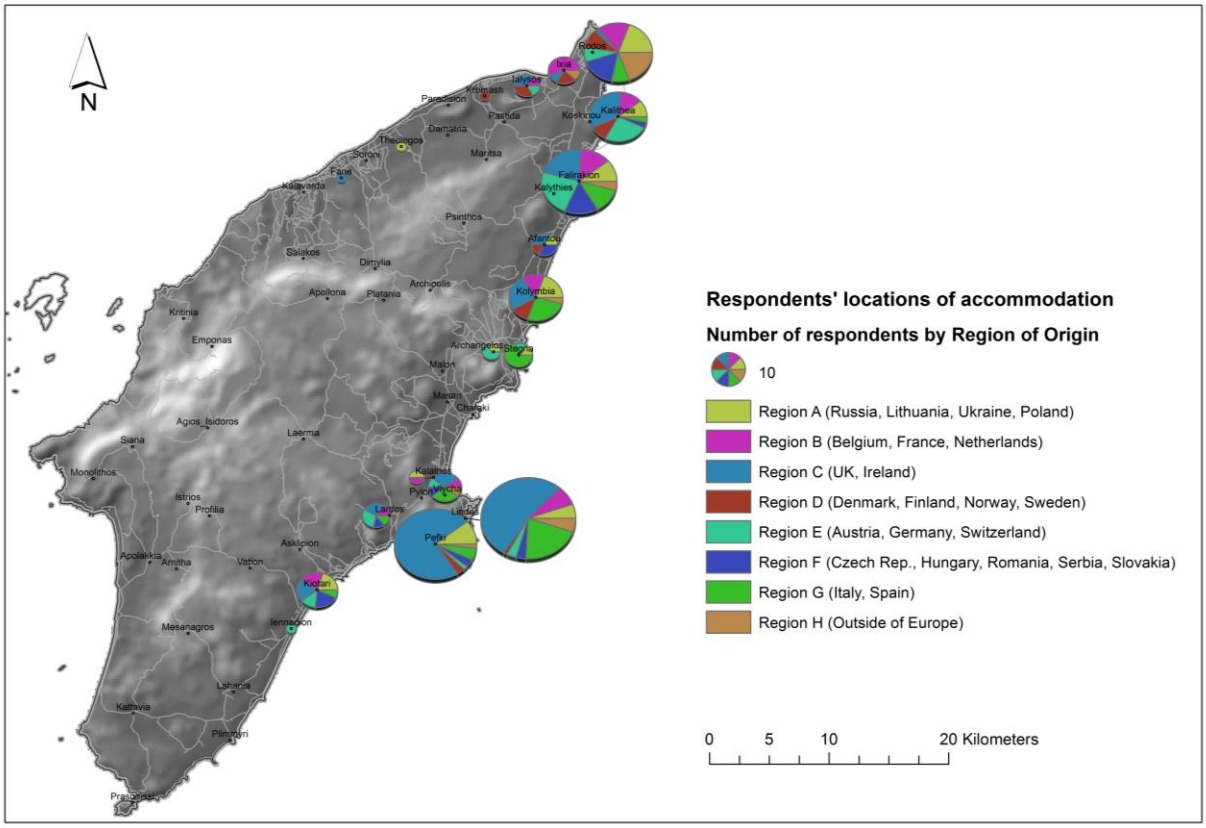


Figure (5.6) Spatial distribution of respondents' locations of accommodation by region of origin



Motivations for tourism landscape experience

The research population has been asked to define the extent to which several factors represented a motive for their experience in the tourism landscape of Lindos area. The factors have been defined according to Crompton's (1979) list of socio-psychological forces (relaxation, escapism, excitement, adventure, knowledge, inspiration, social relations, and prestige) that cause tourists to seek activities to reduce their needs, known as push factors (see chapter2). The collected data of the survey as illustrated in tables (5.7 and 5.8) show that generally, in visiting Lindos the research population appears to be highly (very much and a great deal) motivated by the need for enhancement of kinship relationships (family togetherness), the need for relaxation and the need for acquiring a new cultural experience. Specifically, a great percentage of visitors of Lindos are motivated by spending quality time with their family members or friends (78,5%), relaxing physically and/or mentally (68,4%), experiencing closely a new culture (61,9%) and having fun (60%). In contrast, visitors appear to be much less motivated by factors of self-enhancement such as learning about themselves (33,2% of visitors did not feel that need at all), or developing new friendships (32,7% of visitors did not feel that need at all).

Observing differences among regions, one can notice first that the visitors originated from Region A (Russia, Lithuania, Ukraine, Poland), with respect to other visitors, are the most highly motivated by factors related to familiarization with Lindos area, such as experiencing closely a new culture, increasing their knowledge, gaining a feeling of belonging to a new place, and sharing their experience with their friends through pictures and narration. This can be reasonably interpreted by the fact that the increasing flow of Russian tourists in Greece is relatively new, thanks to more relaxed visa regulations, and therefore Russian tourists are still in a process of exploration and settling into the Greek destinations. Visitors from Region C (UK, Ireland) instead, the most traditional and loyal group of visitors in Lindos area, present the highest percentages of visitors in need for relaxation, having fun, enhancement of kinship relationships and developing friendships. Visitors from Region D (Denmark, Finland, Norway, Sweden) are the least motivated by factors that would create or confirm an affective bond between them and the place, such as developing friendships, gaining a feeling of belonging to the place, learning about themselves, as well as acquiring prestige for visiting a popular destination. Additionally, visitors from Region G (Italy, Spain) are notably those most highly motivated by the factor of prestige as half of them declared a great need for feeling proud of visiting a fashionable place.

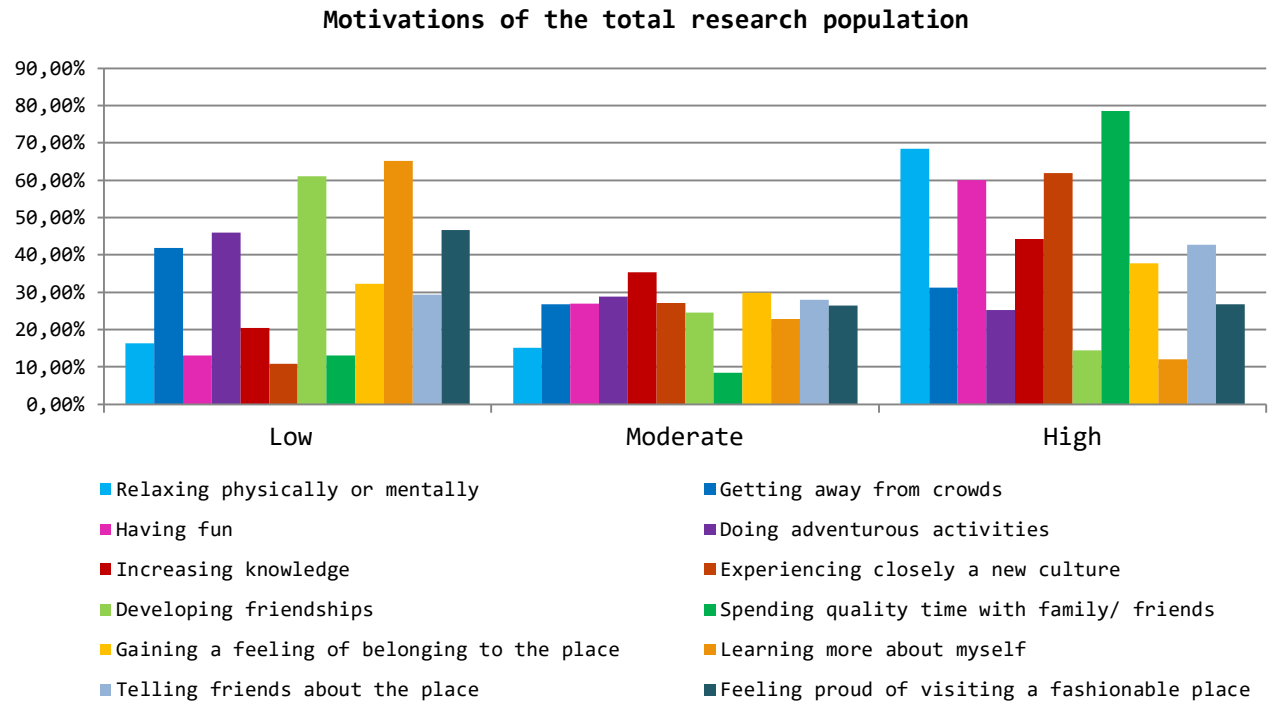
Table (5.7) Visitors' level of motivation for landscape experience grouped by region of origin

		Region of origin								Sample
		A	B	C	D	E	F	G	H	
	Count	41	44	134	21	37	29	52	21	380
Relaxing physically or mentally	Low	9,8%	22,8%	7,6%	35,0%	30,6%	24,1%	15,4%	23,8%	16,4%
	Moderate	19,5%	18,2%	11,3%	25,0%	19,4%	10,3%	13,5%	19,0%	15,2%
	High	70,8%	59,1%	81,2%	40,0%	50,0%	65,5%	71,1%	57,1%	68,40%
	Total	100%	100 %	100%	100%	100%	100%	100%	100%	100%
Getting away from crowds	Low	47,5%	50,0%	30,8%	55,0%	60,0%	58,6%	29,4%	47,6%	41,8%
	Moderate	32,5%	22,7%	24,8%	35,0%	22,9%	20,7%	29,4%	38,1%	26,8%
	High	20,0%	27,3%	44,4%	10,0%	17,2%	20,6%	41,1%	14,3%	31,3%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Having fun	Low	9,8%	22,8%	2,3%	10,0%	19,4%	17,2%	27,4%	19,0%	13,0%
	Moderate	39,0%	22,7%	15,8%	50,0%	30,6%	37,9%	39,2%	9,5%	26,9%
	High	51,2%	54,5%	82,0%	40,0%	50,0%	44,8%	33,3%	71,4%	60,0%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100 %
Doing adventurous activities	Low	29,3%	56,8%	49,6%	45,0%	36,1%	44,8%	50,9%	38,1%	45,9%
	Moderate	22,0%	25,0%	29,3%	30,0%	36,1%	31,0%	35,3%	14,3%	28,8%
	High	48,8%	18,2%	21,0%	25,0%	27,7%	24,1%	13,7%	47,6%	25,3%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100 %
Increasing knowledge	Low	19,5%	25,0%	20,3%	25,0%	25,0%	20,7%	13,5%	19,1%	20,5%
	Moderate	19,5%	38,6%	39,1%	45,0%	30,6%	31,0%	38,5%	33,3%	35,4%
	High	61,0%	36,4%	40,6%	30,0%	44,4%	48,3%	48,1%	47,6%	44,2%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Experiencing closely a new culture	Low	4,9%	9,1%	10,6%	15,0%	19,5%	6,8%	13,7%	9,6%	10,9%
	Moderate	7,3%	34,1%	33,1%	40,0%	25,0%	24,1%	19,6%	28,6%	27,2%
	High	87,8%	56,8%	56,4%	45,0%	55,6%	69,0%	66,6%	61,9%	61,9%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Developing friendships	Low	65,8%	68,2%	44,4%	85,0%	86,1%	58,6%	64,7%	71,5%	61,0%
	Moderate	22,0%	22,7%	33,1%	15,0%	8,3%	27,6%	23,5%	14,3%	24,5%
	High	12,2%	9,0%	22,5%	0,0%	5,6%	13,8%	11,8%	14,3%	14,4%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Spending quality time with family/ friends	Low	14,6%	15,9%	9,8%	10,0%	19,5%	6,9%	17,3%	14,3%	13,0%
	Moderate	12,2%	13,6%	4,5%	20,0%	5,6%	10,3%	7,7%	9,5%	8,5%
	High	73,2%	70,4%	85,7%	70,0%	75,0%	82,7%	75,0%	76,2%	78,5%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Gaining a feeling of belonging to the place	Low	19,5%	29,5%	36,1%	65,0%	37,1%	24,1%	21,6%	38,1%	32,3%
	Moderate	29,3%	31,8%	30,8%	20,0%	25,7%	27,6%	35,3%	28,6%	29,9%
	High	51,3%	38,6%	33,1%	15,0%	37,1%	48,3%	43,1%	33,3%	37,7%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table (5.8) Visitors motivations for landscape experience grouped by region of origin

		Region of origin								Sample
		A	B	C	D	E	F	G	H	
	Count	41	44	134	21	37	29	52	21	380
Learning more about myself	Low	51,2%	77,3%	61,6%	85,0%	66,7%	55,2%	68,6%	71,4%	65,1%
	Moderate	26,8%	15,9%	28,6%	15,0%	25,0%	27,6%	17,6%	4,8%	22,9%
	High	22,0%	6,8%	9,8%	0,0%	8,4%	17,2%	13,7%	23,8%	12,0%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Telling friends about the place	Low	19,5%	36,4%	23,3%	45,0%	37,8%	31,0%	39,2%	14,3%	29,3%
	Moderate	19,5%	27,3%	22,6%	50,0%	27,0%	34,5%	33,3%	38,1%	27,9%
	High	61,0%	36,4%	54,2%	5,0%	35,1%	34,4%	27,4%	47,6%	42,8%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Feeling proud of visiting a fashionable place	Low	51,3%	45,4%	49,6%	70,0%	54,0%	48,3%	21,2%	47,6%	46,7%
	Moderate	22,0%	38,6%	22,6%	30,0%	27,0%	24,1%	28,8%	28,6%	26,5%
	High	26,8%	15,9%	27,8%	0,0%	18,9%	27,5%	50,0%	23,8%	26,8%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure (5.7) Graphic representation of motivations



General reflections

The above analysis on visitors' differences in terms of personal factors aimed at distinguishing and comparing general patterns[64] of travel behavior and psychological motivations shared among visitors originated from neighboring countries. Even though the selected variables on personal factors may differ significantly for each individual, the cultural background that is reflected in a great part by the visitors' country and/or region of origin has an important role in determining similarities among visitors' behavior, motivations, expectations, attitudes, etc. Indeed, from the above analysis, one can notice that within each group originated from a different region of origin, visitors share similar patterns and are quite well distinguished from others. Specifically, visitors from Region C (UK, Ireland), the largest group within the sample, arises as being the most distinct group in terms of travel behavior due to their loyalty in visiting Lindos consecutively for several years and spending most of their vacation time within the area, as well as their psychological motivations which are more social and personal-orientated with respect to other groups, such as the need for enhancement of kinship relationships and developing friendships. In the following paragraph, the region of origin, as a complex factor which aggregates visitors' similar characteristics in patterns, as well as all the other single variables of visitors' personal factors are put in relation with visitors' evaluative perception in order to detect cause-effect relationships between them.

5.4.2 How do personal factors affect visitors' on-site evaluative perception?

The role of sociodemographic variables

Based on the first observations on socio-demographic differences among visitors', the mean scores assigned by visitors on the selected sets of landscape cognitive, affective components, and values, have been calculated for each group of visitors' allocated by region of origin.

The comparison of the results shows that, for the majority of the selected variables, visitors from Region C (UK, Ireland) have notably assigned a higher score than the average of visitors from other regions, revealing a more positive overall image of the tourism landscape, at least for the selected aspects in the questionnaire they have been asked to evaluate. Especially, as regards the landscape cognitive and affective components, such as *naturalness, authenticity, maintenance, cleanliness,*

[64] Behavior pattern makes reference to the characteristic way in which an individual acts

relaxation and friendliness the scores assigned by visitors from Region C considerably exceed the average score of visitors from other regions. The same occurs as regards the scores assigned to variables representing reasons for which Lindos area might be valuable. Visitors from Region C, assigned much higher scores for reasons related to social and personal orientated aspects such as the opportunities for social interaction, their personal bond with the place and the quality of living.

Additionally observing each region mean scores on landscape homogeneity, one can observe that visitors from northern European countries (Region A,B,C, and D) perceive the landscape much more varied than visitors originated from central, eastern and south Europe (Region E, F and G) who contrarily perceive it as quite uniform. Especially, as regards visitors from Region D (Denmark, Finland, Norway, Sweden), one can notice that are those who mostly perceive the landscape of Lindos much more human-influenced and much less familiar with respect all the other groups of visitors.

The mean scores assigned by visitors on the selected sets of landscape cognitive, affective components, and values, have been calculated also for each group of visitors' allocated by the following sociodemographic variables: gender, range of age, educational level and area of living. The major divergences can be noticed comparing the mean scores calculated based on visitors' age range and educational level.

Specifically, the results show a remarkable variance between the mean scores on landscape cognitive and affective components assigned by the youngest as well as oldest visitors (under 18 and over 60 years old) with respect to the total mean scores. The oldest visitors assigned the highest scores to most of the variables and particularly to variables such as *openness, naturalness, safety, cleanliness, relaxation and friendliness*. Similarly, the youngest visitors assigned high scores to most of the variables and particularly to authenticity, maintenance, inspiration and friendliness. As regards the scores assigned to landscape values, the youngest visitors notably assigned the highest scores to aspects such as their personal bond with the place, its natural/cultural heritage, its spiritually special places and its intrinsic character.

As regards, the comparison based on educational level, data show that visitors who completed a high level of education assigned much lower values at most of the selected cognitive variables, and to all the affective ones. Similarly, the lowest mean scores on some of the selected landscape values relative to social and affective aspects, such as the quality of living, opportunities for social interaction and personal bond with the place, are those assigned by visitors who completed a high level of education. In contrast, visitors with a low level of education assigned the highest scores to variables such as *authenticity, amusement, crowding, inspiration* and *friendliness* and

the lowest scores to functional aspects such as *accessibility, maintenance,* and *cleanliness*.

