

Landscape Approaches for Ecosystem Management in Mediterranean Islands

Edited by
Elisabeth Conrad and Louis F. Cassar

Landscape Approaches
for Ecosystem Management
in Mediterranean Islands

Landscape Approaches for Ecosystem Management in Mediterranean Islands

Edited by Elisabeth Conrad and Louis F. Cassar



Maltese National Commission for UNESCO



Institute of Earth Systems
University of Malta

First published in 2012 by
Institute of Earth Systems
University of Malta, Msida, MSD2080, Malta
www.um.edu.mt/ies

Under the patronage of UNESCO
and
with the support of the Maltese National Commission for UNESCO

© Institute of Earth Systems and contributors

All rights reserved. No part of this book may be reprinted or reproduced or utilized in any form or by electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publisher/editors/authors.

The views expressed in this book are solely those of the individual authors, and do not necessarily reflect the views of the editors and/or of the Institute of Earth Systems of the University of Malta and/or the University of Malta. The University of Malta and any of its faculties, institutes, centres and/or subsidiary companies shall not be subject to any liability for the content of the book and/or for the materials, data, facts, information emanating therefrom.

ISBN: 978-99957-812-1-7

Design & Layout by Icon Graphics/DesignTicket.net
Cover design by Icon Graphics
Printed and bound by Progress Press Limited
Cover photos by Louis F. Cassar

Table of Contents

1	Landscape approaches for ecosystem management in Mediterranean Islands: an introduction	
	<i>Elisabeth Conrad and Louis F. Cassar</i>	1
1.1	Exploring the 'magic' of Mediterranean islands.....	1
1.2	Ecosystem management and the landscape approach.....	5
1.3	Aims and scope.....	6

2	Landscape ecology in practice: tools for conservation and management in the Mediterranean	
	<i>Ioannis N. Vogiatzakis and Geoffrey H. Griffiths</i>	11
2.1	Introduction.....	11
2.2	Landscape ecology: concepts.....	12
2.3	Conservation and management at the landscape level.....	12
	2.3.1 Landscape Character Assessment (LCA).....	13
	2.3.2 Quantifying landscape changes.....	14
	2.3.3 Spatially explicit modelling and prioritization.....	14
2.4	Landscape based decision making.....	15
2.5	Conclusion.....	16

3	Rehabilitating Mediterranean island landscapes: the potential contribution of restoration ecology	
	<i>Louis F. Cassar</i>	21
3.1	Introduction.....	21
3.2	Restoration ecology: an overview.....	22
3.3	Planning for restoration: insights from the Mediterranean island of Gozo (Malta).....	24
3.4	Conclusions.....	27

4	Development strategies for smaller island states and territories: an ecological approach	
	<i>Godfrey Baldacchino</i>	31
4.1	Introduction.....	31
4.2	Basket cases of success.....	32
4.3	Two distinct paradigms.....	33
4.4	Economic success.....	36
4.5	Ecological success.....	37

4.6	Trajectories.....	38
4.6.1	Parks and reserves, local elites and private islands.....	38
4.6.2	Beyond democratic governance?.....	39
4.7	Conclusion.....	40
<hr/>		
5	Optimal population density and the sustainability of small island jurisdictions: some considerations	
	<i>Gordon Cordina and Nadia Farrugia</i>	45
5.1	Introduction.....	45
5.2	Literature on conceptual and empirical analyses of optimum population density.....	46
5.2.1	The economic costs of increasing population density.....	47
5.2.2	The environmental and social costs of increasing population density.....	47
5.2.3	Empirical results from the literature.....	48
5.3	A model of the cost of population density.....	49
5.4	Conclusions.....	51
	Appx. 1: Mathematical derivation of the cost behaviour model.....	53
	Appx. 2: Population density in the EU.....	54
<hr/>		
6	Cultural landscapes and landscape change: a case from Turkey - Gökçeada (Imbros) island	
	<i>Işıl Çakıcı, Nur Belkayalı and İlken Tazebay</i>	55
6.1	Introduction.....	55
6.2	The evolution of the concept of cultural landscape.....	55
6.3	Definitional issues: what is a cultural landscape?.....	57
6.4	A changing landscape - why the need to manage change?.....	58
6.4.1	Coherence.....	59
6.4.2	Diversity and identity.....	60
6.5	Gökçeada (Imbros): case study.....	61
6.5.1	Landscape character.....	61
6.5.2	Tourism as a developing sector.....	62
6.5.3	Protected areas.....	62
6.5.4	Landscape change.....	63
6.6	Conclusion.....	63
<hr/>		
7	Implementing ecosystem management in Mediterranean islands: some notes on social capital and public participation	
	<i>Elisabeth Conrad</i>	69
7.1	Introduction.....	69
7.2	Social capital: an overview.....	70
7.3	Social capital and ecosystem management.....	71

7.4	Social capital and Mediterranean islands	73
7.5	Examining the 'functioning' of public participation through a social capital lens.....	74
7.6	Concluding thoughts	77
<hr/>		
8	A political perspective on the management of coastal landscapes in the Mediterranean <i>Salvino Busuttì</i>	83
<hr/>		
9	Improving intelligence: the key to landscape sustainability? <i>Maggie Roe</i>	87
9.1	Introduction.....	87
9.2	Landscape planning, biotope conservation, islands and sustainability.....	88
9.3	Landscape sustainability and the European Landscape Convention (ELC)	90
9.4	Landscape research, knowledge and understanding	91
9.5	Participatory processes and landscape change.....	93
9.6	Developing an intelligence system.....	98
9.7	Climate change as a positive driver in landscape planning in small Mediterranean islands	101
9.8	Cultural landscapes and sustainability.....	102
9.9	Conclusions	103
<hr/>		
10	Landscape - a new area for international cooperation that could benefit the Mediterranean region <i>Adrian Phillips</i>	109
10.1	Landscape - concept and meaning.....	109
10.2	Landscape at the international level.....	110
10.3	The landscape dimension in other areas of international law	110
10.4	Landscape and the World Heritage Convention.....	111
10.5	The emergence of national policy instruments for landscape protection.....	112
10.6	The significance of the European Landscape Convention	122
10.7	Potential application in the Mediterranean region	125
10.8	Conclusion.....	126
<hr/>		
11	The European Landscape Convention: a political project of relevance to Mediterranean Islands <i>Riccardo Priore and Damiano Gallà</i>	129
11.1	The European Landscape Convention: a political project initiated by local and regional authorities.....	129
11.2	Main innovations brought about by the Convention	131
11.3	Main provisions of the Convention.....	132

11.4	From the design stage and establishment phase to concrete implementation.....	134
11.5	Some urgent issues to address when implementing the Convention.....	135
11.6	RECEP-ENELC: an important contribution to international cooperation regarding the Convention.....	139
11.7	Towards the setting up of a pan-European multilevel, multidisciplinary cooperation system dedicated to the Convention.....	143
11.8	A special context for the implementation of the European Landscape Convention in the Euro-Mediterranean area: Mediterranean islands.....	145
<hr/>		
12	Landscapes of tourism in Mediterranean small islands	
	<i>Theano S. Terkenli</i>	151
12.1	Introduction, study context and objectives.....	151
12.2	Landscapes of Mediterranean tourism revisited: a theoretical context.....	152
	12.2.1 Island tourism.....	152
	12.2.2 Tourism and the landscape.....	153
	12.2.3 The Mediterranean setting.....	154
12.3	The Cycladic islands of Greece: a case study.....	156
	12.3.1 Assets and resources over-exploited and/or depleted.....	157
	12.3.2 Problems and challenges so far underrated and/or neglected.....	159
	12.3.3 Under-exploited or ignored potential.....	161
12.4	Concluding remarks.....	163
<hr/>		
13	Evolution and management of landscapes on Mediterranean minor islands: case studies from the Tuscan Archipelago (Italy) and Comino (Malta)	
	<i>Alex Camilleri, Isabella Colombini and Lorenzo Chelazzi</i>	169
13.1	Introduction.....	169
13.2	The Tuscan Archipelago (Arcipelago Toscano).....	169
	13.2.1 Geographical context.....	169
	13.2.2 The origins and geology of the Archipelago.....	170
	13.2.3 Climate and hydrology.....	172
	13.2.4 Floristic aspects.....	172
	13.2.5 Faunistic aspects.....	175
	13.2.6 Human impact.....	176
	13.2.7 Management issues.....	179
13.3	The island of Comino (Kemmuna).....	181
	13.3.1 Geographical context.....	181
	13.3.2 Origins, geology and landform.....	182
	13.3.3 Climate and hydrology.....	184
	13.3.4 Floristic aspects.....	186
	13.3.5 Faunistic aspects.....	189
	13.3.6 Human impact.....	190

	13.3.7 Management issues	194
13.4	Conclusions	196
<hr/>		
14	Some notes on the destruction of Malta's landscape	
	<i>Jeremy Boissevain</i>	205
14.1	Introduction.....	205
14.2	Malta.....	205
14.3	Delayed civic engagement.....	206
14.4	Why is environmental destruction so prevalent in Malta?.....	207
14.5	Defending the landscape.....	210
	14.5.1 The Hilton extension.....	210
	14.5.2 The Munxar leisure complex.....	211
	14.5.3 Tuna farming.....	212
	14.5.4 The Verdala golf course.....	212
14.6	Discussion.....	214
<hr/>		
15	Olive multifunctional landscapes in Cyprus: sustainable planning of Mediterranean rural heritage	
	<i>Jala Makhzoumi</i>	219
15.1	Background.....	219
15.2	Traditional olive landscapes: North Cyprus case study	221
15.3	The extent of olive cultivation	223
15.4	Characterizing olive tree multifunctional landscapes.....	225
15.5	Threats to olive multifunctional landscapes in North Cyprus	228
15.6	Reconfiguring olive landscapes: strategies for sustainable future development.....	230
15.7	Olive tree landscapes as Mediterranean rural heritage	232
<hr/>		
16	Sustainability indicators in the Mediterranean: a tale of two islands	
	<i>Stephen Morse</i>	235
16.1	Introduction.....	235
16.2	The best of times.....	237
16.3	The worst of times.....	239
16.4	Discussion.....	245
<hr/>		
17	Future trajectories for mediterranean islands: concluding thoughts	
	<i>Elisabeth Conrad and Louis F. Cassar</i>	249
<hr/>		
	About the Authors	255

List of Tables

Table 1.1

Characteristics of the major Mediterranean islands.

Table 1.2

Characterizing features of ecosystem management, as compared to traditional management.

Table 3.1

Ecological concepts relevant to, and embedded in, restoration practice.

Table 4.1

Comparing population densities: continents versus islands.

Table 4.2

General characteristics of economic and ecological development.

Table 7.1

Core values of public participation.

Table 9.1

Stages in the intelligence process.

Table 10.1

World Heritage Sites in the Mediterranean region.

Table 10.2

The status of the ELC among States of the Council of Europe (January 2012).

Table 13.1

Data about the main islands of the Tuscan Archipelago.

Table 15.1

A summary of the characteristics of olive plantations in North Cyprus, based on the findings of the field survey.

Table 16.1

Islands of the Mediterranean, ranked in terms of population density.

Table 16.2

Data employed in the calculation of the HPI for Malta and Cyprus.

List of Figures

Figure 5.1
Per capita costs at different population densities.

Figure 5.2
Changes in per capita costs at different population densities.

Figure 7.1
Levels of social capital.

Figure 9.1
The multi-dimensional nature of landscape.

Figure 9.2
The Intelligence Cycle.

Figure 9.3
Ahern's framework method for sustainable landscape ecological planning.

Figure 13.1
Tuscan Archipelago: present-day dry land (dark grey), and extent of Würm landmasses (areas delimited by present 100 m bathymetric contour, light grey).

Figure 13.2
Species number of vascular plants in the minor islands of the Tuscan archipelago, compared to those of Sardegna island and of the Pisa province.

Figure 15.1
Cyprus location map.

Figure 15.2
Management of olive landscapes, Cyprus.

Figure 15.3
Olive trees estimated several hundred years old (Cyprus).

Figure 15.4
The piecemeal destruction of olive orchards in the Kyrenia coastal plain (Cyprus) to accommodate suburban development.

Figure 16.1
Some major Mediterranean islands.

Figure 16.2
GDP/capita of 'Euroland' countries

Figure 16.3
The Human Development Index for Malta and Cyprus form 1990 to 2007/08.

Figure 16.4
The HDI components for Malta and Cyprus (1990 to 2007/08).

List of Plates

Plate 3.1

Map showing spatial relationship between ecological assets and agricultural abandonment/disturbed ground in Gozo.

Plate 6.1

Location map of Gökçeada (Turkey).

Plate 6.2

Views from Tepeköy village (Turkey).

Plate 6.3

Views from Kaleköy (Turkey).

Plate 12.1

Organized tourism beach on Mykonos, Greece.

Plate 12.2

The little fishing port of Skala Symkamnias in Lesvos, Greece.

Plate 12.3

The port city of Mytilini, Lesvos, Greece.

Plate 12.4

The village and small port of Koufonissia, Greece.

Plate 12.5

Barren rural land on Lesvos, Greece.

Plate 12.6

View over the caldera, Oia, Santorini, Greece.

Plate 13.1

View of the new beach at Cala Maestra on the island of Montecristo that originated from the flash flood of 1992 (Tuscan Archipelago).

Plate 13.2

Ailanthus altissima and *Capra aegagrus hircus* as examples of invasive species introduced by man on Montecristo island (Tuscan Archipelago).

Plate 13.3

Giglio island: view of the Faro delle Vaccarecce with allochthonous pine wood plantation (*Pinus pinea*) (Tuscan Archipelago).

Plate 13.4

Montecristo island: ruins of the monastery of S. Mammiliano with *Cistus monspeliensis* (Tuscan Archipelago).

Plate 13.5

Pianosa island: Podere del Marchese built in 1930 and used as convalescent hospital for prisoners.

Plate 13.6

Giglio island: view of the cultivations and terrace-cultivations of vines (Tuscan Archipelago).

Plate 13.7

Il-Bejta tal-Fenek (foreground) with Bejn il-Kmiemem ('Blue Lagoon') and Cominotto in the background (Comino).

Plate 13.8

Garrigue landscape overlooking the western coast near Bejn il-Kmiemem (Comino).

Plate 13.9

The old chapel of Santa Marija, with the heavily degraded saline marshland in the foreground (Comino).

Plate 13.10

Torre di Santa Maria, built in 1618 to defend the island's most strategic points (Comino).

Plate 13.11

Il-Palazz, constructed in the 17th century and extended in the early 20th century (Comino).

Plate 15.1

Field study samples distributed according to the three administrative divisions of Nicosia, Kyrenia and Famagusta (Cyprus).

Plate 15.2

Spatial distribution of olive trees according to the three administrative regions and smaller administrative divisions (Cyprus).

Plate 15.3

Spatial distribution of olive production in North Cyprus (tonnes) according to administrative divisions.

Plate 15.4

Olive landscapes in the upper foothills alongside the forest (Cyprus).

Plate 15.5

Olive landscapes in the vicinity of villages (Cyprus).

Plate 15.6

Olive landscapes in ravines (Cyprus).

Plate 15.7

Integrating olive landscapes into contemporary development ensures local distinctiveness while protecting olive cultural landscape - the Dik Burun Tourist Project along Cyprus' north coast.

List of Acronyms

AD

Alternattiva Demokratika (Maltese green political party)

BIE

Background Tourism Elements

CAMP

Coastal Area Management Programme

CAP

Common Agricultural Policy

CIVILSCAPE

Non-Governmental Organizations for the European Landscape Convention

CLRAE

Congress of Local and Regional Authorities (Council of Europe)

CoP

Conference of the Parties

CPD

Continuous Professional Development

EDF

European Development Fund

EIA

Environmental Impact Assessment

EIS

Environmental Impact Statement

ELC

European Landscape Convention

ENGO

Environmental Non-Governmental Organization

ENPI

European Neighbourhood and Partnership Instrument

EPI

Environmental Performance Index

ESDP

European Spatial Development Perspective

ESI

Environmental Sustainability Index

EU

European Union

EVI
Environmental Vulnerability Index

GDP
Gross Domestic Product

GIS
Geographical Information Systems

GNI
Gross National Income

GNP
Gross National Product

GRP
Gross Regional Product

HDI
Human Development Index

HPI
Happy Planet Index

IAP2
International Association for Public Participation

ICAM
Integrated Coastal Area Management

ICARDA
International Centre for Agricultural Research in
Dry Areas

ICARM
Integrated Coastal Area and River Basin
Management

ICCAT
International Tuna Conservation Commission

ICZM
Integrated Coastal Zone Management

IUCN
International Union for the Conservation of
Nature

LCA
Landscape Character Assessment

m.a.s.l.
Metres above sea level

MEDA
Mediterranean Economic Development Area

MEPA
Malta Environment and Planning Authority

NGO
Non-Governmental Organization

PA
Planning Authority

PEBLDS

Pan-European Biological and Landscape
Diversity Strategy

PLA

Participatory Learning and Action

PSIR

Pressure- State-Impact-Response

RECEP-ENELC

European Network of Local and Regional
Authorities for the Implementation of the
European Landscape Convention

RSPB

Royal Society for the Protection of Birds

SI

Sustainability Indicator

SOPAC

South Pacific Applied Geoscience Commission

SSCN

Society for the Study and Conservation of Nature

TRNC

Turkish Republic of Northern Cyprus

UNDP

United Nations Development Programme

UNEP

United Nations Environment Programme

UNESCO

United Nations Educational, Scientific and
Cultural Organization

UNISCAPE

European Network of Universities for the
Implementation of the European Landscape
Convention

WCPA

World Commission on Protected Areas

WHL

World Heritage List

WHS

World Heritage Sites

Acknowledgments

This publication was made possible through the financial support of the Maltese National Commission for UNESCO. In this regard, we would like to thank Professor Charles J. Farrugia, outgoing Chairman of the Commission, as well as all its other members. We also take this opportunity to welcome Professor Henry Frendo, newly appointed Chairman of the Commission, and to wish him success during his tenure.

We are deeply indebted to the various authors who have provided chapters for this publication. They have not only willingly shared their expertise and experiences through their contributions, but have also been very patient and supportive in awaiting this final product, which has been a long time in the making.

We are very grateful to other members of staff of the Institute of Earth Systems, notably Ms. Michelle Cassar and Ms. Dorianne Cortis, for useful support with editing tasks. We are also indebted to Mr. Herbert Conrad for careful proofreading. Furthermore, thanks are due to Mr. Guido Bonett for providing some of the photographs used in this volume.

Last but certainly not least, we are very grateful to Mr. Gabriel Bajada and Mr. Mario Borg, who were responsible for the design and layout of this book.

We also thank anyone whose contribution we may have overlooked in this note.

CHAPTER 1

Landscape approaches for ecosystem management in Mediterranean Islands: an introduction

Elisabeth Conrad and Louis F. Cassar

"...the island sloped gently down, blurred with the silver and green iridescence of olives, with here and there an admonishing finger of black cypress against the sky. The shallow sea in the bays was butterfly blue, and even above the sound of the ship's engines we could hear, faintly ringing from the shore like a chorus of tiny voices, the shrill, triumphant cries of the cicadas... We sped down a white road covered in a thick layer of silky dust that rose in a boiling cloud behind us, a road lined with prickly pears like a fence of green plates each cleverly balanced on another's edges, and splashed with knobs of scarlet fruit. We passed vineyards where the tiny, stunted vines were laced in green leaves, olive-groves where the pitted trunks made a hundred astonished faces at us out of the gloom of their own shadow... Gradually, the magic of the island settled over us as gently and clingingly as pollen."

Gerald Durrell: *My Family and Other Animals*
(1956)

1.1 Exploring the 'magic' of Mediterranean islands

Gerald Durrell's idyllic work, *My Family and Other Animals*, recounts the author's boyhood adventures on the Greek island of Corfu, experiences which he declared to have positively shaped his life – "if I had the craft of Merlin, I would give every child the

gift of my childhood". The descriptions given in the extracts quoted above, will certainly resonate with anyone who has lived in or visited any of the approximately 5,000 islands scattered across the Mediterranean Sea, and that is because these Mediterranean islands have a distinctive character all unto themselves. Whether large (such as Sicily and Sardinia) or small (such as Lampedusa and Avşa), whether independent states (such as Malta and Cyprus) or forming part of a larger mainland country (such as Rhodes, Ibiza and Corsica), whether densely populated (such as Ischia and Malta) or devoid of significant demographic pressures (such as Saria and Kyra Panagia), all Mediterranean islands share common traits in their identity, even if each has its own individuality – indeed, "all Mediterranean islands resemble each other; each island is different in its own way" (Vogiatzakis et al., 2008: 3).

As *Mediterranean* entities, they share various characteristics with the countries of the Mediterranean Sea's northern and southern shores, common aspects which define the nebulous but powerful concept of *Mediterraneanism* (King, 1997). These include, for instance, the distinctive climate, with hot, dry summers and mild winters, and long hours of sunshine which endow the land with a luminosity that sets landscape features in sharp relief. It is a seemingly hospitable climate,

but the hazards associated with summer drought and aridity are never distant, and seasonal cycles are often punctuated by occasional bouts of torrential rain, frequently resulting in flash floods, which can wreak havoc on the fragile and erodible land surface (Perry, 1997). Another unifying hallmark is the Mediterranean suite of flora, both native and archaeophytic, including species which are now almost synonymous with the region – these include the olive (*Olea europaea*), Holm oak (*Quercus ilex*), lentisk (*Pistacia lentiscus*) and Aleppo pine (*Pinus halepensis*), amongst several others (Allen, 2001). Then there is the turbulent history of trade, commerce and migration, but also warfare and piracy, that forged a common character to the civilizations living around this ‘great sea’ (Abulafia, 2011). What Mediterranean territories also have in common is a long history of human interaction with nature – there are few, if any, areas in the Mediterranean that have not been impacted by anthropogenic activity since antiquity, and as a result, much of what we today perceive as ‘nature’ is semi-natural at best (Allen, 2001; Cassar, 2010). There is hardly ever a sharp divide between what is natural and what is rural, with the two often merging into each other almost imperceptibly; perhaps all of the landscapes of the Mediterranean can truly be regarded as cultural landscapes, shaped or influenced by man.

Equally, Mediterranean islands share several traits with other islands worldwide, fundamental characteristics which shape the complex identity of these geographical spaces. Insularity is often seen to equate to “(physical) isolation, solitude, containment, boundedness and closure, all traceable to a perception of islands as strictly circumscribed units” (Boomert & Bright, 2007: 3). The associated implications are often that islands are disadvantaged environments – with, for example, a restricted usable land area, limited water supplies, restricted sources of energy, limited fishery resources, small markets, dependence on

imports, diseconomies of scale, a limited capacity to influence trade conditions, high vulnerability to a variety of natural hazards, and generally facing higher costs of sea and air transport (Lewis, 2001; Briguglio, 2003; EESC, 2003) – but this is what Baldacchino (2007: 14) terms as the “deficit” model, representing islands in terms of what they don’t have, rather than what they do – and there is plenty of the latter. Amongst the unique qualities of islands are their biotic richness and endemism, their cultural specificities and linguistic nuances, their innovative governance practices and pseudo-development strategies (Baldacchino, 1993; Baldacchino 2007), and the tenacious nature and canny resilience of island societies, which allows the quality of ‘islandness’ to “maintain island communities, in spite of daunting economic pressures to abandon them” (Conkling, 2007: 191).

Notwithstanding these commonalities, Mediterranean islands retain a distinct identity that is all their own, derived from several factors. First, Mediterranean islands are very much an interface. The Mediterranean region has long had a reputation as a ‘melting pot’, lying at the intersection of three continents – Africa, Europe and Asia – and bringing together three major world religions – Christianity, Islam and Judaism – with the Sea as a shared common (albeit regularly contested) space. Mediterranean islands find themselves in this ‘middle ground’, influenced by the different cultural influences of neighbouring shores. Second, Mediterranean islands are defined by their strong link with the Mediterranean Sea. This association is present throughout the Mediterranean coastal regions, but is understandably more marked and pervasive on islands, where the sea plays an integral role in shaping the identity of islanders, and provides both resources - including a material context for developing a tourism economy - as well as a means of communication and interaction with the world ‘outside’. Somewhat paradoxically, the sea plays a dual role - an isolating medium, on the one hand,

Island	Country	Size (km ²)	All-year-round resident population	Density (inhab/km ²)
Sicily	Italy	25,711	5,051,000	196
Sardinia	Italy	24,090	1,675,000	70
Cyprus	Cyprus (island state)	9,241	892,000	97
Corsica	France	8,681	302,000	35
Crete	Greece	8,261	621,000	75
Mallorca	Spain	3,640	860,000	236
Malta	Malta (island state)	247	383,000	1,551

Table 1.1: Characteristics of the major Mediterranean islands.

Source: After Vogiatzakis *et al.*, 2008

and a connecting medium, on the other. A third defining factor is the social, cultural and political history of Mediterranean islands. In his seminal work on the region, Braudel (1949: 154) notes that Mediterranean islands “are more important than is generally supposed... their external role, the role they have played in the forefront of history, far exceeds what might be expected from such poor territories. The events of history often lead to the islands”. Due to their strategic positions, many Mediterranean islands were sought-after territories, considered to be worthy conquests; as a result, many of these passed from ruler to ruler in rapid succession. The repercussions of foreign rule for island territories have been mixed, with both positive and negative dimensions. However, this enduring relationship between Mediterranean islands and mainland powers, and the role of Mediterranean islands as players (or pawns) in international politics both persist, in varying forms, to this day – and shape the particularities and peculiarities of island societies.

The distinct character of Mediterranean islands also stems from their ecological qualities. The Mediterranean is one of the world’s biodiversity hotspots, those regions on Earth characterized by two

traits – extremely high value for global biodiversity because of high levels of endemism, but also facing significant threat (Myers *et al.*, 2000). Islands certainly lie at the geographical and substantive heart of the Mediterranean hotspot, in part due to a third distinctive trait, i.e. their unique biogeographical history. The Mediterranean region has been highly active tectonically, with concomitant but independent episodes of glaciations (corresponding to major regressions and intervening interglacials), resulting in sea level fluctuations over geological time. As a result, many islands have alternated between periods of isolation and periods in which they were connected to the mainland. This allowed mainland species to migrate to island territories, where they subsequently became isolated following sea level rise, isolation which allowed the evolution of distinct species (Hunt, 1997; Hunt & Schembri, 1999; Cassar *et al.*, 2008) and particularly endemics, species which evolved nowhere else in the world. Not surprisingly, many Mediterranean islands thus also play a unique role as biodiversity refugia, in particular for relict species.

There is a danger, however, in overly romanticizing the situation of Mediterranean islands. Whilst these

are undoubtedly attractive places (particularly to short-term visitors), the reality of insularity brings with it many challenges. Many islands in the Mediterranean lack significant natural resources (unless one considers the climate and the sea), and struggle to accommodate multiple land use demands on a limited land area, particularly given high population pressure. Islands which form part of larger states also face disadvantages as a consequence of their isolation from the mainland, with islanders often having to deal with greater distances and more difficult access to several services (including education, health care, social and government services, etc.). Social dynamics also come into play, particularly in relation to demographics and out-migration. There are two extremes. On the one hand, there are densely populated islands, such as Malta, which to a degree struggle to accommodate a human population that is disproportionately large as compared to the actual land area available. On the other, there are islands where depopulation is a major concern, particularly as younger generations opt for an 'easier' and more financially secure life on the mainland.

The present day reality of Mediterranean islands may therefore be a little distant from Durrell's idealized picture. On some islands, you are more likely to hear cars and human bustle, than cicadas and bush crickets. Too many cypress trees and olives have fallen victim to expanding agricultural and urban footprints. Not even Durrell's butterfly blue sea is safe from anthropogenic pollution and overfishing. Blue Plan's review of the state of the Mediterranean (Benoit & Comeau, 2005) makes sobering reading, with a long list of 'issues': widespread environmental degradation, freshwater stresses, marine pollution, excessive waste generation, social and political conflicts, and continuing poverty, amongst many others. The predominant trend towards urbanization in the Mediterranean also emerges clearly – "*some 380 million inhabitants [of the Mediterranean region] or 80% of the population, are soon expected to be living*

in and around cities" (Benoit & Comeau, 2005: 199). This raises a question as to the future of these islands. On the one hand, how will islands experiencing this trend deal with the added stresses of urbanization, when their situation is already strained? On the other hand, how will rural islands fare in this scenario, as they are arguably 'left behind' in this move towards the cities?

Additional questions are raised by recent developments in the Mediterranean Basin. This past year (2011) has seen severe economic crises on the northern shore (notably in Portugal, Spain, Italy and Greece), with attendant social and political impacts which have left few citizens unaffected. Conversely, the southern shore has been experiencing an uneasy *renaissance* – a sudden political awakening that has rippled through the Arab world, as the populations of these states demand democratic governments to replace the dictatorships which have dominated their recent history. It is too early to tell what the outcome of these movements will be, but what is certain is that the 'foundations' of Mediterranean identity and the stereotypical perception of a strong, European northern shore versus an economically weak, politically marginalized southern shore, are in flux. These stereotypes are also being eroded by cross-Mediterranean flows of people, which are in turn further complicated by population growth and ageing trends on southern/eastern and northern shores respectively.

What does the future of Mediterranean islands look like in these circumstances? It is uncertain, challenging, but certainly not all bleak. If there is one trait that characterizes island societies, it is the capacity for innovative thinking. Also, whilst humankind has certainly made many dubious decisions where sustainability is concerned, it is also in 'people' that there is the potential to find solutions and remedies. Islands, as microcosms of the larger world, may not be a bad place to start looking for workable solutions to the dilemmas we face.

Traditional management	Ecosystem management
Emphasis on commodities and natural resource extraction	Emphasis on balance between commodities, amenities and ecological integrity
Equilibrium perspective; stability; climax communities	Nonequilibrium perspectives; dynamics and resiliency; shifting mosaics
Reductionism; site specificity	Holism; contextual view
Predictability and control	Uncertainty and flexibility
Solutions developed by resource management agencies	Solutions developed through discussions among all stakeholders
Confrontation; single-issue polarization; public as adversary	Consensus building; multiple issues; partnerships

Table 1.2: Characterizing features of ecosystem management, as compared to traditional management.

Source: Meffe et al., 2002

1.2 Ecosystem management and the landscape approach

In this publication, we focus on two related approaches that have much potential to guide the future development of Mediterranean islands, namely (i) ecosystem management, and (ii) landscape perspectives. Ecosystem management is an approach born of the lessons learnt in natural resource management. It was not *"a sudden revolution... but a slow evolution, one that has built upon decades of experience of thousands of individuals"* (Meffe et al., 2002: 58). On the basis of an enhanced understanding of how ecosystems operate, the ecosystem approach advocates an expansion in the scope and philosophy of resource management issues. Table 1.2 briefly summarizes some of the traits of this new approach. Most notably, ecosystem management recognizes and embraces the complexity and diversity of the natural world, acknowledging that this does not exist in isolation from the human context, but that the two are very much interlinked and intertwined. A successful management approach therefore cannot focus solely on nature, but must look at

natural assets within a holistic context that includes all relevant considerations and stakeholders. Ecosystem management also injects a strong dose of humility into professional spheres, based on the recognition that ecosystems do not necessarily work in the way we think they will. The natural world is fundamentally dynamic, often with non-equilibrium dynamics and elements of 'chaos', and the only effective management approach will thus be one which embraces this uncertainty and adopts an adaptive learning strategy.

How is ecosystem management relevant to Mediterranean islands? As noted above, many of the islands harbour an important biota, and one that is under very high levels of threat. Protectionist approaches (i.e. legislating in favour of specific species or habitats) have been present for a while in many islands, yet they have failed to stem the trends of biodiversity loss. At the same time, there is often a prevalent perception that biodiversity conservation is 'against' economic development, that the two are mutually exclusive and contradictory, or that the conservation lobby is a constraint to be overcome in reaching socio-economic targets.

Ecosystem management provides an alternative option. By focusing holistically on three contexts – the ecological, socioeconomic and institutional – it links the ‘conservation’ debate directly with islanders’ concerns about their socio-economic wellbeing. In this perspective, biodiversity can become an economic resource and a fundamental component of social and cultural identity, rather than merely a passive presence or, worse, an ‘obstacle’ on the path to better livelihoods.