Figure (5.8) Mean scores comparison based on visitors' regions of origin

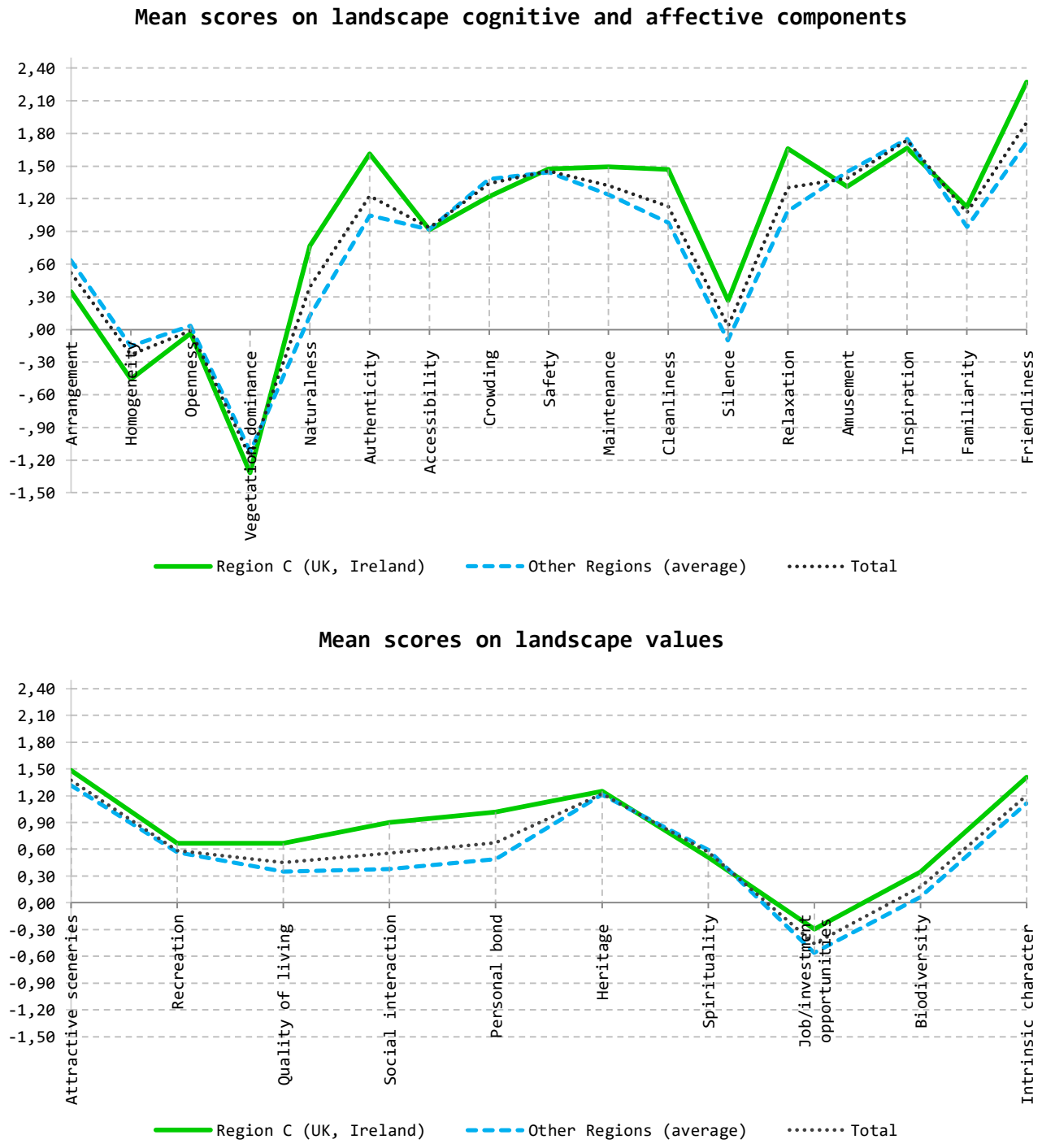


Figure (5.9) Mean scores comparison of cognitive components based on visitors' regions of origin

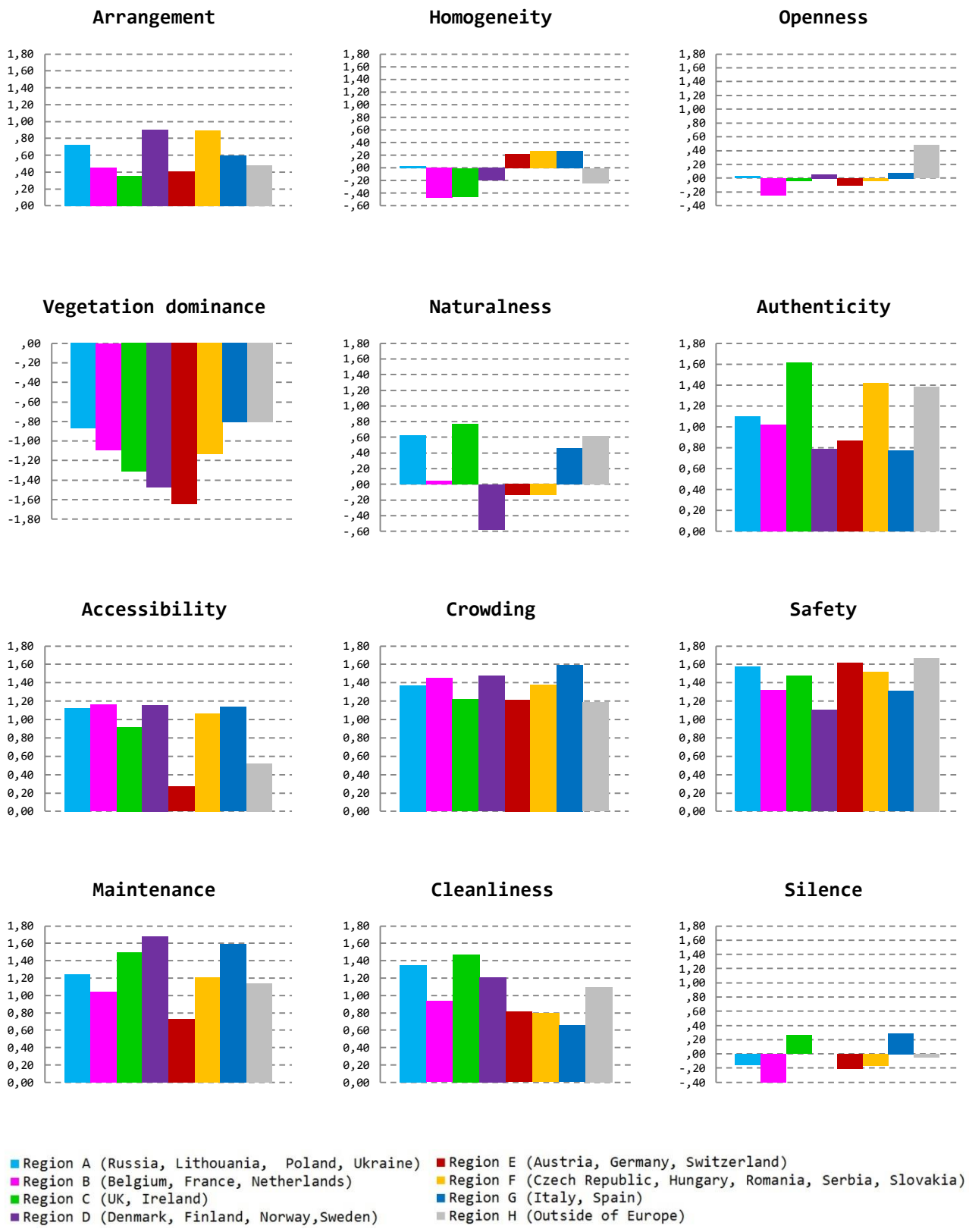


Figure (5.10) Mean scores comparison of affective components based on visitors' regions of origin

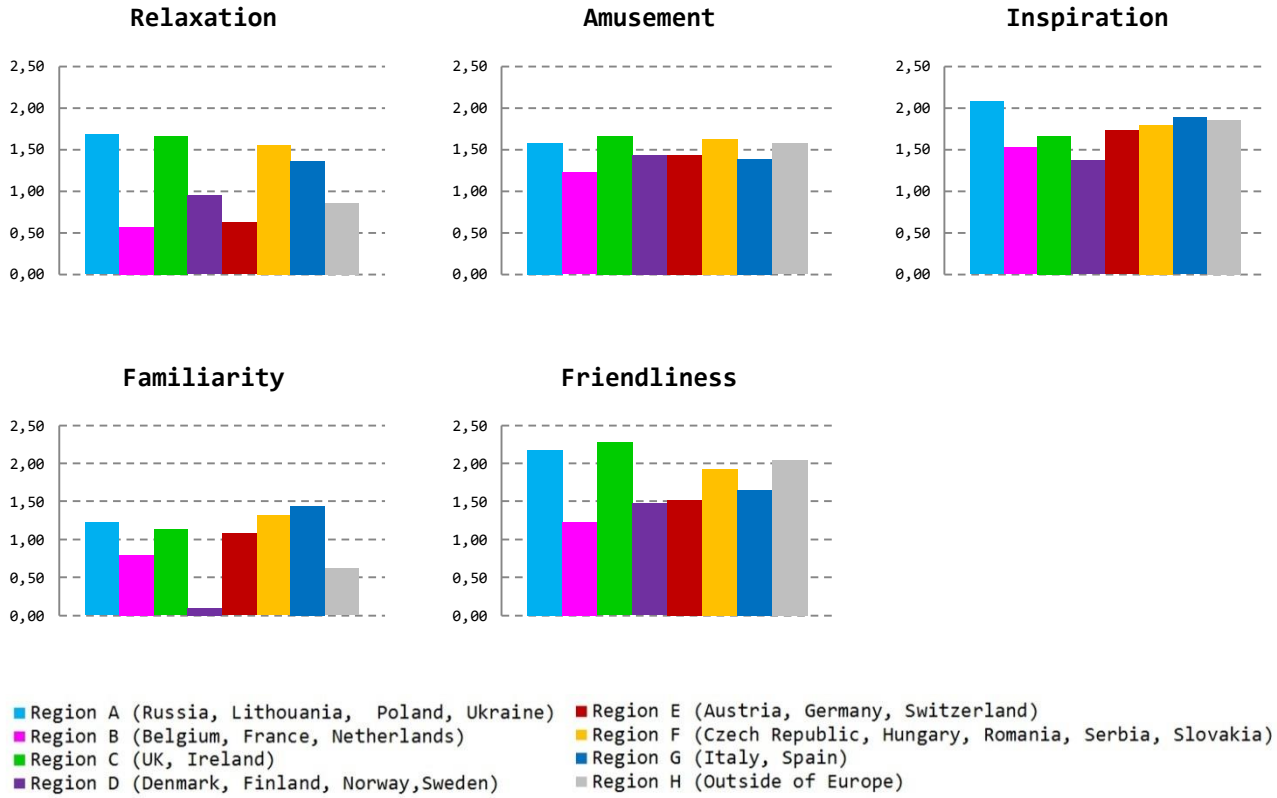


Figure (5.11) Mean scores comparison of landscape values based on visitors' regions of origin

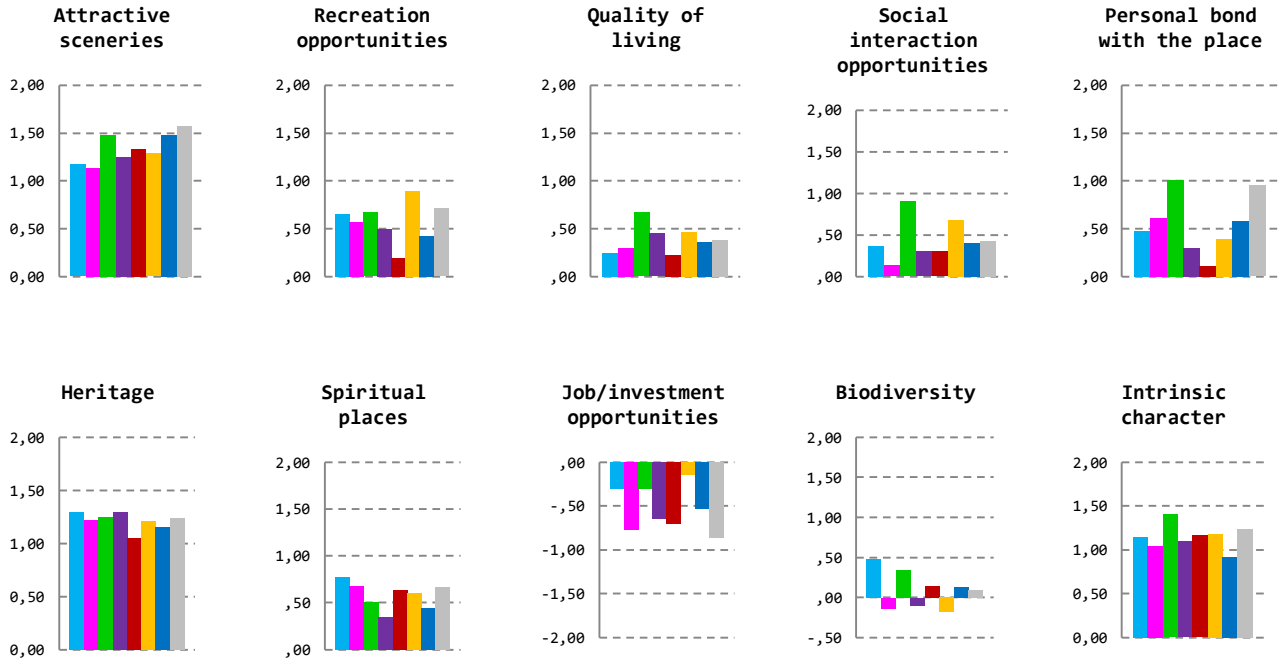
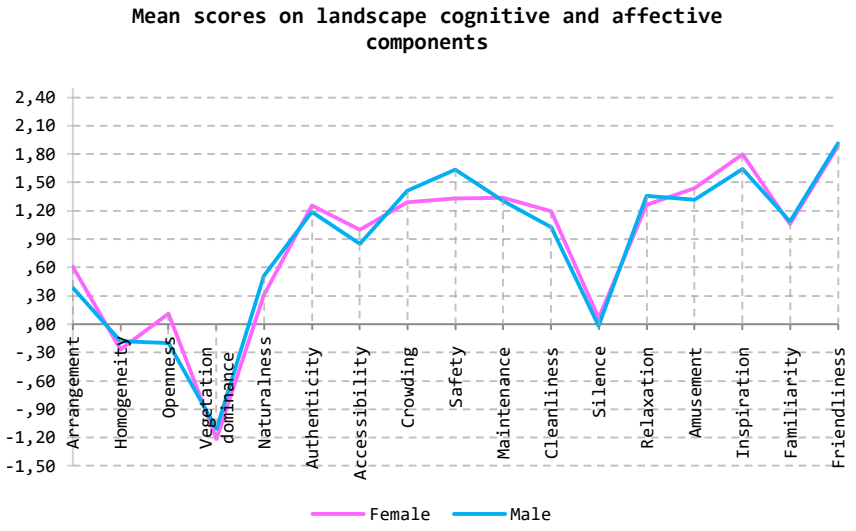
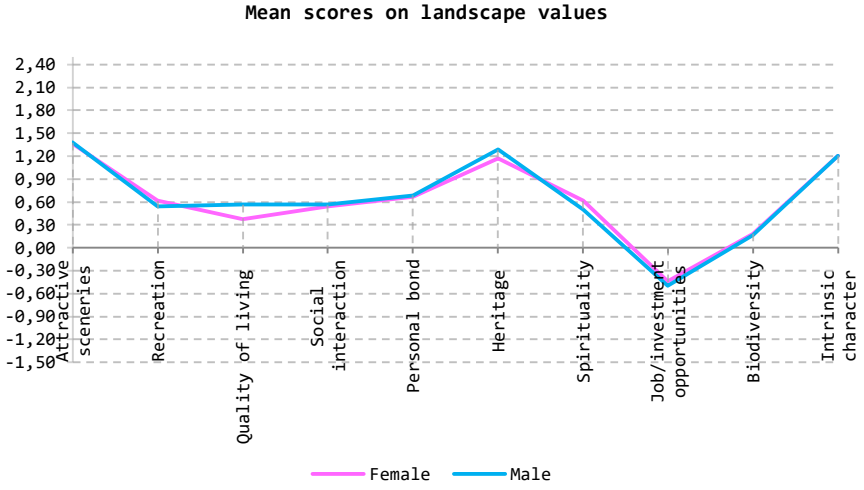


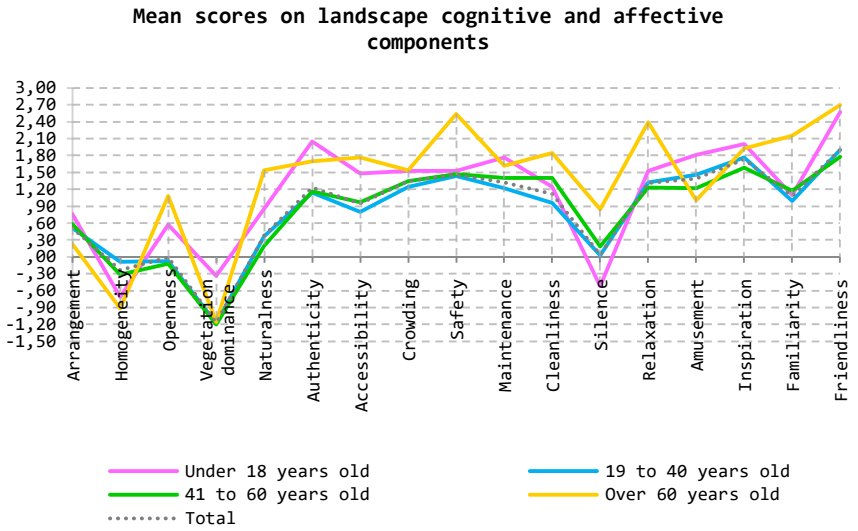
Figure (5.12) Mean scores comparison based on sociodemographic variables

Gender





Age range



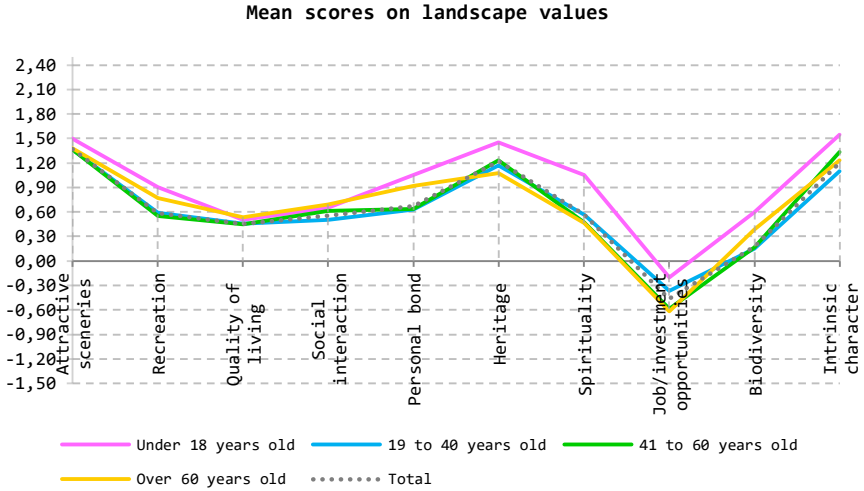
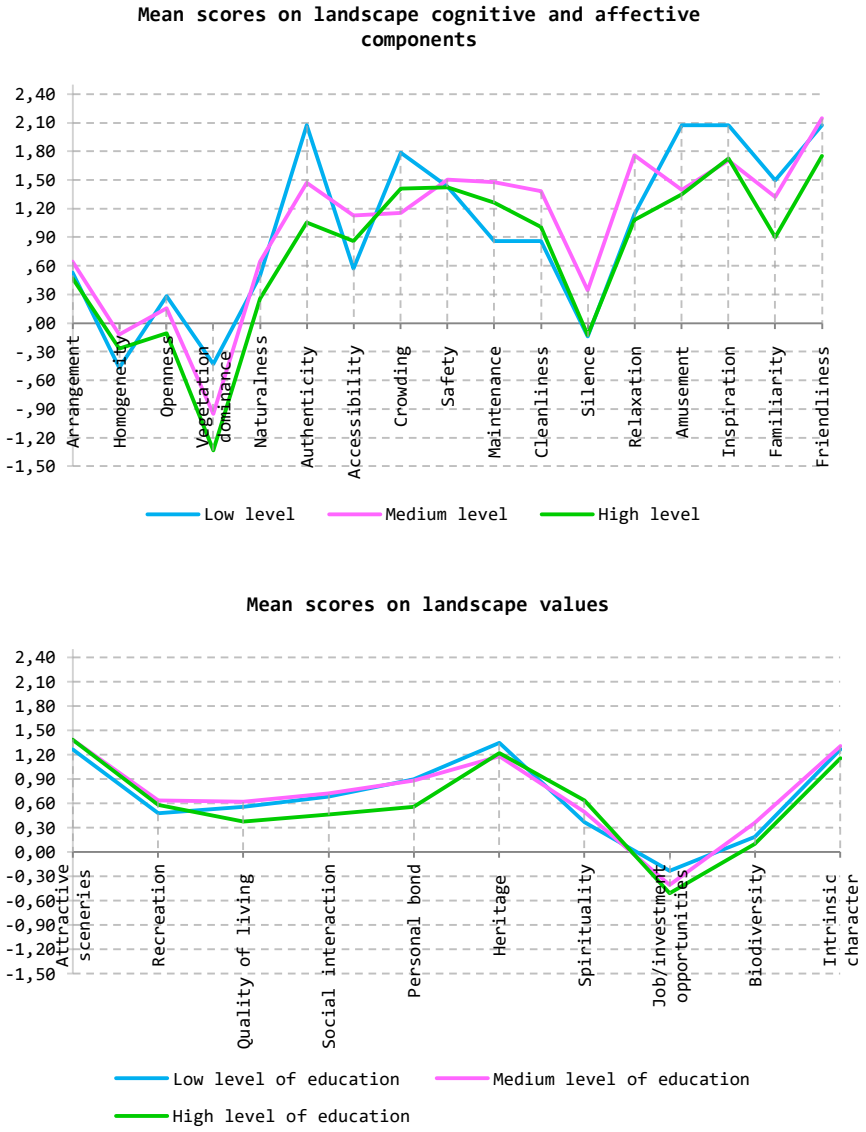
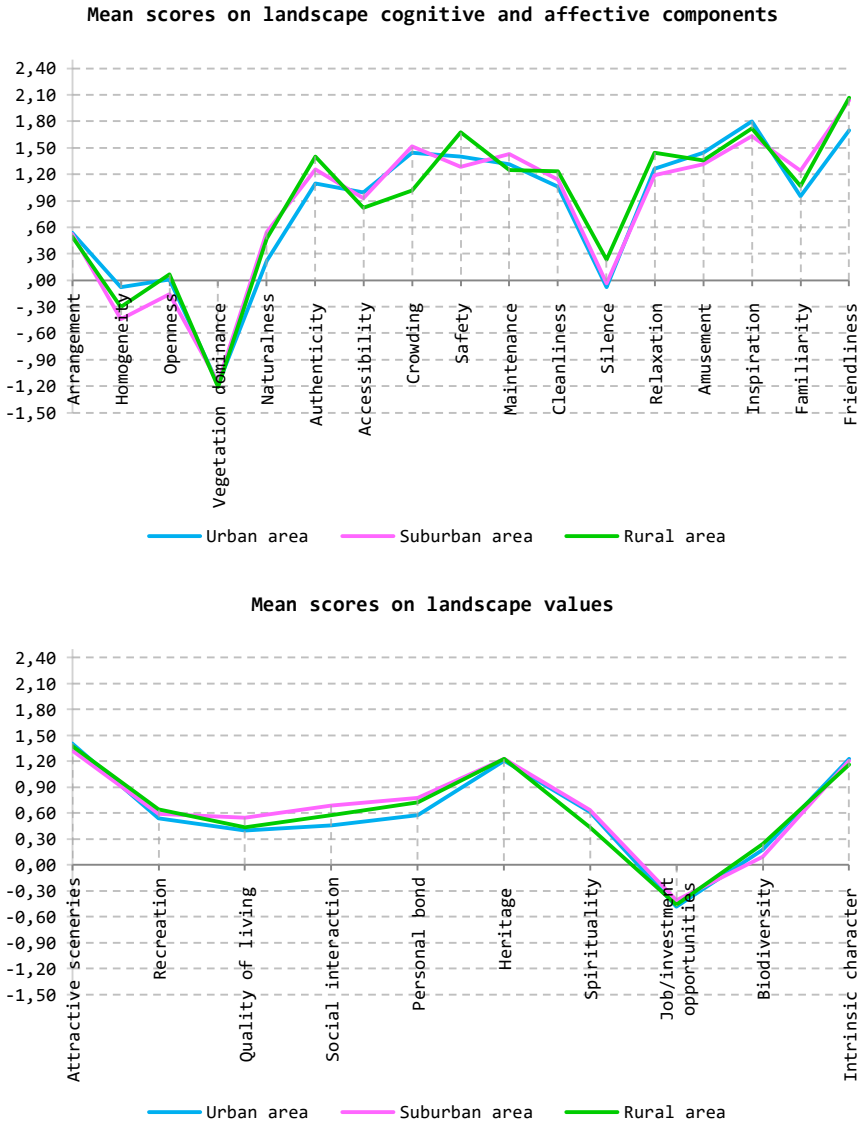


Figure (5.13) Mean scores comparison based on sociodemographic variables

Completed education level



Type of area of living



The role of travel behavior patterns

To identify groups of visitors of Lindos that differed in terms of travel behavior patterns and to classify them into mutually exclusive groups, a two-step hierarchical cluster analysis of the visitors has been undertaken. A three cluster solution appeared appropriate. The 8 variables that have been used as input data for this analysis are shown in table (…). Analyzing the travel behavior of each cluster of visitors, three typologies of visitors have been distinguished and described as following:

Cluster 1: External visitors with a short tourism landscape experience in Lindos area

The first group includes one-day visitors who mostly visited Lindos for first time, travelling with family members or a partner, and who stayed at hotel-type accommodations outside Lindos area. Most of them would prefer a moderate-to-low frequency of visiting coastal locations of the island, and a moderate-to-high frequency of visiting accommodation facilities. This group consisting of 221 visitors is the largest among the 3 clusters.

Cluster 2: Internal visitors with some tourism landscape experience in Lindos area

The second group consisting of 83 visitors includes visitors who mostly stayed 2 to 7 days at alternative accommodation types (such as apartments, historical Lindian houses, modern villas etc.) of the old village of Lindos and its surroundings, travelling with family members or a partner. Almost half of them had visited Lindos area at least one time in the past. A significant amount of these visitors would prefer a moderate-to-high frequency of visiting coastal locations and a low-to-null frequency of visiting accommodation facilities.

Cluster 3: Internal visitors with extended tourism landscape experience in Lindos area

The third group consisting of 61 visitors includes visitors who mostly planned to stay 8-14 days with family members at hotel type accommodations and apartments on the surrounding hills of Lindos village and Pefki. Around 40% of them had visited Lindos 3 times or more in the past. They would prefer a moderate-to-low frequency of visiting coastal locations and a high frequency of visiting accommodation facilities.

Table (5.9) Input data for two-step hierarchical cluster analysis

	Variables	Predictor importance
1	Planned duration of visit in Lindos area (num. of days)	1
2	Duration of visit until the time of the survey execution (num. of days)	1
3	Location of accommodation (within or outside Lindos area)	0,61
4	Type of accommodation	0,19
5	Number of previous visits in Lindos area	0,17
6	Desirable weekly frequency of visits in other coastal locations	0,12
7	Desirable weekly frequency of visits in accommodation facilities	0,11
8	With whom they visited Lindos	0,02

Figure (5.14) Two-step hierarchical cluster analysis output

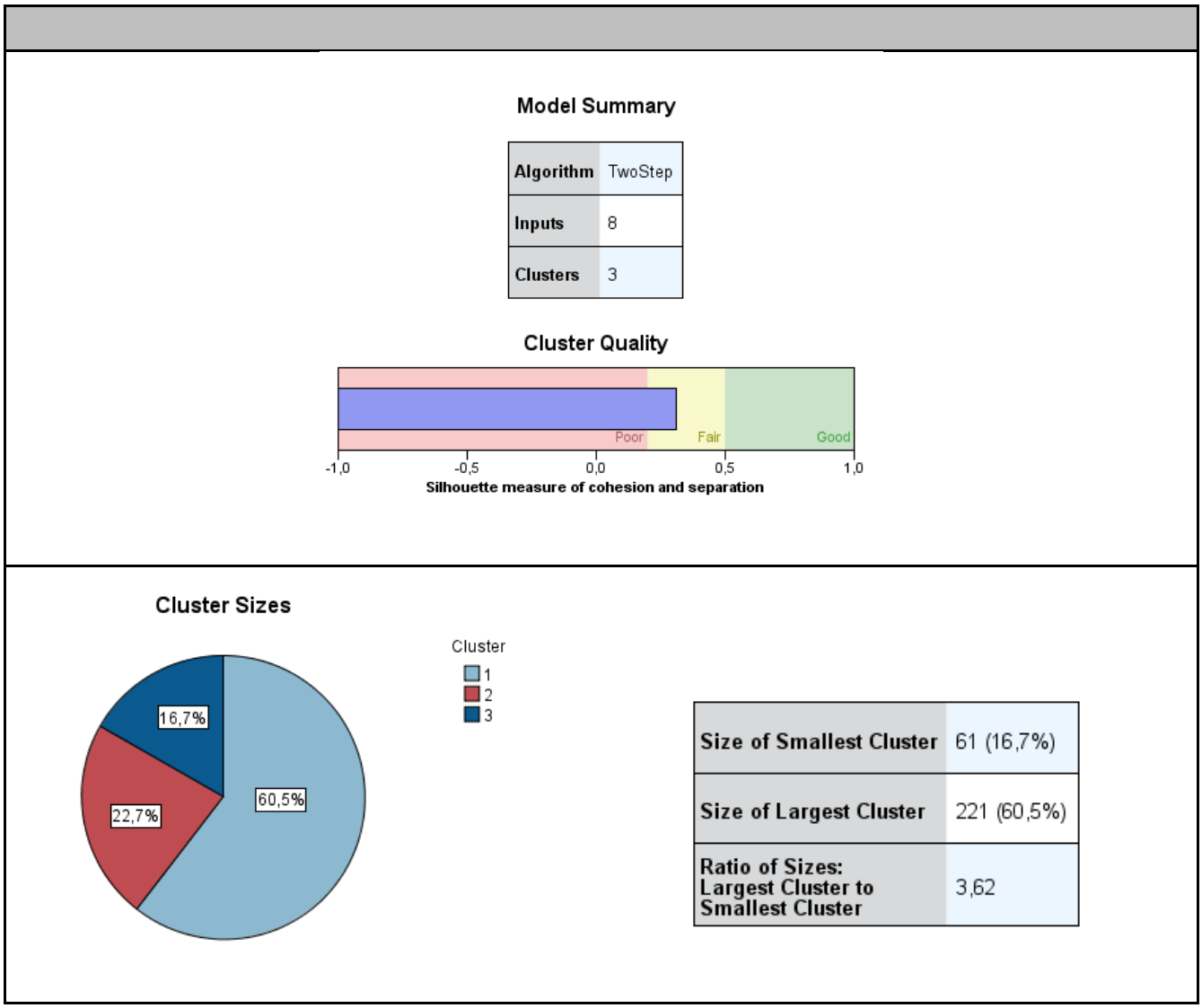


Table (5.10) Travel behavior data of each cluster of visitors

		Cluster 1: External visitors with a short tourism landscape experience	Cluster 2: Internal visitors with some tourism landscape experience	Cluster 3: Internal visitors with extended tourism landscape experience
	Count	221	83	61
N. previous visits	none	77,4%	53,0%	42,6%
	1 time	17,2%	26,5%	11,5%
	2 times	2,7%	8,4%	8,2%
	3 or more	2,7%	12,0%	37,7%
	Total	100%	100 %	100%
With whom they visit the place	Family	41,6%	41,0%	67,2%
	Friends	13,6	10,8	1,6%
	Partner	37,6%	41,0%	21,3%
	Alone	5,9%	7,2%	6,6%
	Other	0,9%	0,0%	3,3%
	Total	100%	100%	100%
Duration of visit	1 day	100%	3,6%	14,8%
	2-7 days	0,0%	79,5%	45,9%
	8-14 days	0,0%	6,0%	39,3%
	more than 15 days	0,0%	10,8%	0,0%
	Total	100%	100%	100%
Planned duration	one-day visit	90,0%	0,0%	0,0%
	2-7 days	9,0%	72,3%	23,0%
	8-14 days	0,9%	14,5%	72,1%
	more than 15 days	0,0%	13,3%	4,9%
	Total	100%	100%	100%
Type of accommodation	Hotel	78,3%	37,3%	45,9%
	Apartment	17,2%	44,6%	50,8%
	Lindian house	0,0%	13,3%	0,0%
	Modern villa	0,5%	3,6%	1,6%
	Other	4,1%	1,2%	1,6%
	Total	100%	100%	100%
Location of accommodation	Lindos v.	1,4%	37,3%	8,2%
	Sur. hills	0,9%	16,9%	37,7%
	Pefki	5,4%	21,7%	45,9%
	Vlycha	0,9%	3,6%	8,2%
	Within Lindos area	8,6%	79,5%	100,0%
	Outside Lindos area	91,4%	20,5%	0,0%
	Total	100%	100%	100%

Table (5.11) Travel behavior data of each cluster of visitors

		Cluster 1: External visitors with a short tourism landscape experience	Cluster 2: Internal visitors with some tourism landscape experience	Cluster 3: Internal visitors with extended tourism landscape experience
	Count	**221**	**83**	**61**
Freq. Of visits Accommodation facilities	Not at all	18,1%	38,6%	0,0%
	Once a week	13,1%	19,3%	4,9%
	2 or 3 times a week	19,9%	12,0%	11,5%
	4 or 5 times a week	15,4%	14,5%	24,6%
	Everyday	33,5%	15,7%	59,0%
	Total	100%	100%	100%
Freq. Of visits coastal locations	Not at all	2,3%	10,8%	3,3%
	Once a week	25,8%	21,7%	52,5%
	2 or 3 times a week	54,3%	36,1%	44,3%
	4 or 5 times a week	9,0%	28,9%	0,0%
	Everyday	8,6%	2,4%	0,0%
	Total	100%	100%	100%

In order to reveal the differences in visitors' evaluative perception as a result of the 3 different travel behavior patterns previously distinguished through the two-step hierarchical cluster analysis, a comparison of the mean scores attributed to the selected landscape cognitive and affective components and values has been carried out.