Landscapes are a recurring theme in ecosystem management, and have also increasingly become the focus of attention in other spheres. Most significantly perhaps, the European Landscape Convention (Council of Europe, 2000) now actively promotes the protection, planning and management of European landscapes, emphasizing that these are an important component of local cultural identity, an irreplaceable resource which plays a key role in ensuring an adequate quality of life for local citizens. Landscapes also make sense as a suitable manageable scale for ‘doing’ ecology. Unlike site-based approaches, which often draw arbitrary boundaries around an area of interest, a landscape is, by definition, all-encompassing, incorporating geological, geomorphological, biological and anthropic influences, and arguably presenting a more complete picture. Landscapes thus dovetail perfectly with ecosystem management – where the latter advocates a holistic approach which includes all relevant concerns and stakeholders in a broad, integrative management framework, landscapes present an appropriate scale and medium for conducting such management. Landscapes also have the strength of being dynamic interfaces (Palang & Fry, 2003) and emotional geographies (Stratford, 2008), bringing together nature, people, past, present, tangible and intangible elements (Phillips, 2005) – in short, being a unit of ‘place’ in its broadest sense, rather than merely ‘place components’.

The Mediterranean makes the case perfectly for a focus on the landscape scale. As Lawrence Durrell

notes, the Mediterranean region is “*landscape-dominated; its people are simply the landscape-wishes of the earth sharing their particularities with the wine and the food, the sunlight and the sea...the familiar prospects of vines, olives, cypresses...the odour of thyme bruised by the hoof of the sheep on the sun-drunk hills*”. The management of Mediterranean islands has to take into account all that feeds into their identity – this is more than just ecosystems, artisanal crafts, cuisine or visual panoramas. It is the entirety of a place, all that contributes to an island’s particular feel. Landscape in this understanding is more than just a visual picture. It is an experience felt by all the senses, a two-way interaction between person and place (Phillips, 2005). It is perhaps a lack of appreciation of landscape that has jeopardized the essence of ‘Mediterraneanism’ in places. A case in point are the various coastal resorts, designed to a homogeneous brief which obliterates any association with local identity – the same hotel could as easily be located in London, as in Tunisia, Crete or Sicily! In the case of Mediterranean islands, this is more than just an academic rant for preserving character – for islands that depend so crucially on tourism, the destruction of place identity is very much a case of killing the goose that lays the golden egg.

1.3 Aims and scope

This book presents a series of essays, drawing on the twin concepts of ecosystem management and landscape approaches, to elucidate and reflect on the present situation and future evolution of Mediterranean islands. This publication brings together contributions from Mediterranean individuals, non-Mediterranean individuals, islanders and non-islanders – there is, after all, no geographical limit on who and what we can learn from. The essays presented here each contribute a specific perspective on the future evolution of Mediterranean islands.

Following this introductory chapter, the first section of the book focuses on the contributions that can be made by the discipline of landscape ecology. Ioannis Vogiatzakis and Geoffrey Griffiths first explain the concepts and relevance of landscape ecology, also presenting and discussing a range of applied tools that can facilitate landscape planning in Mediterranean Islands. Louis F. Cassar then reviews the 'offshoot' discipline of restoration ecology, making a strong case for offsetting the environmental damage inflicted on natural ecosystems over millennia of human occupation, with constructive efforts to effectively restore and/or rehabilitate ecosystems.

The two following chapters bring the socio-economic dimension into the discussion. Godfrey Baldacchino first presents two contrasting paradigms for the development of island territories, reviewing the dual influences of ecological and economic factors, and exploring ways in which the two can be brought together in successful development strategies. Gordon Cordina and Nadia Farrugia then address the demographic dimension of development, presenting a model to explain the economic costs of high population densities on islands.

The third block of chapters expands on the relevance of social and cultural dynamics to the management of Mediterranean Islands. Işıl Çakıcı, Nur Belkayalı and İlksen Tazebay explain the evolution of the concept of a 'cultural landscape', focusing on the challenges of managing change in landscapes with strong heritage values. The chapter concludes with a case study on the Turkish island of Gökçeada (Imbros), which is experiencing major challenges in balancing the conservation of a cultural landscape on the one hand, and the management of inevitable change, on the other. Elisabeth Conrad then discusses the role of social capital in managing the landscape resources of Mediterranean islands, reviewing the potential for

this intangible social fabric to facilitate or impede the sustainable evolution of island territories.

The fourth section includes four chapters, each of which addresses a different aspect relevant to policy development and implementation in Mediterranean islands. Salvino Busuttil presents an essay outlining the political influences on the management of coastal landscapes, the latter so relevant to Mediterranean island territories. The essay derives from the author's professional experience in various policy-related institutions for environmental management within the Mediterranean region. Maggie Roe then reflects on issues of landscape sustainability, focusing on the neglected aspect of intelligence. She discusses ways in which landscape research, knowledge and understanding can feed directly into frameworks for 'sustainable' landscape planning. In the subsequent chapter, Adrian Phillips takes from his substantial experience with international landscape policy, reviewing the gradual emergence of international and national landscape 'tools', to draw out lessons for application in Mediterranean islands. In the final chapter of this section, Riccardo Priore and Damiano Gallà present a comprehensive discussion of the European Landscape Convention, the first international instrument to focus exclusively on landscape. The authors explain the innovative character of this convention, and discuss its potential implementation in Mediterranean islands.

The publication concludes with a series of case studies, highlighting specific constraints, experiences and opportunities in different Mediterranean islands. Theano Terkenli explores the landscapes of tourism in Mediterranean islands – perhaps no other industry has played such a fundamental role in shaping the evolution of Mediterranean landscapes in recent years. The author reviews the theoretical relationship between landscape and tourism across Mediterranean

islands, before focusing on the specific case of the Greek Cycladic islands. In the following chapter, Alex Camilleri, Isabella Colombini and Lorenzo Chelazzi present an in-depth review of the context and challenges being faced on a number of minor Mediterranean islands, namely those of the Tuscan archipelago (Elba, Giglio¹, Capraia, Montecristo, Pianosa, Gorgona and Gianutri), and Comino, the latter forming part of the Maltese archipelago. The comparison between these various islands enables an appreciation of both commonalities across these islands, as well as considerations that are specific to the context of each individual island. Jeremy Boissevain then adopts an anthropological lens to review the cautionary tale of landscape change in Malta, exploring underlying causes of landscape destruction and limited civil engagement. In the subsequent chapter, Jala Makhzoumi outlines the richness of Mediterranean islands' rural landscapes, focusing on olive landscapes in Cyprus. Her research demonstrates the economic and ecological robustness of various olive cultivation practices, and whilst warning of several threats to such sustainable regimes, she outlines strategies for reconfiguring our approach to rural heritage, in order to integrate such assets into sustainable development strategies. Finally, Stephen Morse concludes the section with an evaluation of sustainable development indicators, and the contribution that these can make towards enhancing the management of Mediterranean island territories. He illustrates his arguments with reference to the two island states of Malta and Cyprus.

for ecosystem management and sustainable development in Mediterranean Islands. We truly hope that this publication makes some contribution towards safeguarding the 'magic' of Mediterranean islands, whilst embracing their dynamic characteristics.

To conclude, in the final chapter of this publication, we review key insights emerging from the various chapters, and summarize considerations

1 The tiny island of Giglio made world headlines recently, when the cruise ship Costa Concordia ran aground just offshore. At the time of going to print, attempts to salvage the vessel were underway.

Acknowledgments

The authors are grateful to Godfrey Baldacchino for thorough review of an earlier draft.

References

- Abulafia, D., 2011. *The Great Sea: A human history of the Mediterranean*. Oxford: Oxford University Press.
- Allen, H.D., 2001. *Mediterranean Ecogeography*. Essex: Pearson Education Limited.
- Baldacchino, G., 1993. Bursting the Bubble: the pseudo-development strategies of microstates. *Development and Change*, 24(1), pp.29-51.
- Baldacchino, G., 2007. Introducing a world of islands. In: G. Baldacchino, ed. *A World of Islands*. Charlottetown: Institute of Island Studies, University of Prince Edward Island, pp.1-29.
- Braudel, F., 1949/1995. *La Méditerranée et le Monde Méditerranéen à l'Epoque de Philippe II*. California: University of California Press.
- Benoit, G. & Comeau, A., 2005. *A sustainable future for the Mediterranean: The Blue Plan's Environment & Development Outlook*. London: Earthscan.
- Boomert, A. & Bright, A.J., 2007. Island archaeology: in search of a new horizon. *Island Studies Journal*, 2(1), pp.3-26.
- Briguglio, L., 2003. The Vulnerability Index and Small Island Developing States: a review of conceptual and methodological issues. Paper prepared for the AIMS Regional Preparatory Meeting on the BPOA+10 Review, 1-5 September 2003, Praia, Cape Verde.
- Cassar, L.F., 2010. *A Landscape Approach to Conservation: integrating ecological sciences and participatory methods*. Msida: Institute of Earth Systems, University of Malta/UNESCO.
- Cassar, L.F., Conrad, E. & Schembri, P.J., 2008. The Maltese Archipelago. In: I.N. Vogiatzakis,

- A.M. Mannion & G. Pungetti, eds. *Mediterranean Island Landscapes: Natural and Cultural Approaches*. Dordrecht: Springer, pp.297-322.
- Conkling, P., 2007. On islanders and islandness. *The Geographical Review*, 97(2), pp.191-201.
- Council of Europe, 2000. *European Landscape Convention*. European Treaty Series No. 176. Florence: Council of Europe.
- Durrell, G., 1956. *My family and other animals*. London: Rupert Hart-Davis.
- Durrell, L., 1969. *Spirit of Place: Mediterranean writings*. London: Faber and Faber.
- EESC (European Economic and Social Committee), 2003. *Trans-European Networks and Islands*. Luxembourg: Office for Official Publications of the European Communities.
- Hunt, C.O., 1997. Quaternary deposits in the Maltese Islands: a microcosm of environmental change in Mediterranean lands. *Geojournal*, 41(2), pp.101-109.
- Hunt, C.O. & Schembri, P.J., 1999. Quaternary environments and biogeography of the Maltese Islands. In: A. Mifsud & C. Savona Ventura, eds. *Facets of Maltese Prehistory*. Malta: The Prehistoric Society of Malta, pp.41-75.
- King, R., 1997. Introduction: An essay on Mediterraneanism. In: R. King, L. Proudfoot & B. Smith, eds. *The Mediterranean: Environment and Society*. London: Arnold, pp.1-11.
- Lewis, J., 2001. Island characteristics and vulnerability: some perspectives. Available: <http://www.islandvulnerability.org/resources.html> [Last accessed: 20th December 2011].
- Meffe, G.K., Nielsen, L.A., Knight, R.L. & Schenborn, D.A., 2002. *Ecosystem Management: Adaptive, community-based conservation*. Washington DC: Island Press.
- Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B. & Kent, J., 2000. Biodiversity hotspots for conservation priorities. *Nature*, 403, pp.853-858.
- Palang, H. & Fry, G., 2003. Landscape Interfaces. In: H. Palang & G. Fry, eds. *Landscape Interfaces: Cultural Heritage in Changing Landscapes*. Dordrecht: Kluwer Academic Publishers, pp. 1-14.
- Phillips, A., 2005. Landscape as a meeting ground: Category V Protected Landscapes/Seascapes and World Heritage Cultural Landscapes. In: J. Brown, N. Mitchell & M. Beresford, eds. *The Protected Landscape Approach: Linking Nature, Culture and Community*. Gland: IUCN, pp. 19-35.
- Perry, A., 1997. Mediterranean climate. In: R. King, L. Proudfoot & B. Smith, eds. *The Mediterranean: Environment and Society*. London: Arnold, pp.30-44.
- Stratford, E., 2008. Islandness and struggles over development: a Tasmanian case study. *Political Geography*, 27 (2), pp.160-175.
- Vogiatzakis, I.N., Mannion, A.M. & Pungetti, G., 2008. Introduction to Mediterranean island landscapes. In: I.N. Vogiatzakis, G. Pungetti & A.M. Mannion, eds. *Mediterranean island landscapes: natural and cultural approaches*. Landscape Series Vol. 9. New York: Springer, pp.3-14.

CHAPTER 2

Landscape ecology in practice: tools for conservation and management in the Mediterranean

Ioannis N. Vogiatzakis and Geoffrey H. Griffiths

2.1 Introduction

Landscape is an expression of the complex interrelationship between nature and culture over time and provides the basis for the integrated and sustainable management of natural resources. There is increasing recognition that the spatial structure of landscape elements is a factor of critical significance in determining biodiversity (Turner, 2005) and for achieving sustainable development (Botequilha Leitão & Ahern, 2002). This is also highlighted by European legislation (Council of Europe, 2000) which incorporates measures for the protection of both biological and landscape diversity. The rapid changes of the 20th century and growing concern about their impact on the quality of landscapes has led to a renewed interest in, firstly, the inventory of land cover and land use and, secondly, mapping and understanding landscapes. The shift in ecological thought on the influences of landscape processes on biodiversity (Forman & Godron, 1986) was followed by the notion that landscape scale approaches are also fundamental to the understanding of past and present cultural evolution (Aalen, 2001). The landscape scale is now considered to be the appropriate spatial framework for the analysis of sustainability.

In the Mediterranean, the natural background of diverse climate, geology and topography has

been transformed by human use of the land to create the rich mosaic of cultural landscapes that characterize so much of the Mediterranean basin (Vogiatzakis *et al.*, 2008). After the Second World War this transformation was not only driven by traditional uses of the land such as agriculture, fire and grazing but increasingly by other social and economic imperatives that bore little relation to the local and regional contexts in which settlements and agriculture had developed over millennia. Further, anthropogenic pressures such as population growth and industrialization have stimulated considerable land-use change, especially agricultural intensification, with associated impacts including soil erosion, eutrophication and industrial and power-plant construction (Naveh & Lieberman, 1994). These processes now threaten landscape integrity and diversity in the region altering its characteristically 'fine-grained' and multifunctional nature. The Mediterranean Landscape Charter (known as the Sevilla Charter, 1993) was the first document to cover specific issues about the management and protection of Mediterranean landscapes and to stress the need for protection of their natural and cultural heritage. This was followed by the IUCN (International Union for the Conservation of Nature) publication *Parks for Life: Actions for Protected Areas in Europe* (IUCN, 1994) which advocates an international convention on rural landscape protection in

Europe, involving the Council of Europe. The resulting European Landscape Convention (ELC) was the first international charter aimed at ensuring improved management of Europe's landscapes (Council of Europe, 2000). Similarly, the Pan-European Biological and Landscape Diversity Strategy (PEBLDS) was the first attempt to include the conservation of landscapes into social and economic policy (Council of Europe/UNEP and ECNC, 1996).

This chapter discusses recent shifts toward larger-scale planning and how the development of landscape ecology (theory and tools) can influence management activities. Taking a natural rather than a cultural focus, the latter dealt with elsewhere in this volume, we examine landscape as a framework for ecological assessment, land use change, biodiversity protection and ecological restoration. We evaluate to what extent landscape ecology has been embraced in Mediterranean research and practice providing, where available, examples from the region.

2.2 Landscape ecology: concepts

Landscape ecology involves the study of landscape patterns, the interactions among patches (of natural or semi-natural habitat) within a landscape mosaic, and how these patterns and interactions change over time. The theories of island biogeography (MacArthur & Wilson, 1967) and metapopulations (Hanski, 1999) have been instrumental in the development of landscape ecology as a distinct discipline. Forman (1995) regards the landscape as "a mosaic where the mix of local ecosystems or land uses is repeated in similar form over a kilometers-wide area". The two most common conceptual models are the 'island model' and the 'patch-matrix-corridor model' (Lindenmayer & Fischer, 2006). In the former

the 'island' can be defined simply as a habitat that is 'ecologically' isolated, often by an inhospitable matrix of unsuitable land. An alternative to this model was developed by Forman (1986) where landscapes are perceived as a mosaic of three components: patches, corridors and a matrix. Recent work in landscape ecology (Wiens *et al.*, 2005) has formalized the spatial pattern of habitat islands and their connections within a frequently inhospitable matrix into *habitat, conduit, filter, source* and *sink*.

Landscapes are generally defined from a human perspective, but for the principles of landscape ecology to be relevant for policy and management, landscapes should also be conceived at the species scale. Increasingly landscapes are viewed in an integrative and holistic way as "total space/time defined concrete ecological, geographical and cultural systems" (Naveh, 1990). Naveh (1994) advanced the idea for a holistic approach to the conservation of both the natural and cultural assets of a region's landscape. Landscape ecology developed a spatially explicit landscape approach which is hierarchical and includes human influences (Forman & Godron, 1986; Naveh & Lieberman, 1990; Farina, 2006). The two most fundamental aspects that landscape ecology introduced to planning were its explicit attention to the spatial dimension of ecological processes and its focus on human ecology. The orientation of the discipline towards planning and management makes it more appealing to planners as opposed to more traditional biocentric ecological approaches (Botequilha Leitão & Ahern, 2002)

2.3 Conservation and management at the landscape level

In nature conservation, there has been a paradigm shift away from a designation led approach to a

landscape approach which seeks to encourage a more comprehensive vision of land management and rural decision-making. Habitat conservation and management is often required to fulfill a range of objectives e.g. maintenance of biodiversity, productivity, regeneration capacity, recreation etc. In order to achieve these objectives we need an understanding of ecological processes at the landscape scale. Human practices of land management and natural processes modify habitat structure and composition, and such changes may have positive or negative impacts on biodiversity from the site to the landscape scale. Traditionally, ecologists have been looking at the effects of changes on biodiversity at the site level. However, with the adoption of landscape ecological principles in mainstream ecology, emphasis is now given to landscape scale processes (namely structure, function and changes).

The role of Geographical Information Systems (GIS) has been instrumental in natural resources management in general, and nature conservation and planning in particular. A GIS environment allows a wide range of analyses to be performed and is an invaluable tool in landscape assessment. GIS provides the analytical tools for many of the methods/techniques discussed below from landscape characterization, quantification of changes, modelling and decision making.

2.3.1 Landscape Character Assessment (LCA)

The measurement of the impact of land use change and other forms of development on the biota of the Mediterranean needs to be assessed within an appropriate spatial framework that captures underlying differences in the physical and cultural environment. One such framework is 'landscape character' defined as a distinct, recognizable and consistent pattern of elements in the landscape. It is a functional hierarchy of abiotic, biotic and

cultural components (Mücher *et al.*, 2003). Landscape Character Assessment is a set of techniques and procedures to map differences between landscapes, based on their historical evolution and physical characteristics. The process of characterization comprises the identification of areas of distinct character, the classification and mapping of those areas and the description and explanation of their character. The rationale behind landscape character mapping is that particular combinations of physical and cultural factors occurring in different areas result in similar landscapes. The approach is based on a series of natural (i.e. landform, geology, soils) and cultural factors (i.e. land use, settlement pattern) that are used to describe the variability in the landscape at various spatial scales depending on the aims of the project. The data sources may include existing published material, field survey information and the input of stakeholders to identify and describe areas of common character. LCA can operate at a range of scales from continental to national and regional. In north-west Europe, LCA has a long history as a tool for habitat restoration and species recovery (e.g. Griffiths *et al.*, 2004). In the Mediterranean however, the uptake of the method has been limited with some progress made during the last 10 years (Marušič, & Jančič, 1998; Mata-Olmo *et al.*, 2003). Similar attempts are currently underway in Cyprus with the first Landscape Character Mapping of the island completed at 1: 250,000 scale (Warnock *et al.*, 2008). The existing landscape-specific methodologies and concepts (such as landscape planning and landscape characterization) have not been widely applied for landscape management and protection in a Mediterranean context, despite the implicit reference of the Barcelona Convention to landscape management. This is now gradually changing in the Mediterranean, where assessments of the methodology for coastal zone management have been carried out (Vogiatzakis & Cassar, 2005; Vogiatzakis *et al.*, 2008).

2.3.2 Quantifying landscape changes

Landscape heterogeneity has been the focus and the driving force for the evolution of landscape ecology as a discipline (Turner, 2005; Wiens *et al.*, 2005). The ability to quantify landscape structure has emerged as an important task in ecology, providing insights into the relationship between ecological processes and spatial patterns (Turner, 2005). The quantification and monitoring of spatial patterns is of extreme significance for protected area conservation and management since the species protected within reserves often depend on specific habitats and are at greater risk of extinction when these habitats are degraded or lost. The dramatic changes in land use in Europe over the last 50 years have resulted in the loss and fragmentation of semi-natural habitats, often with negative impacts on biodiversity. A wide range of landscape metrics have been developed to measure landscape composition and configuration with the help of GIS and specialized software such as FRAGSTATS (McGarigal *et al.*, 2002). Despite the limitations associated with their use (Li & Wu, 2005; Turner, 2005) landscape metrics remain widely used and have been applied in the Mediterranean context (e.g. Botequilha Leitão & Ahern, 2002; Romero-Calcerrada & Perry, 2004).

A direct consequence of habitat fragmentation is a loss of connectivity between habitat patches, resulting in isolation of sub-populations at the landscape scale. The movement of species in the landscapes becomes restricted and many species are now confronted with increasing human-made barriers such as roads, buildings, and intensively managed agricultural fields, amongst others. However, physical connectivity is not sufficient without explicit reference to an ecological process. Functional connectivity is the degree to which a landscape facilitates or impedes species movement among habitat patches. In the Mediterranean, potential barriers including major roads and

expanding urban development (particularly along the coast) are significant threats to connectivity, coupled with abandonment of features that have worked (or have the potential to function) as corridors (e.g. stone walls, terraces). The threats to biodiversity resulting from habitat loss and fragmentation can be mitigated by conserving well-connected networks of large areas where natural ecological and evolutionary processes operate over large spatial and temporal scales. Typical examples in a Mediterranean context include field boundaries, particularly stone walls, terraces and dry river valleys or *widien* (i.e. water run-off conduits formed by either stream erosion during a former wetter regime or by tectonic movements), but also artificial corridors in the landscape such as roadside verges.

Identifying habitat corridors in the landscape is considered an effective means of promoting landscape connectivity (see Chapter 3 by Cassar in this volume). Wildlife corridors are necessarily site and species-specific and their successful design and management depends on a clear statement of intended functions. The type of corridor required depends on the target species and the landscape type, and could be in the form of a continuous vegetative strip, or a series of 'stepping stone' patches. It is recognized that an effective habitat corridor should provide a continuous, or near continuous linkage of suitable habitat through the inter-patch landscape (Bennett, 1998).

2.3.3 Spatially explicit modelling and prioritization

Spatial models are employed to represent, simulate and predict geographical phenomena and processes and have become very powerful tools with the conceptual development of landscape ecology and the technical advances in GIS. Models may be spatially implicit where space matters (usually distance) but locations do not, or models

may also be spatially explicit where both space and location are important. Common applications include predicting habitat changes through time, or examining how a process generates pattern and influences habitat or species distribution. Spatial models are used to examine the spread of fire, pathogen outbreaks, species survival in different reserve designs, nutrient inputs from agriculture to streams, flooding and forest succession (Mouillot *et al.*, 2005; Pausas *et al.*, 2006).

Spatial explicitness should also be taken into account in restoration efforts at the landscape level. The restoration of damaged habitats and the re-creation of lost habitats have traditionally taken place at the site level (Holl *et al.*, 2003). This ignores the importance of understanding the spatial pattern of habitat patches and the character of the intervening matrix in targeting potential sites for the creation of new habitats and the restoration of former habitats. Increasingly however, the emphasis has shifted to a broader scale approach that considers the landscape as a whole. The suitability of a patch/land parcel to fulfil a given restoration target at the landscape level is a function of its properties (land use, soils, etc.) but also of other attributes including patch size and distance from similar patches. Although there is some work in the Mediterranean on habitat restoration and recreation, either in a theoretical or practical sense (Naveh 1988, 1998), such approaches have not been widely used to date.

Techniques used to identify gaps/needs in biodiversity conservation are also switching emphasis to the landscape level. For example 'gap analysis', a concept relying on GIS techniques, provides a means of rapidly reviewing the distribution and conservation status of several components of biodiversity (Jennings, 2000). This has already been applied at the European level looking at the current state of protection of European forests (WCMC, 2000). Similar

approaches have been suggested for the Mediterranean Basin in order to identify gaps that may be filled through the establishment of new reserves or changes in land-management practices, or to determine the extent to which a focal species or habitats of European importance are adequately protected by the proposed Natura 2000 sites (Vogiatzakis *et al.*, 2006).

This is also reflected in the two most widely used software packages for reserve selection, MARXAN (Possingham *et al.*, 2000) and ZONATION (Moilanen, 2007). MARXAN, originally developed as a decision support tool for reserve design, finds reasonably efficient solutions to the problem of selecting a system of spatially cohesive sites that meet a suite of biodiversity targets. Using data on species, habitats and/or other relevant biodiversity features and surrogates for a number of planning units (regions, landscapes, etc.), MARXAN minimizes the cost while meeting user-defined biodiversity targets. Similarly ZONATION is a spatial conservation planning software, which can be used to identify sites important for species conservation. ZONATION produces a hierarchical prioritization of the landscape based on the biological values of sites (Moilanen, 2007).

2.4 Landscape based decision making

Landscape Assessment can be used as a decision support tool. The assessment process provides an informed analysis of the way in which the landscape has evolved as a basis for understanding the dynamics of current and future change. For example, although Landscape Character Assessment is entirely separate from Environmental Impact Assessment (EIA), the outputs from Landscape Character Assessment can make an important contribution to EIA as a baseline description of

the landscape (Landscape Institute and the Institute of Environmental Assessment, 2001).

The challenge for planners and land managers in a dynamic and fragile environment such as the Mediterranean is to find new ways of accommodating change whilst at the same time retaining and, where possible, strengthening regional character and local distinctiveness. Although this does not imply or advocate a 'museum-type landscape', it means that we need to retain landscape diversity, manage the countryside more effectively, but also to guide and control the forces for change. Therefore landscape evaluation should go beyond the identification of 'high quality' landscapes i.e. being capable of making reasoned judgements about the relative sensitivity of different types of landscape, their current state, or condition, and how vulnerable they are to change. This is also in line with the European Landscape Convention (Council of Europe, 2000).

Landscape character assessment can be used as a tool to determine the sensitivity of the landscape to the proposed development. Landscape sensitivity, be it ecological, cultural or perceptual, is the ability of a landscape to accommodate change or development while capacity refers to the amount and type of this change that is 'acceptable' (Swanwick, 2004). Capacity judgments are derived from the results of the sensitivity analysis and information from an assessment of landscape values. According to the capacity identified, guidance is provided as to which are the most appropriate locations for development, ensuring that key landscape features are safeguarded.

In a Mediterranean context, a vision for each landscape can be developed for the sustainable use of the local natural and cultural heritage, including the actions required to achieve it. These visions reflect the important interactions between environmental quality and economic and social well-being. In turn

these sustainability visions will be used to inform inputs to plans and strategies for various sectors including Development Plans, local and regional Biodiversity Action Plans, Integrated Catchment Management, Integrated Coastal Zone Management, and Protected Areas Plans.

In the same manner that landscape may provide the spatial framework for the development of indicators, it can be used to measure ecosystem services or derive sustainability indicators. There has been little effort to use landscape as a matrix for analysis (Vogiatzakis *et al.*, 2008). Instead the emphasis has been upon socio-political units such as the 'state' or a region (Morse, 2004).

2.5 Conclusion

It has been argued that landscape ecology's holistic and hierarchical principles (Pungetti, 1996; Jongman & Pungetti, 2004; Makhzoumi & Pungetti, 2008), can guide strategies for landscape evaluation, conservation policies, sustainable planning and landscape management. Ecologically informed landscape strategies are a significant contribution to the conservation, development and planning of a sustainable future for the Mediterranean (Zavala & Burley, 1997). Makhzoumi & Pungetti (2008) argue that the overlapping of ecosystems, landscapes and cultures underpins landscape ecology's holistic and hierarchical approach to the evaluation and management of Mediterranean landscapes. The approach is even more justified in Mediterranean Islands, because spatial limitations and temporal evolutionary processes have resulted in even greater alignment between ecosystems and landscapes.

However, whilst the range and sophistication of tools for the evaluation and management of landscapes is developing rapidly, there are few examples of their application in Mediterranean

Inland contexts (Green & Vos, 2001; Mouillot *et al.*, 2005; Vogiatzakis *et al.*, 2006; Cassar, 2010). This partly reflects their development and use in northern Europe and North America, but may also be a reflection of the challenges faced by the more complex ecosystems that characterize Mediterranean landscapes. Clearly, given the pressures on land and resources in many parts of the Mediterranean Basin, especially in coastal areas, there is the potential to develop and apply methods for habitat protection and restoration that are sensitive to the nature of Mediterranean landscapes, and that are accepted by land managers and policy makers as significant tools for nature protection.

References

- Aalen, F.H.A., 2001. Landscape development and change. In: B. Green & W. Vos, eds. *Threatened landscapes: conserving cultural environments*. London: Spon Press, pp.3-20.
- Bennett, A.F., 1998. Linkages in the landscape: the role of *corridors and connectivity in wildlife conservation*. Gland: IUCN.
- Botequilha Leitão, A. & Ahern, J., 2002. Applying landscape ecological concepts and metrics in sustainable landscape planning. *Landscape and Urban Planning*, 59, pp.65-93.
- Cassar, L.F., 2010. *A Landscape Approach to Conservation: integrating ecological sciences and participatory methods*. Msida: Institute of Earth Systems, University of Malta/UNESCO.
- Council of Europe, 2000. *European Landscape Convention*. European Treaty Series No. 176. Florence: Council of Europe.
- Council of Europe, UNEP & ECNC, 1996. *The Pan-European Biological and Landscape Diversity Strategy: A vision for Europe's natural heritage*. Tilburg: European Centre for Nature Conservation.
- Farina, A., 2006. *Principles and methods in landscape ecology: towards a science of the landscape*. New York: Springer.
- Forman, R.T.T. & Godron, M., 1986. *Landscape ecology*. New York: Wiley and Sons.
- Forman, R.T.T., 1995. *Land mosaics: the ecology of landscapes and regions*. Cambridge: Cambridge University Press.
- Green, B. & Vos, W. eds., 2001. *Threatened landscapes: conserving cultural environments*.

London: Spon Press.

Griffiths, G.H., Porter, J., Simmons, E. & Warnock, S., 2004. *The Living Landscapes Project: landscape character and biodiversity*. English Nature Report no. 475. UK: English Nature.

Hanski, I., 1999. *Metapopulation ecology*. New York: Oxford University Press (USA).

Holl, K.D., Crone, E.E. & Schultz, C.B., 2003. Landscape restoration: moving from generalities to methodologies. *Bioscience*, 53, pp.491-502.

IUCN, 1994. *Parks for Life: Action for protected areas in Europe*. Gland: IUCN.

Jennings, M.D., 2000. Gap analysis: concepts, methods, and recent results. *Landscape Ecology*, 15, pp.5-20.

Jongman, R.H. & Pungetti, G., 2004. *Ecological networks and greenways: concept, design, implementation*. Cambridge: Cambridge University Press.

Landscape Institute & Institute of Environmental Assessment, 2001. *Guidelines for landscape and visual impact assessment*. UK: Taylor & Francis.

Li, H. & Wu, J., 2004. Use and misuse of landscape indices. *Landscape Ecology*, 19, pp.389-399.

Lindemayer, D. & Fischer, J., 2006. *Habitat fragmentation and landscape change: an ecological and conservation synthesis*. Washington DC: Island Press.

MacArthur, R.H. & Wilson, E.O., 1967. *The theory of island biogeography*. Princeton: Princeton University Press.

Makhzoumi, J. & Pungetti, G., 2008. Landscape strategies. In: I.N. Vogiatzakis, G. Pungetti & A.M.

Mannion, eds. *Mediterranean island landscapes: natural and cultural approaches*. Landscape Series Vol. 9. New York: Springer, pp.325-348.

Marušič, J. & Jančič, M., 1998. *Regional distribution of landscape types in Slovenia: methodological bases*. Ljubljana: Ministry of Environment and Physical Planning.

Mata Olmo, R. & Sanz Herráiz, C. eds., 2003. *Atlas de los paisajes de España*. Spain: Secretaría General Técnica, Ministerio de Medio Ambiente & Universidad Autónoma de Madrid.

McGarigal, K., Cushman, S.A., Neel, M.C. & Ene, E., 2002. *FRAGSTATS: spatial pattern analysis program for categorical maps*. Amherst: University of Massachusetts.

Moilanen, A., 2007. Landscape zonation, benefit functions and target-based planning: unifying reserve selection strategies. *Biological Conservation*, 134, pp.571-579.

Morse, S., 2004. *Indices and indicators in development - an unhealthy obsession with numbers*. London: Earthscan.

Mouillot, F., Ratte, J.-P., Joffre, R., Mouillot, D. & Rambal, S., 2005. Long term forest dynamic after land abandonment in a fire prone Mediterranean landscape (Corsica). *Landscape Ecology*, 20, pp.101-112.

Mücher, C.A., Bunce, R.G.H., Jongman, R.G.H., Klijn, J.A., Koomen, A., Metzger, M.J. & Wascher, D.M., 2003. Identification and characterisation of environments and landscapes in Europe. Alterra Rapport 832. Wageningen: Alterra.

Naveh, Z., 1988. Multifactorial reconstruction of semi-arid Mediterranean landscapes for multipurpose land uses. In: E. Allen, ed. *The*

reconstruction of disturbed arid lands: an ecological approach. Boulder: Westview Press, pp.234–256.

Naveh, Z., 1990. Ancient man's impact on the Mediterranean landscape in Israel - ecological and evolutionary perspectives. In: S. Bottema, G., Entjes-Nieborg & W. van Zeist, eds. *Man's Roles in the Shaping of the Eastern Mediterranean Landscape*, pp.43-50.

Naveh, Z., 1998. Ecological and cultural landscape restoration and the cultural evolution towards a post-industrial symbiosis between human society and nature. *Restoration Ecology*, 6, pp.135–143.

Naveh, Z. & Lieberman, A.S., 1994. *Landscape ecology: theory and application*. 2nd ed. New York: Springer.

Pausas, J.G., Lloret, F. & Vilà, M., 2006. Simulating the effects of different disturbance regimes on *Cortaderia seloana* invasion. *Biological Conservation*, 128, pp.128-135.

Possingham, H.P., Ball, I.R. & Andelman, S., 2000. Mathematical methods for identifying representative reserve networks. In: S. Ferson & M. Burgman, eds. *Quantitative methods for conservation biology*. New York: Springer-Verlag, pp.291-305.

Romero-Calcerrada, R. & Perry, G.L.W., 2004. The role of land abandonment in landscape dynamics in the SPA Encinares del rio Alberche y Corio, Central Spain, 1984-1999. *Landscape and Urban Planning*, 66, pp.217-232.

Swanwick, C., 2004. The assessment of countryside and landscape character in England: an overview. In: K. Bishop & A. Phillips, eds. *Countryside planning: new approaches to management and conservation*. London: Earthscan, pp.109-124

Turner, M., 2005. Landscape ecology: what is the state of science? *Annual Review of Ecology, Evolution and Systematics*, 36, pp.319-344.

Vogiatzakis, I.N. & Cassar, L.F., 2005. *Coastal landscapes of Tunisia with special focus on Cap Bon: proposed landscape character assessment*. Split: PAP/RAC.

Vogiatzakis, I.N., Mannion, A.M. & Griffiths, G.H., 2006. Mediterranean ecosystems: problems and tools for conservation. *Progress in Physical Geography*, 30, pp.175–200.

Vogiatzakis, I.N., Griffiths, G.H., Melis, M.T., Marini, A. & Careddu, M.B., 2006. Landscape typology in the Mediterranean context: a tool for habitat restoration. *Journal of Mediterranean Ecology*, 7, pp.23-30.

Vogiatzakis, I.N. & Griffiths, G.H., 2008. Island biogeography and landscape ecology. In: I.N. Vogiatzakis, G. Pungetti & A.M. Mannion, eds. *Mediterranean island landscapes: natural and cultural approaches*. Landscape Series Vol. 9. New York: Springer, pp.61-81.

Vogiatzakis, I.N., Griffiths, G.H. & Morse, S., 2008. Linking landscape character assessment and sustainability indicators in the Mediterranean. In: L.F. Cassar, E. Conrad & S. Morse, eds. *Measuring sustainability: theory and experience from the Mediterranean*. Trieste: ICS- UNIDO, pp.25-35.

Vogiatzakis, I.N., Pungetti, G. & Mannion, A.M., eds., 2008. *Mediterranean island landscapes: natural and cultural approaches*. Landscape Series Vol. 9. New York: Springer.

Warnock, S., Griffiths, G.H. & Vogiatzakis, I.N., 2008. *Cyprus Landscape Mapping Project: final report*. UK: Landscape Mapping Group, University of Reading.

WCMC, 2000. *European Forest Gap Analysis*.
Cambridge: UNEP.

Wiens, J.A., Moss, M.R., Turner, M.G. &
Mladenoff, D.J., eds., 2005. *Foundation papers in
landscape ecology*. New York: Columbia University.

Zavala, M.A. & Burkey, T.V., 1997. Application of
ecological models to landscape planning: the case
of the Mediterranean basin. *Landscape and Urban
Planning*, 38, pp.213-227.

CHAPTER 3

Rehabilitating Mediterranean island landscapes: the potential contribution of restoration ecology

Louis F. Cassar

3.1 Introduction

There is little within the Mediterranean region that is untouched or uninfluenced by humankind. The Basin has been inhabited by a succession of cultures since at least the eighth millennium BC (Bradford, 1971), possibly longer, and today there are more than 500 million inhabitants distributed across the twenty-one countries of the littoral. Indeed, *"peoples and ideologies have collided throughout history in processes of assimilation, integration and eradication which have left numerous, frequently enigmatic, traces in the contemporary human landscape"* (Proudfoot, 1997: 57). It is expected that the 'traces' of recent generations dominate in the present-day landscape, but there is a pertinent concern that perhaps we are modifying landscapes, sometimes radically and irreversibly so, at a much faster pace than our predecessors ever did. Taking the island state of Malta as an example, over the past four decades, the urban land-mass has increased by approximately 361% (even as population increased only by 29%). To put this into perspective, over a period of some 40-50 years, there has been three and a half times more construction than took place during the preceding seven thousand years of human colonization of the Islands (Cassar, 2010)!

Not surprisingly, nature has been an unfortunate casualty of this process of human colonization

of the region. Of the 34 recognized biodiversity hotspots that are found worldwide, the Mediterranean Basin is the one that has been occupied for longest by man (Conservation International, 2007). That is not to say that anthropogenic impacts on nature are always or necessarily bad. In the Mediterranean, for example, there is a very important heritage of cultivated biodiversity which derives precisely from human modification of wild crop ancestors over time; the Mediterranean Basin is in fact considered to be a Centre of Diversity (Vavilov, 1951) (i.e. one of the geographical locations where agriculture took root) for several agricultural species, including varieties of cereals, legumes, forage plants, vegetables and spices. Wild diversity has, however, suffered greatly. Evergreen oak forests, deciduous forests and conifer forests once extended across much of the region, covering an estimated area of some 2,085,292 km². Of this, a mere 98,009 km² remain (Conservation International, 2007), representing a decline of over 95% of the original habitat area. Floral and faunal species have suffered accordingly, with many (both endemics and indigenous non-endemics to the region) having a vulnerable, endangered or critically endangered conservation status. Future prospects for biodiversity also do not look too promising. Whilst there are significant tracts of protected areas in all Mediterranean countries,

these often represent no more than pockets of land, often facing a multitude of management problems, and whose long-term viability is questionable, particularly in the light of global phenomena such as climate change (Conrad, 2004; Cassar *et al.*, 2007; Conrad, 2008). Furthermore, urbanization continues to pick up pace across the region, and rural production has also morphed into industrialized forms that are becoming less and less compatible with healthy habitats. Indeed, the region's title of 'biodiversity hotspot' comes not only in recognition of its important heritage but also from a realization of the immense threat that its biodiversity faces.

In this context, a viable strategy for conservation within the Mediterranean, and particularly within Mediterranean islands where land area is so limited, must be proactive as well as reactive. Protectionist measures are certainly necessary, but have been shown to be inadequate on their own, particularly when resources for enforcement and management are often lacking. Aside from protecting what is left, we also need to look at establishing new habitats. Within both urban and rural settings, however, there is significant scope for utilizing areas that have already been 'damaged' in some way or form, to restore, rehabilitate or create habitat areas. Enter the discipline of restoration ecology.

3.2 Restoration ecology: an overview

Ecological restoration has been practised, in some way or other, for decades or even centuries, at least in its more applied forms, such as erosion control, reforestation, and habitat or range improvement (Young *et al.*, 2005). Back in the 1930s, for example, Aldo Leopold and colleagues initiated a project of plant community restoration at the University of Wisconsin arboretum, based on manipulating ecosystem processes and vegetative structure

(Groom *et al.*, 2006). Since then, both the practice of ecological restoration and the related scientific discipline of restoration ecology have evolved beyond recognition, now encompassing insights from various disciplines (ecology and landscape ecology, geology, geomorphology, soil science, geochemistry, population biology, hydrology, etc.) and guided by an established theoretical body of work and a wealth of international experiences. It is, however, only recently that firm conceptual and methodological foundations of restoration ecology have truly been established, in parallel with the emergence of a new understanding of how ecosystems work (Hobbs, 2006). In particular, there has been a shift from viewing ecosystems as equilibrium entities subject to simple linear causation, to viewing them as complex, dynamic systems characterized by nonlinearity and uncertainty (Wallington *et al.*, 2005), with important implications for how we seek to restore and ultimately manage these systems.

Ecological restoration is understood to refer to an attempt to restore a system to some historical state, although the difficulty or, at times, impossibility of achieving this aim is widely recognized (Palmer *et al.*, 2006). More realistically, many restoration efforts seek to modify a damaged system in a manner that will bring it within acceptable limits representing a less disturbed system (Falk, 1990; Allen *et al.*, 2002), or to 'engineer' degraded ecological assemblages in such a way that the end result resembles natural communities of vegetation and fauna of high scientific and/or conservation value (Cassar, 2010). Ecological restoration is not, however, a process of mere afforestation, or randomly adding in species where at present there are few or none. The discipline is systematic in seeking to recreate or restore not only species but a natural range of ecosystem composition, structure and dynamics (Palmer *et al.*, 2005). It does not seek to restore only state but also accompanying functions and processes,

1	Competition: (plant) species compete for resources, and competition increases with decreasing distance between individuals and with decreasing resource abundance.
2	Niches: species have physiological and biotic limits that restrict where they can thrive. Species selection and reference communities need to match local conditions.
3	Succession: in many ecosystems, communities tend to recover naturally from natural and anthropogenic disturbances following the removal of these disturbances. Restoration often consists of assisting or accelerating this process (Luken, 1990). In some cases, restoration activities may need to repair underlying damage (soils) before secondary succession can begin (Whisenant, 1999).
4	Recruitment limitation: the limiting stage for the establishment of individuals of many species is often early in life, and assistance at this stage (such as irrigation or protection from competitors and herbivores) can greatly increase the success of planted individuals (Whisenant, 1999; Holl <i>et al.</i> , 2000).
5	Facilitation: the presence of some plant species (guilds) enhances natural regeneration. These include N-fixers and overstorey plants, including shade plantings and brush piles.
6	Mutualisms: mycorrhizae, seed dispersers and pollinators are understood to have useful and even critical roles in plant regeneration.
7	Herbivory/predation: seed predators and herbivores often limit regeneration of natural and planted populations (Holl <i>et al.</i> , 2000; Howe & Lane, 2004).
8	Disturbance: disturbance at a variety of spatial and temporal scales is a natural, and even essential, component of many communities (Cramer & Hobbs, 2002; Poff <i>et al.</i> , 2003; White & Jentsch, 2004). The restoration of disturbance regimes may be critical.
9	Island biogeography: larger and more connected reserves maintain more species, and facilitate colonizations, including invasions (Naveh, 1994; Lamb <i>et al.</i> , 1997; Bossuyt <i>et al.</i> , 2003; Holl & Crone, 2004; Hastings <i>et al.</i> , 2005).
10	Ecosystem function: nutrient and energy fluxes are essential components of ecosystem function and stability at a range of spatial and temporal scales (Ehrenfeld & Toth, 1997; Aronson <i>et al.</i> , 1998; Bedford, 1999; Peterson & Lipcius, 2003).
11	Ecotypes: populations are adapted to local conditions, at a variety of spatial and temporal scales. Matching ecotypes to local conditions increases restoration success (Knapp & Dyer, 1997; Montalvo <i>et al.</i> , 1997; McKay <i>et al.</i> , 2005).
12	Genetic diversity: all else being equal, populations with more genetic diversity should have greater evolutionary potential and long-term prospects than genetically depauperate populations (Rice & Emery, 2003; McKay <i>et al.</i> , 2005).

Table 3.1: Ecological concepts relevant to, and embedded in, restoration practice.

Source: Modified from Young *et al.*, 2005

and to endow restored systems with resilience, i.e. the ability to cope with change and recover from stresses. In doing this, it draws on a multitude of ecological concepts, which are in turn embedded into restoration practice (Table 3.1).

It is important that the process of restoration commences with a clear goal. What is the target? What exactly *can* or *should* be restored? What functions and processes is restoration seeking to reinstate? In this respect, philosophies vary on the extent to which habitat reconstruction or restoration should seek to copy or influence nature. At one extreme lies the horticultural school, which aims to create colourful, interesting and attractive habitats for people in the places where they live or which they visit. At the other end

of the scale, the nature conservationist prioritizes good quality semi-natural habitats, free, as far as possible, from negative human influence. There is, of course, scope for both options, as well as for reconciliation and compromise. Indeed, there is a suite of possibilities available to the restoration scientist. Rehabilitation, for example, is used to refer to attempts to improve a system from some degraded state, rather than returning it to a model condition. Re-creation efforts seek to return a site to some previous historic condition. Replacement occurs when a community type is being created on site but was not present there previously; in such cases, the choice of a 'replacement' community is presumably to achieve a particular conservation objective. At a lower level of investment, enhancement or augmentation efforts seek to

add or increase ecosystem functions, without necessarily addressing all processes or functions (Groom *et al.*, 2006). The choice of an appropriate restoration goal will depend on several factors, including (i) the level of damage that an ecosystem has sustained, and the present state of ecosystem processes/functions, (ii) the degree of change from the historical system being considered as a 'baseline', and (iii) available resources for restoration, amongst others.

3.3 Planning for restoration: insights from the Mediterranean island of Gozo (Malta)

The potential for implementing ecological restoration projects on the island of Gozo was explored in this case study (for further reading, see Cassar, 2010). As with many other Mediterranean islands, Gozo has been intensely modified by human occupation, though to a lesser degree than its sister island of Malta. Several important habitat hotspots still exist, distributed across the island's northern, western and southern coasts, and harbour within them many endemics among the biotopes in which there is much richness and diversity. These important habitat areas are, however, increasingly fragmented and segregated, with inadequate buffering, and separated from each other by a matrix of land uses that is inhospitable to many species attempting to move from one habitat patch to another. There is thus a strong rationale for using ecological restoration principles to rehabilitate degraded habitats and restore scarred landscapes, providing benefits of habitat creation *in-situ*, and also contributing to an island-wide network of connected habitats (of varying degrees of 'naturalness'), through linear corridors, stepping stones and landscape mosaics.

'Restoring' the landscape of Gozo to some past form may prove difficult, since it is not always

clear what the terrain or its constituent habitats looked like even centuries ago, let alone before the time the island was initially colonized and its landscapes modified. Nor is it clear which biotic elements colonized specific areas, and whether these or closely related assemblages still persist on the island today; even if these are still present, their relative spatial distribution may be substantially different from what it was in the past. In the case of the Maltese Islands, finding out what constituted the ecological make-up prior transformation of the landscape by the different waves of human colonizers, or earlier still prior the arrival of the first human settlers, may require complex examination and analysis of sequences of deposits dating back to the late Pleistocene. Palaeontology can provide valuable information on vegetation cover, terrain and climatic regime changes over time, through coring and subsequent analysis (e.g. pollen, seeds, wood, snail shells, minerals, etc.) (Jackson & Hobbs, 2009), although the preservation of such records is often problematic in calcareous environments (Cassar, 2010). Additionally, the examination of medieval manuscripts, and closer examination of place-names, could perhaps lend some insight into what the terrain may have looked like at different points in the past. An example of the latter is the place-name *tal-Hida*, used for a number of localities in both Malta and Gozo, which translates as 'of the Red Kite', a species that is now quite rare across its European range but which is assumed to have been more widespread (and perhaps to have even bred locally) in the distant past.

Even if the composition of a previously existing biotope could be known, this does not mean that it can necessarily be reproduced. Abiotic and biotic conditions may have changed to such a point that even if a system can be reproduced, it may not be able to persist long-term. This is a concern relevant to all restoration schemes, whether small-scale habitat enhancement or whether large-scale species reintroduction schemes. The approach to

be adopted will furthermore depend extensively on the state of the environment in question and on pragmatic considerations. In the case of Gozo, for example, a significant opportunity is presented by the trend of agricultural land abandonment. Whilst the progressive decline of the rural sector is certainly a matter of concern for socio-economic reasons, it also means that there are now large tracts of land which are not being put to productive use, and which often adjoin, or lie in close proximity to, natural habitat areas (Plate 3.1). Indeed, this represents perhaps the simplest restoration scenario, where degraded or unused land lies adjacent to high quality habitats and can be 'restored' through relatively low-intervention means that encourage natural colonization and appropriate management, an approach that Newbold (cited in Buckley, 1989) terms the *duplication* solution. Such 'near-to-nature' strategies require reasonably low levels of intervention, particularly where secondary succession is already underway or where this process need merely be assisted. More radical approaches seek to recreate habitats from scratch or to re-introduce species that are rare, or even extinct

in recent years, for example, biotechnologists from the European mainland have unveiled plans to breed back the now-extinct aurochs, the much larger ancestor of cattle breeds, raising difficult questions of what sort of habitat could reasonably sustain a species much larger than any that roams the wild in European forests today. Indeed, any restoration attempts that result in ecologically 'unbalanced' scenarios, or where there is simply too much uncertainty for comfort, are the basis for much debate.

Within the context of Gozo, restoration can work towards several end goals, including (i) creating visually attractive vegetation assemblages, (ii) providing educational and, ideally, also scientific interest, (iii) safeguarding rare species or rare biotic communities, and (iv) creating low maintenance landscapes (Cassar, 2010). The

priority assigned to each of these goals will vary. Within urban environments, for example, where restoration takes place as part of urban greening schemes, priority may well be given to providing aesthetic, recreational and psychological benefits, but there is no reason why indigenous species of conservation or scientific interest can not be used in the process. Indeed, developing attractive soft-landscaped patches with planted stands of indigenous trees and irregularly shaped ponds, in place of the traditional hard-landscaped (often concrete-dominated) urban park (which has prevailed to date, with few exceptions, in the Maltese Islands), has evident advantages both for people and for nature. A parallel example from Gozo is the use of *Eucalyptus* sp. trees for bird-shooting purposes; hunters and trappers have planted numerous square-shaped groves of this species in order to attract birds. The practice has been frowned upon by many conservationists, given that *Eucalyptus* is not native to Malta and these 'monoculture' plantations are also known for their allelopathic qualities and intensive consumption of soil moisture. These square-shaped groves stand out as evidently 'artificial' additions to the visual landscape of Gozo. Using restoration ecology principles to develop ecosystems based around indigenous trees in their stead would have multiple benefits. The use of indigenous species would provide awareness-raising and environmental education opportunities and the habitat would be of wider benefit to a suite of organisms, both floral and faunal. From a pragmatic point of view, indigenous and archaeophytic species are also better adapted to the Mediterranean setting for physiological (acclimatization), ecological (phytosociological association and context) and aesthetic reasons. Ultimately, the goal of attracting birds for shooting and trapping (which whilst admittedly controversial will not be dealt with further in the current work) can also still be satisfied, effectively 'killing several birds with one stone'.

In each instance of habitat restoration, the starting point is the habitat stereotype, i.e. an image of the type of ecological assemblage to be reproduced. Most habitat restoration work subsequently takes place at either of two levels: (i) that of the single plant population (i.e. transplanting a number of specimens of a single species) or (ii) that of planting groups of species which usually occur together in nature (phytosociologically associated) as part of the existing community. The former approach is limited and often fails to reproduce the site conditions desired or to integrate with other elements of the community occurring on and around the site. A phytosociology-based approach, on the other hand, often holds more potential for restoring functions and processes, as well as species. In either case, however, the origin of source material needs to be carefully considered, for genetic, conservation and ethical reasons. The main affinities of the Maltese biota, for example, are with Sicily, and in particular with the Hyblean plateau region within the south-eastern portion of the island. The native species of this area thus have close genetic similarities with the flora and fauna of the Maltese Islands, and where local stock (the preferred option, in order to avoid genetic contamination) is unavailable, this would be the optimal source of provenance. Conservation concerns are also relevant, particularly when restoration involves rare and/or attractive species; in such cases, care must be taken to ensure that restoration does not provide a blanket excuse for indiscriminate collection or harvesting of such species. Additionally, when planting does eventually take place, this must be done in ecological context, i.e. all species used should not just be indigenous to the region or country but should 'belong' to that specific habitat where rehabilitation is being carried out (Cassar, 2010).

A variety of assemblages may be used in Gozo for purposes of habitat restoration and habitat creation, based on the various considerations

outlined above. An island-wide restoration scheme must, however, be based on a case-by-case evaluation of the land available for restoration and of its surrounding context. On the western coast of the island, for example, lies the area of Dwejra, an important hotspot of particular ecological importance for its endemics. In such a case, restoration should be based wholly around indigenous species specific to the area, including (i) elements of the Mediterranean halo-nitrophilous scrub (*Atriplex halimus*), (ii) Sicilian channel *Periploca* scrub in more exposed areas, and (iii) elements of the Nerio-Tamaricetea assemblage, based around *Tamarix africana* and *Vitex agnus-castus*, within the seaward and lower reaches of this segment of land (Cassar, 2006). On the northern coast of Gozo, on the other hand, lies an area of land which was formerly cultivated but which is now abandoned, and which adjoins an exposure of clay slopes. Here, the use of Mediterranean nitrophilous scrub is advisable, given that the characterizing species *Atriplex halimus* is quite common in its natural state. Other parts of this area, however, lie adjacent to an existing pine plantation and could thus be planted with copses of Aleppo pine (*Pinus halepensis*), with a view to extending the relatively small but established pinetum. The central tract of this restoration area, where the remnants of agricultural terracing are still in evidence, could be restored with the goal of creating Thermo-Mediterranean brush thickets and heath garrigue, made up of numerous species typical of the Islands, including *Olea europaea*, *Rhamnus alaternus*, *Quercus ilex* and *Chamaecrops humilis* (Cassar, 2006). Like these examples, numerous other opportunities exist across Gozo. Ultimately, a restoration scheme must also be evaluated in the light of other considerations, including land ownership, availability of species for planting, resources available for subsequent maintenance and interventions, political will and support at local and regional levels, social acceptability and policy thrusts.

3.4 Conclusions

There is no disputing that Mediterranean nature has been 'hard done' by the societies living within the Basin. We have used and abused, destroyed and eradicated, leaving only pockets of vulnerable habitat within which remaining species now struggle to survive. Islands have certainly been no exception; on the contrary, the value of land on islands is disproportionately magnified, given the comparatively small size of these territories. Wildlife has really had little chance of competing with myriad other demands and interests, many of which render more immediate economic benefits. It is perhaps time, however, to take stock and 'give something back' to nature, if not only for ethically altruistic reasons then also for egoistic ones. Humans do not exist independently from nature; indeed, human reliance on ecosystems is well enshrined in the concept of ecosystem services, and in destroying nature, we have also undermined our own health and well-being. Ecological restoration provides an opportunity for 'added value' - better and more habitats for nature, better and healthier environments for the human citizens of the Mediterranean Basin.

References

- Allen, C.D., Savage, M., Falk, D.A., Suckling, K.F., Swetnam, T.W., Schulke, T., Stacey, P.B., Morgan, P., Hoffman, M. & Klingel, J.T., 2002. Ecological restoration of southwestern Ponderosa pine ecosystems: a broad perspective. *Ecological Applications* 12(5), pp.1418-1433.
- Aronson, J., Le Floch, E., David, J., Dhillon, S., Abrams, M., Guillermin, J. & Grossman, A., 1998. Restoration ecology studies at Cazarils (southern France): biodiversity and ecosystem trajectories in a Mediterranean landscape. *Landscape and Urban Planning*, 41, pp.273-283.
- Bedford, B.L., 1999. Cumulative effects on wetland landscapes: links to wetland restoration in the United States and southern Canada. *Wetlands*, 19, pp.775-788.
- Bossuyt, B., Honnay, O. & Hermy, M., 2003. An island biogeographical view of the successional pathway in wet dune slacks. *Journal of Vegetation Science*, 14, pp.781-788.
- Bradford, E., 1971. *Mediterranean: Portrait of a Sea*. San Diego: Harcourt Brace Jovanovich.
- Buckley, G.P., ed, 1989. *Biological Habitat Reconstruction*. London: Belhaven.
- Cassar, L.F., 2006. *A Landscape Approach to Conservation: integrating ecological sciences and participatory methods*. PhD thesis, University of Reading.
- Cassar, L.F., 2010. *A Landscape Approach to Conservation: integrating ecological sciences and participatory methods*. Msida: Institute of Earth Systems, University of Malta/UNESCO.
- Cassar, L.F., Baccar, F., Ellul, A. & Xuereb, R., 2007. *La gestione dei problemi multidisciplinari*

- riguardanti l'ambiente costiero del Parco Regionale della Maremma. In: F. Scapini & M. Nardi, eds. *Il Parco Regionale della Maremma e il suo territorio*. Pisa: Pacini Editore, pp.239-254.
- Conrad, E., 2004. Evaluating management effectiveness of protected areas: a framework for the Maltese Islands. MSc (Environmental Management) dissertation, Imperial College, University of London.
- Conrad, E., 2008. Conservation planning in a cultural context – an island perspective. *International Journal of Environmental Consumerism*, 4(7-8), pp.37-42.
- Conservation International, 2007. Biodiversity hotspots: Mediterranean Basin. Available: <http://www.biodiversityhotspots.org/xp/hotspots/mediterranean/Pages/default.aspx> [Last accessed: 10th December, 2011].
- Cramer, V.A. & Hobbs, R.J., 2002. Ecological consequences of altered hydrological regimes in fragmented ecosystems in southern Australia: impacts and possible management responses. *Austral Ecology*, 27, pp.546–564.
- Ehrenfeld, J.G. & Toth, L., 1997. Restoration ecology and the ecosystem perspective. *Restoration Ecology*, 5, pp.307-317.
- Falk, D.A., 1990. Discovering the past, creating the future. *Restoration and Management Notes* 8 (2), pp.71-72.
- Groom, M.J., Meffe, G.K. & Ronald Carroll, C., 2006. *Principles of Conservation Biology*, 3rd ed. Massachusetts: Sinauer Associates.
- Hastings, A., Cuddington, K., Davies, K.F., Dugaw, C.J., Elmendorf, S., Freestone, A., Harrison, S., Holland, M., Lambrinos, J., Malvadkar, U., Melbourne, B.A., Moore, K., Taylor, C. & Thomson, D., 2005. The spatial spread of invasions: new developments in theory and evidence. *Ecology Letters*, 8, pp.91-101.
- Hobbs, R.J., 2006. Foreword. In: D.A. Falk, M.A. Palmer & J.B. Zedler, eds. *Foundations of Restoration Ecology*. Washington DC: Island Press/ Society for Ecological Restoration International, pp.ix-x.
- Holl, K.D. & Crone, E.E., 2004. Applicability of landscape and island biogeography theory to restoration of riparian understorey plants. *Journal of Applied Ecology*, 41, pp.922-933.
- Holl, K.D., Loik, M.E., Lin, E.H.V. & Samuels, I.A., 2000. Tropical montane forest restoration in Costa Rica: overcoming barriers to dispersal and establishment. *Restoration Ecology*, 8, pp.339-349.
- Howe, H.F. & Lane, D., 2004. Vole-driven succession in experimental wet-prairie restorations. *Ecological Applications*, 14, pp.1295–1305.
- Jackson, S.T. & Hobbs, R.J., 2009. Ecological restoration in the light of ecological history. *Science*, 325, pp.567-568.
- Knapp, E.E. & Dyer, A.R., 1997. When do genetic considerations require special approaches to ecological restoration? In: P.L. Fiedler & P. Karieva, eds. *Conservation Biology for the Coming Decade*. New York: Chapman & Hall, pp.345–363.
- Lamb, D., Parrotta, J., Keenan, R. & Tucker, N., 1997. Rejoining habitat fragments: restoring degraded rainforest lands. In: W.F. Laurance & R.O. Bierregaard, eds. *Tropical Forest Remnants: Ecology, Management, and Conservation of Fragmented Communities*. Chicago: University of Chicago Press, pp.366–385.

Lukon, J.O., 1990. *Directing Ecological Succession*. New York: Chapman and Hall.

McKay, J., Christian, C., Harrison, S.P. & Rice, K.J., 2005. How local is local? A review of practical and conceptual issues in the genetics of restoration. *Restoration Ecology*, 13(3), pp.432-440.

Montalvo, A.M., Williams, S.L., Rice, K.J., Buchmann, S.L., Cory, C., Handel, S.N., Nabhan, G.P., Primack, R. & Robichaux, R.H., 1997. Restoration biology: a population biology perspective. *Restoration Ecology*, 5, pp.277-290.

Naveh, Z., 1994. From biodiversity to ecodiversity: a landscape ecology approach to conservation and restoration. *Restoration Ecology*, 2, pp.180-189.

Palmer, M.A., Berhardt, E., Allan, J.D., Alexander, G., Brooks, S., Clayton, S., Carr, J., Dahm, C., Pollstad-Shah, J., Galat, D.L., Gloss, S., Goodwin, P., Hart, D., Hassett, B., Jenkinson, R., Kondolf, G.M., Lake, S., Lave, R., Meyer, J.L., O'Donnell, T.K., Pagano, L., Srivastava, P. & Sudduth, E., 2005. Standards for ecologically successful river restoration. *Journal of Applied Ecology*, 42, pp.208-217.

Palmer, M.A., Falk, D.A. & Zedler, J.D., 2006. Ecological theory and restoration ecology. In: D.A. Falk, M.A. Palmer & J.B. Zedler, eds. *Foundations of Restoration Ecology*. Washington DC: Island Press/Society for Ecological Restoration International, pp.1-10.

Peterson, C.H. & Lipcius, R.N., 2003. Conceptual progress towards predicting quantitative ecosystem benefits of ecological restorations. *Marine Ecology Progress Series*, 264, pp.297-307.

Poff, N.L., Allan, J.D., Palmer, M.A., Hart, D.D., Richter, B., Arthington, A.H., Rogers, K.H., Meyer, J.L. & Stanford, J.A., 2003. River flows and

water wars: emerging science for environmental decision-making. *Frontiers in Ecology and the Environment*, 1, pp.298-306.

Proudfoot, L., 1997. The Graeco-Roman Mediterranean. In: R. King, L. Proudfoot & B. Smith, eds. *The Mediterranean: Environment and Society*. London: Arnold, pp.57-74.

Rice, K.J., & Emery, N.C., 2003. Managing microevolution: restoration in the face of global change. *Frontiers in Ecology and the Environment*, 1, pp.469-478.

Vavilov, N.I., 1951. The origin, variation, immunity and breeding of cultivated plants. Translated by K. Starr Chester. *Chronica Botanica*, 13, pp.1-366.

Wallington, T.J., Hobbs, R.J. & Moore, S.A., 2005. Implications of current ecological thinking for biodiversity conservation: a review of the salient issues. *Ecology and Society*, 10(1), pp.15.

Whisenant, S., 1999. *Repairing Damaged Wildlands*. Cambridge: Cambridge University Press.

White, P.S. & Jentsch, A., 2004. Disturbance, succession and community assembly in terrestrial plant communities. In: V.K. Temperton, R.J. Hobbs, T. Nuttle & S. Halle, eds. *Assembly Rules and Restoration Ecology: Bridging the Gap Between Theory and Practice*. Washington DC: Island Press, pp.342-366.

Young, T.P., Petersen, D.A. & Clary, J.J., 2005. The ecology of restoration: historical links, emerging issues and unexplored realms. *Ecology Letters*, 8, pp.662-673.