Among the three groups of visitors, the first group, consisting of external visitors with a short tourism landscape experience in Lindos area, attributed the lowest scores at almost all of the cognitive and affective components, as well as the lowest scores on most tourism landscape values. The only variables evaluated higher by the first group with respect to the other groups are the heritage and spirituality value of the landscape. Specifically, one can observe that the first group significantly differed from the other groups as regards landscape components such *as crowding, safety, silence, relaxation, familiarity, and friendliness*, displaying a more negative image of Lindos both as regards its functional and emotional aspects. The tourism landscape of Lindos appears to be experienced as a busy and unfamiliar place that is worthy to be visited mostly because of its historical and spiritual features.

The second group, consisting of internal visitors with some tourism landscape experience in Lindos area, presents a more positive image of the landscape with respect to the first group. The scores attributed to landscape components such as *safety, silence, relaxation familiarity* and *friendliness* exceed significantly the scores given

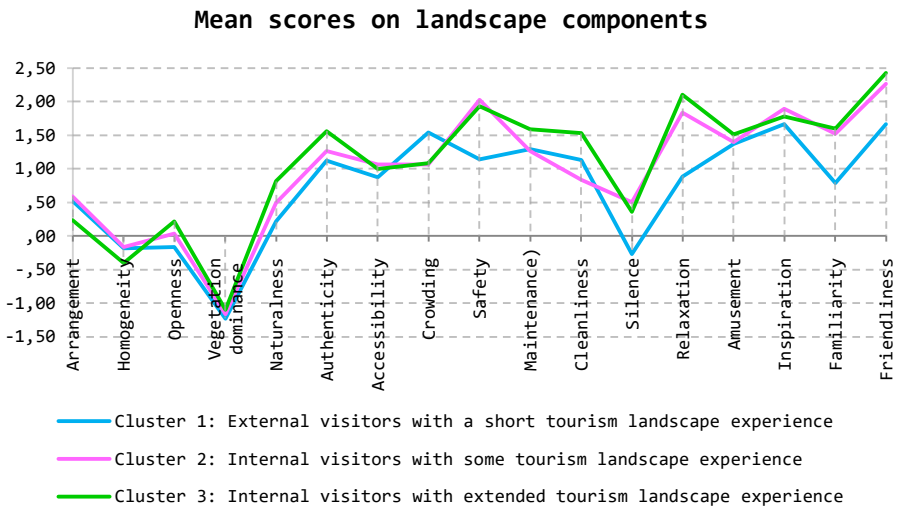
by the first group. The same occurs as regards the scores attributed to values such as quality of living, opportunities for social interaction and personal bond with the place. However, one can observe that among the three groups, the second group of visitors attributed the lowest scores to *maintenance* and *cleanliness*, and that can be explained by the fact that most of them have been accommodated in the old village of Lindos which indeed faces such issues due to the antiquity of its infrastructures.

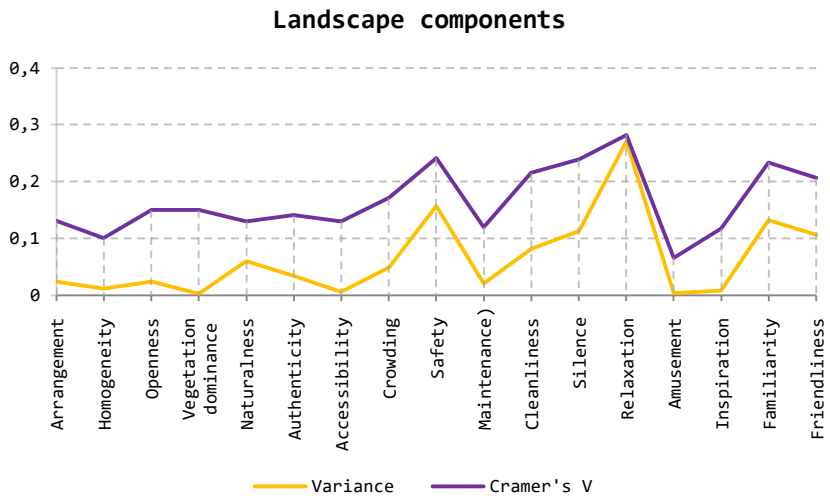
The third group of visitors with the most extended experience in Lindos area presents the most positive overall image of the landscape. Especially landscape components such as *naturalness, authenticity, maintenance* and *relaxation*, as well as landscape values such as recreation opportunities, quality of living, opportunities for social interaction and personal bond with the place are much higher evaluated with respect to the other two groups.

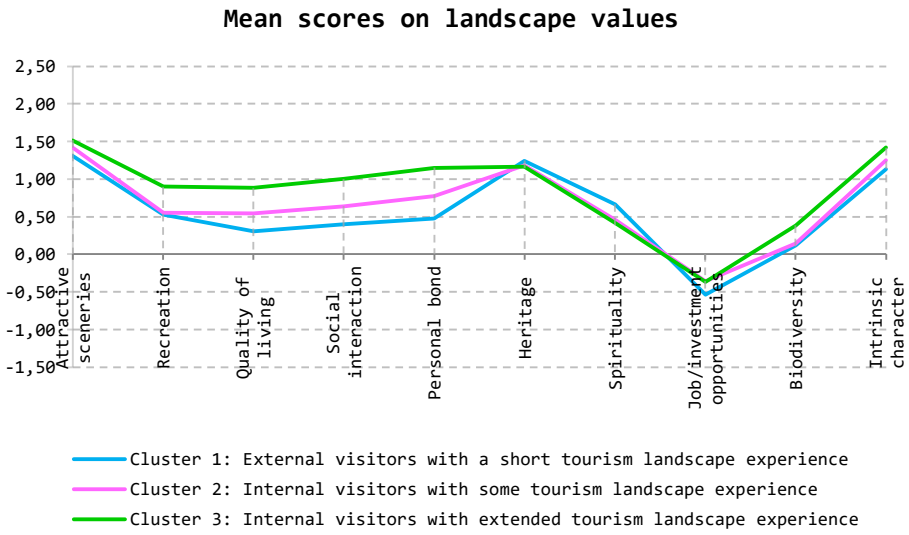
Therefore, as it was expected, this analysis showed that visitors' travel behavior significantly affects their evaluative perception. The shorter is the experience in Lindos area, the lowest are the scores attributed to landscape components and values. Considering, however, the variance of the scores attributed by the three groups of visitors with different travel behavior, data additionally show that the highest variance is mostly manifested on affective landscape components (such *relaxation, safety, familiarity and friendliness)* and on personal and social-orientated landscape values (such as the personal bond with the place, opportunities for social interaction, quality of living and recreation).

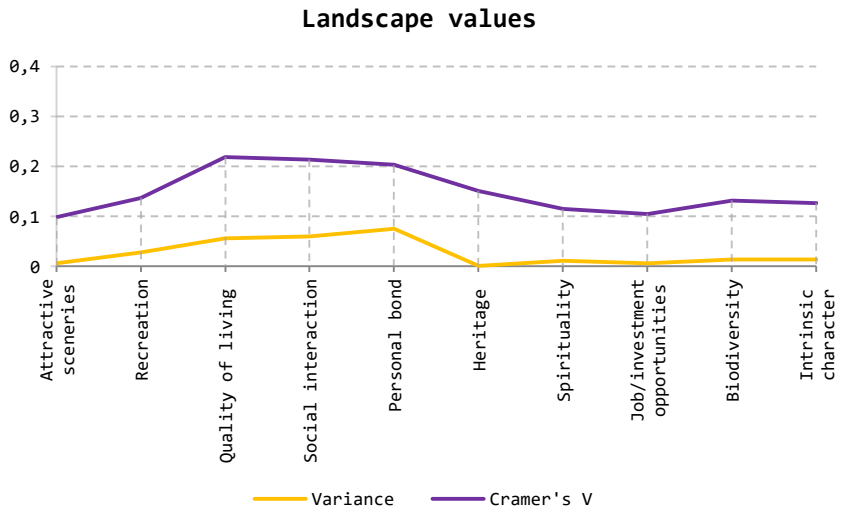
In contrast, an interesting observation regards the almost null variance of the scores on cognitive components and especially on accessibility. Even though accessibility is conceptually linked to visitors' travel behavior and therefore one may expect to find out that accessibility vary significantly in relation with visitors' travel behavior, data show that the three groups of visitors evaluated accessibility almost equivalently.

Figure (5.15) Mean scores, variance and Cramer's V based on 3 clusters of visitors with different travel behavior









The role of motivation patterns

In order to detect general patterns of motivation for tourism landscape experience among visitors, first a factor analysis has been conducted in order to identify smaller sets of explanatory composite factors that define the fundamental constructs assumed to underlie the original variables of socio-psychological motivations.

Only the four factors with an eigenvalue higher than 1.1 were considered. To ensure quality of measurement, the variables were also subjected to reliability (Cronbach alpha reliability test) and appropriateness (Bartlett's test of sphericity and KaiserMeyer-Olkin measure of sampling adequacy) testing (see table…). Furthermore, the variables with a factor loading coefficients higher of 0.30 were considered significant[65]. Subsequently, the four distinguished factors have been described on the basis of literature on travel motivation.[66]

Factor 1: Prestige

The prestige component assesses the extent to which visitors are motivated to engage in activities through which may acquire social recognition such as sharing the experience of visiting a fashionable place and therefore satisfying the need for the esteem of others.

Factor 2: Stimulus avoidance

The Stimulus avoidance component assesses the desire to escape and get away from crowds. It can also be the need to seek calm conditions, rest and relaxation.

Factor 3: Intellectual

The Intellectual component assesses the extent to which visitors are motivated to engage in leisure activities involving mental deeds such as learning, discovery, thought or imagery.

Factor 4: Pleasure

The pleasure component assesses the degree to which visitors engage in entertaining and/or exciting activities as well as leisure activities for the enhancement of kinship or other interpersonal relationships.

As a second step, a k-means cluster analysis on the 4 factors has been conducted to identify different groups of visitors depending on their socio-psychological motivations for tourism landscape experience. A three cluster solution has been chosen.

[65] Generally, a factor loading of 0.30 is considered significant and a factor loading of 0.50 is considered very significant (Field, 2005).
[66] Stimulus avoidance and Intellectual components based on Beard and Ragheb (1983).

Final cluster centers on each factor are shown in the table (…). These cluster centers represent the mean on the four factors of all respondents grouped in each cluster.

Based on literature on travelers' personality typologies (Stanley Plog's psychographics model, 1967) which are known as psychographics, the first cluster of visitors can be described as mostly allocentric. **Allocentric visitors or venturers** are intellectually curious about and what to explore, they continually seek new experiences and enjoy activity. In alternative, they can be described as self-confident, independent and anxiety-free novelty seekers that like to travel especially to very unique destination areas.

The two other clusters can be described as basically psychocentric or dependable personality visitors, who are somewhat intellectually restricted, prefer popular destinations, like structure and routine, and prefer to be surrounded by friends and family. The second cluster can alternatively be described as **pleasure seekers**, while the third one **relax and prestige seekers**. Nevertheless, it should be mentioned that these two personality traits are the opposite ends of a continuum of traits, and this study has adapted them aiming merely at distinguishing visitors' main socio-psychological patterns and exploring their influence on the on-site image formation.

Table (5.12) Factor analyses on motivation variables (component scores matrix).

	Mean score	Standard deviation	Factors			
			1 Prestige	2 Stimulus avoidance	3 Intellectual	4 Pleasure
Relaxing physically and/or mentally	2,72	1,21	-,145	**,394**	-,090	,156
Getting away from crowds	1,75	1,26	-,078	**,468**	,018	-,109
Having fun	2,63	1,03	-,046	-,043	-,040	**,555**
Doing exciting and/or adventurous activities	1,71	1,16	-,005	-,217	,201	**,383**
Increasing my knowledge	2,34	1,04	-,125	,007	**,507**	-,026
Experiencing closely a new culture	2,67	0,96	-,084	,064	**,480**	-,082
Developing friendships	1,25	1,15	,074	,243	,053	,034
Spending quality time with family/friends	2,97	1,20	-,066	,047	-,061	**,389**
Gaining a feeling of belonging to a new place	2,00	1,22	,272	,171	,089	-,248
Learning more about myself	1,17	1,09	,197	,171	,091	-,128
Sharing photos and telling friends about the place	2,20	1,21	**,434**	-,208	-,119	,132
Feeling proud of visiting a fashionable place	1,65	1,30	**,476**	-,120	-,175	-,019
Explained variance (total 62,3%)			17,6%	16,1%	15,6%	12,9%
(Factor loadings >0.3, KMO measure of sampling adequacy= 0,712, p<.001)						

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table (5.13) Description of visitors' personality typology, based on cluster analysis, displaying the final cluster center of the k-means cluster analysis

	Clusters		
	1 (venturers)	**2 (pleasure seekers)**	**3 (relax seekers)**
Factor 1 : PRESTIGE	,12145	-,88523	,77492
Factor 2: STIMULUS AVOIDANCE	-1,15208	,14269	,66784
Factor 3: INTELLECTUAL	,53291	-,39281	,00855
Factor 4: PLEASURE	-,48980	,40297	-,04859

In order to reveal the differences in visitors' evaluative perception as a result of the 3 different motivation patterns, a comparison of the mean scores attributed by each cluster of visitors to the selected landscape cognitive and affective components and values has been carried out.

The outcomes show that among the three clusters of visitors, the third one, described as relax seekers, notably formed the most positive overall image of Lindos, as they attributed the highest scores to every cognitive and affective component as well as values of the tourism landscape (the crowding has negative connotation and for this reason, this group attributed the lowest score). Notably, relax seekers, who are mostly motivated by the need for calm conditions and crowding avoidance, perceive the landscape of Lindos less crowded and more relaxing than the other two clusters of visitors.

Venturers and pleasure seekers appear to have mutually formed a less positive overall image with respect to relax seekers. Nevertheless, divergences can also be noticed between them, and especially as regards the components of *authenticity, accessibility, crowding, silence* and *relaxation,* to which venturers have attributed the lowest scores among the three clusters of visitors. Similarly, venturers attributed the lowest scores to recreational value, the quality of living and the opportunities for social interaction. Venturers are mostly seeking for increasing their knowledge and experiencing a new culture, therefore, a tourism landscape that is perceived by them as very crowded, noisy, not particularly authentic and accessible, and does not offer opportunities for social interaction and recreation, may not offer the appropriate conditions for them to engage in leisure activities involving mental deeds such as learning, discovery, thought or imagery. Nevertheless, notwithstanding these negative evaluations, venturers recognize the presence of heritage and special spiritual places in Lindos area, and they perceive the landscape as quite inspiring.

Pleasure seekers, attributed similar scores as venturers to most of the landscape components, however they perceive the landscape of Lindos much less crowded and a little more authentic, silent, relaxing and accessible. In visiting a tourism landscape,

pleasure seekers are motivated by the need to engage in entertaining and/or exciting activities as well as leisure activities for the enhancement of kinship or other interpersonal relationships. Notably, among the three clusters of visitors, they attributed the lowest scores to the aspects that regard the place itself and their relationship with it, such as heritage, spirituality, job/investment opportunities, biodiversity and their personal bond with the place. Nevertheless, their evaluation on the recreation opportunities, social interaction opportunities and quality of living is much more positive than that one of venturers.

In conclusion, this analysis shows that different motivation patterns do affect visitors' evaluative perception of the tourism landscape of Lindos. In contrast with the travel behavior patterns for which the three clusters of visitors present high variance merely on affective components and social orientated values, the clusters of visitors with different motivation patterns present high variance on cognitive components and place orientated values too (such as openness, vegetation dominance, naturalness, etc., biodiversity, job/investment opportunities, presence of special spiritual places, etc.)

Figure (5.16) Variance in visitors' evaluative perception based on variables of personal factors.

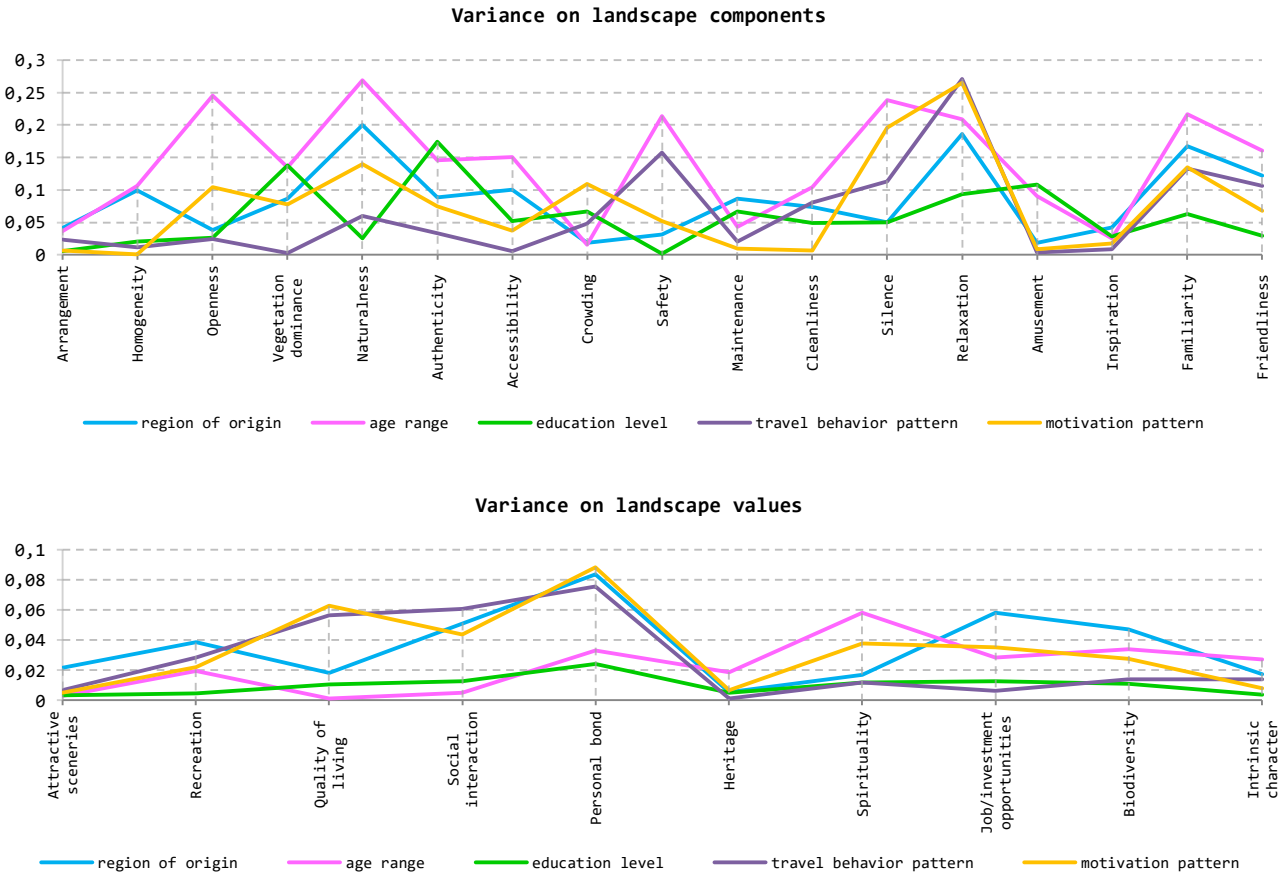
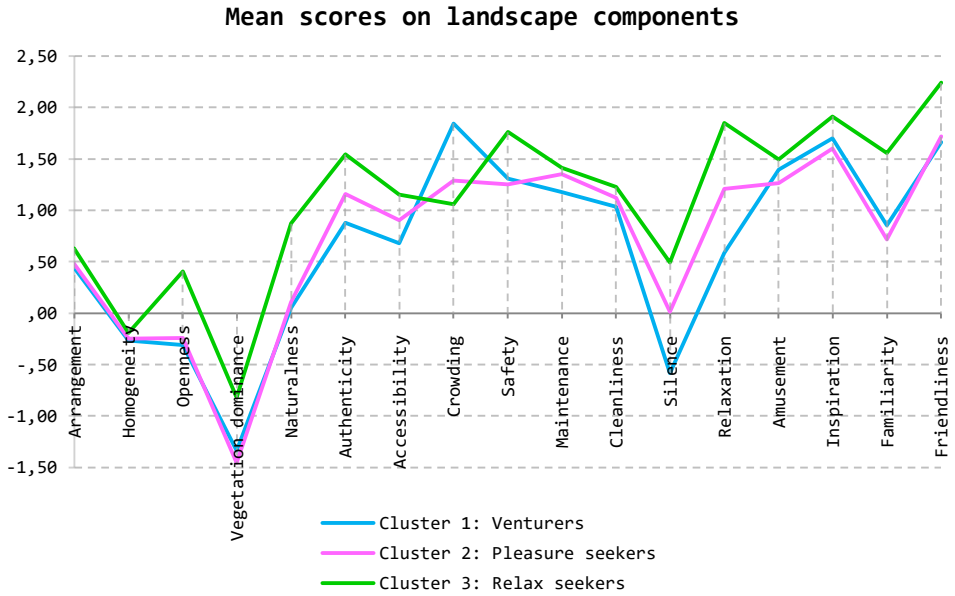
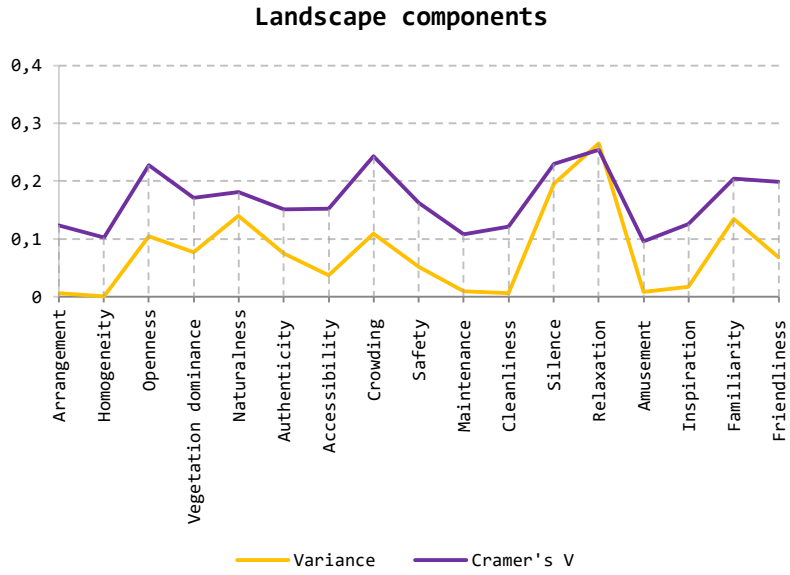
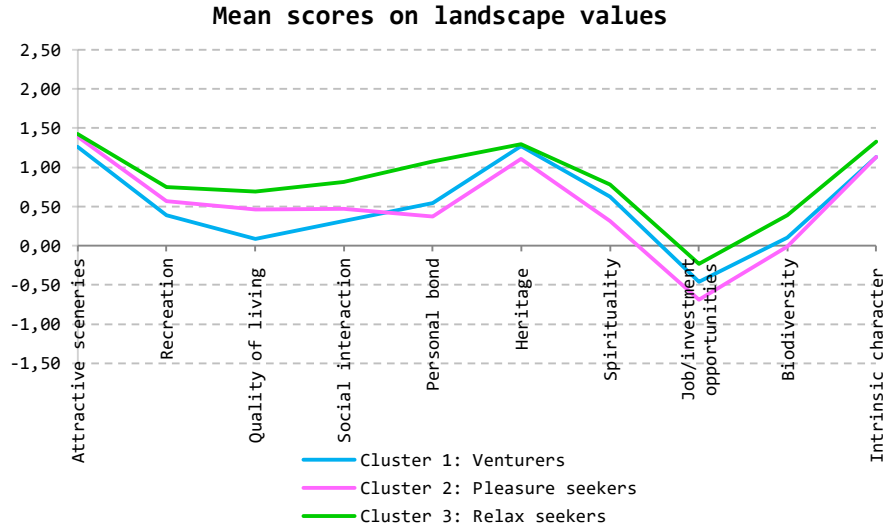
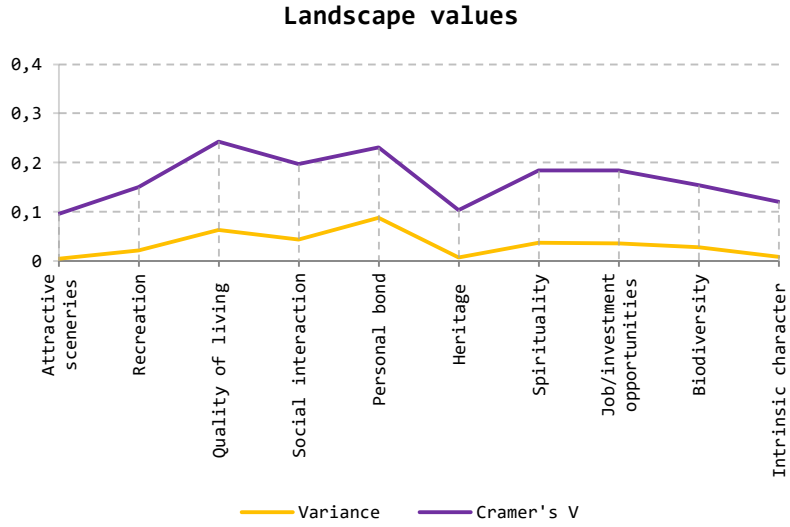


Figure (5.17) Mean scores, variance and Cramer's V based on 3 clusters of visitors with different motivations of landscape experience









General reflections

The analysis described above aimed at exploring the cause-effect relationships between personal factors and visitors' evaluative perceptions on the tourism landscape of Lindos.

The outcomes have shown that among the sociodemographic variables a factor with a significant effect on the evaluative perception of the visitors (especially on landscape values) is the region of origin. This might mean that the region of origin, as a variable that reflects the cultural[67] background of visitors, is a complex factor that determines and aggregates similar patterns of travel behavior and socio-psychological motivations and therefore affects visitors' individual evaluative perception as well. In particular one can observe the great image divergences between visitors originated from Region C (UK, Ireland) who share completely distinct characteristics and have notably formed a more positive on-site image of the landscape and the visitors originated from other regions. Nevertheless, the region of origin, besides the behavior and motivations of visitors, also reflects their past landscape experiences in their area of living that may interfere in the evaluation of the tourism landscape. This can be noticed from the fact that visitors originated from the northern European countries and especially from Scandinavian countries perceive the landscape of Lindos much more varied than visitors originated from central, eastern and south Europe, as well as much more human-influenced and much less authentic and familiar than all the other groups of visitors. This might be due to the fact that the Scandinavian visitors when evaluating the tourism landscape of Lindos make reference to the landscapes of the Scandinavian countries characterized by high vegetation coverage and therefore are experienced as more uniform and unspoiled landscapes with respect to the coastal rocky tourism landscape of Lindos.

Other socio-demographic variables affecting visitors' evaluative perception are visitors' age range and educational level. Especially as regards the educational level,

[67] Culture is a factor that could filter the individual's perception. Culture can be defined as a collection of beliefs, ideas and norms of individuals (Sherry, 1986). These cultural values are learned, permanent, dynamic and preserved over time. Cultural values could play a significant role in tourism having important effects on the behavior of tourists in general. In tourism research, culture has been examined according to the tourist's geographical origin. A close relationship between country of origin and culture has been proposed in previous studies. Countries are considered to represent different cultural factors, attributing differences in individual's responses to the distinct cultural values (Crotts, 2004). Tourists from different countries have heterogeneous cultural values and consequently a different perception of the same tourism landscape.

the analysis reveals that the highest is the educational level that visitors have completed, the lowest are the scores attributed at the landscape components and principally the affective ones.

A significant variance can be noticed in visitors' evaluative perception as a result of the 3 different travel behavior patterns (see table…). The analysis show that the longest is visitors' tourism landscape experience within Lindos area the most positive is the overall on-site image they form. However, the different travel behavior patterns mostly affect the evaluation of the affective components of the landscape as well as the personal and social-orientated landscape values.

In contrast, as regards the analysis of socio-psychological motivation patterns, the outcomes show a significant variance among the scores attributed by groups of visitors with different motivation patterns on both cognitive and affective landscape components. In addition, one can notice that visitors who are motivated by the need for calm conditions and crowding avoidance formed a more positive on-site image in Lindos area with respect those motivated by the need for increasing knowledge and experiencing a new culture.

In conclusion, one cannot argue that personal factors do affect visitors' on-site evaluative perception in different ways. Recognizing the cause-effect relationships between them is an important step towards a deeper understanding of visitors' entire evaluation process of the tourism landscape.

In the following paragraph, all visitors' individual images are going to be studied and grouped through a cluster analysis in order to reveal the prevailing images shared by the total research population independently of personal factors. The scope of this step of analysis is to consequently detect relationships between visitors' images and attitudes.

5.4.3 The prevailing overall images of the tourism landscape and their influence on visitors' attitudes.

Unfolding visitors' prevailing images

In order to explore the relationship between visitors' images and attitudes, one should first distinguish visitors' prevailing overall images of Lindos as a combination of both cognitive and affective components. To unfold these images, a multivariate analysis has been carried out in two steps. As a first step an explanatory factor analysis was conducted on the 17 image components selected and used in the survey questionnaire, in order to identify the underlying dimensions in visitors' images. Subsequently, the factors behind the image components were introduced in a cluster analysis to unfold the variety in the overall images of visitors. Factor analysis on image components has revealed five image factors expressing different qualities of the tourism landscape (only variables with a factor loading coefficients higher of 0.30 have been considered).

Table (5.14) Factor analyses on image cognitive and affective components (component scores matrix).

	Mean score	St. dev.	Factors				
			1 (calmness)	2 (recreation)	3 (security)	4 (stewardship)	5 (scenery)
Arrangement (Ordered/Disordered)	0,52	1,45	-,072	-,113	,094	,167	,284
Homogeneity (Uniform/Varied)	-0,23	1,59	-,102	-,066	,047	-,081	**,451**
Openness (Vast/Enclosed)	-0,01	1,57	-,024	,145	-,071	-,119	**,313**
Vegetation dominance (Green/Rocky)	-1,17	1,63	,006	-,016	-,025	-,059	**,435**
Naturalness (Unspoiled/Human-influenced)	0,39	1,68	,158	,172	**-,301**	,149	,143
Authenticity (Authentic/Commercial)	1,23	1,58	,165	,247	-,233	,111	,000
Accessibility (Accessible/Inaccessible)	0,94	1,43	-,101	-,067	,293	-,005	,094
Crowding (Crowded/Deserted)	1,34	1,33	**-,461**	,208	,054	,088	,036
Safety (Safe/Dangerous)	1,45	1,47	,002	-,077	**,411**	-,002	-,118
Maintenance (Well-maintained/Neglected)	1,32	1,22	-,050	-,013	-,021	**,459**	-,048
Cleanliness (Clean/Dirty)	1,13	1,38	,049	-,089	-,095	**,559**	-,132
Silence (Silent/Noisy)	0,03	1,45	**,338**	-,124	,078	,070	-,037
Relaxation (Relaxing/Distressing)	1,30	1,42	**,312**	,023	,121	-,072	-,064
Amusement (Amusing/Boring)	1,39	1,05	-,160	**,405**	,057	-,070	-,050
Inspiration (Inspiring/Uninteresting)	1,74	1,08	-,133	**,452**	-,020	-,097	,034
Familiarity (Familiar/Unfamiliar)	1,07	1,49	,049	,026	**,322**	-,151	,087
Friendliness (Friendly/Unfriendly)	1,90	1,19	,093	,132	,235	-,048	-,099
Explained variance (total 57,2%)			12,3%	12,3%	11,9%	10,8%	9,9%
(Factor loadings >0.3, KMO measure of sampling adequacy= 0,758, p<.001)							

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Component Scores.

The five factors can be described as:

Factor 1: Calmness

The first factor consisting of silence, relaxation and crowding (as negative value) can be described as the quality of calmness of the tourism landscape. In literature, calmness is often considered as an important motive for visiting recreational areas and therefore represents a basic quality of the tourism landscape (Frick et al., 2007; Gidlof-Gunnarsson and Ohrstrom, 2007).[68]

Factor 2: Recreation

The second factor consisting of inspiration and amusement can be described as the quality of recreation, which determines the capacity of the tourism landscape to provide refreshment of the mind, body and/or spirit.

Factor 3: Security

The third factor consisting of safety, familiarity, and naturalness (as negative value) can be described as the quality of security. It's noteworthy that human-influenced landscapes are associated in this survey with the quality of security in the context of recreation. Even though, in literature a general consensus on peoples' preference of natural landscapes for recreation is frequently assumed (Kaplan, 1995) human-influenced landscapes might provide instead, a sense of controllability, stability and reliability that are important aspects for certain visitor/traveler personality typologies who seek for security more than adventure.

Factor 4: Stewardship

The fourth factor consisting of maintenance and cleanliness can be described as the quality of stewardship of the tourism landscape. Stewardship refers to the management of the tourism landscape, perceived by visitors through a visible 'aesthetic of care'. Previous literature has emphasized how the optimal degree of maintenance within a landscape depends on the context, highlighting the fact that a high maintenance level and a low one can both be valued negatively (Coeterier, 1996).

Factor 5: Scenery

The fifth factor consisting of homogeneity, openness and vegetation dominance can be described as scenic/visual quality. The visual quality is the most commonly associated quality with the tourism landscape, as peoples' esthetic appreciation of a landscape increases its attractiveness for recreation purposes. Previous research has

[68] Frick, J., Degenhardt, B., Buchecker, M., 2007. Predicting local residents' use of nearby outdoor recreation areas through quality perceptions and recreational expectations. Forest Snow and Landscape Research 81, 31–41. Gidlo¨f-Gunnarsson, A., Ohrstrom, E., 2007. Noise and well-being in urban residential environments: the potential role of perceived a (Effects of habitat and landscape fragmentation on humans and biodiversity in densely populated landscapes Manuela Di Giulio*, Rolf Holderegger, Silvia Tobias)

focused on concepts such as the complexity or the visual variety of the landscape that are reflected in landforms and vegetation cover (Tveit, et al. 2006). However, as individual aesthetic experiences of landscapes vary significantly, in this study this factor does not aim at evaluating visual quality through assumptions on landscape preferences (such as the assumption that open landscapes are preferred with respect to enclosed landscapes). The aim is to examine the degree of proximity of visitors' images between two opposite poles: from a uniform, vast and green landscape to a varied, enclosed and rocky landscape and in consequence to detect an eventual effect of this image differentiation in visitors' attitudes.