CHAPTER 4

Development strategies for smaller island States and Territories: an ecological approach

Godfrey Baldacchino

4.1 Introduction

The Mediterranean basin will find it difficult to even contemplate an ecological approach to development. With high populations concentrated on coastal regions, massive waves of tourist visitations all the year round, and now with a regular stream of immigrants from the Middle East and North Africa, the region appears to be locked in a development paradigm that threatens its natural assets. On the other hand, many island territories in the region are challenged by wholesale depopulation or serious demographic imbalances that threaten their survivability. This chapter explores the economic versus ecological development paradigms as they apply to islands, with special reference to the Mediterranean basin.

What set me thinking about this topic was a foreign landscape that was, nevertheless, vaguely familiar. It was September 2000, and I was on a bus, taking the 90-minute journey from Chania to Rethymnon on the Greek island of Crete. It was sunny and humid. The route was mainly open countryside, with occasional rubble walls of limestone, and large sections of garrigue dotted with hundreds of olive and carob trees. This island, the 5th largest in the Mediterranean, with its half a million inhabitants residing

mainly on its extensive north shore, has been snubbed by industrialization. This, I suddenly realized, is how Malta, my own birth island, most likely would have looked before we 'developed' it: a euphemism for a radical reshaping and domestication of the natural landscape through feverish quarrying, construction and landscaping. Could Malta have done differently, I asked myself? Or was Crete just catching up with Malta in any case (Baldacchino, 2000)?

Much of the literature on the development prospects of small, often island, jurisdictions is steeped in pessimism, driven by a serious concern as to the ability of such players to exploit the opportunities of an increasingly globalized world and its emergent liberalized trade rules. It is common to argue that small size, islandness, vulnerability, and a low governance capacity conspire to exacerbate the existing marginalization of small economies, and is a condition which therefore calls for special treatment. These arguments, however, are by no means uncontentious, and are part of an ongoing debate (e.g. Briguglio, 1995: 1615-1620; Encontre, 1999: 265; WTO, 1999 and UNCTAD, 2004 for sympathetic reviews of the special concerns of small economies; and Srinivasan, 1986; Streeten, 1993; Easterly & Kraay, 2000; and Page & Kleen, 2004: 82-90, for opposing reviews). I am likely to be associated with a more optimistic view of the

prospects for these territories and their citizens, who continue to exploit opportunities and maximize economic gains in a turbulent and dynamic external environment. Unable to reap economies of scale, they practise economies of scope. They do so also by keeping alive a portfolio of skills and revenue streams which enables these actors to migrate both inter-sectorally, as well as trans-nationally (e.g. Baldacchino & Bertram, 2009).

While recognizing the real environmental threats of being a small, open, often islanded economy – hurricanes, droughts, sea level rise, water shortages, waste ‘mountains’ – some small economies have done well and continue to do so. They are ‘developed’, or have ‘graduated’, not so much for having avoided major hazards, but for having risen up to their challenge and prospered, because – and not in spite – of their openness, perhaps becoming more resilient and nimble in the process.

In a globalized and interdependent world, all countries today face threats and dependencies. All oil and gas importing countries have rediscovered their dependency on fossil fuels with the recent price hikes in these resources. Autarchy is hardly a policy option, and so some measure of trade dependence is a characteristic of contemporary jurisdictions. It is the responsiveness to threats – not the existence of threats per se – that deserves kudos and analysis. The capacity to get up and move on in the face of various disasters deserves being celebrated and researched. Nor should such successes be simply dismissed as ‘special cases’ (as the Seychelles are described in Kaplinsky, 1983) or ‘paradoxes’ (as is the ‘Singapore Paradox’ in Briguglio, 2002) that fly in the face of all-too-obvious vulnerabilities: they deserve critical recognition and serious scrutiny on their own terms.

A series of patterns and conditions for development may emerge from a scrutiny of what are understood to be smaller developed island states and territories

today. Some of these characteristics will be peculiar and idiosyncratic to specific jurisdictions, of course, but others may lend themselves to some useful, policy relevant, comparative inquiry.

4.2 Basket cases of success

Which smaller island countries in the world today are considered ‘successful’, and not just in orthodox economic terms? At least two sub-sets can be identified here. First, are the sovereign states of the Bahamas, Barbados, Cyprus, Malta and Mauritius. One could add New Zealand and Singapore as well – if we go beyond the threshold of 1.5 million population, and up to just over 4 million. These are all stable, prosperous, sovereign and democratic polities, and all are former British colonies. Secondly, there are such sub-national jurisdictions such as Åland, Bermuda, Guernsey, Jersey, Isle of Man... again, most (but not all) are associated with the British Crown/ United Kingdom. Many have crafted a future that is based on niche (inclusive of second home) tourism, along with banking and financial services. One may venture to argue that smaller size, certainly in the case of the territories identified above, has not been a crucial handicap to development, nor has islandness or peripherality. Strong levels of social capital and outward facing cultural attitudes would also contribute to a dynamic economy, able to respond confidently to opportunity (Srebrnik, 2000; Baldacchino, 2005). Meanwhile, for most of these jurisdictions, and certainly for the smallest, high population density per unit of land area comes across as a common feature, and all, except the largest identified (New Zealand), have an insignificant agricultural sector.

Islands that are political units are also geographical enclaves that tend to have higher population densities than mainlands, since offloading people across the sea remains

Land Mass	Population (A)	Land Area (km ²) (B)	Population Density (A/B)
Eurasia, America, Africa, Australia	6,550,435,000	136,071,330	48
As (1) above, less Australia	6,530,000,000	128,453,330	51
All Island States and Territories	588,807,050	6,263,612	94
As (3) above, less Greenland	588,752,050	4,088,000	144

Table 4.1: Comparing population densities: continents versus islands.

more problematic than offloading them onto a contiguous land mass. Moreover, around half of humankind dwells on or near coastal regions, because continental interiors are disadvantaged locations for settlement. These preferences are evinced from the much higher mean population density for islands than for continents. Excluding the large but practically empty mass of Greenland, and idiosyncratic Antarctica, island units have a mean population density of 144 persons per km² – three times the mean value of 48 persons per km² that one obtains for continental Eurasia, America, Africa and Australia combined (Table 4.1).

There is however another distinguishing feature of islands, and one that connects us with the inclusion of New Zealand in our listings. This island jurisdiction emerged as 'settlement colony' in the Modern age, absorbing surplus population from the colonial homeland (Warrington & Milne, 2007; King, 2009), but it remains characterized by a low population density of just 15 persons per km².

If one is looking for extreme cases of population density, examples of both ends of the continuum are to be found on islands. In other words, island states and territories do not just provide scenarios of very high population density – with places like Bermuda, Malta and Singapore

topping the list. They also provide examples of land areas with very low population density, as well as the only examples of completely de/unpopulated, geographically discrete areas on the globe. "Uninhabited" is a word attached only to islands" (Birkett, 1997: 14). These locales are attractive and have their own value, one that exploits their often unique natural qualities and apparent 'underdevelopment', for the purpose of more sustainable living, exclusive retirement locales and/or niche tourism.

4.3 Two distinct paradigms

Most of what are seen as successful island jurisdictions today have managed to avoid extensive resorts to industrialization, and the environmental fall-out that such a development trajectory unwittingly implies. This is not to exclude the environmental degradation that can result on small islands from excessive dependence on one mineral resource - as in the case of Nauru and its phosphate, and Malta because of limestone quarrying. However, other than Malta, Fiji and Mauritius, no other smaller island economies have embarked on any significant industrial programmes, thus often managing to 'leap frog' from primary to tertiary sector production in a few decades (e.g. Baldacchino, 1998). This development path, jumping straight from

agriculture to services, often in the space of just one generation, avoids the industrial rustbelts and derelict factory landscapes that now characterize cities or regions whose manufacturing industries have declined or disappeared.

Having said that, many of these successful smaller island jurisdictions today find themselves operating within two distinct and quite diametrically opposed development paradigms. In a variant of 'the Triple Bottom Line' – an approach to decision making that considers economic, social and environmental issues in a comprehensive, systematic and integrated way – this paper focuses on just the two 'e' terms in this configuration, relegating the status of the third, social dimension to that of an intervening variable.

The first batch is typified by dynamic, aggressive and competitive export producers who can depend on strong knowledge and finance capital pools. Such locations typically have high population densities, limited land areas, large pools of immigrant labour, considerable foreign direct investment, significant manufacturing sectors and extensive overseas investments, but poor and degraded local natural environments (if any exist) and higher per capita carbon footprints. 'City states' such as Hong Kong, Malta, Monaco and Singapore – as well as larger countries such as Japan – are leading examples (e.g. Debattista, 2007). These would have usurped the "*slowcoach of agriculture*", given the absence or low political clout of a rural hinterland (Streeten, 1993: 199). This could be, in turn, an outcome of poor soils or difficult terrain unsuitable for commercial farming. This cluster of features can be labelled as the economic development approach.

In contrast, the second batch of examples is typified by island locales that flaunt their clean, serene and pristine natural environments, often accompanied by distinctive cultural practices associated with

indigenous communities. Low populations and low population densities, perhaps supported by remittances and transfers from elsewhere, help to maintain this more environmentally sustainable lifestyle, which in turn promotes a potentially more nature friendly, more exclusive, tourism industry (however, for a critical view, see Gössling, 2003). Iceland, New Zealand but also Dominica, Greenland, Molokai, Samoa, Seychelles, Tobago and the Faroes are apt examples, and are internationally recognized as such (e.g. National Geographic, 2006). Many of these locales are associated with states that have dedicated significant portions of their land and/or sea to nature parks, or have maintained their natural forest, tundra, taiga or permafrost cover. For example, five Micronesian governments (Palau, followed by the Federated States of Micronesia, the Republic of the Marshall Islands, the US Territory of Guam and the US Commonwealth of the Northern Mariana Islands) have pledged a commitment to effectively conserve 30% of their near-shore marine resources and 20% of their terrestrial resources by 2020 (Nature Conservancy, 2008). This second cluster of features can be labelled as the ecological development approach.

The main features of, and differences between, these two approaches are schematically described in Table 4.2. Interestingly, different parts of the same country can exhibit these sets of features: in archipelagic Japan, for example, metropolitan high density Honshu is contrasted to Yakushima Island (World Heritage Site) and the sacred island of Miyajima. The same can be said for the Bahamas, where two-thirds of the population lives on New Providence, which has just 3% of the country's total land area. In Indonesia, the Moluccas (or Spice Islands) have a population density of 20 persons per km²; contrast this to 2,070 on Java.

The contrast between these two sets of island features can also be discerned from the same geographical region. In the island rich Mediterranean, for

Economic development	Ecological development
High population density	Low population density
Outpost islands	Fortress islands
Low, fragmented and strained natural resources	Significant, unadulterated and pristine natural resources
Aggressive exporters (mass markets)	Choosy exporters (niche markets)
Mass tourism appeal	Exclusive tourism appeal
High carbon footprint	Low carbon footprint
High urbanization	Low urbanization

Table 4.2: General characteristics of economic and ecological development.

example, population density ranges from a high of over 1,200 per km² for the Maltese Islands to 68 for Sardinia and just 32 for Corsica: in the latter two cases, a rugged topography and associated landscape makes settlement, as well as farming, more challenging, and difficulty of access conserves a rather unspoilt interior.

It thus appears that geography and history conspire to render islands differently suited for development strategies. On the basis of the typology suggested by Warrington & Milne (2007), island entrepôts have acted as magnets for significant incoming and circulating population movements and diversity; they are well placed to exploit their 'in betweenness' to accumulate fiscal, human and material capital for development. They are challenged to come up with solutions to the pressing problems resulting from an acute lack of space and associated high costs of land (e.g. The Economist, 2006). This would include a brand of tourism that is more appreciative of built environments, socio-cultural townscapes and urban living. They are well honed to take upon themselves an economic approach to their development.

Meanwhile, other islands appear better suited

at keeping newcomers away, making access to their shores more difficult, tortuous, time-consuming, challenging or otherwise risky. These conditions suggest that an ecological approach to development may be a more natural option for these to follow. Connell & King (1999: 3), echoing Churchill Semple (1911), observe that islands which find themselves at important crossroads - in a "nodal location" - tend to attract immigrants and may thus be challenged by overpopulation, whereas those which find themselves isolated, on the periphery, may be thus better adept at sending people away and may suffer stagnant or declining populations in the outcome, risking depopulation.

That there should be at least two contrasting 'development paradigms' in the first place may belie a basic misunderstanding about the very nature and expression of development. The leading examples of economic development, with their significantly negative environmental impacts, may not be successful over the longer term. Their success may often depend on the ability to lure value added from away, while exporting negative externalities offshore. The examples of ecological development (if any such term can be used, since the clause comes

across as an oxymoron), in contrast, typically maintain much lower environmental footprints. Dahl (1996: 49) reminds us that, in spite of “the ‘eco’ as a unifying concept...the chasm between economics and ecology is a symptom of the malfunctioning of modern society which threatens our very future”. Given the strong sense of place that they engender, islands are ideal spaces to experience the pernicious and dysfunctional chasm between these two separate ‘ecos’ (Depraetere, 2008: 20).

If we are to posit these two sets of island candidates as success stories, then we need to be better able to critically but cogently identify what led them to assume such a status. Are there (other) discernible patterns behind either of these two, apparently diametrically opposed, trajectories of success? Which political episodes (including crises?) and dynamics (including non-democratic processes?) have galvanized these island societies and economies towards competitive economic or ecological prosperity? What particular set of goods and services have permitted these jurisdictions to occupy and secure export markets? What human resource development policies have they pursued? What beneficial links with their respective diasporas have they fashioned? How have they exploited bilateral and multilateral agreements via shrewd (para)-diplomacy and international relations? Have higher education, tourism, financial services and niche manufacturing been important contributors to economic growth? Is there an active concern with sustainability and visions of a future that will lower fossil fuel dependency? These are some of the questions that beckon further island studies research.

A second set of questions is also pertinent. These questions would connect with considerations or opportunities to shift gear from one developmental approach to another. What does one do if a particular

island territory wants to be successful on both these development fronts? Can one be both economically and ecologically successful, and be known globally for both? Can an island be both green and clever at the same time, balancing tensions between modernizers and traditionalists (e.g. Grydehøj, 2008, in the case of Shetland). Or is this ‘best of both worlds’ scenario only a myth, possible only via a deliberate foray into marketing spin and camouflage? Could especially archipelagic island states — such as the Bahamas, Fiji, Maldives, Malta, Seychelles, Tonga, St Vincent and the Grenadines - but also mainland states with outlying island units – such as Croatia, France, Greece, Italy, Spain, Tunisia and Turkey in the Mediterranean - zone their territory in such a way that they can pursue differential development strategies via geographically delineated (that is, enclaved) policies?

4.4 Economic success

The *economic* road to success is the easier to chart, because it follows well-worn, conventional principles and definitions. Standardized economic statistics rank countries according to gross national/domestic product or purchasing power parity standards. Wealth is often defined in such terms as GNI/GNP/GDP per capita, with purchasing power parity. Smaller, often island, territories do exceptionally well on these counts. In their analytic critiques, Armstrong *et al.* (1998: 644), Easterly & Kraay (2000: 2015), and Armstrong & Read (2002) agree that smaller (and mainly island) jurisdictions actually perform economically *better* than larger (mainly continental) states. Moreover, comparative research has shown that, on average, non-sovereign island territories tend to be richer per capita than sovereign ones (Poirine, 1998; Bertram, 2004). The citizens of French Polynesia, Aruba, Bermuda and (until recently) Iceland, have been counted amongst the world’s

top ten richest people, in terms of these conventional standards (*The Economist*, 2003). Armstrong & Read (1998: 13) have also argued that many of the smaller states – most of which are island or archipelagic territories – have managed to compensate effectively for their smaller size by a high quality of “*endogenous policy formulation and implementation*”. Earlier, Katzenstein (1985) had made similar remarks in relation to smaller European states.

Island-specific literature suggests five policy areas as being critical ingredients in shaping prosperity, economic development-wise (e.g. Milne, 2000). Contestation over ‘who does what’ in these economic policy areas is typically tense, especially in federal political systems, and may in itself lead to demands for more self-rule, its withdrawal or its renegotiation between the parties concerned. These powers are premised on effective governance: however, unlike other models that seek to explain the principles behind revenue flows to island economies, these policy areas depend much more on the proactive nurturing of specific, local, jurisdictional capacities or local powers (Baldacchino, 2006a). They comprise the management of external relations “... by means of domestic policies and governing institutions” (Warrington, 1998: 101). These five select policy areas are: (1) powers over finance, mainly banking, insurance and taxation; (2) powers over environmental policy, particularly natural resources; (3) powers over access, particularly in relation to air and sea transportation; (4) powers over free movement of persons; and (5) powers over tourism policy (Baldacchino, 2006b; Baldacchino & Milne, 2000). Looking at these policy areas more holistically, Bertram and Poirine (2007: 362) conclude that “...the combination of offshore finance and high-quality tourism stands out as the strategy of the most successful island economies”.

4.5 Ecological success

The defining characteristics behind ecological success are much more elusive. They typically include low population figures enjoying longevity and healthy low-stress lifestyles, low urban footprints, large concentrations of undisturbed habitats, pristine and unfragmented landscapes, rich air quality, and abundant local fauna and flora that are not exposed to risk of disturbance and degradation. But one needs to be careful that such features are not (mis)construed as those of a primitive, late-coming, underdeveloped economy, intent on achieving economic success, even at considerable ecological cost.

The European Union has been extending significant funding to regions that are threatened by depopulation or low population densities. This has been done mainly via two complementary thrusts. The first is an investment in infrastructure which would make access to the mainland or metropolitan heartland cheaper, safer, easier and faster, improving the sustainability of island and other remote communities, while boosting their attraction to visitors and second home owners. The second is an investment in information technology, including broadband, which will assist cross-border, transnational and interregional co-operation, broaden access to all kinds of data, and facilitate the growth of remote employment. There are two main dangers associated with such strategies. First is an excessive dependence on EU-driven initiatives which may dampen entrepreneurship and private enterprise. Other, potentially successful, projects would be abandoned, or not pursued with the required zeal and perseverance, in the face of the near certainty of such external funding, resulting in a less diversified economic structure. Second, immigrants, second home buyers and seasonal residents are not always made to feel welcome by the host community, leading to some interesting tensions between ‘come heres’ and ‘from heres’ (e.g. Cohen, 1987; Marshall, 2003).

4.6 Trajectories

The trajectory from ecological towards economic development is often a victim of the sheer momentum of democratic politics. Once local residents start buying into the tourism industry, they develop an interest in increasing tourism numbers, hoping to tap into the accruing wealth by landing an additional job or contract, or else offering that one additional bed, meal, tour, or souvenir, a dynamic well explained in the 'development phase' by Butler (1980) in his Tourism Area Life Cycle model, or by the 'Tragedy of the Commons' as outlined by Hardin (1968). But more tourists does not necessarily translate into higher local value added, especially when a locale's exclusive charm is eroded and the local environment becomes irreparably degraded with the impact of tourist invasions. Diminishing returns are a real threat, especially on the smallest islands. Politicians may be loathe, or find it difficult, to adopt unpopular measures that may, or are seen to, thwart the 'trickle down' benefits – such as rents and employment - that may accrue from this industry.

Still, in spite of these real political challenges, there are a few examples which suggest a fairly successful brake on the normal expansion of tourism and its creeping penetration on a smaller island's infrastructure, economy and society. In the Seychelles, the more distant islands in the sprawling archipelago are more expensive to visit. In St Barthélemy, a French territory in the Caribbean, the short runway ensures that only a few rich millionaires can visit. In Italy, Spain, Greece and Turkey, some islands are for sale. It is much easier for sub-national island jurisdictions to adopt and maintain an ecological approach to their development than an independent state. This is because they can be zoned for such a

purpose, while other economic development related activities can take place elsewhere, presumably in the metropole. There are three general ways in which such islands have been carved out and enclaved.

4.6.1 Parks and reserves, local elites and private islands

The first is via the designation of parks or nature/culture reserves. With suitable management and regulatory enforcement in place, park status prevents finite, prized but public resources from falling victim to the 'Tragedy of the Commons'. The world's largest protected marine area, until recently, was Australia's Great Barrier Reef (which includes many islands). Since 2006, the Papahānaumokuākea (originally Northwestern) Hawaiian Islands Marine National Monument (USA) is even larger, with an area of some 362,000 km², more than the total area of all current U.S. national parkland (e.g. Eilperin, 2009). In the Orkney Islands of Scotland, the largest land owner today is the Royal Society for the Protection of Birds (RSPB).

Perhaps the most prestigious listing of all is UNESCO's list of World Heritage Sites (WHS). Inscription on this high-status list identifies a locale as having cultural and/or natural features that are recognized as deservedly common heritage of humankind and therefore meriting being preserved for all, beyond the actual political borders where they may happen to be situated. Islands, singly or in groups, are the only places in the world that can find themselves totally ensconced as World Heritage Sites. There are some 60 WHS sites in the Mediterranean, making this the region with the second largest concentration of such sites (after continental Western Europe); at least a dozen of these are located on islands (Aeolians, Corsica, Cyprus, Gozo, Ibiza, Malta, Rhodes, Sardinia, Sicily).

4.6.2 Beyond democratic governance?

The second route to ecological development is via non-democratic control and non-pluralist governance. (The designation of land or sea as parks, reserves or world heritage sites is in itself a form of wresting such spaces from the non-regulatory and laissez faire tendencies of democracy.) The 'political geography' of cold water islands might partly explain why there are typically less pressures to expand tourism on these locations. Extreme island regions of larger states tend to lie on the political periphery, especially when they have small populations, are un/under-represented in the corridors of power, are largely forgotten by centralized policy makers suffering from 'the urban bias', or are dismissed as insignificant backwaters other than, perhaps, in strategic (military and resource) terms (Butler, 1993; Wilkinson, 1994). A weak local political influence and a lackadaisical interest from the centre do, in turn, suggest that local elites assume significant politico-economic power. These elites also tend to be narrower, less fragmented and more concentrated in island jurisdictions with small populations (e.g. Buker, 2005; May & Tipouniua, 1980; Richards, 1982). Moreover, in non-sovereign island territories, the concentration of local politico-economic power is more likely to rest in the hands of a small identifiable group – a religious congregation (Solovetsky), a team of scientists (Macquarie), an indigenously controlled corporation (Baffin; Nunivak), an arms-length enterprise trust (Chatham), or a municipality (Lulea) (for individual case studies, see Baldacchino, 2006c). Such skewed influence creates a situation where there is hardly a plurality of interest groups clamouring to benefit, and benefit fast, from the tourism bandwagon. The oligopolies in power are champions of tradition; they effuse caution and harbour a suspicion of change. They are fully aware of the environmental and economic risks of mass tourism and are immune to populist pressures

that may oblige them to consider such investments in that industry. Thus, there is limited discussion (at best) on whether to take the tourism industry forward. Most of those in power have no stake in tourism – which is not a key industry anyway – and so are more likely to view its intrusion with some grave, even legitimate, concerns. This is well captured in the following statement, uttered by none other than Archimandrite Josef, the head of the Monastery on the Solovetsky Islands, Russia. It leaves no room for discussion:

"Overgrowth of tourism flows and preservation of divine spirit of the island are incompatible. Nobody even thinks of converting Solovetsky into a trendy resort where the White Sea shore is full of restaurants and... the sky above the Monastery's towers is crossed by paragliders" (quoted in Nevmerzhitskaya, 2006: 162).

A third variant, and extreme rendition of this 'governance for exclusivity', is that found on totally private islands – again, one island condition that cannot be found on continents. Private islands exist all round the world, and many can be bought – with potential for commercial development or private recreational use¹. While even private islands operate within the purview of sovereign states, their status as the objects of lease or purchase allows the buyer considerable discretion (which varies from state to state) as to how to manage the island – but commonly with the intent to restrict access to a select few, typically some of the owners' relatives, the rich and the famous. Ironically, it is the cash and value added created in the *economically* successful 'hot spots' of the world that is often behind the financing needed to purchase, craft and conserve *ecological* island enclaves. This is another way of tapping 'the hinterland beyond' (Baldacchino, 2006b). Thus,

1 For a web-site dealing in private islands, visit: <http://www.privateislandsonline.com/>.

the two sides of the 'eco principle' connect in a rather perverse but symbiotic relationship.

4.7 Conclusion

Perhaps one can modify a proposition made by Funk (2008) and schematize a relationship between economic development and ecological development based on the state of 'natural capital'. In such a model, there are two broad, ideal-type, development trajectories. In the first, countries which have significant 'natural assets', would allow their natural resource endowments – sugar, banana, copra, timber, phosphate, oil and gas... – to be mined and exported, and particularly in a raw state which means that most of the value added is reaped in other economies. Thus, these countries are not likely to 'develop' beyond 'plantation economy' status. They are liable to transform their land into a mono-economy, and are not necessarily much richer for it (*Rich Land, Poor Economy*). In a variant of this model, mass tourism risks transforming many Mediterranean islands and coasts into anonymous chunks of concrete high rises and degraded natural resources.

Even countries that had no natural capital worth exploiting to start off with – because of poor soils and fishing grounds, as well as limited fresh water, exacerbated by high population densities – have tended to promote such services as tourism and finance; these have typically done well economically, driven by the need to tap hinterlands and markets beyond their shores (e.g. Kakazu, 1994). Bar some isolated 'pockets' of nature, these would have ruined any natural capital which they may have had originally (*Poor Land, Rich Economy*).

The middle road between these two routes is one where any natural capital is prized and conserved, not adulterated. The question then becomes: how

do you make such natural capital pay for itself and its maintenance? How does one avoid "picturesque poverty", as argued by Isle of Wight Councilor Harry Rees (Arnold, 2003)? Low population densities help, though these may also mean that there are less opportunities to reap economies of scale. However, economies of scale considerations are not that critical in service or exclusive market provisioning. Niche and second home tourism, investments in transport and ICT infrastructure, and outright sale to private interests, are development options. In such cases, the landscape is more likely to emerge relatively unscathed.

Clearly, it becomes very difficult for any jurisdiction to maintain itself on exclusively ecological principles. Although whole islands and archipelagos have been ensconced on the UNESCO World Heritage List, no whole country has been, and is not likely to be.

Let me conclude by revisiting Crete. How have the Cretans reacted to the absence of any proper industrialization phase? Firstly, they continue to do what they have traditionally done well: harvesting the produce of their land. Farming continues as a core occupation, providing various fresh fruits and vegetables, with olives, grapes, tomatoes, green peppers and oranges leading the way. High value processed food is much sought after: olive oil, wild honey and wild thyme, yoghurt and local cheese, local wines as well as ouzo and raki (like grappa) and retsina (a mixture of wine and pine) are recommended. Rounded off with cooked edible snails and mature capers, "Eat Crete" must be incredibly healthy: the Cretans enjoy the highest life expectancy in Europe (St Vincent, 2004), and are the least likely Europeans to develop coronary heart disease (Natural Health Perspective, 2002). This is how a 'backward' region capitalizes on its strengths. Of course, Crete is no paradise: many Cretans emigrate from the island to metropolitan Greece or elsewhere, for education,

work or adventure. However, the island's working landscape, and its natural offerings, provides a very direct contribution to an enviable quality of life that is becoming increasingly attractive to returning islanders and foreigners alike.

Acknowledgements

My sincere thanks to Geoff Bertram, Louis F. Chikara, Stefan Gössling and Sandy Kerr for useful comments on an earlier draft, as well as to Elizabeth Conrad for careful editing. The usual disclaimers apply.

For a fuller treatment of the ideas and arguments espoused in this chapter, consult Baldacchino (2010: Chapter 8).

References

- Armstrong, H.W., De Kervenoael, R.J., Li, X. & Read, R., 1998. A comparison of the economic performance of different micro-states, and between micro-states and larger countries. *World Development*, 26(4), pp.639-656.
- Armstrong, H.W. & Read, R., 1998. The international political economy of micro-states: an overview. In: ISISA (International Small Islands Studies Association), *Islands V Conference*. Mauritius, 1-5 July. Mauritius: University of Mauritius.
- Armstrong, H.W. & Read, R., 2002. The phantom of liberty? Economic growth and the vulnerability of small states. *Journal of International Development*, 14(3), pp.435-458.
- Arnold, J., 2003. Isle of Wight hits stormy waters. BBC News, 14 February. Available: <http://news.bbc.co.uk/2/hi/business/2752341.stm> [Last accessed: 25th November 2011].
- Baldacchino, G., 1998. The other way round: manufacturing as an extension of services in small states. *Asia Pacific Viewpoint*, 39(3), pp.267-279.
- Baldacchino, G., 2000. Malta as it could have been. *The Malta Independent on Sunday*, 24 Sep, p.20.
- Baldacchino, G., 2005. The contribution of social capital to economic growth: lessons from island jurisdictions. *The Round Table: Commonwealth Journal of International Affairs*, 94(378), pp.35-50.
- Baldacchino, G., 2006a. Innovative development strategies from non-sovereign island jurisdictions: a global review of economic policy and governance practices. *World Development*, 34(5), pp.852-867.
- Baldacchino, G., 2006b. Managing the hinterland beyond: two ideal-type strategies of economic

- development for small island territories. *Asia-Pacific Viewpoint*, 47(1), pp.45-60.
- Baldacchino, G. ed., 2006c. *Extreme tourism: lessons from the world's cold water islands*. Oxford: Elsevier.
- Baldacchino, G., 2010. *Island enclaves: offshoring strategies, creative governance and subnational island jurisdictions*. Montreal and Kingston, Canada: McGill-Queen's University Press.
- Baldacchino, G. & Bertram, G., 2009. The beak of the finch: insights into the economic development of small, often island, economies. *The Round Table: Commonwealth Journal of International Affairs*, 98(401), pp.141-160.
- Baldacchino, G. & Milne, D., eds., 2000. *Lessons from the political economy of small islands: the resourcefulness of jurisdiction*. New York: St. Martin's Press, in association with Institute of Island Studies, University of Prince Edward Island.
- Bertram, G., 2004. On the convergence of small island economies with their metropolitan patrons. *World Development*, 32(2), pp.343-364.
- Bertram, G. & Poirine, B., 2007. Island political economy. In: G. Baldacchino, ed. *A world of islands: an island studies reader*. Malta: Agenda Academic, in collaboration with Institute of Island Studies, University of Prince Edward Island, pp.323-378.
- Birkett, D., 1997. *Serpent in paradise*. New York: Anchor Books.
- Briguglio, L., 1995. Small island developing states and their economic vulnerabilities. *World Development*, 23(9), pp.1615-1632.
- Briguglio, L., 2002. The economic vulnerability of small island developing states. In: H.H. Hsiao, C.H. Liu & H.M. Tsai, eds. *Sustainable development for island societies: Taiwan and the world*. Taipei: National Central University, pp.73-89.
- Buker, P.E., 2005. The executive administrative style in Prince Edward Island: managerial and spoils politics. In: L. Bernier, K. Brownsley & M. Howlett, eds. *Executive styles in Canada: cabinet structures, leadership practices in Canadian government*. Toronto: University of Toronto Press, pp.111-131.
- Butler, R.W., 1980. The concept of a tourist area cycle of evolution. *Canadian Geographer*, 24(1), pp.5-12.
- Butler, R.W., 1993. Tourism development in small islands: past influences and future directions. In: D.G. Lockhart, D. Drakakis-Smith & J.A. Schembri, eds. *The development process in small island states*. London: Routledge, pp.71-91.
- Churchill Semple, E., 1911. *Influences of the geographic environment*. London: Constable.
- Cohen, A., 1987. *Whalsay: symbol, segment and boundary in a Shetland Island community*. Manchester: Manchester University Press.
- Connell, J. & King, R., 1999. Island migration in a changing world. In: R. King & J. Connell, eds. *Small worlds, global lives: islands and migration*. London: Pinter, pp.1-26.
- Dahl, A.L., 1996. *The eco principle: ecology and economics in symbiosis*. London: Zed.
- Debattista, M., 2007. The smart island in the making. *The Times of Malta (1-Tech Supplement)*, 6 Dec.
- Depraetere, C., 2008. The challenge of nissology: a global outlook on the world archipelago - part II: the global and scientific vocation of nissology. *Island Studies Journal*, 3(1), pp.17-36.

- Forster, W., & Kraay, A.C., 2000. Small states, small problems? Income, growth and volatility in small states. *World Development*, 28(11), pp.2013-2037.
- Edgerly, J., 2009. Bush to protect three areas in the Pacific. *Washington Post*, 6 January. Available: <http://www.washingtonpost.com/wp-dyn/content/story/2009/01/06/ST2009010600211.html> [Last accessed: 25th November 2011].
- Evencio, P., 1999. The vulnerability and resilience of small island developing states in the context of globalization. *Natural Resources Forum*, 23(2), pp.261-270.
- Funk, M., 2008. Mustique field notes – 1. [Handout] April 2008. Master of Arts in Island Studies Programme, University of Prince Edward Island.
- Gooding, S., ed., 2003. *Tourism and development in tropical islands: political ecology perspectives*. Cheltenham: Edward Elgar Publishing.
- Gydeboj, A., 2008. Branding from above: generic cultural branding in Shetland and other islands. *Island Studies Journal*, 3(2), pp.175-198.
- Hardin, G., 1968. The tragedy of the commons. *Science*, 162(3859), pp.1243-1248.
- Kakazu, H., 1994. *Sustainable development of small island economies*. Boulder: Westview Press.
- Kaplinsky, R., 1983. Prospering at the periphery: a special case. In: R. Cohen, ed. *African islands and enclaves*. London: Sage, pp.195-216.
- Katzenstein, P.J., 1985. *Small states in world markets*. Cornell: Cornell University Press.
- King, R., 2009. Geography, islands and migration in an era of global mobility. *Island Studies Journal*, 4(1), pp.53-84.
- Marshall, J., 2003. Tradition and modernity: changing social and space relations on Grand Manan. In: H. Millward, K. Beesley & B. Ilbery, eds. *The new countryside: geographic perspectives on rural change*. Winnipeg: Brandon University Press, pp.278-293.
- May, R. & Tupouniua, S., 1980. The politics of small island states. In: R.T. Shand, ed. *The island states of the Pacific and Indian Oceans: anatomy of development*. Canberra: Australian National University, pp.419-437.
- Milne, D., 2000. *Ten lessons for economic development in small jurisdictions: the European perspective*. Charlottetown: Institute of Island Studies, University of Prince Edward Island.
- National Geographic, 2006. Destinations rated: islands. Available: <http://www.nationalgeographic.com/traveler/features/islandsrated0711/islands.html> [Last accessed: 25th November 2011].
- Nature Conservancy, 2008. Micronesia. Palau: a champion of coral reefs. Available: <http://www.nature.org/wherework/asiapacific/micronesia/features/mcpalau.html> [Last accessed: 25th November 2011].
- Natural Health Perspective, 2002. Cretan Mediterranean diet: the Seven Countries Study. Available: <http://naturalhealthperspective.com/food/sevendecountriesstudy.html> [Last accessed: 25th November 2011].
- Nevmerzhitskaya, J., 2006. The Solovetsky Archipelago, Russia. In: G. Baldacchino, ed. *Extreme tourism: lessons from the world's cold water islands*. Oxford: Elsevier, pp.159-168.

- Page, S. & Kleen, P., 2004. *Special and differential treatment of developing countries in the World Trade Organisation*. London: Overseas Development Institute.
- Poirine, B., 1998. Should We Hate or Love MIRAB? *Contemporary Pacific*, 10(1), pp.65–107.
- Richards, J., 1982. Politics in Small, Independent Communities: Conflict or Consensus? *Journal of Commonwealth and Comparative Politics*, 20(2), pp.155–171.
- Srebrnik, H.F., 2000. Identity, culture and confidence in the global economy. In: G. Baldacchino & D. Milne, eds. *Lessons from the political economy of small islands: the resourcefulness of jurisdiction*. Basingstoke: Macmillan, pp.56–71.
- Srinivasan, T.N., 1986. The Costs and Benefits of Being a Small, Remote, Island, Landlocked or Ministate Economy. *World Bank Research Observer*, 1, pp.205–218.
- St Vincent, D., 2004. The complete guide to Crete. *The Independent*, 16 Oct. Available: <http://www.independent.co.uk/travel/europe/the-complete-guide-to-crete-543828.html> [Last accessed: 25th November 2011].
- Streeten, P.P., 1993. The special problems of small countries. *World Development*, 21(2), pp.197–202.
- The Economist, 2003. On the world's rich list. *The Economist*, 17 May, p.33.
- The Economist, 2006. Marketing New Zealand: fantasy worlds to food. *The Economist*, 11 Nov, p.73.
- UNCTAD, 2004. Is special treatment of small island developing states possible? UNCTAD/LDC/2004/1. New York and Geneva: UNCTAD.
- Warrington, E., 1998. Introduction: Gulliver and Lilliput in a new world order: the impact of external relations on the domestic policies and institutions of micro-states. *Public Administration and Development*, 18(2), pp.101–105.
- Warrington, E. & Milne, D., 2007. Island history and governance. In: G. Baldacchino, ed. *A world of islands: an island studies reader*. Malta: Agenda Academic in collaboration with Institute of Island Studies, University of Prince Edward Island, pp.379–427.
- Wilkinson, P.F., 1994. Tourism and small island states: problems of resource analysis, management and development. In: A.V. Seaton, ed. *Tourism: the state of the art*. Chichester: John Wiley, pp.41–51.
- WTO, 1999. Proposals for addressing concerns on marginalisation of certain small economies. WT/GC/W/361. Geneva: World Trade Organisation.

CHAPTER 5

Optimal population density and the sustainability of small island jurisdictions: some considerations

Gordon Cordina and Nadia Farrugia

0.1 Introduction

An important consideration in the environmental sustainability of small jurisdictions is the relationship between territory size, population density and the economic cost of interventions towards improving sustainable development. This chapter presents a model to show that there exists an optimum population density beyond which the per capita cost of the provision of infrastructural services and similar interventions would progressively increase. The question of the economic costs of interventions towards sustainable development deserves special consideration in the case of small, insular and coastal territories with relatively high population densities.

The European Spatial Development Perspective (ESDP) recognizes that regions with low population densities, typically defined as the number of inhabitants per square kilometre, suffer from a number of competitive disadvantages related to spatial development. Indeed, low population densities incur higher per capita overhead costs, particularly in the case of telecommunications, transport and environmental projects and the benefits of such projects are felt by a smaller amount of population than if they are implemented in an area with a high population density. In other words, the same level

of per capita benefits may be obtained at a higher cost in regions with a very low population density. While this reasoning is certainly applicable over a certain range of population density, it may, however, no longer apply for relatively large population densities. In the latter case, the more intensive use of land, and its relative scarcity, may engender higher costs, arising, for example, out of the intensity of demand for the usage of infrastructural amenities. It is thus hypothesized that whereas over relatively low ranges of population density, an increase in such density would lead to lower costs due to the spreading of overheads per capita, at higher population densities this effect would be neutralized and even reversed by the more intensive use of the scarce land and associated resources available. The costs of population pressure would offset the reduction in per capita overheads. There thus exists an optimum population density, beyond which the per capita cost of the provision of infrastructural services would progressively increase.

These considerations would especially apply to small insular territories, such as Malta, due to the fact that the coastline acts as a barrier for the spread of the population over larger territories, thereby often resulting in a population density which is higher than optimal. It is to be furthermore considered that coastal zones are often highly sensitive areas

from the viewpoint of environmental management and in terms of the intensity of conflicts between sustainability and various economic uses. These conflicts are themselves indicative of higher than optimal population densities, and may lead to higher costs of interventions towards promoting sustainable development. Considerations of climate change and retreat of populations from coastal zones may further exacerbate these issues in the future.

The hypothesis presented in this chapter is closely related to the concept of diminishing returns in economics. This states that at relatively low output levels, an increase in output would reduce per unit production cost due to the reduced allocation of fixed costs to each unit of output. Beyond a certain level of output, however, the variable cost of production would increase sufficiently to offset this effect. Likewise, beyond a certain level of population density, the costs of intensity of use of transport and environmental facilities, which are directly and positively related to population size, would offset the spreading of overhead effect. This concept has important implications for spatial development policies in the EU. The ESDP, ratified in May 1999, does not reflect the changes of recent years, in particular the accession of the ten new member states into the European Union in 2004. Malta, one of the new member states, has a population density, which is more than 11 times higher than the EU average.¹ This concept also has important implications for issues such as the formulae for allocation of cohesion funds which consider a high population density as purely an advantage, hence resulting in a lower allocation of funds.

This study involves an economic assessment of the costs of high population density. The

assessment shall identify examples through which high population densities would result in higher costs, and evaluate the relative effects where possible. A discussion regarding the threshold value of population density beyond which further expansion of such density would impose burdens, together with the rate at which such burdens would accumulate, is also undertaken. Following this introduction, a review of international literature associated with optimum population densities is presented. This is followed by a description of the underpinnings of the concepts utilized to derive the concept of optimum population density. Finally, some tentative conclusions on the optimal population densities in small island jurisdictions are put forth on the basis of the results of the model developed in the chapter.

5.2 Literature on conceptual and empirical analyses of optimum population density

The more important contributions to the literature on optimal population density assess whether high population densities in cities are justifiable in terms of greater efficiencies in the production of goods and services and the amenities offered to their inhabitants or whether these are simply the combined product of inefficient agglomeration economies and continued population growth². Within the context of small insular territories, inefficiently high population densities may also be ascribed to the constraints on territorial expansion imposed by the coastline, combined with lack of mobility of populations beyond the territorial shores.

1 Appendix 2 provides data for population densities in the EU.

2 See, for example, Speare & White (1990), Biermann (2002) and Henderson (1986).

5.2.1 The economic costs of increasing population density

One argument for the existence and development of high population densities rests on the notion of agglomeration economies. These economies have advantages in production that derive from the spatial proximity of producers of goods and services in an interrelated economy. By agglomerating, producers reduce the transportation costs of moving goods from one firm or stage of the production process to another. Invocation of the agglomeration economy argument seemed to work well in explaining the development of the great industrial urban centres in the nineteenth century dedicated to the production of durable goods where it was advantageous for producers to congregate. Such agglomeration economies were also viewed to be operating in the services sector, where again, face-to-face contact through physical proximity served to cut costs and foster the more rapid spread of ideas.

Throughout the twentieth century technological advances have eroded agglomeration economies. Improvements in roads and the shift toward truck from railroad car, and most recently, the development of high speed electronic communication have worked in this direction, promoting suburbanization and then enabling movement to even lower density settings, including smaller metropolitan areas and rural communities. This argument indeed extends to the observation that there exist diseconomies of agglomeration, increased costs or disadvantages associated with higher density and proximity. Congestion costs and pollution are the most frequently mentioned of these. Proximity should reduce the cost of delivering goods and services by decreasing the length of transport needed, but traffic is perhaps the most obvious congestion cost. Indeed, data from the census of the United States indicate that workers in larger metropolitan areas spend a longer

time getting to work than in smaller metropolitan areas. Much of this difference is due to congestion. An important result obtained by Henderson (1986) from industrial data from the United States and Brazil indicates that resource productivity improvement initially rose with agglomeration, but then declined. If technological change continues along the same line as it has in recent years, then any productivity advantage of agglomeration will continue to dissipate.

In spite of these observations, there appears to be no consensus on an exact optimum value for city population, but social scientists have tried to estimate the magnitudes and effects of agglomeration economies and diseconomies. As one might imagine, it is very difficult to disentangle the 'true' effects of agglomeration on industrial productivity, congestion and pollution. It is also the case that as Biermann (2002) states, the optimum size of the population density depends to a major extent on country and time specific factors and should therefore be analysed on a case by case basis.

5.2.2 The environmental and social costs of increasing population density

Large population concentration usually requires higher costs per person for the maintenance of sustainable environmental conditions, particularly in the areas of water resource management, waste management and air quality. It is difficult to derive generic results in this respect which are applicable over a wide spectrum of situations.

There are, however, interesting studies which delineate the environmental problems present in densely populated areas. Zero Population Growth, a United States research institute in demographic, economic and social issues, has constructed an index of environmental pollution which combines measures of air quality, water

quality, sewage treatment and hazardous waste (see Zero Population Growth, 1988). This index showed that environmental quality in larger cities was poorer than that in smaller cities. There was a significant dividing line between central cities of 250,000 or more and smaller ones. Less densely populated cities are shown to have two advantages in dealing with the environment. First, because of the lower density, they have lower concentrations of pollutants to deal with. Second, they may find it easier to mobilize support for programmes to regulate and reduce pollution.

Much of the attention in the literature on the costs and benefits of high population density has focused on economic criteria, as the discussion above indicates. Other important aspects of the costs and benefits of population density may be viewed from the social side. These include the relative distribution of income (or more generally resources) for urban areas, crime, anti-social behaviour, and racial and ethnic conflict. These are externalities or agglomeration diseconomies from the sociological or psychological points of view. Although many *ad hoc* theories exist, solid empirical evidence linking population densities to these social costs is not readily available, such that this aspect will not be further treated in this study.

5.2.3 Empirical results from the literature

Formal modelling of the costs of high population densities with the view of obtaining empirical results is an area of study which is as yet in its inception phase. A recent valid contribution in the respect is Biermann (2002). Presenting empirical evidence from two case studies, Biermann challenges the commonly held view that costs increase with distance and decrease with increasing density. The cost-effectiveness of central versus peripheral locations and of increasing residential densities are investigated. It is concluded that in terms of

development costs, dictating a specific urban form i.e. compact city, with the implicit requirement that function follows form, is not the way to achieve sustainable urban environments.

The first case study considered relates to the application of a bulk infrastructure potential cost model in the metropolitan area of Greater Pretoria. Using threshold analysis, potential costs are calculated on the basis of demand for services in terms of population density, supply of existing services, including capacity considerations and the additional infrastructure required to meet the demand. The output of the model is in the form of potential cost surfaces, facilitating the comparison of infrastructure costs between different density scenarios and between different locations. The second case study concerns the effect of locality on costs and energy consumption and involves the comparison of locality-related costs between two specific localities in the Johannesburg metropolitan area.

The results have indicated that bulk infrastructure costs do not simply decrease with increasing density and with decreasing distance from the central areas. In all cases, total infrastructure costs increase as density increases due to the additional demand placed on the system as a whole. Per capita costs, however, do decrease with increasing densities for some cost items but not for all. Electricity per capita costs, for example, increase with increasing density. It has also been demonstrated that for all services considered, the more central areas can be as costly if not more costly to develop than certain more peripheral areas, as a result of existing spare capacity and environmental and land use conditions. Furthermore, environmental and location conditions of the land being used influence infrastructure costs in a manner unrelated to distance from the central areas. For the study area, the most significant impacts of these factors were steep slopes and difficult soils.

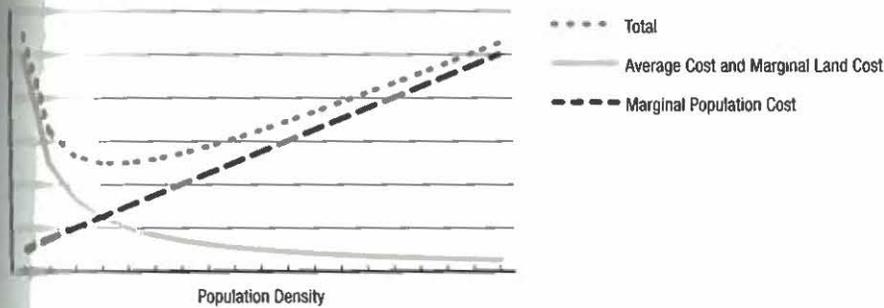


Figure 5.1: Per capita costs at different population densities.

Thus, the results of this kind of study would be highly dependent upon the region in which the projects are being undertaken.

5.3 A Model of the Cost of Population Density

In order to formalize the issues involved in the dependence of per capita costs on population density and to have a working basis to apply to practical situations, this section of the study develops a mathematical model of the costs of a project. The total costs of a project are here defined as the present value of the entire stream of costs of the project, associated both with its development as well as with its operation. This section presents a qualitative approach to the results of the model. A formal mathematical derivation is given in Appendix I.

The principal result which can be derived from the model is that the per capita costs of the project would fall in response to an increase in population density on account of:

- the size of the per capita costs themselves, because the per capita variable has the population quantity as a denominator;

- the marginal cost associated with the element of increase in land area covered, because with an increase in land area, keeping everything else constant, there would be a drop in population density and a commensurate rise in project costs.

On the other hand, the model also shows that per capita project costs would rise with population density on account of the marginal cost element associated with an increase in the population serviced by the project. There are thus two contrasting cost elements, which can be expected to result in a U-shaped response of per capita costs to population density, with a stationary point at the level of population density which gives the lowest per capita costs, as shown in Figure 5.1.

The optimum population density, D^* , which minimizes the per capita costs of a project can be found as:

$$D^* = \frac{MCC(L)}{MRC(P) - PCC} \quad (1)$$

where:

PCC is the per capita cost of the intervention;
MCC(L) is the increase in total costs as a result of an increase in land area covered, and;

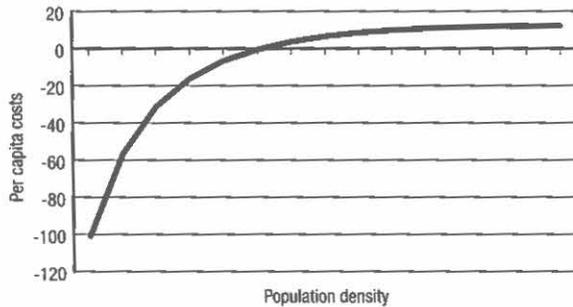


Figure 5.2: Changes in per capita costs at different population densities.

$MRC(P)$ is the increase in costs as a result of an increase in the population serviced.

The optimal value of population density for a given project thus depends on the marginal costs of the project with respect to land area covered and the population serviced, together with the magnitude of the per capita costs. On the basis of equation (1), the threshold value of population density beyond which per capita costs would increase in response to a higher population density would rise with:

- the marginal cost of land element because the higher the costs involved in servicing an increased area, the larger the benefit of having high population densities; and,
- the per capita costs, because the higher the costs per capita, the more prolonged the benefits of a high population density would be.

On the other hand, the value of the optimal population density would be rather low in the case of projects with a high marginal cost of population servicing element. This would typically involve relatively high costs to extend the service to more people, thereby offsetting any positive effects on per capita costs arising out of the possible spreading of overheads among more heads of population.

A hypothetical numerical example can serve to better illustrate this concept. Consider, for example, a project with a total cost of 25 million Euros covering a population of 500,000, implying a per capita cost of 50 Euros. It is assumed that the marginal cost of extending the project by 1 square kilometre, keeping population constant, is 0.5 million Euros. Furthermore, the marginal cost of extending the service to one more unit of population, keeping land area constant, is assumed at 5,000 Euros. Applying the formula in (1), the optimum population density which would minimize the per capita costs of this project is:

$$\frac{500,000}{5,000-50} = 101 \text{ persons per square kilometre}$$

In this particular example, the result is mainly sensitive to changes in the marginal cost of coverage of land and population, as the numerical value of the per capita cost is relatively small.

Figure 5.2 shows, for this example, the effect on per capita project costs of different population densities. For densities below the optimal, it can be seen that an increase in density will reduce per capita costs quite rapidly. However, per capita costs will increase for population densities above the optimal, in a slower but consistent manner.

Another implication of this model is that the responsiveness of per capita costs to population density turns from negative to positive at the point where the marginal costs of servicing extra population become higher than the sum of the total project per capita costs and the marginal costs of extending land area cover spread over the size of the population serviced.

It is reasonable to expect that the marginal costs involved in servicing extra population and extending land cover, as well as the total per capita costs of a project, would depend on project-specific and country-specific conditions. Cost elements would of course vary by project type, since there would be different balances between development and operational costs, and different behaviour with respect to scale economies and returns to factor inputs. Important cost behaviour differences can also be expected to be found between similar projects implemented in different countries, due to factors such as topographical and geographical characteristics, macroeconomic developments and availability of factor resources.

Since the marginal costs and per capita cost elements vary by type of project and by country where projects are implemented, it is conceptually impossible to derive a single value for optimal population density. This would have to be assessed on a project by project basis and a country by country basis on the premises of the model described above.

These conclusions may be *a priori* used to derive two tentative implications with regards to population density in small island jurisdictions. The first is that there appears to be no reason why the optimal population density in a small island should be higher than that in a larger territory. The main justification for a higher population density would be a lower cost of extending a project for an additional unit of population. There is no *a priori* reason to believe

that this is so in small island territories. Therefore, the presence of higher population densities in some small island jurisdictions can be ascribed more to constraints to territorial expansion rather than to the quest for economic efficiency.

The second is that since the coastal zones in small islands are relatively sensitive and imply higher costs of management directly linked to the territory, it would be optimal for such coastal zones to have a lower population density, and for the population in such territories to concentrate mainly in inland zones. A corollary of this, with implications for the first conclusion, is that since coastal zones typically occupy a high share of the total territory in small islands, the population density in such islands would ideally be lower than in jurisdictions where coastal zones are not as prevalent.

5.4 Conclusions

This study shows that while it is true that increasing population density may result in lower per capita costs of infrastructural projects, this reasoning may no longer apply for relatively high population densities. In the latter case, the more intensive use of land and its relative scarcity may engender higher costs arising, for example, out of the intensity of demand for the usage of infrastructural amenities. This applies especially in small insular economies such as Malta.

A survey of international literature shows that there are a number of studies which indicate that high population densities impose economic, social and environmental costs. Furthermore, the way in which population density impacts on costs is likely to depend on a number of conditions specific to the geographical location where the project is being implemented.

The study develops a model of the incidence of population density on the per capita costs of

infrastructural projects. The model shows that the optimal value of population density for a given project depends on the marginal costs of the project with respect to land area covered and the population serviced, together with the magnitude of the per capita costs. The threshold value of population density beyond which per capita costs would increase in response to a higher population density would rise with the marginal cost of land element and the per capita costs.

However, the conclusions described above are to be interpreted as tentative and calling for further study. This is because since the marginal costs and per capita costs elements vary by type of project and by country where projects are implemented, it is conceptually impossible to derive a single value for optimal population density.

References

- Biermann, S., 2002. Cost variation with density and distance and implications for sustainable urban form. In: CSIR (Council for Scientific and Industrial Research), *5th Symposium of the International Urban Planning and Environment Association*. Oxford, 23- 26 September 2002.
- Henderson, J.V., 1986. Efficiency of resource usage and city size. *Journal of Urban Economics*, 19, pp.47- 70.
- Speare, A. & White, M., 1990. *Optimal city size and population density for the 21st century*. NPG Forum Paper no. 11. Alexandria (VA): Negative Population Growth (NPG).
- Zero Population Growth, 1988. *Urban stress test*. Washington DC: ZPG.

Appendix 1: Mathematical derivation of the cost behaviour model

In order to understand the development of the total costs of a project, TC, with respect to population density, the total costs in turn are divided into those elements which depend on the land area covered, $C(L)$ and those which depend upon the size of population serviced, $R(P)$, where L is a measure of land area and P is a measure of total population. Thus:

$$TC = C(L) + R(P) \quad (1)$$

It is often the case that $C(L)$ relate mainly to project development costs while $R(P)$ would be more likely to arise out of the operational cost element. This is however a generic statement which can have exceptions and which does not in any way impinge on the results to be developed here.

On the basis of equation (1), the per capita costs of the project can be derived by dividing throughout by the population size, thus:

$$TC/P = [C(L) + R(P)]/P \quad (2)$$

In order to study the evolution of per capita costs with respect to the population density P/L , we take the derivative of equation (2) with respect to P/L thus:

$$\frac{\partial (TC/P)}{\partial (P/L)} = (1/P^2) \left[P \frac{\partial [C(L) + R(P)]}{\partial (P/L)} + [C(L) + R(P)] \left(- \frac{\partial P}{\partial (P/L)} \right) \right] \quad (3)$$

Denoting the per capita costs as PCC, the increase in total costs as a result of an increase in land area covered as $MCC(L)$ – which stands for the marginal costs of land) – the increase in costs as a result of an increase in the population serviced as $MRC(P)$ – which stands for the marginal costs of population – and the population density as D , further manipulation of equation 3 gives the result that:

$$\frac{\partial PCC}{\partial D} = - [PCC/D + MCC(L)/D^2] + [MRC(P)/D] \quad (4)$$

Equation (4) shows that the per capita costs of the project would fall in response to an increase in population density on account of the size of the per capita costs themselves, because the per capita variable has the population density as a denominator and of the marginal cost associated with the element of increase in land area covered, because with an increase in land area, keeping everything else constant, there would be a drop in population density and a commensurate rise in project costs. On the other hand, Equation (4) also shows that per capita project costs would rise with population density on account of the marginal cost element associated with an increase in the population serviced by the project.

The optimum population density can be found by setting equation (4) equal to zero. Manipulation of equation 4 also indicates that the responsiveness of per capita costs to population density turns from negative to positive at the point where:

$$\text{MRC}(P) > \text{PCC} + \text{MCC}(L)/P \quad (5)$$

That is, a higher population density would start to increase per capita project costs when the marginal costs of servicing extra population become higher than the sum of the total project per capita costs and the marginal costs of extending land area cover spread over the size of the population serviced.

Appendix 2: Population density in the EU (number of inhabitants per km²)

Country	Population density (2006)
Malta	1282
Netherlands	484
Belgium	347*
United Kingdom	249*
Germany	231
Italy	199
Luxembourg	181
Czech Republic	133
Denmark	126
Poland	122
EU-27	115
Portugal	115
Slovakia	110
Hungary	108
France	100
Austria	99
Slovenia	99
Romania	94
Spain	86
Greece	85
Cyprus	83
Bulgaria	70*
Ireland	62
Lithuania	54
Latvia	37
Estonia	31
Sweden	22
Finland	17

* 2004 data for the United Kingdom and 2005 for Belgium and Bulgaria.

Source: Eurostat/European Commission, 2010. *Tourism Statistics. Luxembourg: Office for Official Publications of the European Communities.*

"A cultural landscape is fashioned out of a natural landscape by a culture group. Culture is the agent, the natural area is the medium, and the cultural landscape is the result. Under the influence of a given culture, itself changing through time, the landscape undergoes development, passing through phases and probably reaching the end of its cycle of development. The natural landscape is of course of fundamental importance, for it supplies the materials out of which the cultural landscape is formed. The shaping force, however, lies in culture itself".

Growing interest in the concept of cultural landscape during the second half of the 20th century has been accompanied by the emergence of various definitions of the term, by scientists from different disciplines. Jones (1988) examined the use of the term and identified 3 main forms of understanding:

1. As landscapes modified or influenced by human activity;
2. As valued features of a human landscape that are threatened by change or disappearance;
3. As elements in the landscape with meaning for a human group in a given cultural or socio-economic context.

The above 3 forms of understanding regard cultural landscapes from 2 perspectives:

1. Historical stages of change influenced by human activity;
2. Elements in landscape that are valued by people, and heritage to protect.

An important political development concerning the identification and recognition of cultural and natural heritage occurred through the United Nations Educational, Scientific, and Cultural Organization's (UNESCO) World Heritage Convention, adopted in 1972. This legal tool, which

had a key role in facilitating implementation of UNESCO policy, was adopted with the purpose of "establishing an effective system of collective protection of the cultural and natural heritage of outstanding universal value, organized on a permanent basis and in accordance with modern scientific methods" (extract from the preamble to the Convention).

Through the establishment of a World Heritage Committee, cultural, natural and mixed properties of outstanding universal values which are to be protected under the Convention are listed on the World Heritage List (WHL). However, it was not until 1992 that this Convention became the first international legal instrument to protect cultural landscapes. At its 16th session, the World Heritage Committee adopted guidelines concerning their inclusion in the World Heritage List, acknowledging that cultural landscapes represent the "combined works of nature and of man", as designated in Article 1 of the Convention. The World Heritage Committee thus adopted (in December 1992) three categories of cultural landscapes (UNESCO, 1992), as follows, to be integrated into their operational guidelines:

1. *Clearly defined landscapes designed and created intentionally by humans* - this category embraces garden and park landscapes constructed for aesthetic reasons, which are often (but not always) associated with religious or other monumental buildings and ensembles.
2. *Organically evolved landscapes* - these result from an initial social, economic, administrative, or religious imperative and have developed into their present form by association with, and in response to, the natural environment. Such landscapes reflect that process of evolution in their form and component features.
3. *Associative cultural landscapes* - the inclusion of such landscapes on the World

Heritage List is justifiable by virtue of the powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent (UNESCO, 1992).

The attention to island cultural landscapes at the international scale increased and expanded first through this UNESCO Convention on Cultural and Natural Heritage, and consequently, by the inclusion of island sites and island cultural landscapes on the World Heritage List.

Subsequently, the European Landscape Convention was introduced by the Council of Europe in 2000; the Convention adopts a very culturally sound approach. The preamble indeed makes it clear that both cultural landscapes and landscape change are key factors to be considered in management:

"Aware that the landscape contributes to the formation of local cultures and that it is a basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity..."

"Noting that developments in agriculture, forestry, industrial and mineral production techniques and in regional planning, town planning, transport, infrastructure, tourism and recreation and, at a more general level, changes in the world economy are in many cases accelerating the transformation of landscapes..."

The European Landscape Convention defines landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors". This definition emphasizes the human dimension of landscapes and the resulting ways in which people contribute to landscape distinctiveness and diversity. Furthermore, the recognition of landscapes and related values depends

on human perception, which is a predominantly cultural element (Moreira *et al.*, 2006). In this respect, at least two peculiar features are relevant to island cultures and sustainable development. On the one hand, the aim of the Convention is that of framing the landscape in planning and management terms, therefore attributing a cardinal role to culture in designing praxis. On the other, the perception of the landscape by the individual local communities is regarded as the reference basis for protection, management, and planning, therefore focusing on those geographical features that are regarded as culturally relevant to the local systems (Vallega, 2007).

6.3 Definitional issues: what is a cultural landscape?

Various definitions of cultural landscape can be found both in political and scientific documents. Here, some common uses of the term will be reviewed. Farina (1998) defines cultural landscape as a region in which human disturbance has occurred for thousands of years, creating a unique assemblage of patterns, species and processes (cited in Moreira *et al.*, 2001). In this understanding, cultural landscapes thus reflect the long term interactions between people and their natural environment. However, as Forman (1997) and Dunn *et al.* (1991) state, temporal changes in landscape patterns can be attributed to a combination of natural and human derived disturbances (cited in Moreira *et al.*, 2001).

The definition adopted by Domosh (2004: 3081) describes cultural landscapes as "patterns that cultures imprint on the land". Another approach to the concept is taken by Antrop (2005), who describes cultural landscapes "as the result of consecutive reorganizations of the land in order to adapt its use and spatial structure better to changing societal demands" (p. 21). A cultural landscape is

defined by Bucklet et al. (2008: 48) as “an area where the landforms have been created by human culture as well as by nature; human culture has been created by the landscape as well as the people; and each now depends upon and continues to exist because of the other”.

In its broadest sense, the cultural landscape thus reflects the interconnections between humans and their environment in space and time and it consists of:

- Cultural and natural features and elements;
- Imprints of cultural processes;
- Components from history; and
- Layers of change over time.

Change is an important feature of cultural landscapes which results from human activity and it is inevitable, but should be managed to the desired direction to avoid loss of its features.

In the light of these definitions, a cultural landscape can be defined as follows:

A cultural landscape is a physical area with natural features and elements modified by human activity resulting in patterns of evidence layered in landscape which give a place its particular character reflecting human relationships with and attachment to that landscape. Change is one of the main features of it and it should be managed to sustain and transfer its values to the future generations.

6.4 A changing landscape - why the need to manage change?

Landscape change and the management of such change have been key areas of interest in cultural landscape studies. Cultural landscapes change as

a result of changing human needs and demands in time. These landscapes are heavily dependent on human factors. Today, human activities, various interests and land use conflicts have resulted in rapid change in cultural landscapes, in what is often perceived to be a negative trend. These at times devastating changes are increasingly threatening the cultural and natural aspects of landscapes and their integrity and character.

Ongoing influences from conflicting and unsustainable land uses are having major effects on the cultural landscapes of islands. Islands, even more than mainland areas, are facing extreme land use conflicts and rapidly intensifying human activity. The transformations are more evident on islands given fundamental characteristics of insular vulnerability and limited land areas. Some processes in cultural landscapes result not only in loss of an island's biological qualities but also in the impoverishment of its cultural heritage and in a loss of identity (Vos & Meekes, 1999).

Some of the key consequences of negative change in cultural landscapes can be summarized as follows:

- Loss of local identity;
- Loss of cultural heritage;
- Degradation of natural resources; and
- Loss of landscape quality.