As a second step, a k-mean cluster analysis on the five factors described above was carried out, choosing a three-cluster solution. Final cluster centers on each factor are shown in table (5.15). These cluster centers represent the mean on the five factors of all respondents grouped in each cluster.

The outcomes show the three prevailing overall images of the tourism landscape of Lindos that can be described as:

Image 1: Secure but not calm – the busy landscape

The first image is shared among 113 respondents who have experienced the landscape of Lindos as a quite busy (noisy, distressing and crowded) landscape and not particularly amusing or inspiring, neither very well-maintained. However these visitors positively perceived the landscape as regards the feeling of security (safe, familiar, and human-influenced). Their visual perception of the landscape is that one of a quite uniform, vast and green landscape. The locations of these respondents while participating in the survey are along the main road network, near bus stops as well as close to the beaches.

Figure (5.18) Representative photos for image 1

Image 2: Calm but not recreational- the boring landscape

The 139 respondents of the second cluster have experienced in Lindos a quite calm landscape that offers relaxation, but not enough recreation (inspiration, amusement). Also as regards security, the landscape is perceived as mostly unfamiliar, natural and somehow dangerous, as well as a little neglected in terms of maintenance. The visual perception is inclined towards an almost uniform, vast and green landscape. The locations of the respondents while participating in the survey are concentrated in the historical village of Lindos and especially on the hill of acropolis and in various caffe-bars.

Figure (5.19) Representative photos for image 2

Image 3: Calm and recreational – the pleasant landscape

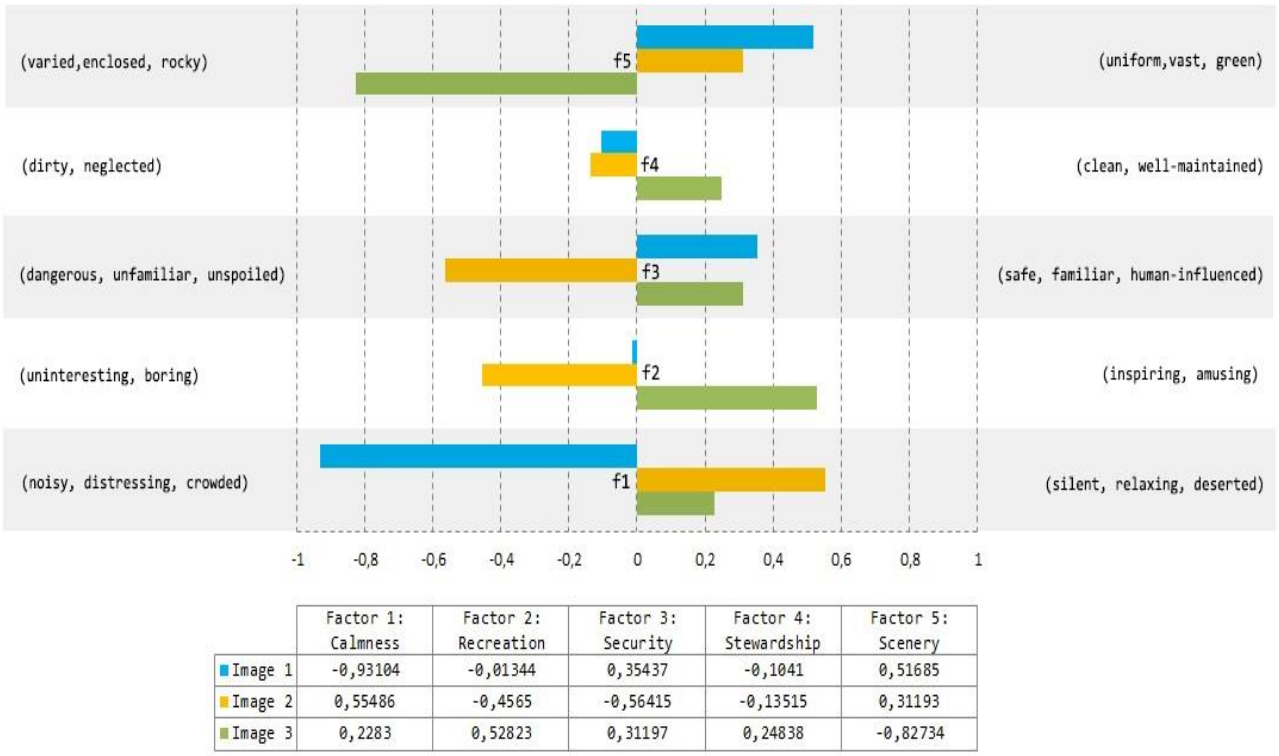
The respondents of the third cluster have experienced a moderately calm and preserved landscape, which however offers much recreation and security. In contrast with the other two groups of visitors, the landscape of Lindos is perceived by this group as very varied, enclosed and rocky. The locations of the respondents are concentrated in Pefki village.

Figure (5.20) Representative photos for image 3

Table (5.15) Visitors' images, based on cluster analysis, displaying the final cluster centers of the k-mean cluster analysis

	Image 1 (N=113)	Image 2 (N=139)	Image 3 (N=123)
Factor 1: Calmness	-,93104	,55486	,22830
Factor 2: Recreation	-,01344	-,45650	,52823
Factor 3: Security	,35437	-,56415	,31197
Factor 4: Stewardship	-,10410	-,13515	,24838
Factor 5: Scenery	,51685	,31193	-,82734

Figure (5.21) Graphic representation of the final cluster centers of the k-mean cluster analysis



	Factor 1: Calmness	Factor 2: Recreation	Factor 3: Security	Factor 4: Stewardship	Factor 5: Scenery
Image 1	-0,93104	-0,01344	0,35437	-0,1041	0,51685
Image 2	0,55486	-0,4565	-0,56415	-0,13515	0,31193
Image 3	0,2283	0,52823	0,31197	0,24838	-0,82734

The three prevailing overall images of the tourism landscape of Lindos have been also related to the socio-demographic characteristics of the respondents (see table…).

One can notice, however, that there is no clear relationship between the three prevailing images and most of the socio-demographic variables.

One interesting relationship is that almost half of visitors (46,2%) originated from Region C (UK, Ireland) belong to the third image, representing the pleasant landscape, while a significant percentage of visitors from Region B (Belgium, France, Netherlands) and Region G (Italy, Spain) belong to the first image (the busy landscape).

In addition, data show that there is a less strong but worth mentioning relationship between images and visitors' age and area of living. A significant amount of young visitors (under 40 years old) happen to belong to the second image (the boring landscape), while older visitors (over 40 years old) to the third image (the pleasant landscape). Furthermore, within the total number of visitors who live in rural areas, only 24% belongs to the first one (the busy landscape), while visitors living in urban areas are quite equally distributed among the three images (see table…).

Figure (5.22) Percentages of respondents within each cluster representing one of the three prevailing visitors' images of Lindos

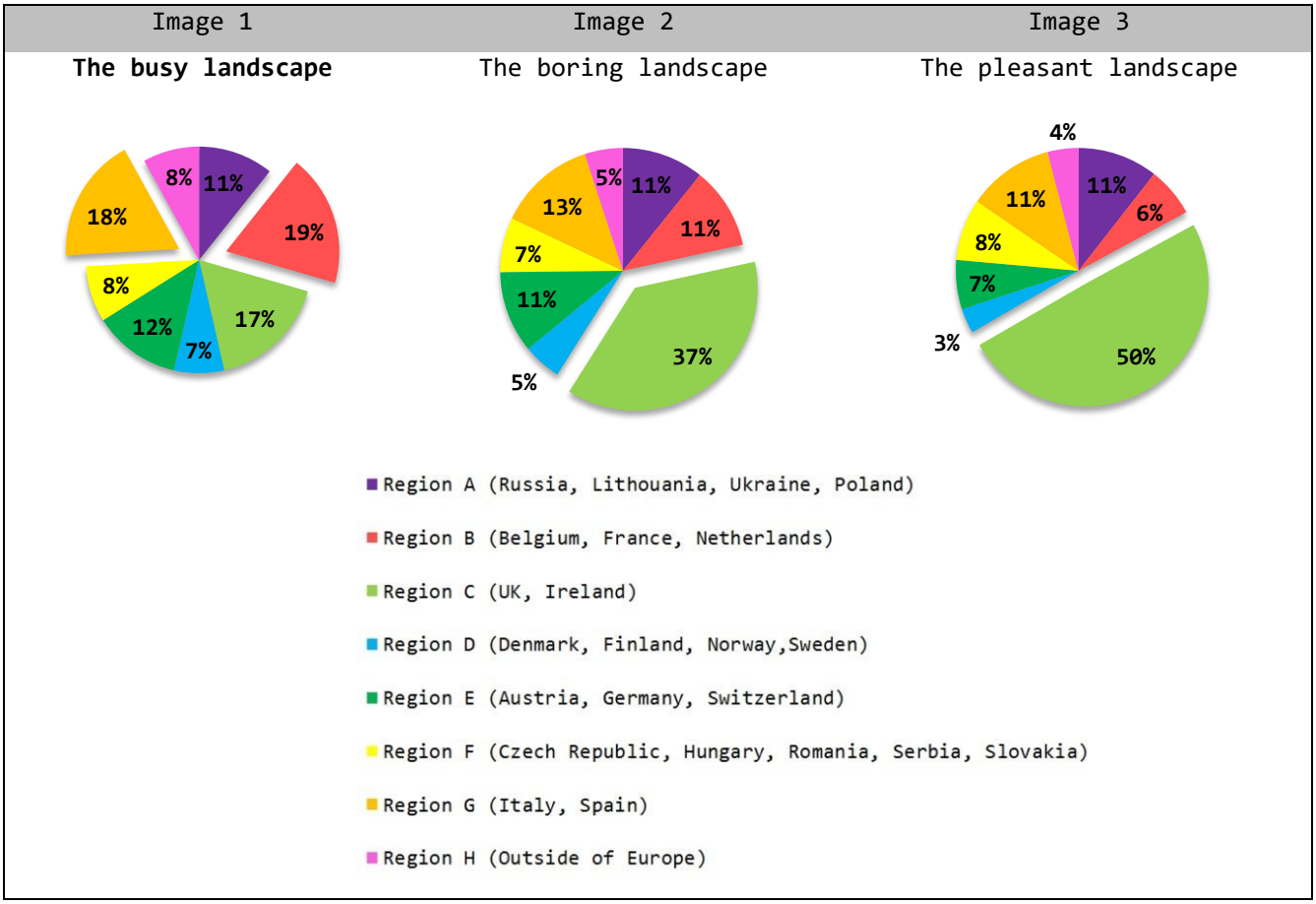


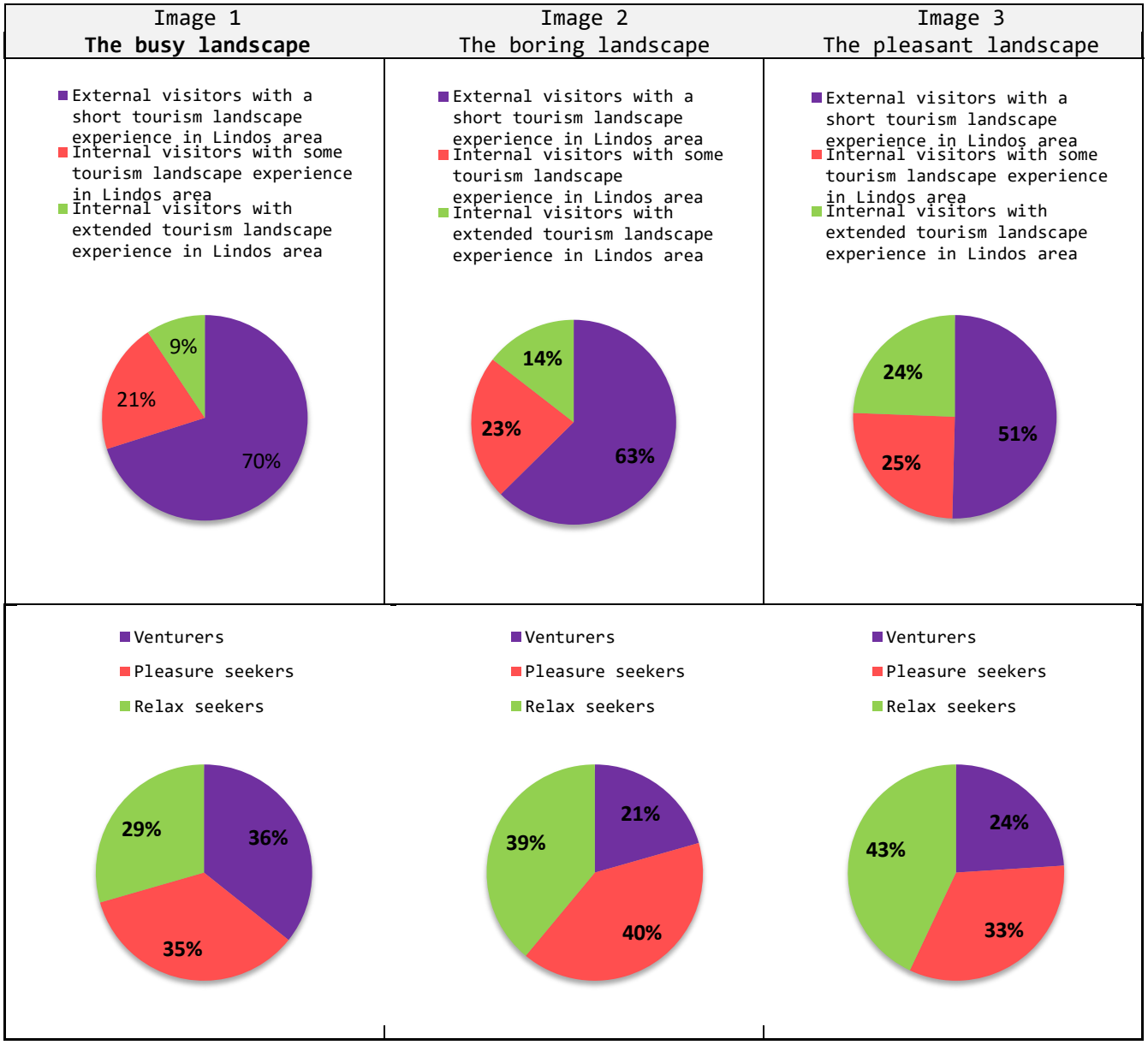
Table (5.16) Socio-demographic characteristics and visitors' overall images (displaying within each sociodemographic variable the percentages of respondents belonging to each image)

		Image 1 (busy)		**Image 2** (boring)		**Image 3** (pleasant)		**Total**	
	n. respondents	**113**		**139**		**123**		**375**	
		Count	%	Count	%	Count	%	Count	%
Gender	Female	71	31,8%	84	37,7%	68	30,5%	223	100,0%
	Male	41	27,2%	55	36,4%	55	36,4%	151	100,0%
Range of age	Under 18 years old	8	38,1%	6	28,6%	7	33,3%	21	100,0%
	19 to 30 years old	47	32,4%	**59**	**40,7%**	39	26,9%	145	100,0%
	31 to 40 years old	19	27,1%	30	42,9%	21	30,0%	73	100,0%
	41 to 50 years old	24	29,3%	24	29,3%	34	41,5%	83	100,0%
	51 to 60 years old	12	29,3%	15	36,6%	14	34,1%	42	100,0%
	Over 60 years old	1	7,7%	4	30,8%	8	61,5%	13	100,0%
	Total under 40	74	31,4%	95	40,3%	67	28,4%	236	100,0%
	Total over 40	37	27,2%	43	31,6%	56	41,2%	136	100,0%
Education level	Low level	5	35,7%	5	35,7%	4	28,6%	15	100,0%
	Medium level	33	26,8%	48	39,0%	42	34,1%	124	100,0%
	High level	112	31,5%	138	36,2%	122	32,3%	238	100,0%
Area of living	Urban area	60	34,9%	61	35,5%	51	29,7%	172	100,0%
	Suburban area	26	27,4%	35	36,8%	34	35,8%	95	100,0%
	Rural area	25	24,0%	42	40,4%	37	35,6%	104	100,0%
Region of origin	Region A	12	30,0%	15	37,5%	13	32,5%	40	100,0%
	Region B	21	47,7%	15	34,1%	8	18,2%	44	100,0%
	Region C	19	14,4%	52	39,4%	61	46,2%	132	100,0%
	Region D	8	42,1%	7	36,8%	4	21,1%	19	100,0%
	Region E	14	37,8%	15	40,5%	8	21,6%	37	100,0%
	Region F	9	31,0%	10	34,5%	10	34,5%	29	100,0%
	Region G	20	38,5%	18	34,6%	14	26,9%	52	100,0%
	Region H	9	42,9%	7	33,3%	5	23,8%	21	100,0%

The three prevailing overall images of the tourism landscape of Lindos have been also related to the visitors' travel behavior and socio-psychological motivations as well. The outcomes show a more clear-cut relationship between images and travel

behavior. Indeed, within the amount of visitors who formed the first two images of the busy and boring landscape, a great percentage represent external visitors with short landscape experience in Lindos area. As regards the socio-psychological motivations, one can notice that relax seekers are those who mostly formed the image of the pleasant landscape. In contrast, venturers present the highest percentage within the image of the busy landscape, and pleasure seekers within the image of the boring landscape.