Thus, the rationale to control changes in cultural landscapes in islands incorporates many elements:

- To preserve their unique cultural and natural values;
- To transmit cultural heritage to future generations;
- To ensure sustainable development;
- To preserve the cultural identity connoted by cultures;

To preserve the cultural endowment of island communities.

Identifying and recording the cultural landscape consists of its features, characteristics and change and should be considered as an important stage of any cultural landscape study. This necessitates a detailed analysis of the landscape over time. Lohr (1999) defines the following points to be considered in order to ensure that cultural landscape change studies are systematic, and their results comparable:

1. Origin of the change (abiotic, biotic, social sphere);
2. Character of change (acute, chronic, composite, single cause disturbance);
3. General place of change (abiotic, biotic, social sphere);
4. Exact place of change (ecological variable, ecosystem);
5. Scope of change (point, ecosystem, landscape);
6. Dynamics of change (slow, rapid);
7. (Un)predictability of change (its beginning, development/direction, ending);
8. Reactions of landscape homeostatic mechanisms (responses in abiotic, biotic social sphere);
9. Possibilities to prevent changes (feasibility, desirability, etc.);
10. Value systems behind landscape change or behind the opposition of it.

Thus, understanding landscape change is a continuous and complex process and an important prerequisite for successful cultural landscape management. Coherence, diversity and identity are characteristic of cultural landscapes and should also be considered as important components of cultural landscape change studies.

6.4.1 Coherence

Cultural landscapes are the reflection of people's interventions on their environment as well as of human values, beliefs and perceptions. They are embedded with meanings which shape the landscape's character. Reading and understanding a landscape is crucial to one's interpretation of a 'sense of place'. Thus, legibility plays an important role in appreciating cultural landscapes. Coherence between the features of a landscape is key to identifying legibility. Coherence of a landscape can be defined as the degree to which elements of a particular landscape are consistent with each other within space and through time. Four types of landscape coherence are identified by Hendriks *et al.* (2000):

- *Vertical coherence*: refers to the relationship between abiotic factors, biotic factors and land use.
- *Horizontal coherence*: refers to the relationship between visual, spatial, functional and/or ecological components of the landscape.
- *Seasonal coherence*: refers to the relationship between season and colour, form and texture of landscape components.
- *Historical coherence*: is the relationship between past, present and possible future human activities.

While coherence is mainly considered in terms of spatial organization in landscape research, cultural coherence is another important factor that shapes cultural landscapes. Driving forces of landscape change can have a huge impact on cultural coherence through impacts such as fragmentation and loss of distinctiveness. Coherence is strongly related with the identity of a place; for this reason, changing the characteristics and coherence of a landscape might lead to loss of identity or to the formation of a new identity (Antrop,

2005). Today, as the influence of the globalized economy and technological developments on cultural landscapes grows, coherence of natural and cultural landscape elements seems to be more vulnerable than ever. This is even more so in islands, which are relatively isolated places. Here, changes in cultural dynamics seem to have larger proportionate effects on coherence of both natural and cultural structure, and consequently, on cultural heritage in islands.

As Nassauer (1995: 229) points out; "culture and landscape interact in a feedback loop in which culture structures landscapes and landscapes inculcate culture". Therefore, understanding the cultural dynamics which shape and transform landscapes is essential in conservation and improvement of the coherence of a particular landscape.

6.4.2 Diversity and identity

Cultural landscapes are expressions of lifestyles and cultural heritage. Diversity and identity are two basic aspects of these elements. These two concepts are also essential in the sustainable development of societies. They reflect heritage values of a particular community. Both concepts are strongly correlated with the coherence of the landscape. While coherence of particular properties defines identity (Antrop, 2005), diversity without coherence leads to chaos in landscapes (Hendriks *et al.*, 2000).

Diversity has always been fundamental to the survival of living organisms. It allows communities to adapt to changes as necessary. Diversity has been a core subject in sustainable development since 1992, when the United Nations Convention on Biological Diversity was opened for signature; the Convention subsequently came into force in 1993. However, until recently, the concept of diversity has been mainly restricted to biological diversity, even within landscape research. Notwithstanding, changes in cultural landscapes

due to rapid globalization and urbanization processes have raised concerns for loss of cultural diversity, especially within the last decade. It has become a major issue on the international agenda; for example in December 2000, the Council of Europe adopted a *Declaration on Cultural Diversity* and in November 2001, UNESCO adopted its *Universal Declaration on Cultural Diversity* and associated Action Plan for its implementation. Both declarations aim to promote maintaining and sustaining cultural diversity in the context of sustainable development. Cultural diversity is accepted as a driving force of development in terms of both economic growth and providing a more intellectual and moral life (UNESCO, 2010).

The diversity of cultural landscapes reveals a historical record of the relationship between communities and their environment as an evolutionary process. Cultural landscapes contain both biological diversity and cultural diversity resources. Hence, both resources should be considered in a comprehensive way in sustainable development. Diversity of the landscape plays a significant role in determination of landscape typologies and classification of landscapes. However, although thematic maps of landscape diversity are widely used in landscape planning and management, cultural components are rarely covered in detail.

Currently, there is a growing concern for the loss of traditional cultural landscapes due to landscape change (Antrop, 2005) and it becomes harder to identify landscape and design forms which are necessary in order to preserve local identity (Brabec, 2004). Since landscape is shaped by the interaction between people and their environment, cultural identity is reflected as a landscape image in spatial context. For instance, when one is told about a 'Japanese garden' or an 'English landscape', landscape images with certain characteristics are evoked in people's minds. Identity of a landscape can be expressed as "the specific composition of the characters of

landscape components" (van Mansvelt & Pedroli, 2003: 304), which is also highly influenced by cultural values. As Arreola (1995: 518) points out "identity can change through time, as may image". However, the speed and magnitude of landscape change have both dramatically increased, leading to sudden and unexpected alterations in landscape character both in natural and cultural terms. Traditional landscapes are often thought to be more diverse and ordered, compared to new landscapes which seem to be more homogenous and more chaotic (Van Eetvelde & Antrop, 2004).

The effects of landscape change are often more influential and visible in small islands due to their geographical location, limited resources and size. Globalization trends and urbanization alter islands' natural and cultural dynamics more rapidly. This rapid change causes landscapes to lose their character, and consequently their diversity and identity. One of the major issues that cultural landscapes of small islands face is relatively scarce economic resources. Generally, tourism activities play a significant role in islands' economical development (Macleod, 2004) and mass tourism is the main kind of tourism activity in many Mediterranean islands. However, the pressure exerted on natural and cultural resources by mass tourism often exceeds the carrying capacity. Moreover, mass tourism damages local diversity and identity more than any other kind of economic activity. Thus, it is essential to manage tourism activities in islands with a more sustainable approach to protect natural resources and cultural heritage, which are extremely vulnerable to changes.

0.6 Gökçeada (Imbros): case study

The selected area of study, Gökçeada (Plate 6.1), or as it was known in ancient times, Imbros Island, is located in the north-eastern Aegean Sea. It is an

important Turkish island, with a unique landscape, resulting from its cultural diversity and its perfect harmony with natural structures. Gökçeada is the biggest island belonging to Turkey (289.5 km²) and also constitutes the westernmost point of the country. Administratively, it belongs to the province of Çanakkale. The island is 32 miles from Çanakkale and 14 miles from Kabatepe Harbour on Gallipoli (Bozbeyoğlu & Onan, 2001). Besides the town centre, there are 9 villages on the island. As of 2010, it had a population of 7074 (Turkish Statistical Institute, 2010).

Gökçeada, has been inhabited by many civilizations including the Persians, and Spartians, and also formed part of the Roman, Byzantine, Greek and Ottoman Empires. The island remained under Turkish sovereignty following the Treaty of Lausanne in 1923. It has gone through many migration processes, especially between Greek and Turkish populations. Although the island was exempted from population exchange between Turkey and Greece, the Rum population has nevertheless decreased significantly.

6.5.1 Landscape character

Gökçeada is an island comprising diverse cultural and natural patterns. The cultural landscape of Gökçeada has evolved as a result of the dynamic interaction between the culture of the inhabitants, and the physical resources of the island landscape. Turkish and Greek inhabitants of the island both adapted their culture to use available natural resources, and shaped the landscape in the process.

Although Gökçeada's economy largely depends on the mainland, it has some valuable natural and cultural resources. For instance, Gökçeada is the 4th ranked island in the world in terms of its richness of freshwater resources (Bozbeyoğlu & Onan, 2001). There is also an important amount of

land which is suitable for agricultural production. Today, olive orchards are a significant element of the agricultural pattern. Besides crop production, animal farming and fishery activities are also pursued on the island. Recently, organic farming has become popular throughout Gökçeada. There have been many projects in olive, honey and grape production, supported by local and national authorities.

Settlement areas of the island display different characteristics (Plate 6.2). Five of the villages are old settlements, mainly influenced by Greek culture. There are many historic buildings, churches and other features within these settlements. The historic island capital of Kaleköy (Plate 6.3) features the remains of a large Venetian/Byzantine fortress built on an ancient site. The other four villages were established by Turkish governments. Turks from different parts of the mainland, resettled by the government on Gökçeada, live in these new villages. While it is possible to experience different cultures in the more historic settlements of the island, interactions between different cultures are hardly present in the new settlements (Ozözen Kahraman, 2005b). The differences between old and new settlements can also be seen in architectural character. For example, while Çınarlı consists of cutting stone houses and cobbled streets, Yeni Mahalle has the characteristics of modern urban settlements (Hüryılmaz, 2006). Nevertheless, despite recent developments and changes in landscape character in newer areas, Gökçeada's landscape still reflects the influence of many cultures and has a diverse and unique character.

6.5.2 Tourism as a developing sector

Tourism is a newly advancing sector of the island's economy. Although the natural and cultural heritage of the island offers significant potential for tourism activities, the political status of the

island prevented public and private investment until recently. Salt Lake lagoon which is a natural breeding area for migratory birds as well as a mud bath area, Kaleköy, Cheese Cliffs, New Almond Mound, Lazkoyu, Marmaros Falls, Zeytinlikoy, Yildizkoy, and the Underwater Marine Park, are various important natural and cultural tourism areas. The unspoiled and rich marine biodiversity of Gökçeada offers opportunities for diving tourism. Moreover, Aydıncık (Kefaloz) Zone and Güzelcekoy are suitable for surfing (Kokal, 2008). Churches, monasteries, chapels, and various fine examples of Greek civil architecture, are attractive cultural values in the old settlement areas of the island. Archeological studies have also revealed an important element of the cultural history of the island, namely Yenibademli Höyük, which shows typical characteristics of Aegean culture in the early Bronze Age (Hüryılmaz, 2006).

Social activities, such as festivals, also attract tourists. For example, the Gökçeada film festival, and the festival for the commemoration of the death of the Virgin Mary, are the two well-known activities which take place annually on the island.

6.5.3 Protected areas

More than half of the island is legally protected in accordance with the Law on Protection of Cultural and Natural Heritage (No. 2863), by virtue of its natural, religious, architectural, and archeological characteristics. Gökçeada is also considered to be one of the most important regions for the conservation of the endangered Mediterranean monk seal (*Monachus monachus*). In addition, Turkey's first underwater marine park (Gökçeada Underwater Marine Park) is located along the northeastern coastal line of the island, between Kaleköy and Kuzulimanki; it was established with the aim of protecting marine biodiversity within the region.

6.6.4 Landscape change

Migration processes have played a major role in cultural landscape change in Gökçeada. National and International policies and conflicts have resulted in continuous migration movements. At the start of the 20th century, the Rum population dominated the island. However, the Turkish population grew significantly after 1965 (Özözen Kahraman, 2005a). Because of the government's policy for 'Turkification' of the island, many Turkish citizens from Anatolia were brought to the island, starting in 1946 (Babul, 2004), bringing with them their own cultural values. The local population has continued to abandon the island, particularly since the 1960s. The establishment of an open prison and a state production farm on the island played a significant role in the out-migration of Rums. Most of the local residents of the island were traditionally engaged in fishery, farming and animal husbandry. In the 1960s, fishing was restricted and three large agricultural plains were devoted to other land uses. Consequently, the cultural landscape structure of the island started to change. One of the major changes is the decline of vineyard landscapes on the island (Özözen Kahraman, 2005b; Yaşar, 2006). Although wine production has gained some popularity recently, it is not local people who are investing in viticulture.

Compared to Turkey's Aegean coastline, Gökçeada is less affected by urbanization processes; nevertheless, recently there has been a rapid increase in urbanization processes. The legal protection afforded to various areas on the island has considerably prevented development along the coastal zone. However, the character of settlement areas developed after 1973 is inconsistent and incoherent with the vernacular architectural identity (Yaşar, 2006). Gökçeada has become a popular summer vacation destination among high income groups especially from Istanbul, leading to expansion of settlement areas. The problem is that

many of these mainlanders tend to have their own houses, instead of staying at hotels or pensions. Unfortunately, houses built by outsiders often conflict with local architectural style and identity.

Today, the landscapes of many Aegean and Mediterranean islands have been modified mainly under the influence of tourism. On the contrary, although Gökçeada's landscape presents a high potential for tourism activities, its landscape character has not shown a dramatic change yet, due to some limitations, such as lack of public and private sector investment in the past, inadequate transportation systems and limited accommodation facilities. Nevertheless, the island's landscape is under threat from developing tourism activities, particularly given that tourism is considered to be an important economic income source, and hence authorities are promoting tourism development actively.

Changes in the Gökçeada cultural landscape can be characterized by socio-economical and socio-political drivers, and land use management policies. Migration policies changed the homogeneous structure of the community and caused a change in cultural landscape structure. Due to this, major changes occurred in the rural land-use patterns and settlement types; urbanization and tourism developments caused further changes. As a result of these various influences, there has been a loss of unique natural and cultural values, and major changes have occurred in visual landscape values, in landscape diversity and in the identity of the landscape. While still preserving some of its local diversity and identity values, the landscape of Gökçeada needs specific management policies to address emergent threats.

6.6 Conclusion

Cultural landscapes have a complex character, resulting from the combination of many natural

and cultural features layered over many years. The meaning and significance of cultural landscapes is largely derived from the relationship between the landscape and the elements within that landscape, as well as the relationship between the individual elements themselves. Thus, landscape meaning and significance can be lost when important components of a cultural landscape are removed, or when evidence relating the feature to the landscape setting vanishes (such as a bridle path linking two settlements). This means that a cultural landscape is effectively an extensive, integrated management unit.

People, nature, change and time are some basic dimensions to be considered when studying these landscapes. The main challenge is to avoid undesirable change and to preserve cultural landscapes, while accommodating the socio-economic needs and demands of people, and consequently to ensure sustainability. In an ideal cultural landscape, people should be capable of meeting their social and economic needs without compromising the landscape's natural health (Anko, 1999). However, this is rarely the case and managing cultural landscapes thus involves planning for positive change, as well as preventing negative change. It is guiding change to the desired direction.

Gökçeada is an island of immigrants. Gökçeada has become one rare example of areas where different cultures live together. The ethnic and cultural structure of the island has been enriched through migration, but imprints of cultural processes and components from history rapidly diminished, resulting in the loss of the island's unique cultural and natural features. Today, policies are leading the island on a path towards mass tourism, resulting in large-scale changes, mainly in land use patterns, settlement types and demographic structure, which will surely lead to major alterations in landscapes over the coming years.

To ensure the sustainability of the island's cultural landscape, the management approach should be holistic and systematic, to bridge cultural and natural aspects, and also past and future uses. The clear definition of interconnections of people and nature, and of the evolving needs and demands of people is important in this context, as is an evaluation of the process of landscape change. The overall management aim can be defined as satisfying the needs of various land use interests while sustaining cultural landscapes for existing and future generations. Some basic considerations of cultural landscape management for Gökçeada can be defined as follows:

- To avoid undesirable landscape change, the process of change should be controlled. This requires knowledge on the process of change in space and time. However, landscape planning and management should address the process of change rather than the changes themselves (Anko, 1999). Nevertheless, the causes of change and the magnitude of change should also be taken account.
- Since cultural landscapes reflect interconnections between people and nature, it is important to look at the forces driving landscape change. The interrelations of humans and landscape, and changes within these, should be analysed. Such analysis should be integral to the management strategy. Indeed, due to their complex nature, a detailed analysis of the various aspects of cultural landscapes is needed for any policy and management strategy to be effective.
- An interdisciplinary approach integrating physical and social components is vital in studying cultural landscapes. Natural and cultural components of cultural landscape should be evaluated from the perspective of sustainable development.

As stated by Russell (1997), today's landscapes are the result of many layers of past natural processes and human interventions, and therefore, a historical perspective is needed. Such a landscape history provides valuable information for managing cultural landscapes (Bürgi *et al.*, 2004). Studying how landscape evolved in the past is important to predict the possible conflicts that may arise in the future. Historical dynamics and past functioning of landscape should be an integral part of management.

Defining and analysing changing characteristics, fragmentation, loss of distinctiveness and loss of cultural identity, should be an integral part of cultural landscape management planning.

Public participation should be considered as an important component of cultural landscape management to conserve and sustain cultural values. All parties, and especially the actor groups representing the history and culture of the island, should be actively involved in this process.

We conclude, each cultural landscape should be defined to express its unique identity. Gökçeada has a unique identity and this should be an important integral part of cultural landscape management. National and local authorities should take account of this, preserving cultural landscape and diversity while developing appropriate policies and plans. The multicultural character of Gökçeada should also be safeguarded, to protect and sustain the island's distinctive cultural landscape.

References

- Anko, B., 1999. Environmental management of landscapes. In: B. Nath, L. Hens, P. Compton & D. Devuyt, eds. *Environmental Management in Practice: Volume 3 – Managing the Ecosystem*. London: Routledge, pp.230-250.
- Antrop, M., 2005. Why landscapes of the past are important for the future. *Landscape and Urban Planning*, (70), pp.21-34.
- Arreola, D.D., 1995. Urban ethnic landscape identity. *Geographical Review*, 85(4), pp.518-534.
- Babul, E., 2004. Belonging to Imbros: Citizenship and Sovereignty in the Turkish Republic, *Nationalism, Society & Culture in post-Ottoman South East Europe*, St. Peter's College Oxford, 29-30 May 2004. Available: <http://www.sant.ox.ac.uk/esc/esc-lectures/babul.pdf> [Last accessed: 20th November 2011].
- Bozbeyoğlu, A.C. & Onan, I., 2001. Changes in the demographic characteristics of Gökçeada. Available: http://www.iussp.org/Brazil2001/s80/OtherPosters_P01_Bozbeyoglu.pdf [Last accessed: 20th November 2011].
- Brabec, E., 2004. Landscape change: the influence of external cultural forces. *Fifth International Workshop on Sustainable Land-Use Planning*, Wageningen, June 2004. Available: [http://works.bepress.com/cgi/viewcontent.cgi?article=1005&context=elizabeth_brabec&seiredir=1#search=Landscape+c change:+the+influence+of+external+cultural+forces](http://works.bepress.com/cgi/viewcontent.cgi?article=1005&context=elizabeth_brabec&seiredir=1#search=Landscape+c%20change:+the+influence+of+external+cultural+forces) [Last accessed: 20th November 2011].
- Buckley, R., Ollenburg, C. & Zhong, L., 2008. Cultural landscape in Mongolian tourism. *Annals of Tourism Research*, 35(1), pp.47-61.

- Bürgi, M., Hersperger, A.M. & Schneeberger, N., 2004. Driving forces of landscape change-current and new directions. *Landscape Ecology*, 19(8), pp.857-868.
- Hendriks, K., Stobbelaar, D.J. & van Mansvelt, J.D., 2000. The appearance of agriculture: an assessment of the quality of landscape of both organic and conventional horticultural farms in West Friesland. *Agriculture, Ecosystems and Environment*, 77, pp.157-175.
- Hüryilmaz, H., 2006. Urban organization and administration in Gökçeada-Yenibademli Höyük [Online]. Available: <http://www.e-sosder.com/dergi/1830-43.pdf> [Last accessed: 20th November 2011].
- Jones, M., 1988. Kulturlandskapsdebatten i Norge 1987-1996. In: A. Norderhaug, ed. *Nordisk landskapsseminar Sogndal 1996*. Sogndal: Høgskulen i Sogn og Fjordane, Avedline for naturfag, pp.47-64.
- Jones, M., 2003. The concept of cultural landscape: discourse and narratives. In: H. Palang & G. Fry, eds. *Landscape interfaces*. Dordrecht: Kluwer Academic Publishers, pp.21-51.
- Özözen Kahraman, S., 2005a. Effect of migration on population evolution and change in Gökçeada. *Ankara Üniversitesi Coğrafya Bilimler Dergisi*, 3(2), pp.39-53.
- Özözen Kahraman, S., 2005b. Geçmişten Günümüze Gökçeada'da Yerleşmelerin Dağılımında Etkili Olan Faktörler, *Istanbul Üniversitesi Edebiyat Fakültesi Coğrafya Bölümü Coğrafya Dergisi*, 14, pp.25-42.
- Kokal, Ö., 2008. Son Güneş, Gökçeada'da. Available: http://www.omerkokal.com/yayinlar/voyager_mayis05_gokceada.htm [Last accessed: 20th November 2011].
- Macleod, D.V.L., 2004. *Tourism, globalisation, and cultural change: an island community perspective*. London: Multilingual Matters Limited.
- Moreira, F., Reho, F.C. & Ferreira, P.G., 2001. Temporal (1958-1995) pattern of change in a cultural landscape of northwestern Portugal: implications for fire occurrence. *Landscape Ecology*, 16, pp.557-567.
- Moreira, F., Queiroz, A.I. & Aronson, J., 2006. Restoration principles applied to cultural landscapes. *Journal for Nature Conservation*, 14, pp.217-224.
- Nassauer, J.I., 1995. Culture and changing landscape structure. *Landscape Ecology*, 10(4), pp.229-237.
- Russell E.W.B., 1997. *People and the land through time: linking ecology and history*. New Haven: Yale University Press.
- Sauer, C.O., 1925. The morphology of landscape. *University of California Publications in Geography*, 2(2), pp.19-53.
- Turkish Statistical Institute, 2010. Population statistics [Online]. Available at: <http://tuikapp.tuik.gov.tr/adnksdagitapp/adnks.zul> [Last accessed: 20th November 2011].
- UNESCO, 1992. Guidelines on the inscription of specific types of properties on the World Heritage List, Annex 3 [Online]. Available: <http://whc.unesco.org/archive/opguide05-annex3-en.pdf> [Last accessed: 20th November 2011].
- UNESCO, 2010. Cultural Diversity [Online]. Available at: http://portal.unesco.org/culture/en/ev.php-URL_ID=34321&URL_DO=DO_TOPIC&URL_SECTION=201.html#topPage [Last accessed: 20th November 2011].

Vallega A., 2007. The role of culture in island sustainable development. *Ocean & Coastal Management*, 50, pp.279-300.

Van Etvelde, V. & Antrop, M., 2004. Analyzing structural and functional changes of traditional landscapes - two examples from Southern France. *Landscape and Urban Planning*, 67, pp.79-95.

Van Mannevelt, J.D. & Pedroli, B., 2003. Landscape as matter of identity and integrity: towards sound knowledge, awareness and involvement. In: H. Fabrig & C. Fry, eds. *Landscape interfaces: cultural heritage in changing landscapes*. Dordrecht: Kluwer Academic Publishers, pp.375-394.

Van W. & Meekes, H., 1999. Trends in European cultural landscape development: perspectives for a sustainable future. *Landscape and Urban Planning*, 46, pp.3-14.

Yasar, O., 2006. Turizm coğrafyası açısından bir araştırma: Gökçeada (İmroz). *Firat University Journal of Social Science*, 16(1), pp.1-32.

Yilmaz İrdiç, L., 2008. *Gökçeada ve Bozcaada'nın doğal ve kültürel peyzaj özelliklerinin belirlenmesi, koruma ve geliştirme olanakları (Determination of natural and cultural landscape characteristics and conservation development possibilities of Gökçeada and Bozcaada)*. Ankara University, Graduate School of Natural and Applied Sciences, PhD thesis.

CHAPTER 7

Implementing ecosystem management in Mediterranean islands: some notes on social capital and public participation

Elisabeth Conrad

7.1 Introduction

This book focuses on the principles of ecosystem management and their application at a broad landscape scale on Mediterranean islands. A hallmark of both the former and the latter approaches is the involvement of people, understood to mean a broad spectrum of society, in processes of discussion, negotiation and ultimately, decision-making. Indeed, ecosystem management talks specifically about 'consensus building', 'partnerships', and 'solutions developed through discussions among all stakeholders' (Melle *et al.*, 2002), whilst the involvement of people in landscape protection, planning and management is likewise enshrined in the very definition of landscape given in the European Landscape Convention – "*an area... as perceived by people*" (Council of Europe, 2000). Yet the involvement of the public remains perhaps one of the more 'slippery' aspects of ecosystem management and indeed of planning and environmental management processes in general. There is agreement, broadly, on the principle that, at least within democratic societies, people should be involved in decision-making. There is agreement, likewise, that such involvement is both an ethical and legal right, as well as a key contributor to the eventual success of initiatives being implemented. The specifics of who is to be

involved, when, how and in what capacity are, however, far less clear-cut. There is also ambiguity on the extent to which the public has influence (or should have influence) on decisions taken, and whether there are (or should be) any reasonable exceptions to the rule of public participation.

This chapter explores some of these questions from the lens of social capital. Social capital, understood to refer to the 'glue' that keeps a society together (Bennett & Clerveaux, 2003), arguably underlies the success of public involvement in ecosystem management, particularly where the latter is seeking to address some 'greater good' or general public interests. It is of explicit interest within island territories, where social dynamics often take on distinctive forms. Social capital is thus fundamental to public participation and to *effective* public participation in particular, in contrast to 'fake' or token participation (Snider, 2010). This chapter provides an overview of the social capital concept, and explores the relevance of social capital to ecosystem management approaches and to Mediterranean island societies. The role of social capital for effective public participation in decision-making is then discussed with reference to a study conducted within the Mediterranean island-state of Malta. The chapter concludes with some thoughts on the relevance of social capital considerations to the management of Mediterranean island landscapes.

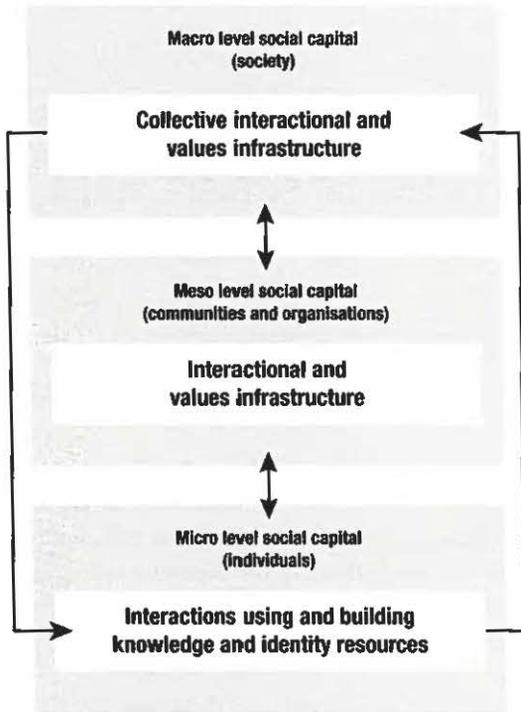


Figure 7.1: Levels of social capital.

Source: Kilpatrick, 2000

7.2 Social capital: an overview

The management of natural resources has always been tied to some form of collective action through hunter-gatherer groups, clan or kin, groups or societies, families, communities or associations (Pretty & Ward, 2001). Yet this 'collective' aspect has not really been a major focus of concern in spatial or resource planning, or in sustainability discourses, until relatively recently, with a tendency for discussions to oscillate primarily between small-scale and large-scale levels – the behaviour of the individual, on the one hand, and the functioning of organizations and institutions, on the other (Young, 2002; Grothmann & Patt, 2004). As of late, however, there has been growing interest in the intermediate concept of social capital, i.e. the bonds and norms that endow a society with internal coherence (Serageldin

& Grootaert, 2000), and that operate across individuals, groups and institutions at multiple nested scales (Figure 7.1). The concept of social capital was first advanced by Jacobs (1961) and later by Bourdieu (1986), and was subsequently taken up by several authors (e.g. Coleman, 1988; Putman, 1993, 1995; Ostrom, 1998; Uphoff, 1999). An understanding of social capital was, however, also evident before the term acquired its pedigree. In 1968, for example, Garrett Hardin demonstrated the importance of cooperative mechanisms in the use of common-property resources through a 'worst-case' scenario of what happens when these are absent – the 'Tragedy of the Commons', where a resource is rapidly over-exploited and degraded as a result of individuals acting only out of self-interest. Even before then, von Neumann & Morgenstern (1944) addressed similar considerations in game theory, looking at

possible outcomes resulting from combinations of cooperative and non-cooperative behaviour in the now classic 'prisoner's dilemma'. It is not, however, inevitable that shared resources are subject to misuse, and Baldacchino (2012), for example, discusses the role of collaborative mechanisms (such as indigenous and cooperative governance) in enhancing the use of common property resources.

Definitions of social capital abound, particularly now that the concept has gained a widespread theoretical foothold across political, economic and social spheres. Putman (1993) explains social capital as horizontal associations amongst people, which have an impact on community productivity. Coleman (1990: 302) expands the definition to include "a variety of different entities, with two elements in common: they all consist of some aspect of social structure, and they facilitate certain actions of actors...within the structure". Other definitions encompass the social and political environments that enable norms to develop and which shape social structures (Serageldin & Crostaert, 2000). Paldam (2000) explores three 'families' of social capital concepts, revolving around (i) trust, (ii) ease of cooperation and (iii) networks. The first of these appears in practically all social capital definitions, and refers both to trust in individuals whom we know, as well as trust in individuals whom we do not know but are able to trust based on our confidence in social structures. Trust is important in minimizing transaction costs, enabling people to 'predict' how others will act, reducing deviant behaviour and thus minimizing costs of enforcement and monitoring (Bennett & Clerveaux, 2003). Trust, however, takes time to build and is a fragile quality, easily destroyed. Ease of cooperation draws on reciprocity and exchanges, both of which contribute to the development of long-term relationships between people, and to the building of trust. The latter is in turn a

prerequisite for effective reciprocity. Ease of cooperation also encompasses the ability of people to work voluntarily together with others, based on common rules, norms and sanctions, or "mutually agreed or handed-down norms of behaviour that place group interests above those of the individual" (Pretty & Buck, 2002: 26). Finally, connectedness, networks and groups, and the nature of these relationships are a vital aspect of social capital. Connectedness manifests itself at various levels, including between individuals, horizontal connections between groups, vertical connections between groups, and connections between groups and external agents.

7.3 Social capital and ecosystem management

Social capital has been shown to have the potential to translate into positive effects on the use of the environment and environmental resources. Collective action can lead to increased economic efficiency through decreased costs of action, increases in knowledge and information flows, less resource degradation and depletion, more investment in common resources and improved monitoring and enforcement (Molinas, 1998; Anderson *et al.*, 2002; Daniere *et al.*, 2002; Koka & Prescott, 2002). Swinton (2000) notes that social capital can contribute to the internalization of economic externalities, such as erosion, whilst Bennett & Clerveaux (2005) observe that social capital can enhance cooperation and compliance in relation to fisheries management. There is also a body of literature showing that social capital has the potential to render more sustainable the use of natural resources through collective action (Pretty & Ward, 2001; Sobel, 2002; Walters, 2002). At a broader developmental level, social capital may lower the costs of working together, facilitating cooperative action and cooperation to resolve problems, and voluntary compliance

with rules (Fukuyama, 2001; Isham & Kahkonen, 2002; Pilkington, 2002). Fundamentally for the goal of sustainable development and its inherent principles of inter- and intra-generational equity, social capital also has the potential to energize individuals from behaving just as egocentric agents, with little sense of obligation towards others, to members of a community with shared interests and a common identity, and working towards a common good (Adler & Kwon, 2002). There is also some evidence linking social capital to greater innovation and flexibility in policy making (Knack, 2002). Additionally, Torras & Boyce (1998) find that widening the distribution of power in society can positively affect environmental quality. Similarly, in a model of social capital-environment relationships, Grafton & Knowles (2004) find that at least some aspects of social capital (namely democracy and corruption) are likely to impact on national environmental performance.