Figure (5.23) Percentages of respondents within each cluster representing one of the three prevailing visitors' images of Lindos

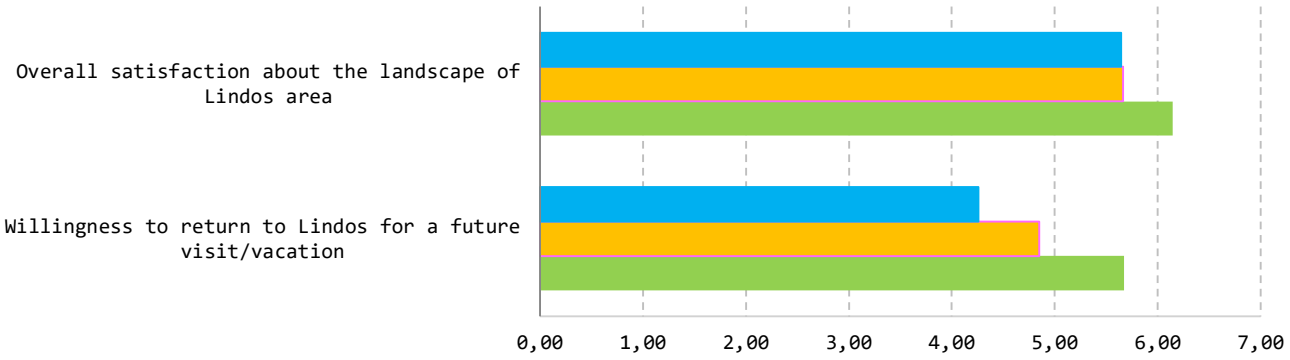


How do the prevailing overall images affect visitors' attitudes?

In order to explore how images of visitors affect their attitudes towards the destination, as a first step, the mean scores measuring the average overall satisfaction

of visitors about the landscape of Lindos and willingness to return for a future visit, have been calculated for each group of visitors who formed one of the three different prevailing overall images. As illustrated in table (…), among the three groups of visitors, the first group belonging to the image of the "busy landscape", even though appears as much satisfied as the second group belonging to the image of the "boring landscape", it is the least willing to return to Lindos for a future visit. In contrast, as it was expected, the third group of visitors who formed the image of the "pleasant landscape" presents the highest average overall satisfaction as well as willingness to return.

Figure (5.24) Mean scores for each group of visitors belonging to the three prevailing images



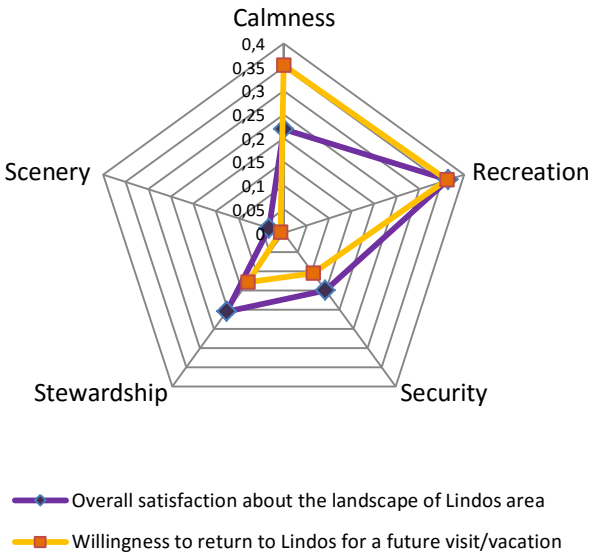
	Willingness to return to Lindos for a future visit/vacation	Overall satisfaction about the landscape of Lindos area
Image 1	4,26	5,64
Image 2	4,85	5,67
Image 3	5,67	6,15

As a second step, the strength of the statistical relationship between the 5 image factors and visitors' attitudes has been tested using the Pearson correlation coefficient. The outcomes of this test show that there is a medium[69] positive correlation (0,364) between visitors' overall satisfaction about the landscape and the factor of recreation, while the other image factors present lower correlation coefficients. The factor of scenery, which distinguishes the two opposite poles of visual perception of the landscape (from a uniform, vast and green landscape to a varied, enclosed and rocky landscape), does not appear to be correlated with visitors' satisfaction, neither with their willingness to return. Visitors' willingness to return to Lindos present medium positive correlation coefficients with the image factors of calmness and recreation.

[69] *High correlation:* .5 to 1.0 or -0.5 to 1.0
Medium correlation: .3 to .5 or -0.3 to .5
Low correlation: .1 to .3 or -0.1 to -0.3

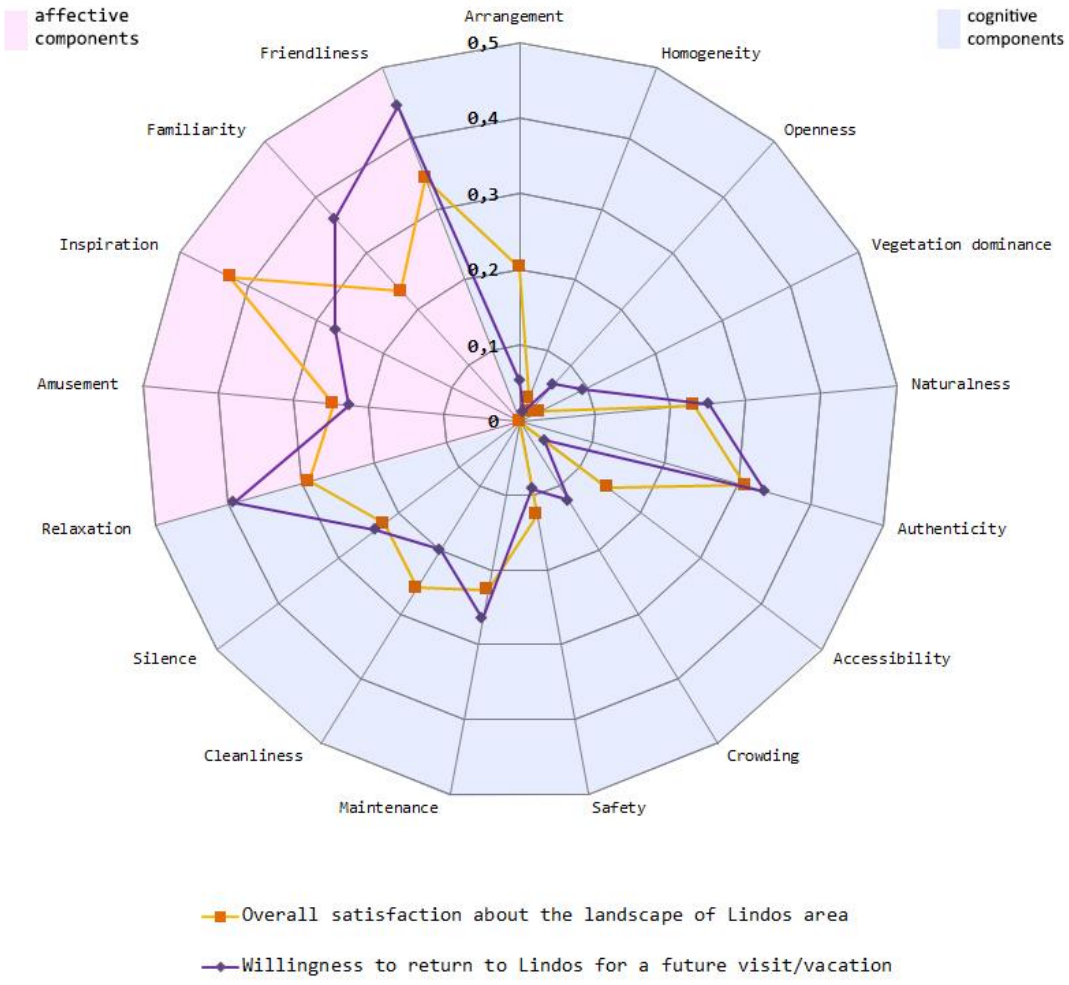
Figure (5.25) Pearson correlation coefficients for each image factor and visitors' attitudes

	Overall satisfaction about the landscape of Lindos area	Willingness to return to Lindos area for a future visit/vacation
Image factors	Pearson Correlation	Pearson Correlation
Calmness	,219**	,354**
Recreation	**,364****	,361**
Security	,149**	,104*
Stewardship	,205**	,128*
Scenery	,033	,007



In order to better understand the influence of the tourism landscape in visitors' attitudes towards the destination, Pearson correlation coefficients have also been used to test the relationship between each of the cognitive and affective landscape component and visitors' attitudes. The outcomes show that generally the affective components of the landscape present higher correlation coefficients than the cognitive components. Specifically, visitors' overall satisfaction is highly and positively correlated with inspiration. The more inspiring is perceived the landscape the more satisfied visitors are about it. Visitors' willingness to return, instead, is highly correlated with relaxation and friendliness and moderately correlated with familiarity. Authenticity is the only cognitive component that presents at least a medium correlation with both variables of visitors' attitudes. The more commercial and fake is perceived the landscape the less satisfied and willing to return the visitors are.

Figure (5.26) Pearson correlation coefficients for each image factor and visitors' attitudes



** crowding and openness are very slightly but negatively correlated with visitors' willingness to return

5.5 Discussion

This empirical study, applied in Lindos area, aimed at exploring the relationships among the different variables composing a conceptual model for the tourism landscape evaluation by its visitors, derived from the literature review and the definition of the theoretical framework of research.

Using this conceptual model into a questionnaire-based survey, the respondents could externalize the images they formed through their own tourism experiences in Lindos

area, simultaneously providing useful information about their personal characteristics and attitudes towards the visited tourism landscape.

The first question that this study attempted to respond is related to the influence of personal factors (socio-demographic characteristics, travel behavior and socio-psychological motivations for tourism landscape experience) on visitors' evaluative perception. The outcomes show that even though there is a general common trend in visitors' evaluative perception of Lindos area, each personal factor significantly affects the evaluation of specific landscape components and consequently generate different overall images. Specifically, travel behavior was demonstrated as an important influencing factor for the evaluation of the affective components of the tourism landscape, while different socio-psychological motivations could also diversify the evaluation of the cognitive components as well. In addition, the evaluative perception of visitors was also notably affected by some of the sociodemographic variables included in the conceptual model, such as region of origin, age and education level.

The second attempt of this study was the unfolding of the variety in visitors' images. This was obtained by trying to statistically underpin visitors' prevailing images of the tourism landscape of Lindos. The outcomes show that the respondents shared three prevailing overall images:

The first image may denote the visitors' discontent as a result of the impacts of the intense tourism flows in Lindos area, as the landscape is perceived as a noisy, distressing and crowded place. This image is mostly formed by external visitors with a short staying in Lindos and who are motivated by the need for an authentic tourism landscape experience that could increase their knowledge and bring them closer to the local culture (venturers).

The second image instead may denote the lack of recreation opportunities through leisure activities in Lindos area. The landscape of Lindos is perceived as boring mostly by external visitors with a short staying in Lindos and whose great need for exciting activities and entertainment (pleasure seekers) could not get met.

The third image may denote that the landscape of Lindos is pleasant for visitors with an extended staying and whose need for relaxation and crowding avoidance (relax seekers) is met because of their particular travel behavior consisting of rare visits around the island and long staying within the accommodation facilities.

Therefore, through the unfolding of the variety in visitors' images formed during their own tourism experience in Lindos area, this study offers a reflection on the general focus on consensus of the perceptual landscape studies which often are characterized by a strong detachment between the landscape experience of the perceiver and the real landscape.

As concerns the tourism landscape, this approach of detachment from visitors' landscape experience could not be adopted. The tourism landscape involves important experiential characteristics that need to be considered in order to understand how people interpret and make sense out of the tourism landscape.

This becomes more obvious when exploring the relationship between images and visitors' attitudes. The outcomes show that the role of the affective components is crucial for determining a positive or less positive attitude towards the destination. The study finds out that a positive evaluation of the affective components of the landscape denotes a higher overall satisfaction about the tourism landscape and a stronger willingness to return for a future visit. The affective components of the tourism landscape, however, cannot be perceived and evaluated without the immediate and somehow extended involvement of the perceiver with the physical landscape.

Visitors' landscape evaluations, or elsewise visitors' on-site formed destination images, besides being useful as providing predictions about visitors' attitudes towards the tourism landscape, they may also provide indications about future scenarios aiming at improving the destination's attractiveness on the basis of different desired targets of visitors. This possibility is discussed in the next chapter (Chapter 6) on the basis of the outcomes of this empirical study integrated with the results of the expert-based approach applied in Lindos area (Chapter 4).

One possible limitation of the study, however, is its very local context of application. Lindos area is a special type of destination that eventually developed different tourism models. Today, as it is one of the most visited places in Rhodes island, Lindos area is visited by numerous types of tourists and therefore their images of Lindos are also very diversified. This fact makes more difficult the generalization of the outcomes of the study. It is considered necessary the replication of the same approach in different case studies with an appropriate comparison of the results.

Another limitation regards the appropriate selection of the landscape components forming the visitors' images. This study included a list of both cognitive and affective components on the basis of literature review. However, before applying a structured (attribute based) methodology, it is considered more suitable to conduct a qualitative

research through which the appropriate landscape components are selected ensuring that also unique attributes of the tourism landscape in question are included.

Nevertheless, the value of this empirical study could be sought in the attempt to combine landscape cognitive attributes, often used in several studies of landscape research, with the tourism destinations' affective attributes in an integrated methodology. The outcomes make emerge new research questions about methodological improvements and further theoretical reflections that are discussed in the next chapter (chapter 6.).

Chapter 6.
An integrated interpretation of research findings

6.1 Integrated conclusions from the empirical study

This research project focused on the analysis and evaluation of multiple aspects of the tourism landscape of Lindos located on the southeastern coast of the island of Rhodes. This geographical area has been chosen because it belongs to a typology of the Aegean coastal landscapes, where the paradox between the changeless image of the morphologically protected traditional settlements and the effective and unavoidable landscape character transition, especially due to tourism development, takes place. Therefore, an empirical study on this area has been considered particularly useful for acquiring knowledge on the dynamics of this typology of landscape which involve particular contextual factors, landscape physiognomic characteristics, as well as tourists' cognitive and affective images.

From the analysis of the contextual factors of the case study, the results show that Lindos area makes part of a territory which has unique natural and cultural characteristics (such as a biodiversity with a great number of endemic species, high luminosity, mild climatic conditions, distinctive Aegean architecture, unique social and historical features etc.), as well as a long tradition as a tourism destination.

The tourism development on the island of Rhodes has been established during the Italian occupation of the Dodecanese islands (1912-1946), with a very well defined strategy which besides the propaganda concerning the publicity of the Italian dominance in the Aegean, consisted in the improvement of the existing tourism attractions of the island (restoration of monuments, developing natural parks, etc.), the creation of new general and tourism specific infrastructure (road network, hotels, tourist establishments etc.), as well as the diversification of tourism offer and the formation of a destination image which both have been based on the exploitation of local natural and cultural resources. During this period, even though tourism accommodations had not been established in Lindos area, the improvement of the road network connecting the city of Rhodes with southern locations, as well as the restoration of the fortifications of the Acropolis of Lindos, constituted the first interventions that transformed Lindos into a tourism attraction.

However, after the reunification of the Dodecanese islands with Greece (1948), and especially after the ‘70s, the tourism form promoted on Rhodes was mass tourism. Mass tourism has been promoted with several directives for multi-storey hotel construction (1966-1970) and a master plan which aimed at concentrating the tourism development in specific tourism zones merely based on the favorable climatic conditions of the NE and NW coasts for seaside tourism, totally neglecting the southern and continental part of the island in terms of development. During the 60’s as regards planning, Lindos area simply remains a tourism attraction without new tourism accommodations, whose attractiveness depends on the presence of the traditional settlement characterized by the typical Aegean architecture, as well as the presence of other single monuments such as post-byzantine churches and the archeological area of the Acropolis. In fact, after the reunification with Greece, in search of a redefinition of the Greek identity of the Dodecanese islands, awareness about the historical value of traditional settlements, as Lindos, is gradually developed at the institutional level. The need for explicitly transmitting the new Greek image of Lindos at the rest of Greece and abroad, involved declarations for the conservation of single monuments (mainly churches and residential architecture), as well as in 1960 the conservation of the whole settlement of Lindos under a legislation which merely aims at a “morphological” conservation and lacking any regulation for the functions of the settlement and land uses. In addition during the 60’s, Lindos was promoted through several movies filmed on Rhodes (such as the Guns of Navarone, in which the guns are placed on the Acropolis of Lindos) and this international fame in the following years transformed Lindos into an idyllic holiday place for artists, musicians and writers who bought and restored a great part of traditional houses of Lindos village. As the socio-economic prosperity of the inhabitants of Lindos was rapidly growing, fishing, grazing and agricultural activities have started to diminish and Lindos village has undergone several transformations in order to respond to the modern standards of living and the growing tourism needs: the cobbled streets of the village has been cemented over, urban green has been planted on the hill of Acropolis, historical villas were transformed to tourist shops and bars, on the streets all signs were in English to accommodate tourists from Britain on cheap package deals, the beaches has been equipped with umbrellas, pedal-boats and snack bars and donkeys have turned into transportation means for guiding tourists from the village to the Acropolis. During the 80’s and the 90’s the growth of tourism on Rhodes was inevitable and tourism activities have also expanded on the southeastern coast without any specific strategy and planning. In Lindos area, tourism accommodations were built where once small agricultural and fishing bases used to be (Pefki and Vlycha), while after 2000, new tourism areas have been created in two zones of restricted development in the valleys close to Lindos village (Krana and Avlonas). Therefore, Lindos, besides a

tourism attraction for daily visitors, today constitutes a tourism destination which offers a considerable number of accommodations. From the analysis of the built uses of Lindos area, the tourism dominance is evident, as 46,5% of the buildings concern tourism accommodations, 33,5% residential buildings and 12,8% commercial (shops, restaurants, bars).

From the application of socio-economic indicators and indicators of tourism carrying capacity with the most recent available data, one can observe that today the socioeconomic function of Lindos is highly depended on tourism. The numerous accommodations (principally of small scale such as rooms and apartments) and other tourism activities (restaurants, tourist shops, etc.) in Lindos manifest the dominance of recreational activities within the total number of economic activities in the area. However, employment seasonality of tourism activities increases unemployment rate, and this can explain the reason for which, in 2001, Lindos presents the highest rate of unemployment on Rhodes which amounts to 40%. Furthermore, in the last decade, Lindos is the area where the population still grows with one of the highest growth rate (14%) on the island and where the initial price (80euro/m^2) of land is the second highest (following the city of Rhodes). Consequently, today the acquisition of properties in Lindos area is addressed to wealthy and principally foreign people (English, Germans and Italians). Furthermore, data show that during the years 2003-2008, Lindos is the area for which the technical office of the Prefecture of Dodecanese has authorized the majority of permissions (30%) for use of second homes (rent for more than one month) by foreign people. The typology of these homes is mostly based on a two-storey house equipped with spacious yard and swimming pool. The phenomenon of the high concentration of swimming pools in Lindos manifests the uncontrolled and continuous adaptation of the territory to mass tourist preferences. Indeed, the remote sensing analysis shows that today, on Rhodes there are around 2.000 swimming pools and one of the biggest water parks of Europe, all distributed along coasts, showing that the swimming pool has become a fundamental component of the tourism landscape on Rhodes. The massive production of swimming pools surrounded by the exotic vegetation of tourism establishments, besides a discourse on the aesthetic quality of tourism landscape which involves the transmission of images without any connection with the physical and socio-cultural context of the island, reflects one of the most significant environmental threats for Rhodes: water exploitation. During the last decades, the increasing needs for water due to mass tourism and rapid population growth has significantly affected the quality of underground water resources of the island. From the estimation of wastewater effluent produced by domestic and recreational uses on Rhodes, the results show that from 1991 to 2011 wastewater effluent has been increased by 24%. Therefore, in order to meet the

long-term water supply needs of the island and especially of the city of Rhodes, a dam of a great reservoir capacity has been built between the local departments of Lindos and Archangelos. The construction of the dam has inevitably provoked a visible transformation of the landscape and it is expected to affect ecological functions and biodiversity, as changes in vegetation may place at risk the birds and animals that depend on it. However, among the major environmental threats for the broader area of Lindos are forest fires. The estimation of burnt areas shows that within the local department of Lindos, although 53% is declared protected natural area (Natura2000 bird directive and wildlife refuges), due to the greatest forest fires of the last 20 years and especially that one in 2008, 63% of protected areas has been burnt (51,4% forests, 34,1% grasslands, 14,5% agricultural land).

At a smaller geographical scale, from the analysis of the capacity of the landscape of Lindos area to provide ecosystem services, based on a detailed map of land uses deliberately prepared, the results show the importance of natural grasslands (covering 50,4% of the area) in ecological integrity and regulating services, as well as the importance of the distribution of complex cultivation patterns (covering 8,7%) in preservation of ecological corridors between the natural areas and the avoidance of further isolation of the peninsulas which are characterized by high biodiversity. The few olive groves (covering 1,4%) are valuable for the landscape as they offer provisioning services, while the coniferous vegetation, merely delimited on the south (in Pefki village), is important in the provision of aesthetic and recreational value. The risks that emerge from this analysis regard the distribution of leisure facilities within the area which gradually create a barrier between the peninsulas and the vast area of grasslands, as the various clusters gradually merge along the main road network which runs parallel to the coast. Moreover, due to the proximity of these clusters of leisure facilities to the shoreline, there is a higher risk of soil erosion in the area.

From the analysis of the intrinsic characteristics of the landscape character of Lindos (geomorphological features, climatic and visibility conditions, vegetation) the results show that Lindos area has a particular scenic quality due to the presence of neotectonic faults which create morphological discontinuities. These discontinuities contribute to a sense of mystery, as while one starts to move on the road network lacks the possibility of having a general overview on Lindos area, and therefore the landscape of Lindos becomes gradually discovered, generating a sense of surprise to the visitor/observer, especially in the locations where the main road intersects a fault. As a matter of fact, from the visibility analysis the results show that the most visible parts of land are very limited on the rocky surfaces of the fault scarps and limestone slopes. However, the geological structure of the area contributes in the vulnerability

of the landscape to a series of geological hazards (such as rock falls, landslides, reactivation of active faults, coastline displacements), of particular importance if we consider the association of geomorphological and historical features (such as the location of the Acropolis on the top of a rocky hill of karstified limestone).

Concluding with the analysis of landscape physiognomic characteristics and the contextual factors that have affected it, all the results mentioned above based on historical, socio-economic, ecological data contribute to formulate an idea about the image of Lindos as seen by the experts. Considering all information and data analyzed, I conclude that Lindos today projects an image of an "abused landscape" (Castiglioni et.al, 2010, p.108). The lack of planning and the uncontrolled tourism development during the last decades, which dominated functions and forms of the landscape, is significantly threatening landscape qualities such as the socio-economic, biological and aesthetic quality.

Generally, the degradation of landscape qualities is expected to affect tourists' experiences and evaluation of a tourism landscape. From the analysis of visitors' images, the results show that three images prevail among the visitors and these images are differentiated on the basis of visitors' personal factors (socio-demographics, travel behavior and socio-psychological motivations). The landscape of Lindos is perceived as more attractive by those who search the secure, relaxing and friendly environment of the tourism accommodations and facilities (relax seekers) and less by those who are motivated by the need of a shorter but more active and participative experience in the tourism landscape (venturers and pleasures seekers). The intense tourism flows in Lindos which create crowding and noise as well as the lack of recreational opportunities that would make visitors more participants in the landscape seem to be the most negative factors influencing the experience of tourists in Lindos area. As regards the reasons for which Lindos might be valuable according to the opinion of tourists, visitors seem to acknowledge more the aesthetically attractive sceneries, the historicity, and the distinctive landscape character while they negatively evaluate the job/investment opportunities provided in Lindos area. The most evident difference between visitors' and experts' acknowledged landscape values concerns the biodiversity value for which the majority of visitors are unaware and uncertain.

6.2 Suggestions for future decision making in Lindos area

From the analysis of the empirical study, I could discern the need for defining a new image for the tourism landscape of Lindos, which should be based on a strategy and

vision about its future evolution, both as an attractive place for tourists and as a place of living quality for its inhabitants.

Over the last decades, the lack of planning, along with a feeble environmental awareness has seriously affected the tourism landscape of Lindos. According to Terkenli and Pavlis (2012), one of the most significant socio-cultural factors at the root of the Greeks' problematic relationship with their landscapes is the lack of a sense of the landscape as a common good. This is also evident in Lindos area, which today istead of being managed as a beneficial resource for the community, appears to be the battlefield where various conflicting interests of local stakeholders develop (tour operators, real estate managers, tourist guides, archeologists, local and foreign shopkeepers, taxi drivers, "donkey drivers" etc.). From my personal experience from the contact I had with the responsible archeologist of the Acropolis of Lindos, I additionally noticed that there is kind of fear of intervention to the dynamics evolving among the stakeholders in Lindos area, as well as an explicit indifference about what tourists might think about the landscape of Lindos and the necessity of research on this topic. Both tourists and landscape are treated as parts of the same mecchanism which produce financial benefits. The presence of historical monuments, the beaches (maintenained clean thanks to a wastewater treatment system) and international fame of Lindos seem to be enough to guaranty the survival of tourism system, refusing to see what have actually changed during the last years. However, private initiatives started to develop new forms of tourism in Lindos such as wedding tourism that may somehow extend tourism seasonality.

For the future evolution of the tourism landscape of Lindos, there is a need for taking decisions concerning the target groups of tourists to attract. From my empirical research, I noticed the importance of travel behavior in the on-site image formation and in tourits' attitudes as well. As it was expected the more the landscape is perceived attractive the more willing tourists are to return to Lindos for a future visit. Taking into consideration tourists' opinions does not mean that the landscape should blindly follow tourist preferences. Instead, unfolding the variety of tourists' images, may contribute to distinguish aspects that should be improved on the basis of their compatibility with experts' knowledge and criteria for sustainable development. In this view, the landscape of Lindos should not be perceived pleasant merely by tourists isolated in a swimming pool behind the fence of their accommodations. This means that following mass tourism preferences, such as increasing the number of swimming pools, cannot be the only strategy to make the tourism landscape more attractive. The tourism landscape of Lindos should also provide favorable conditions for tourists really interested in the landscape to explore it and get informed about it. This involve not only the regulation of crowding (do really all cruise passengers need to be forced by

tour operators to visit Lindos just for few hours?), but also a better stewardship of the natural and agricultural areas (Do all tourists really need to approach beaches by car and to park within olive groves?), the conservation of corridors among the clusters of tourism facilities, as well as the diffusion of the ecological value and natural heritage (what about informing tourists on the presence of Natura2000 site in Lindos and its protected species?).

Furthermore, it is generally accepted that the understanding of the (external/internal) image formation process contributes to improve attractiveness and market competitiveness of tourist destinations. The results of my research show that affective components of image (such as friendliness, familiarity and relaxation) are those that positively affect tourists' willingness to return. Indeed, the hospitality of the inhabitants of Lindos is well-known and there are many small tourism enterprises managed by family members who besides offering tourists their services, they create social and affective connections with them. The loyalty of tourists who participated in my survey seems to be based on these connections. This might offer an indication about the typology of tourism accommodations that are preferred more by tourists in Lindos.

6.3 Research limitations

From this research project, difficulties in the integration of both theoretical and methodological references concerning landscape assessment have been emerged, as this project has required a deep understanding of different "languages" and "values" used in various disciplinary fields, as well as my ability to use diverse research tools and to develop interdisciplinary skills.

A specific limitation of my research regards the limited availability of quantitative data and cartographic material in the appropriate spatial scale and time of reference, which has driven the selection of the indicators to apply and has required the construction of a database which has been a very time-consuming process. Another limitation concerns the selection of landscape cognitive and affective attributes included in the survey. These have been selected on the basis of the existing tourism and landscape literature. However, in order to ensure that all the important cognitive and affective attributes of the tourism landscape of Lindos have been included, qualitative explorative research should have been conducted first.

Lastly, the research project would be particularly enriched if the images of the inhabitants and local stakeholders would have been studied along with the images of tourists as well. Although tourists are the protagonists and fondamental component of

tourism system, in a “democratic” view of the landscape (Castiglioni et.al 2010), it is necessary if not mandatory, to understand if the tourism landscape, besides satisfying tourists’ needs, also corresponds to the needs of the community and if the decision-makers act appropriately to meet the desires and the aspirations of the local people. Therefore, in order to suggest appropriate indications for the future evolution of the tourism landscape of Lindos in view of a coherent decision-making (Ferrario, 2011), different point of views should first emerge in their complexity and variety.

6.4 Theoretical and methodological conclusions

The scientific contribution of this study could be sought in the effort to capture the multifaced nature of the landscape, using it as an integrative concept in order to address a variety of issues related to tourism dynamics on the territory and tourists’ images. The effort of adopting an integrated approach for tourism landscape conceptualization, analysis and evaluation has occurred in various levels. Each of these levels opens new challenges and research questions:

1. Integration of existing knowledge with new knowledge derived from original empirical study.

The decision of using the landscape at the interface of culture and nature, led to the need of deepening a great variety of aspects (historical, geological, environmental, socio-economic, etc.). The objective of this research project to respond to this need has been achieved to a great extent thanks to a considerable number of studies existing in literature on various aspects of the case study. In fact, the island of Rhodes has always attracted the interest of many researchers at national and international level, producing a considerable number of studies. However, the effort to collect knowledge from different studies and integrate them in a single research project has never been attempted. This research project although its limitations, has constituted a struggle for creating a unique database, bringing together as much as information as possible concerning the case study. Collected secondary data and cartographic materials have then processed, in order to make them applicable to the scale of interest, incorporating them as well with the results obtained from original analyses and the empirical study. One of the challenges has been the integrated interpretation of the results. For this reason, in order to facilitate interpretaion and make the results more useful to decision making, another attempt of this study has been the representation of information in thematic maps. Certainly, in order to deepen even more each single aspect analysed in

this study, the formulation of an interdisciplinary group of researchers would be needed.

2.Integration of theoretical concepts and methodologies from various disciplinary fields

The decision of accepting the tangible, intangible and experiential character of the landscape has led to a broad conceptualization of the tourism landscape, that required theoretical and methodological deepening of three different objects of study: the contextual factors of the tourism destination that generate and affect the landscape, the landscape character as results from the combination of its intrinsic qualities with the effects of tourism and other driving forces, as well as the images of tourists formulated during their own experience within the landscape. The first two objects of study which are more related to the tangible nature of the landscape, used research paradigms from spatial sciences, tourism impact studies, landscape ecology, and landscape character assessment, while the third one focusing on its intangible nature used research paradigms from environmental psychology and tourism marketing.

3. Integration of experts' knowlegde and tourists' opinions

Accepting the transactional nature of the landscape, lying between reality and the image of that reality, which is particularly emphasized in the definition of the landscape given by the ELC, has led to the effort to take into consideration both the outcomes of specific experts' based techniques for tourism landscape analysis and evaluation (GIS, remote sensing, land uses classification, application of indicators, etc.) and the tourists' evaluative perception. The outcomes of the expert analyses attempt to reach an evaluation of the reality, using as much "objective" information as possible. The objectivity of an expert evaluation depends on how much explicit the purposes and criteria of the evaluation are. In contrast, tourists' evaluative perceptions formulate images of the reality that are strongly affected by subjective personal factors. Even though there is no reason for comparison between two different matters, as objective and subjective information might be, understanding both has contributed to detect existing and missing linkages between what is acknowledged as real in the tourism landscape and what is actually perceived by people who have a relatively short experience within it.

4. Integration of cognitive and affective components of image

Several studies from tourism disciplines, geographic literature and environmental psychology have proposed that images have cognitive-affective nature. Accepting that the concept of image is composed not only by the individual's cognitive evaluations but also

by their affective evaluations, has led to incorporate into a standardized instrument several cognitive and affective attributes of the tourism landscape as well as to explore the influence of each attribute on tourists' attitudes.

6.5 Towards a successful integration…

In the previous paragraph, I tried to illustrate the various levels on which the concept of integration entailed by "the intrinsic ability of the landscape to create synthesis" (Castiglioni et al., 2015, p. 10) has been challenged in my research project. In this paragraph, I try to answer to the following questions: Where the concept of integration has been challenged more? Is integration among the three objects of study (contextual factors, landscape physiognomic characteristics and images) really possible?

While the integration of the contextual factors that describe the territory of the tourist destination with the character of the landscape have been integrated quite well (the characteristics of the landscape of Lindos have been explained by the history and dynamics of the territory), the problem has been identified in the integration between the physical landscape and mental images of tourists. For the exploration of tourists' images, I have chosen to use paradigms from environmental psychology and tourism marketing by creating a research tool (questionnaire) that could be applied in any tourism landscape. This led me to exclude specific landscape features of Lindos that would have helped me to "geo-reference" the images of tourists. Following these paradigms, in my analysis I have focused much on the characteristics of tourists and on subjective factors that influence their images and less on understanding the landscape features of Lindos as seen by tourists. In other words, the landscape has been used as a means to understand how tourists form their images. The result was to obtain images that describe several qualities of the landscape, but without connections with specific features and places of Lindos. Therefore, in order to display the three prevailing tourists' images of Lindos, I arbitrarily selected some representative photographs expressing the characteristics of tourists' images.

Therefore, in order to better compare the images with the expert-based landscape analysis and to make tourists' images more useful for decision-makers, it is considered necessary to include in the research tool landscape elements that can tie the images with certain places of the case study. Especially as regards affective components, given their particular importance in affecting tourists' attitudes, new empirical studies should define more affective components trying to associate them with physical features of the landscape.

In conclusion, I consider that all the process of knowledge acquisition concerning different aspects of the tourism landscape, as well as the preparation of a consistent database and cartographic material for the case study, constitute just the first but also important steps towards the general and ambitious objective of this study to capture the complex and multifaceted nature of tourism landscapes. After following these first steps of research, an interdisciplinary study of tourism landscapes could be successfully conducted.

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