The rationale for including social capital considerations in managing landscapes also emerges from ecosystem management itself, and specifically from the dynamic interaction between people and nature through social-ecological systems (Walker *et al.*, 2004). Ecosystems are complex adaptive systems (Levin, 1998; Dietz *et al.*, 2003), characterized by uncertainty and constant change. Knowledge acquisition for the management of such systems has to be ongoing (Folke, 2004), and effective governance seems to require institutional frameworks and social networks nested across scales to be effective (Berkes *et al.*, 2003; Gunderson & Holling, 2002) – both of these form an integral part of social capital. Social capital is also fundamental to developing resilience (Ledogar & Fleming, 2008), the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function,

structure, identity and feedback loop (Walker *et al.*, 2004). Landscape management similarly draws heavily on social capital elements. The European Landscape Convention talks of “*shared cultural and natural heritage*”, of the need for “*cooperation*” in landscape protection, planning and management, and of “*aspirations of the public*”, thus framing its clauses directly or indirectly in social capital terms. Social capital will also be relevant to the Convention’s implementation in signatory states; its call for defining landscape quality objectives (Council of Europe, 2000), for example, requires some form of shared vision across communities, which will undoubtedly draw on social networks, norms and values.

A note of qualification is, however, necessary here: whilst the benefits of social capital are evident, the concept is not necessarily benign. Not all social interactions have positive or beneficial outcomes; neither do all interactions build social capital, and the same characteristics that enable beneficial, productive benefits can also be put to negative use. Examples include fostering unproductive behaviour, acting as a barrier to social inclusion and mobility, dividing rather than uniting communities or societies, excessive claims on group members, pressures for conformity, restrictions on individual freedoms and network closure around negative norms (Portes, 1998; Paldam, 2000; Kawachi & Berkman, 2001; Aldridge *et al.*, 2002; Ledogar & Fleming, 2008). Indeed, every feature of social structures could potentially become social capital, provided it produces desired beneficial outcomes. Conversely, however, social structures can also become liabilities if they produce results that are undesirable or damaging to the ‘common good’. Ultimately, the quality of social capital resources and the nature of outcomes they produce or influence, are dependent on the social capital available and drawn on in social interactions.

7.4 Social capital and Mediterranean islands

In some respects, island communities provide an ideal setting for the study of social capital given that their interactional infrastructure is readily isolated for study (Kilpatrick & Falk, 2003). Woolcock & Narayan (2000) distinguish between extra-community 'bridges' and intra-community 'bonds', the latter typically being stronger than the former within small island societies. Bridging ties, which extend beyond the boundaries of a community, are, however, of particular interest to islanders, as their geographical seclusion brings with it automatic challenges in developing links with the rest of the world. Kilpatrick & Falk (2003) note, for example, that the isolation experienced by many living and working in island communities reduces the opportunity to build information and support networks, a concern which is highly relevant to natural resources management. Conversely, however, seemingly isolated island societies have long been involved in extensive networks of communication and exchange with neighbours, even where these are located substantially far away (Eriksen, 1993). Bonding ties, i.e. those occurring within communities, can also be particularly strong within islands. Baldacchino (2004: 17) notes, for example, that where islands have an "ethnic....a 'moral community' with shared history and language", island identity can replace ethnicity, class or political partisanship as the referent social fabric. Eriksen (1993) similarly refers to phenomena of 'cultural entropy' on islands, resulting in the dissolution of internal cultural boundaries.

Perhaps it would be overly simplistic to try to identify general traits characteristic of Mediterranean island societies, given that each is unique in its own way. However, a closer look at different Mediterranean island cultures can

readily attest to the relevance of social capital, and in particular its role in the creation of island identity. Lopašić (2001), for example, explores the role of insularity in the social networks of Sardinia and Sicily, with people emphasizing their *Sardità* or *Sicilianità*, and their separation from, and non-conformity with, the Italian mainland. (Indeed, both islands have nationalist and secessionist political movements.) Indeed, Lopašić further argues that the Mediterranean Sea played a dual role in the history of Mediterranean islands. On the one hand, the sea facilitated trade and exchange of ideas, but on the other, it acted as a welcome barrier, enabling islands to become refuges for island populations, through which they could avoid contact with outside powers and through which they could preserve their own particular way of life. At the same time, conflict and confrontation was (and perhaps still is) a feature *within* Mediterranean island societies. On the basis of his work in Sardinia, for example, Le Lannou (1967) discusses a confrontation between the diverse lifestyles of more readily accessible coastal areas and the more conservative societies of the island interior. Insular identity and autonomy may be expressed politically, either through legal activism or island-based political parties or through more illicit means of influence, such as the Sicilian mafia. The latter is tied to another social feature of some Mediterranean islands, the concept of amoral familism (Banfield, 1958), a moral system that sacrifices public good for the sake of nepotism and the family. Whilst the island of Malta has not experienced the 'mafia' in the way that Sicily did, Boissevain (2010) nevertheless sees the extensive manifestation of amoral familism as a form of social capital in Malta (and also elsewhere in the Mediterranean), compounded by other characterizing phenomena such as political patronage and weak civil society. The colonial history of Malta and other islands may also be a point of relevance, potentially fostering a perception of governments as being separate

1	Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process.
2	Public participation includes the promise that the public's contribution will influence the decision.
3	Public participation promotes sustainable decisions by recognizing and communicating the needs and interests of all participants, including decision makers.
4	Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision.
5	Public participation seeks input from participants in designing how they participate.
6	Public participation provides participants with the information they need to participate in a meaningful way.
7	Public participation communicates to participants how their input affected the decision.

Table 7.1: Core values of public participation.

Source: IAP2, 2007

from, rather than representative of, lay people and perpetuating a sense of 'us' and 'them'- citizens versus authorities. Similarly, *omertá*, a code of silence that safeguards against the divulging of information to outsiders, whilst often associated with the mafia, is also well in evidence to this day on rural islands such as Gozo (Cassar, 2010; Conrad *et al.*, 2011a).

7.5 Examining the 'functioning' of public participation through a social capital lens

The necessity of involving the public in decision-making is now fundamentally established in law and policy across the world (Stringer *et al.*, 2007; Reed, 2008), but there is much to suggest that practices fall far short of rhetorical ideals (Rowe & Frewer, 2000; Rowe & Frewer, 2004), with shortcomings in the way participatory processes are administered and with limited real public influence on decisions. Indeed, the notion of *effectiveness* is now figuring

more prominently in studies of participatory dynamics. The International Association for Public Participation (IAP2) identifies seven core values for effective public participation (Table 7.1) and notions of social capital are embedded deep within these. The '*promise that the public's contribution will influence the decision*', for example, implies that people need to be able to trust that the decision-making process will consider their input as valuable and will evaluate it objectively on its merit. The notion that '*public participation communicates to participants how their input affected the decision*' similarly draws on concepts of reciprocity, as does the notion that '*public participation promotes sustainable decisions by recognizing and communicating the needs and interests of all participants, including decision makers*'. The process should thus be based on mutual exchanges of information. Social norms also come into play: public participation, for example, '*is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process*', reflecting fundamental beliefs in justice and democracy. The entire process is ultimately based on both horizontal and vertical networks, bringing together different sectors of the public, and enabling communication between various levels of decision-making.

This section presents some insights on the functioning of public participation and the role of social capital, based on a participatory review of environmental management and spatial planning procedures conducted on the island of Malta (see Conrad *et al.*, 2011b). The study draws on inputs from two sets of stakeholders. The first group comprised 30 informed members of the public – i.e. those with no official affiliation to environmental or planning agencies, but who through their personal or other experiences have some knowledge of the Maltese planning system. These members of the public participated through a series of workshops. The second group comprised 15 'insiders' to the process, i.e. mid-management level professional planners and/

in policy makers, who were involved through confidential semi-structured interviews. The review found that public participation was seen to perform below par by participants from both groups, with several 'problem areas' identified, including overall lack of influence of lay people on decisions, shortcomings in professional ethics and expertise, inappropriateness or insufficiency of methods and techniques used, problems with information provision and local cultural influences (Conrad *et al.*, 2011b). The discussion below does not reproduce the full results of this work, but draws some insights in relation to different aspects of social capital.

Trust

Evident shortcomings of trust emerged from the review conducted: both 'horizontal', peer-to-peer trust across individuals and institutions, as well as 'vertical' trust issues, between different levels of decision-making. Starting with the latter, several members of the public spoke of their lack of faith in the process of public participation, with the process described as one of "*hearing but not listening*", a mere token gesture of taking note of public concerns. The fragility of trust was also evident, as also the truth that trust lost is not rapidly regained. Several members of the public referred to a major project which had already been publicly marketed by the government while the participation process was still underway, and cited this as an example of the betrayal of public trust in decision-making processes – "*involving us only when everything is cooked and ready*" and at times not even making an effort to hide that fact. Indeed, this lack of trust may appear to be justified, at least to some extent – several planners agreed that in reality, the public is involved merely because there is a legal requirement for participation – "*ticking the box...saying, yes, we consulted the public*" and not because there is any real intent that public views will influence a decision. This hypocrisy was seen to apply in particular to public sector projects,

which were perceived to be held up to a different (lower) standard of accountability. A fundamental cause of 'trust' issues seems to stem from the unclear scope of public participation. Members of the public made it clear that they expect to be able to influence a decision, treating the process as a democratic one. Several planners, on the other hand, disagreed arguing, in a positivist vein, that planning decisions should be treated as matters of technical competence and not of democracy – "*for me, participation stops at consultation...otherwise we end up with people dictating an outcome on a subject which they know nothing about*"; similarly, "*planning is not, and should not, be a democracy*".

There was also some evidence of lack of trust between members of the public, with workshop participants criticizing what they perceive as public input based on narrow egoistical interests, or on NIMBYism. The latter is a particular concern within small islands – as one planner put it, "*something like a power station has to go somewhere, and there is nowhere that is far away from people*". In such a context, and particularly within small and densely populated islands, public participation arguably cannot be productive unless it is motivated by "*something other than mere self-interest*" (member of the public). The motivation for public involvement was, in fact questioned, not only by planners but also by members of the public – one individual cynically stated that "*the only reasons people get involved are egoism and/or envy*", going on to explain that individuals often resent the success of others and get involved in order to put spokes in the wheels of new projects, with little faith in the idea that people act as concerned citizens for the 'greater good'.

Ease of cooperation

Shortcomings in reciprocity and exchanges also emerge as influences on the effectiveness of public participation. Three major influences on ease of cooperation appear to be (i)

knowledge sharing, (ii) communication skills and (iii) prejudices and stereotypes. One major bone of contention amongst the public, for example, was the provision of information from authorities, with a common perception that this is (i) incomplete and selective, (ii) heavily imbued with jargon and technical difficulty, making it inaccessible to the lay public, and (iii) difficult to find. Conversely, however, the 'blame' for problems in cooperation and exchanges was also partly given to the public by those involved in planning – many policy makers were critical of public involvement in decision-making because of the perception that the public is not usually well informed, and that people make little effort to 'educate' themselves about a topic before putting across their views. Some members of the public were themselves critical of their peers, for failing to communicate effectively or appropriately. On the one hand, workshop participants referred to a general lack of self-confidence amongst the public, and an associated reluctance to make public submissions of any sort. On the other hand, there was some criticism of members of the public who lack 'polish' and who may come across as uncouth (for example, because of the use of foul language), reducing the credibility of public input. Island-based social dynamics were furthermore seen to be very influential, with respondents discussing the fears that people may have of publicly criticizing someone else's initiative, in "a society where everyone knows everyone else, and word gets around quickly".

There was criticism of the public hearing method used for public involvement, on the basis that it limits reciprocity, allowing only the few capable of speaking "with a loud voice" to get their message across; one policy-maker questioned whether the public hearing method is seen to be convenient precisely because it does *not* effectively facilitate input by a wide spectrum of the public, and went

on to question whether these are also *deliberately* scheduled at times that make it difficult for the wider public to attend. Establishing reciprocity in public participation may, however, be more than merely a matter of good intentions. Some planners and policy makers expressed their doubts as to whether the technical competence to be able to effectively liaise with the public even exists within their institutions – "what the public says about poor communication is true because I myself sometimes struggle to communicate with people effectively – I don't possess those skills, but I am expected to do it and therefore have to do it". Similarly, several planners acknowledged that they struggle to deal with public comments and concerns simply because they do not have the training to handle this sort of knowledge and feedback. Stereotypes appear to play a part in public participation exchanges, with both sides (planners/public) often assuming that the other party has an agenda, on which they are not willing to negotiate. Several planners explained that any possibility of constructive dialogue is often undermined by negative public perceptions of the authorities – "it's pointless to try and talk to the public, because when we're involved, they just don't want to know" (planner). Indeed, many called for more effective use of the media, not only to play on the sensationalist value of controversies, but also to document and communicate 'success stories', in order to reverse this stereotype: "we must make the public understand that we are not as bad as we seem" (planner).

Networks

The extent of networking across the public appears to have an influence on the effectiveness of public participation. On the one hand, lobby groups and citizen groups have been effective in challenging certain initiatives and even in getting decisions reversed or revoked (as described, for example, in the chapter by Boissevain within this publication). On the other hand, some workshop participants were critical of those who passively criticize but who make no effort to involve themselves in networks of advocacy or opposition

knowledge sharing, (ii) communication skills and (iii) prejudices and stereotypes. One major bone of contention amongst the public, for example, was the provision of information from authorities, with a common perception that this is (i) incomplete and selective, (ii) heavily imbued with jargon and technical difficulty, making it inaccessible to the lay public, and (iii) difficult to find. Conversely, however, the 'blame' for problems in cooperation and exchanges was also partly given to the public by those involved in planning – many policy makers were critical of public involvement in decision-making because of the perception that the public is not usually well informed, and that people make little effort to 'educate' themselves about a topic before putting across their views. Some members of the public were themselves critical of their peers, for failing to communicate effectively or appropriately. On the one hand, workshop participants referred to a general lack of self-confidence amongst the public, and an associated reluctance to make public submissions of any sort. On the other hand, there was some criticism of members of the public who lack 'polish' and who may come across as uncouth (for example, because of the use of foul language), reducing the credibility of public input. Island-based social dynamics were furthermore seen to be very influential, with respondents discussing the fears that people may have of publicly criticizing someone else's initiative, in "a society where everyone knows everyone else, and word gets around quickly".

There was criticism of the public hearing method used for public involvement, on the basis that it limits reciprocity, allowing only the few capable of speaking "with a loud voice" to get their message across; one policy-maker questioned whether the public hearing method is seen to be convenient precisely because it does *not* effectively facilitate input by a wide spectrum of the public, and went

on to question whether these are also *deliberately* scheduled at times that make it difficult for the wider public to attend. Establishing reciprocity in public participation may, however, be more than merely a matter of good intentions. Some planners and policy makers expressed their doubts as to whether the technical competence to be able to effectively liaise with the public even exists within their institutions – "what the public says about poor communication is true because I myself sometimes struggle to communicate with people effectively – I don't possess those skills, but I am expected to do it and therefore have to do it". Similarly, several planners acknowledged that they struggle to deal with public comments and concerns simply because they do not have the training to handle this sort of knowledge and feedback. Stereotypes appear to play a part in public participation exchanges, with both sides (planners/public) often assuming that the other party has an agenda, on which they are not willing to negotiate. Several planners explained that any possibility of constructive dialogue is often undermined by negative public perceptions of the authorities – "it's pointless to try and talk to the public, because when we're involved, they just don't want to know" (planner). Indeed, many called for more effective use of the media, not only to play on the sensationalist value of controversies, but also to document and communicate 'success stories', in order to reverse this stereotype: "we must make the public understand that we are not as bad as we seem" (planner).

Networks

The extent of networking across the public appears to have an influence on the effectiveness of public participation. On the one hand, lobby groups and citizen groups have been effective in challenging certain initiatives and even in getting decisions reversed or revoked (as described, for example, in the chapter by Boissevain within this publication). On the other hand, some workshop participants were critical of those who passively criticize but who make no effort to involve themselves in networks of advocacy or opposition

One respondent described the Maltese public as being in a state of "hypnosis", lulled into a permanent state of *laissez-faire*. Some individuals, however, also criticized "self-made experts", who act either on behalf of lobby groups or on their own initiative, and who claim to speak on behalf of the wider public without having been entrusted with such authority. Furthermore, power relations in society were seen to be influential; in particular, many individuals expressed concern that specific stakeholders, such as politicians, business groups and certain lobby groups, seem to wield undue power and thus have disproportionate influence on decision-making processes. In the process, the 'man-in-the-street' is marginalized.

Organizational networks likewise appear to be an influential factor; one planner pointed out that because of hierarchical organizational structures, "individual professionals cannot speak for the organization without going through the public relations office...so we are wary...and the statement eventually issued by the public relations office is not necessarily faithful to what we said", exacerbating the perceived 'barriers' across multiple vertical channels of communication. Similarly, another planner pointed out that until exchanges with the public are looked upon positively by the organizations concerned (not seen to be the case at present), it will be difficult for individual planners to liaise with wider society in an effective manner.

7.6 Concluding thoughts

Ecosystem management and landscape approaches share a common emphasis on the involvement of people, for these to take an active role in planning and decision-making processes, and shape their physical and social landscapes. For this active role to translate into productive long-term sustainability, however, it must arguably be motivated by fundamental principles of equity, care

and social justice. Similarly, functional cooperative public participation mechanisms are assumed to be premised on a sense of citizenship, of 'belonging' to a wider community, and by a sense of responsibility towards some greater good. It is by no means certain that this is the case on Mediterranean islands; whether because of amoral familism, *omertà* or simple NIMBYism, the social fabric of island communities may not necessarily lend itself well to environmentally sustainable decisions, particularly where egoistical or self-interested concerns are more likely to take precedence. It is also uncertain whether decision-making mechanisms, and public participation in particular, are really facilitating such collective decision-making, or whether they are serving merely to reinforce public distrust in authorities and political systems, and in fellow citizens. Undoubtedly, however, social capital is complex and multi-faceted, and there are also plenty of parallel examples of people coming together to work towards a mutually beneficial outcome, even within these same societies (as can be seen, for example, in the extensive voluntary sector, which characterizes Maltese society). There are thus many shades of grey, and it is also true that social capital is not some fixed essence, but rather something that is inherently dynamic: norms change, networks are nourished or fall into disuse, trust is repeatedly established and broken and communication and cooperation mechanisms evolve continuously.

Social capital is of interest to a discussion of ecosystem management not only because of its influence on people's involvement in planning, but also because of its potential influence on the evolution of the landscape itself. A landscape is ultimately a physical manifestation of social value systems. In Carl Sauer's classic words (1926), "*culture is the agent, the natural area the medium, the cultural landscape is the result*". Whilst landscapes shape our own identity, contributing to the development of 'habitus' (Bourdieu, 2005) and sense of place (Davenport & Anderson,

2005), people also modify landscapes constantly, creating a palimpsest with multiple layers of past and present meanings (Palang & Fry, 2003). This two-way interaction is of particular interest in the present day and age, when both landscapes and social capital appear to be changing rapidly. Urbanization, for example, is creating new metropolitan and urban conglomerations, in the process subsuming traditional town and village divides. Conversely, technological developments are creating new forms of virtual community that appear to be place-less, and with them, new forms of social capital. Globalization, similarly, is expanding the scale and scope of communities. At the same time, the interaction between people and place grows increasingly strained in places, particularly on islands which are already limited in their land area and in their capacity to 'juggle' a multitude of demands coming from many different stakeholders. Perhaps a challenge for ecosystem management is thus to find ways to productively tap forms of beneficial social capital, whilst managing its more malign manifestations. This task is one that must be context-specific given the particularities of each society, and is certainly no easy feat given the complexities of social capital in both its theory and methodologies. If, however, landscape is indeed to be managed as a shared public good, then gaining a better understanding of this social 'glue' is imperative.

Acknowledgments

I am grateful to Louis F. Cassar, Ioan Fazey and Mike Christie who contributed, in various capacities, to the study outlined in this chapter. I am also indebted to Godfrey Baldacchino for comments on an earlier draft.

References

- Adler, P.S. & Kwon, S., 2002. Social Capital: Prospects for a new concept. *Academy of The Academy of Management Review*, 27, pp.17-40.
- Aldridge, S., Halpern, D. & Fitzpatrick, S., 2002. Social Capital: A Discussion Paper. London: Performance and Innovation Unit.
- Anderson, C.L., Locker, L. & Nugent, R., 2002. Microcredit, social capital and common pool resources. *World Development*, 30, pp.95-105.
- Baldacchino, G., 2004. Sustainable use practices, including tourism in/for small islands. *Insula, International Journal of Island Affairs*, pp.5-10.
- Baldacchino, G., 2012. Preface. In: G. Baldacchino, ed. *Extreme Heritage Management: the practices and policies of densely populated islands*. New York: Berghahn Books, pp.xxv-xli.
- Banfield, E.C., 1958. *The moral basis of a backward society*. Glencoe: The Free Press.
- Bennett, E. & Clerveaux, W., 2003. Size Matters: fisheries management and social capital on the Turks and Caicos Islands. *Proceedings of the Gulf Caribbean Fisheries Institute*, 54, pp.136-146.
- Bennett, E. & Clerveaux, W., 2005. Social capital and fisheries management on small islands. *Aquatic Resources, Culture and Development*, 1(2), pp.109-118.
- Berkes, F., Colding, C. & Folke, C., 2003. *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge: Cambridge University Press.
- Boissevain, J., 2010. Tourists, developers and civil society: on the commodification of Malta's landscapes. In: J. Scott & T. Selwyn, eds. *Thinking through Tourism*. Oxford: Berg, pp.93-116.
- Bourdieu, P., 1986. Forms of Capital. In: J. G. Richardson, ed. *Handbook of Theory and Research for the Sociology of Education*. Westport: Greenwood Press, pp.241-260.
- Bourdieu, P., 2005. Habitus. In: J. Hillier & E. Rooksby, eds. *Habitus: a sense of place*. Aldershot: Ashgate, pp.43-49.
- Cassar, L.F., 2010. *A Landscape Approach to Conservation: integrating ecological sciences and participatory methods*. Msida: Institute of Earth Systems, University of Malta/UNESCO.
- Coleman, J.S., 1988. Social capital in the creation of human capital. *American Journal of Sociology*, 94 (Supplement), pp.S95-S120.
- Coleman, J.S., 1990. *Foundations of Social Theory*. Cambridge: Belknap Press of Harvard University.
- Conrad, E., Christie, M. & Fazey, I. 2011a. Understanding public perceptions of landscape: a case study from Gozo, Malta. *Applied Geography*, 31(1), pp.159-170.
- Conrad, E., Cassar, L.F., Christie, M. & Fazey, I., 2011b. Hearing but not listening? A participatory assessment of public participation in planning. *Environment and Planning C: Government and Policy*, 29(5), pp.761-782.
- Council of Europe, 2000. *European Landscape Convention*. European Treaty Series No. 176. Florence: Council of Europe.
- Daniere, A., Takahashi, L.M. & NaRanong, A., 2002. Social capital and environmental management: culture, perceptions and action among slum dwellers in Bangkok. In: J. Isham,

- T. Kelly & S. Ramaswamy, eds. *Social Capital and Economic Development: Well-being in Developing Countries*. Cheltenham: Edward Elgar, pp.197-214.
- Davenport, M.A. & Anderson, D.H., 2005. Getting from sense of place to place-based management: an interpretive investigation of place meanings and perceptions of landscape change. *Society and Natural Resources*, 18, pp.625-641.
- Dietz, T., Ostrom, E. & Stern, P.C., 2003. The struggle to govern the commons. *Science*, 302, pp.1907-1912.
- Eriksen, D.H., 1993. In which sense do cultural islands exist? *Social Anthropology*, 1, pp.133-147.
- Folke, C., 2004. Traditional knowledge in social-ecological systems. *Ecology and Society*, 9(3), 7 [online]. Available: <http://www.ecologyandsociety.org/vol9/iss3/art7/> [Last accessed: 22nd January 2012].
- Fukuyama, F., 2001. Social capital, civil society and development. *Third World Quarterly*, 22, pp.7-20.
- Grafton, R.Q. & Knowles, S., 2004. Social capital and national environmental performance: a Cross-Sectional Analysis. *Journal of Environment and Development*, 13(4), pp.336-370.
- Grothmann, T. & Patt, A., 2005. Adaptive capacity and human cognition: the process of individual adaptation to climate change. *Global Environmental Change*, 15(3), pp.199-213.
- Gunderson, L. H. & Holling, C.S., eds., 2002. *Panarchy: understanding transformations in human and natural systems*. Washington DC: Island Press.
- Hardin, G., 1968. The Tragedy of the Commons. *Science*, 168, pp.1243-1248.
- International Association for Public Participation, 2007. *IAP2 core values of public participation*. Available: <http://iap2.affiniscap.com/displaycommon.cfm?an=4> [Last accessed: 22nd December 2011].
- Isham, J. & Kahkonen, S., 2002. How do participation and social capital affect community-based water projects? Evidence from Central Java, Indonesia. In: T. van Bastelaer, ed. *The Role of Social Capital in Development*. Melbourne: Cambridge University Press, pp.175-187.
- Jacobs, J., 1961. *The Death and Life of Great American Cities*. New York: Random House.
- Kawachi, I. & Berkman, L.F., 2001. Social ties and mental health. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 78(3), pp.458-467.
- Kilpatrick, S., 2000. Community learning and sustainability: practice and policy. Keynote address to First Conference on the Future of Australia's Country Towns, LaTrobe University, Bendigo, 29th June 2000. Available: <http://www.crlra.utas.edu.au/files/discussion/2000/D6-2000.pdf> [Last accessed: 22nd December 2011].
- Kilpatrick, S. & Falk, I., 2003. Learning in agriculture: building social capital in island communities. *Local Environment*, 8(5), pp.501-512.
- Knack, S., 2002. Social capital and the quality of government: evidence from the states. *American Journal of Political Science*, 46, pp.772-785.
- Koka, B.R. & Prescott, J.E., 2002. Strategic alliances as social capital: a multidimensional view. *Strategic Management Journal*, 23, pp.795-816.
- Ledogar, R.J. & Fleming, J., 2008. Social capital and resilience: a review of concepts and selected literature relevant to Aboriginal youth resilience

- research. *Piwatisiwin: A Journal of Aboriginal and Indigenous Community Health*, 6(2), pp.25-46.
- Le Lannou, M., 1967. *Le déménagement du territoire: Reveries d'un géographe*. Paris: Editions Du Seuil.
- Levin, S.A. 1998. Ecosystems and the biosphere as complex adaptive systems. *Ecosystems*, 1, pp.431-436.
- Lopašić, A. Mediterranean islands: a concept. *Collegium Antropologicum*, 25(1), pp.363-370.
- Mellé, G.K., Nielsen, L.A., Knight, R.L. & Schenborn, D.A., 2002. *Ecosystem Management: Adaptive, community-based conservation*. Washington DC: Island Press.
- Molinas, J.R., 1998. The impact of inequality, gender, external assistance and social capital on local-level cooperation. *World Development*, 26(3), pp.413-431.
- Ostrom, E., 1998. A behavioural approach to the rational choice theory of collective action. *American Political Science Review*, 92(1), pp.1-22.
- Palang, H. & Fry, G., 2003. Landscape interfaces. In: H. Palang & G. Fry, eds. *Landscape interfaces: cultural heritage in changing landscapes*. Dordrecht: Kluwer Academic Publishers, pp.1-13.
- Paldam, M., 2000. Social capital: one or many? Definition and measurement. *Journal of Economic Surveys*, 14(5), pp.629-653.
- Pilkington, P., 2002. Social capital and health: measuring and understanding social capital at a local level could help to tackle health inequalities more effectively. *Journal of Public Health Medicine*, 24, pp.156-159.
- Portes, A., 1998. Social capital: its origins and applications in modern sociology. *Annual Review of Sociology*, 24, pp.1-24.
- Pretty, J. & Buck, L., 2002. Social capital and social learning in the process of natural resource management. In: C.B. Barrett, F. Place & A.A. Aboud, eds. *Natural Resources Management in African Agriculture: understanding and improving current practices*. Oxon: CABI Publishing, pp.23-34.
- Pretty, J. & Ward, H., 2001. Social capital and the environment. *World Development*, 29(2), pp.209-227.
- Putnam, R.D., 1993. *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.
- Putnam, R.D., 1995. Tuning in, tuning out: The strange disappearance of social capital in America. *Political Science and Politics*, 28(4), pp.664-683.
- Reed, M.S., 2008. Stakeholder participation for environmental management: a literature review. *Biological Conservation*, 141, pp.2417-2431.
- Rowe, G. & Frewer, L.J., 2000. Public participation methods: a framework for evaluation. *Science, Technology and Human Values*, 25, pp.3-29.
- Rowe, G. & Frewer, L.J., 2004. Evaluating public participation exercises: a research agenda. *Science, Technology and Human Values*, 29, pp.512-557.
- Sauer, C., 1926. The morphology of landscape. *University of California Publications in Geography*, 2, pp.19-54.
- Seralgedin, I. & Grootaert, C., 2000. Defining social capital: an integrating view. In: P. Dasgupta & I. Serageldin, eds. *Social Capital: a multifaceted perspective*. Washington DC: The World Bank, pp.40-58.

- Snider, J.H., 2010. Deterring fake public participation. *International Journal of Public Participation*, 4, pp.89-103.
- Sobel, J., 2002. Can We Trust Social Capital? *Journal of Economic Literature*, 40(1), pp.139-154.
- Stringer, L.C., Reed, M.S., Dougill, A.J., Rokitzki, M. & Seely, M., 2007. Enhancing participation in the implementation of the United Nations Convention to Combat Desertification. *Natural Resources Forum*, 31, pp.98-211.
- Swinton, S.M., 2000. More social capital, less erosion: evidence from Peru's Altiplano. Paper presented at the annual meeting of the American Agricultural Economic Association, Tampa, Florida, 30 July-2 August 2000.
- Torras, M. & Boyce, J.K., 1998. Income, inequality, and pollution: a reassessment of the environmental Kuznets curve. *Ecological Economics*, 25, pp.147-160.
- Uphoff, N., 2000. Understanding social capital: learning from the analysis and experiences of participation. In: P. Dasgupta & I. Serageldin, eds. *Social Capital: A multifaceted perspective*. Washington DC: The World Bank, pp.215-252.
- von Neumann, J. & Morgenstern, O., 1944. *Theory of Games and Economic Behaviour*. New York: Princeton University Press.
- Walker, B., Holling, C.S., Carpenter, S.R. & Kinzig, A., 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, 9(2), 5 [online]. Available: <http://www.ecologyandsociety.org/vol9/iss2/art5/> [Last accessed: 22nd January 2012].
- Walters, W., 2002. Social capital and political sociology: re-imagining politics? *Sociology*, 36, pp.377-397.
- Woolcock, M. & Narayan, D., 2000. Social capital: implications for development theory, research and policy. *World Bank Research Observer*, 15(2), pp.225-249.
- Young, O.R., 2002. *The Institutional Dimensions of Environmental Change: fit, interplay and scale*. Massachusetts: Massachusetts Institute of Technology.

CHAPTER 8

A political perspective on the management of coastal landscapes in the Mediterranean

Salvino Busuttil

In the most Serene Venetian Republic, Water Magistrates (*Magistrati delle acque*) exercised authority over the celebrated Lagoon and its surrounding shores. Through them, the *Serenissima*, as Folco Quilici (1992)¹ narrates "Seppe mutare la incolta natura delle sue lagune e delle valli in un ambiente al servizio dell'uomo. Con una trasformazione che non ferì l'ambiente, ma anzi ne rafforzò le difese nei confronti di calamità naturali" ("she knew how to change the untilled surroundings of her lagoons and valleys into an environment at the service of man. A transformation that not only did no harm to the environment, but indeed strengthened her defences in relation to natural calamities"). Coastal management in the Mediterranean responds to political agendas not necessarily sharing the same priorities as those, for example, of the UN Mediterranean Action Plan. Indeed, that Plan had pioneered the Coastal Area Management Projects, known as CAMPs, which, in my days as Coordinator of the Plan, I considered one of our major achievements. Those Projects, and the Protocol now adding political

muscle to the sustainable management of the coast, would not have been possible, as a joint Mediterranean comparative exercise, had the 1976 Barcelona Convention on the Protection of the Mediterranean Sea against Pollution not been ratified. Manifestly, the Convention was a unique political achievement, furnishing for the first time a binding legal instrument for environmental cooperation among all the littoral States, and of which the European Union became one of the Contracting Parties.

Primarily because the coast is not just the physical landscape but includes the areas which are either directly surrounded by the sea (i.e. islands) or have the sea (and the rivers, tributaries and canals to it connected or flowing) surround them (i.e. estuaries), the political impact of the Convention spilled into land-based sources of pollution. The Protocol covering those sources represented one of the most innovative legal measures ushered in the Mediterranean Action Plan, for it *de facto* and *de iure* extended the Convention's brief beyond the actual shoreline limitations stipulated in Article 1 of the Convention (the latter providing the geographical shoreline delineations covered by the Convention).

That extension is twofold. In the sea itself, it refers to the territorial waters of each country which, in the

1 Quilici, Folco, *Il mio Mediterraneo*, Milan 1992, p.373. Quilici and Fernand Braudel cooperated on a book on Venice. Quilici subsequently produced a film on Braudel, who had carried out a good part of his research at the Biblioteca dei Frati in Venice.

Mediterranean (Exclusive Economic Zones apart) were 12 nautical miles from the coast, except for Greece and Turkey which have an allocation of 6 nautical miles. On land, different 'interpretations' endure, a problem which plagues the gathering and analysis of comparable coastal data. Not always coinciding with the legal definitions of the respective coast, these divergences affect also the juridical extension of coastal communities, rendering socio-economic and socio-cultural comparisons questionable, and environmental monitoring, control and planning problematic.

France, for example, defines the coast as one including coastal 'communes' bordering the sea, while Algeria, in its recent legislation, considers the coast as including all islands and islets, the continental shelf and a land area of not less than 800 metres all along the shore. Spain, on the other hand, has opted for a loose option since its coastal legislation, while referring 19 times to the coast, eschews any definition.²

A major difficulty, then, in intra-Mediterranean cooperation, is posed by the dichotomy present in some littoral states between their concept of the coast and of coastal communities. Hence there is a disparity in the approach, for example, to fisheries, tourism (especially cultural) and environment. In fisheries, both Libya and Tunisia have unilaterally declared exclusive fishing areas, despite 'protests' by neighbouring countries (e.g. Malta). In tourism, many riparian countries still project the sun and the sea as their main attractions with resultant mass tourism which often generates very low foreign exchange multipliers and modest employment opportunities. Yet the real 'glamour' of the Mediterranean should be the over 100

recognized (some figuring in the UNESCO world heritage list) historic sites and monuments on or close to the shore.³

Sustainable development, however, presents a problem due to the different treatment accorded to it by different coastal states. While the 1976 Convention is strong (and even stronger now because of the relevant Protocol) in its focus on environment and its sustainability, yet it has little or no empowerment, lacking any effective compliance machinery except through periodic reports. It does not convey the real authority, including penalization, that the EU has for recalcitrant States of the Union.

Although the Mediterranean Commission for Sustainable Development has, in principle, the responsibility to carry out the decisions of the Contracting Parties to the Convention, yet it has no implementation mechanism and remains, unfortunately, an *humilis ancilla* of the Mediterranean Action Plan.⁴ As I have often argued, it should, on the contrary, be the leading and spurring entity for the execution of the major projects of the Union for the Mediterranean.⁵

Most of those projects will or should concern the environment and energy, such as water production through solar energy, pollution control through appropriate physical resources, aquaculture and fisheries in their ecological setting, and the endogenous development of environmentally-

2 See: *Méditerranée, Les Perspectives du Plan Bleu sur l'environnement et le développement* (Benoît & Comeau, 2005: 301).

3 See *op.cit* p. 303

4 That both the Plan and the Commission are tied too tightly to UN (and specifically, UNEP) bureaucracy deprives both of an independent robustness of action. Some UN officials smart at this criticism, arguing that *de facto* the Plan and the Commission are not UN vessels. But he who pays the piper plays the tune.

5 See Busuttill, D.R. & Busuttill S. (Eds.), *TELOS*, Vol. II, Malta, 2009.

friendly technology. Some projects, yet to be debated due to their political sensitivity, may eventually relate to joint oil and gas exploration and exploitation.

It is understandable that at this untried stage of the activities of the Union for the Mediterranean, one has to caution prudence, without foregoing courage in promoting new endeavours due to narrow political expediency. On the contrary, however, I would argue that if the Union for the Mediterranean projects are perceived by the 'south' (and some northern African countries are openly sceptical) as ephemeral palliatives, then the Union itself is doomed, sentencing the whole Mediterranean to uncertainty and insecurity.

An eminently political mechanism, the Union itself can only experience some success in the measure that the 'south' feels that it has real power not just of consultation but also of decision, and that it will be not an exercise in a rhetorical rehashing of the old and failed Barcelona and MEIDA (Mediterranean Economic Development Area) processes (with an unfortunate history of fomenting promise destined not to be fulfilled), but a genuine departure to a new and cohesive landscape where politics can be subservient to sustainable solidarity.

No contradiction is implied. In its authentic sense, politics, as Aristotle taught us, is at the service of man as it seeks the common good that, properly identified, sets the teleology and practice of enlightened political action. Natural and symbolic resources provide the raw material, as it were, for the application of sustainable policies. But such policies and such practices cannot have any real or lasting value in the Mediterranean unless they are effectively and justly shared by all the littoral states. Beyond national interests, one has to convince all the riparian countries, especially the southern ones, that taking a veritable holistic approach to

the overall economic landscape will enrich their people far more than an isolated national policy would allow.

Admittedly, this is not easy ground. But in my view early positive economic returns attributable to a functioning Union for the Mediterranean could outweigh those sceptical stances which some Mediterranean countries still nurture on the Union, one which they believe should be, rather than for, of the Mediterranean.

Recent history shows promise. The Five plus Five Process was initially scorned by some states. Now that it has considerably widened its brief, encompassing practically all aspects of socio-economic, and not just narrow political concerns, it is proving its usefulness. *Mutatis mutandis*, properly extrapolated and extended to the pan-Mediterranean landscape, that Process could serve the Union for the Mediterranean in evolving to the Union of the Mediterranean.

New efforts could also be undertaken by the Union to agree on a pan-Mediterranean Exclusive Economic Zone controlled and managed by the Mediterranean Commission for Sustainable Development. So far elusive due to geographic constraints (although some littoral countries have gone through the motions of declaring one), the Exclusive Economic Zone can only become a reality in the Mediterranean through a joint administrative mechanism where all riparian states are represented.⁶

In a changing human landscape affected by globalization, we witness a transformation of

6 Perhaps one of the early tasks of the Union should be to infuse some order in the various 'assemblies' by having one representative parliamentary body, agreed to by all 'parties', and thus to do away with the present confusing situation.

the sense of community, regressing through standardization. As the village grocer and the 'native' bistro cede ground to the supermarket and to the fast food chains, the patterns and styles of community life, with its typical Mediterranean cohesion and informal warmth, are also menaced, especially on Mediterranean islands and on the southern rim, by the imported vision of a 'western' hedonistic way of life alien to Mediterranean traditions and beliefs.

To assist in conserving the 'human' qualities of the region's communities, enlightened environmental management can protect that 'belonging', so characteristic of Mediterranean societies, through public participation in decision-making particularly in insular and coastal areas where different stakeholders may express their priorities on the various uses to which their shores and immediate hinterland may be put, in the perspective, however, of a non-sectoral but all-embracing common good.

Mediterranean resolve, strengthened by the Union, could ensure that our overall landscape, extending beyond the coasts, should be one of serene far-sighted sustainability, much like that of the *Serenissima*, but with better longevity.

CHAPTER 9

Improving Intelligence: the key to landscape sustainability?

Maggie Roe

9.1 Introduction

This chapter reflects on issues of landscape sustainability. In particular the focus is on intelligence about the landscape, with particular reference to Mediterranean small island landscapes. There is a link between decisions concerning landscape sustainability and the knowledge and understanding that ordinary people as well as experts hold about landscape change. Greater sustainability in the landscape is to a considerable extent about decision-making based on informed choices and understandings, and so we need to improve the basis on which such decisions are made. It is important to improve knowledge capital at every level within communities, and the opportunities to express that knowledge and visions for future landscapes within the decision-making system. This is particularly important in small communities where outside experts may be regarded with some suspicion and critical losses to the knowledge pool may easily occur. Thinking about sustainability demands more integrated and participatory research and other processes, and a key consideration is how to unlock ordinary people's experiences of the landscape and combine these with expert knowledge to find creative solutions to issues that are regarded as problems within changing landscapes.

Intelligence is a term most often associated with crime prevention, military information and spies. However, it is also a potentially useful concept in the context of landscape sustainability because it means much more than obtaining simple raw information; it is the product of a process which includes information collection and manipulation or analysis. This product – or intelligence – can then be used by a range of actors to inform decisions relating to different landscape approaches. It can be seen as one of a range of decision-support tools that are of critical importance in planning for sustainability.

The three (and sometimes four) pronged stool of sustainability – economic, ecological and socio-cultural considerations – and definition by Brundtland of *sustainable development*, or “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987) is largely familiar to all in the environmental field. However, the concept of sustainability itself is widely contested and often misused as an achievable aim rather than a comparative term. While terms such as *targets* and *indicators* are now commonly bandied about by politicians and policy-makers, those working hard to live up to requirements of sustainability objectives and implementing sustainability policies often find the practicalities

of implementation difficult to achieve and so landscape sustainability as a concrete concept also remains largely intangible and elusive. However, there have been some recent important contributions to thinking in relation to landscape sustainability, particularly within Europe. Embedded within the concept of landscape now defined within the European Landscape Convention (ELC) is the understanding of sustainability and change, that landscapes and communities are dynamic and that we need to develop planning, design and management that works with change.

An examination of Mediterranean island landscapes provides the opportunity to consider two particularly compelling drivers of change: humans and climate. Using the idea of intelligence as a backdrop, this chapter therefore provides some reflection on key issues in relation to recent thinking about landscape and sustainability overall, but in particular how learning and understanding is now an important aspect of policy and theoretical development in relation to landscape change. Small islands of the Mediterranean are a hotbed of potential landscape research and practice issues because of the cultural and environmental interrelationships, the ecological fragility and the intense demands that humans now put upon the ecological systems.

9.2 Landscape planning, biotope conservation, islands and sustainability

A landscape scale approach has been identified as useful by a number of researchers working with sustainability issues. However some have suggested that a regional scale is more useful and there has been some investigation into a variety of scales including biogeographic units; perhaps the appropriate scale may differ in different contexts.

Cousins & Ihse (1998) and Antrop (1993) suggest that certainly, when considering the potential for biodiversity and the effects of rapid changes, a variety of scales must be considered including the detailed level (genes and species) and the general level (biotopes and landscapes). They also indicate that such examination has yet to be carried out in most European countries. When considering small islands, examination of a range of scales is important including the whole island scale. This may correspond to a single landscape or it may be possible to discern a number of different landscapes. Social and economic data may only be available at scales other than a landscape scale and so relating data from different sources can be difficult (see Odum, 2002). Planning at the landscape scale rather than at a single site level does not just entail consideration of the size of the area, it is also a matter of complexity. While site-based design and management may well have to consider all the possible species and human impacts, such consideration begins to become unmanageable at the larger landscape scale. Monitoring landscape change, a key component of sustainability planning, has also been shown to be required at local and regional scales in order to plan the evolution of Mediterranean landscapes¹. New methodologies are required that provide approaches for dealing with the potential data to be gathered at a wide range of scales and for understanding where the key areas of focus should be.

Landscape ecological theory is now providing the basis for much landscape planning in relation to sustainability. While much of the research that emerges is still focused on single

1 See Antrop, 1993. Also, the CORINE (Co-ordination of information on the environment) programme of the European Commission is an example of a GIS-based survey that can be used as a baseline against which landscape change may be monitored.

species over an area of landscape, the theoretical basis of landscape ecology concentrates upon holistic thinking at the landscape scale and the inclusion of cultural and social considerations within any examination of landscape processes. This is particularly obvious for example in relation to the landscape ecological concept of *connectivity* which is an important component in new planning initiatives related to green infrastructure planning. Patch size is also a key concept that has been of particular use in relation to reserve planning. Much landscape ecological thinking owes its basis to E.O. Wilson and his collaborator Robert MacArthur and their seminal book *The Theory of Island Biogeography*. These researchers were not the only ones who found their inspiration in island landscapes - of course Charles Darwin's key influence came from his voyage on the *Beagle*; in particular his observations on the Galapagos Island fauna and flora were crucial to the development of his theory of evolution. As MacArthur and Wilson point out "*Insularity is... a universal feature of biogeography. Many of the principles graphically displayed in the Galapagos Islands and other remote archipelagos apply in lesser or greater degree to all natural habitats*" (MacArthur & Wilson, 2001 edition [orig. 1967]: 3)

Since these observations, islands have been much used for a range of anthropological research as well as for developing ecological thinking. St Kilda, a remote island archipelago off the coast of Scotland, now a nature reserve, was for many years a self-sustaining community where islanders lived in close association with various maritime fauna and flora, in particular seabirds which they ate and whose eggs they harvested. The breakdown of this community is largely attributed to outside influences and the loss of self-sufficiency. Tuvalu, an island in the Pacific Ocean has more recently been in the news over a controversy related to climate change (see Baliunas & Soon, 2002). Such controversies simply illustrate

the need for better intelligence to provide and interpret scientific facts and reveal the views of the various communities of interest. Studying islands has thus taught us much about sustainability, about the interconnectedness of social, economic and ecological systems and about what happens when any of these systems breaks down or overwhelms the others. Islands have aided our theoretical development in relation to concepts such as *limits to growth* and *carrying capacity*. Small islands provide rich pickings for landscape researchers in particular, in a variety of discipline areas. Nagarajan who is from the University of Prince Edward Island, on the east coast of Canada has described small islands as "*closed and bounded systems in many respects, and they are manageable units of study*" (Nagarajan, 2006: 296). He goes on to suggest small islands as "*model living laboratories for the Earth, which is also a closed system on a planetary scale. In small islands, people can see and experience the impacts of their actions on their ecosystems with the cascading feedback effects on the overall island systems*". He also provides a strong warning that the development of small islands should "*not transcend the ecological functions and physical limits found in the island system*". Undoubtedly part of the attraction of islands is one of aesthetics: often the remoteness or inaccessibility adds to the mystery and beauty of islands. Many islands have been imbued with mystical or sacred qualities. In the North East of England, Lindisfarne (Holy Island) and the nearby Farne Islands are riddled with associations relating to early Celtic Christianity and more recent stories of bravery and daring². These islands were often chosen because of their possibilities for defence and are now protected under various landscape and ecological designations. Such islands are now

-
- 2 Grace Darling was the heroine of a dramatic rescue off the Northumberland coast in 1838. She lived with her father, the lighthouse keeper on one of the Farne Islands, and at the age of 22 helped her father to save nine lives from a shipwrecked vessel in terrible conditions using only a small rowing boat known locally as a 'coble'.

important tourist destinations, as a result of both natural and cultural qualities. This story is similar throughout the world and nowhere more so than in the small islands of the Mediterranean which are the focus of this volume.

9.3 Landscape sustainability and the European Landscape Convention (ELC)

Landscape sustainability is as much about people's perceptions and understanding of changes that occur as about their ability to respond to that change. Such change is often difficult to predict but past change in the landscape has become a significant area of research. A number of theories and tools have been developed from these studies. Changes that affect the landscape may derive from many natural and human sources; these are often now termed *drivers of change* and this has become an area of study in itself. Within the increasing societal demands for more sustainable solutions, policy makers and landscape planners have a constant struggle in responding to landscape change.

The European Landscape Convention (ELC) is now a landmark in European – and increasingly global – policy in relation to landscape change. There are two key points within the Convention that are particularly useful to consider in relation to landscape change and this chapter. The first is set out clearly in the preamble: *“landscape is an important part of the quality of life for people everywhere;”* that is, all landscapes matter. The second is set out in Article 5c: *“to establish procedures for the participation of the general public... with an interest in the definition and implementation of... landscape policies”*.

These two parts of the Convention text have a particularly close association. The assumption is that ordinary people should have a say in what

happens to ordinary landscapes, the landscapes that they probably live and work in. In further unpicking of what this actually means there is an implication that ordinary people have a potential understanding and ability to assess, plan and monitor their local landscapes, and to have a potential not only to understand local landscape change, but to devise appropriate strategies for future management of landscape change. This could be thought of as a tall order, particularly as it is now recognized that people's relationship with the land has altered to such an extent that they do not understand or even perhaps notice landscape change. There is a separation between people and the landscape and in spite of efforts in the academic literature to move the argument away from landscape as simply a 'view' (see also Thompson, 1999), this may not reflect the experience of ordinary people who regard landscape as scenery because visual exposure is the only real contact they have with it. This idea relates to Thayer's (1994) explanation of the *surface* and *core* properties of landscapes where surface values are those that can be readily seen and sensed and the core values are the more functional or operative properties that may be hidden. The point about this, according to Thayer, is that our present culture has reduced the concentration on and understanding of the core properties – those that keep the landscape alive and functioning – and as these become less visible and people care less about the core in favour of the surface, the less we understand and see what is actually happening. This is of course a contested concept and one that the European Landscape Convention is trying to circumvent. By ensuring that all landscapes are valuable and that ordinary people have a say in those landscapes it aims to remove the elitism in both the view of landscape – i.e. only 'special' landscapes should have attention – and the view that only 'experts' are able to experience the landscape fully and therefore are 'qualified' to make decisions about the landscape. The Convention brings the attention firmly back

to encouraging ordinary people to be creators and managers of the landscape.

The Convention text is remarkable in many ways, but in particular it manages to pull together the conceptual understandings that we need to protect the landscape, and also that we also need to understand that landscape is fundamentally about change. Change is fundamental to the sustainability of the landscape, and by default therefore also to the communities living within that landscape. How this works in policy and practice at a more detailed level is much more difficult. Many landscape policies throughout Europe are now about protection, but there is a disjuncture here because, as is clearly seen in many Mediterranean landscapes, societies cannot be pickled in aspic – they are changing and will continue to change. Changes in community structures and livelihoods have direct effects on the landscape. In many areas, changes result in abandonment of landscape practices that have occurred over many years. Jared Diamond has written extensively about the degradation of the landscape as a result of societal and economic collapse, often manifesting itself in unsustainable land management practices such as deforestation. In his book *Collapse* (2005), he provides a five-point checklist of factors for societal collapse: environmental damage, climate change, hostile neighbours, loss of friendly trade partners and the fifth, a society's responses to its problems, which is the key point that determines ultimately the survival or collapse of the society. Diamond compares a number of examples in the present and past and in particular he uses island communities to illustrate his thinking. He points to the case of Easter Island – commonly cited in relation to the collapse of island communities - where he summarizes: "*Easter's isolation makes it the clearest example of a society that destroyed itself by overexploiting its own resources*" (Diamond, 2005: 118). This reveals some particularly important

questions that are relevant for this chapter in terms of understanding sustainability issues: how can we ensure that our responses to the impacts on our landscape are such that we do not destroy the resource? And what should we protect in the landscape in order for sustainable practices to occur that will not stifle landscape (and societal) change, but that will look to the future and be flexible enough to respond to the critical drivers of change of our time?

The European Landscape Convention is not prescriptive as to how governments should respond to its Articles; indeed the Council of Europe encourages a variety of implementation strategies and the development of suitable tools. In England it has been recognized that a baseline is required from which to monitor policy and landscape change in relation to the Convention's aims. However recent research has shown the difficulties of assessing existing policy because although the intent of the Convention may be reflected, the language used provides no explicit link to landscape objectives (Roe *et al.*, 2008). In many cases the intent only partially reflects the Convention's aims. Further work is now being carried out to provide a robust baseline for the whole of the UK policy but which also examines the issue of developing indicators that link change on the ground with the aims of the Convention.

9.4 Landscape research, knowledge and understanding

Attitudes to research have changed over the years. There has been a fairly recent move in academic circles to reject the Baconian model of 'science-as-objective-truth' and as the only kind of acceptable or useful basis for decision-making. It is now understood that scientific understandings are shaped and mediated by social and political

outlooks and values (Foster *et al.*, undated). There is also a tension between expert and 'indigenous' or 'local' knowledge and this is nowhere more obvious than in landscape issues. There is a growing interest in the definition of different types of knowledge, particularly that which is not 'scientific' knowledge in all its forms. It has long been understood by those in the landscape field that working with the landscape requires the bringing together of many kinds of knowledge, for example, scientific, applied and human e.g. ecological, hydrological, cultural (meanings and symbolism), perceptual, experiential, etc. (Soini, 2001). These are often categorized as 'objective' (scientific) qualities and 'subjective' (human) values. Knowledge, based purely on natural sciences, has not provided adequate information to make successful landscape planning decisions because of the cross-disciplinary nature of the problems that need to be solved. There has been a tacit understanding that just as ecosystems are diverse and develop to respond to various environmental conditions, so do social, economic and cultural systems (Karjala and Dewhurst, 2003). There is a growing focus on and literature concerning the potential and use of indigenous knowledge in landscape decisions, and methods which allow for full expression of this knowledge (e.g. Calvo-Eglesias *et al.*, 2006). As Sillitoe points out, it is increasingly acknowledged "that other people have their own effective "science" and resource use practices and that to assist them we need to understand something about their knowledge and management systems" (Sillitoe, 1998: 223). Pretty criticizes the traditional scientific model for being equated with "true" knowledge and the "only proper way" of thinking and doing (Pretty, 1995). Sillitoe suggests that a cross-cultural study of knowledge may have the potential to advance our "scientific understanding of natural processes by challenging our concepts and models" (Sillitoe, 1998: 227). There is still considerable adherence to the idea that sound science should be the only basis for policy in spite

of this change in attitude to the way scientific facts are regarded, valued or measured. Qualitative research is still often seen as the poor relation compared to quantitative research in spite of the recognition that values are the basis on which actual decisions are made. In real and practical terms, an integrated approach is needed to develop sustainable ecosystem management solutions, particularly in complex landscapes. Often simple quantitative options and spatially explicit management plans need to be developed based on both qualitative and quantitative research and analysis (see Hobbs & Lambeck, 2002).

Another area of contention is the interpretation of data. Although there has been a rise in methods that help the prediction of future conditions, there is considerable debate over the meaning of existing data and future gazing because of the difficulties, not only of estimating future environmental conditions, but also as regards future values. Examples of this can be found in relation to the sustainability debate, and in particular concerning climate change. In landscape research, this has had a strange effect. On the one hand government agencies require 'good science' to back up their decisions, but they often do not really know or understand what this means. When they have commissioned research that does not provide 'the answer' – as of course much good research does not – they do not know then what to do with it in developing policy. Politicians and policy-makers are particularly unhappy with uncertainty, risk and concepts which appear to conflict. Environmental research is full of uncertainty and much genuine indeterminacy (Foster *et al.*, undated). This is particularly difficult for policy-makers as clearly policy cannot be said to be supported by research which is indeterminate.

In landscape research there is also sometimes a poor understanding of measurements and methods of research; the difference between a

consultancy project and good research is an area of confusion, particularly in relation to landscape issues. In many cases consultants appear to be carrying out research with little idea concerning the justification of the robustness of their methods; however the commissioners of such research also have so little understanding of such things that information is concluded from poor data or through weak methodologies, and policy also seems to be formulated from poor research. In some cases, policy-making agencies appear to have short memories and very little 'joined-up' thinking, particularly when it comes to cross-sectoral thinking. Another problem is that more sustainable solutions may not provide the quick fix, the cash crops or the range of options that are often required by farmers and others and that may be provided by hi-tech alternatives (Sillitoe, 1998). Projects which attempt to gain a hybrid of scientific and indigenous knowledge are sometimes criticized, but it is perhaps better to think that there is no 'right' way of doing a project, no 'best' balance between different kinds of knowledge and how these are used, and each project should be assessed on its own merits. Researchers and practitioners need to be able to work across disciplines and thus training in inter-disciplinary thinking and methods is important for both.

9.5 Participatory processes and landscape change

In both academic research and landscape practice greater realization has grown of the benefits of designing projects that include stakeholders in the research and implementation process. Much has now been written concerning the involvement of people in decision making about the environment. The movement to improve participatory processes was given a boost following the 1992 Rio Earth Summit and the adoption of the Agenda 21 initiative which opened

up new possibilities for communities to become involved in working towards more sustainable development³. In many countries, projects can be found where communities are now involved in regeneration projects, and in improving their neighbourhoods. Personalising sustainability to the local level often makes it much easier for people to understand because it meshes with their daily lives, and it is for this reason that thinking in terms of biotopes is also useful when developing participatory methods. Biotopes have importance in biodiversity conservation. They may create part of the ecological infrastructure and act as refuges for example ponds, mounds of stones and single old trees, but they can also act as corridors for dispersal in fragmented landscapes and may include linear elements such as ditches, earth banks, stone walls, hedges and road verges⁴. Such biotopes may have considerable significance within communities. At a larger scale, there are fewer examples of community involvement, partly because it is so difficult to define who the 'community' is and often the community is one of 'interest' rather than 'place' which makes the practicalities of getting together to instigate or take part in action much more difficult, in spite of increasing communication opportunities (see Roe & Benson, 2001).

In landscape research, theory and practice have changed so that communities are sometimes the subject rather than the object of the research. In cultural geography, there is much theorizing over this subject-object relationship. In more applied landscape research, such methods are based on the understanding that building social

3 See UNCED, 1992 and also Selman & Parker's (1997) review of the Local Agenda 21 strategies in Britain.

4 Cousins & Ihse (1998) have identified these features and provide a useful picture of such biotopes in Swedish agricultural landscapes.

Intelligence stage identified in military and crime literature	Traditional research process	Stages in landscape intelligence process
Planning & direction	Research question definition; literature review	Project planning/brief development/ research questions/hypothesis/task identification/scoping/ limitation identification
Collection	Data collection	Plan for information collection/survey/ data collection
Processing and exploitation	Results	Results
Analysis and production	Analysis	Analysis/inferences/conclusions/ target identification
Dissemination and integration	Writing up	Sharing/dissemination/validity checking
Feedback and evaluation	Conclusions	Feedback, evaluation and review/monitoring

Table 9.1: Stages in the intelligence process.

capital and social learning can be an important and useful part of the research process (Roe, 2007b). In practice there is also an increased use of participatory methods, and measurement of the success of projects can be through monitoring of the process as well as the project outcome (see Margerum & Born, 1995; Pretty, 1995; Roe, 2007b). The measurement of success depends upon the objectives of the project and most often in landscape projects the desired outcome is about landscape change - a changed management regime or structure, or a new design or plan for an area. However it might also be about changing attitudes, perceptions or understanding about the landscape. This is more about building social capital and social learning, two key factors in increasing social sustainability generally, as well as potentially having an effect on the sustainability of the landscape.

The theory of participatory working with communities has changed very little over the last ten to twenty years although new methods have been developed. Arnstein (1969) provided the now classic conceptual expression of a ladder of participation and there have been a number of

reinterpretations and re-conceptualizations and explanations of participatory action such as a wheel of participation⁵ and the classification of typologies (Pretty, 1995). The key point here is that there are various forms of community involvement and the appropriate form needs to be found for each particular project. It is also important that there is an understanding within the community as to what form the participation is to take: if it is consultation – one of the most common forms of participation in landscape projects – then it is not necessarily interactive and may not result in a change in social learning. Participatory learning is perhaps an area that is of increasing interest, and is particularly relevant in relation to working towards greater sustainability in landscape, where understanding change is critical and rights and responsibilities are key issues. Jules Pretty has carried out a lot of excellent work in relation to sustainable agriculture and in particular work that provides a

5 Davidson (1998) wrote about this in a short article in *Planning* and it was further developed by South Lanarkshire County Council in their 2002 Community Plan, now superseded.

critique on positivist scientific methodologies as the sole solution for achieving more sustainable solutions to agricultural systems (Pretty, 1995). He concludes that some interpretations of 'participation' can often hinder rather than support greater sustainability. Each participant brings a different viewpoint, knowledge and understanding based on background, culture and experience. One person's solution often, if not always, leads to another person's problem. Pretty has proposed that new systems of learning and action are needed, particularly in response to multiple viewpoints, to the changing environmental conditions and to the need to encouraging debate and finding solutions as well as in establishing trustworthiness. He strongly recommends that processes that work towards more sustainable agriculture are not proscribed, particularly because the actual lived experience of farmers is often very different from that of those experts or scientists also testing new methods. This is a key issue in relation to the ability of those actually managing the land and the knowledge of the 'expert'. While those working the land may need to improve their understandings about potential solutions and techniques for dealing with change that lie outside their understanding or experience, experts need to have a good understanding of conditions of the landscape that may only be available from close experience with it over a long period. Experts can also learn much about associations, traditional use and history from working with those on the ground and these are key components to developing more sustainable management structures for landscapes and ensuring that community landscape memories are not forgotten in the process.

Although research and practice may appear to be focused on ecological or aesthetic objectives, Thompson also found that such goals of landscape projects are often "*justified in terms of the beneficial effects upon people*" (Thompson, 1999: 133) rather indicating that the balance of the sustainability

stool is tipped firmly in favour of social sustainability considerations. However others have found the converse. Professionals working in urban forest landscapes in UK were found by Coles & Bussey (2000) to be undervaluing the social importance of woods and the importance of the community interactions when designing. Both these cases indicate the interdependence in landscape studies between ecological, economic and socio-cultural issues and that trying to separate the different dimensions of landscape is not always helpful (Figure 9.1). Understanding where the key focus of a project lies is more useful.

One of the problems of participatory working is actually building the will between practitioners and people for such work. While the difficulty of working with communities is now well documented, there are also often difficulties that result in the attitudes and expertise of professionals. In his survey of British Landscape Architects, Thompson (1999) found that while some professionals felt participatory working was a waste of time, most took a middle path and were enthusiastic about involving communities in particular projects such as those in residential areas. In spite of the difficulties, there was also some recognition that professionals might learn useful information during the process of working with communities. Many of the comments collected by Thompson and published in 1999 indicate that the kind of participatory working in which most professionals are likely to be involved is consultation, and the expert – the landscape practitioner in this case – may feel his or her expertise threatened. However, there is an increasing realization within the professions that a more responsive attitude towards participatory work and professional learning is needed. This is indicated by the growth in CPD (Continuous Professional Development) monitoring and the rise of ideas

that professionals need to be more 'reflective'. The kinds of ideas suggested in Schön's books⁶ seem to have an increasing influence on this thinking for many professionals. He recommended that professionals need to have a better understanding of their limitations and to improve their competence by a constant 'reflection-in-action' approach. He found that professionals are often regarded by communities as representatives of the establishment or the opposing view rather than as enablers. This is important in relation to community participatory working and Schön suggests that professionals – or experts – could work on a more reflective basis. Such professionals should then be seen "as participants in a larger societal conversation; when they play their parts well, they help that conversation to become a reflective one" (Schön, 1983: 346). This then develops a process of constant learning and an increase of the knowledge base where both professionals and the community together reflect and consider the issues concerned fully. Schön also implies very strongly the need for creativity in professional working. In landscape projects, much of the conceptual and methodological development of participatory working has come from social projects and many of the methods commonly used are now very familiar with both practitioners and researchers and relate to the more consultative range of work. There is also now some useful information related directly to environmental or landscape projects, particularly from work in developing countries, which is informing academics and practitioners in the developed world. The level of involvement by the public in landscape projects

is still very variable, even in a country such as the UK where the principles of involvement have been embedded and practised for some years. Even though there is now evidence from comparative studies that participation is a key component of success (Pretty, 1995), there is very little evidence that establishes the link between greater sustainability in the landscape and more involvement by ordinary people *per se* as opposed to projects that are deemed successful and that have been purely the result of expert involvement. However, as already suggested, the point here in relation to sustainability is that it is not possible to separate the three aspects of sustainability (ecological, community, economic) and so assessments of success are, like the concepts of sustainability and landscape, complicated and often elusive and demand creative thinking. There is an increasing realization of the need for more integrated approaches and thinking, not only in terms of integrating different types of expert knowledge from different discipline backgrounds to find better solutions, but also integrating expert and indigenous – or local – knowledge in relation to tackling issues about landscape sustainability⁷. In small islands there is another key point to consider; there may not be capacity within the 'expert' community to develop appropriate or innovative responses to the sustainability agenda and/or to

6 Donald Schön wrote a number of books based on his theory of reflection-in-action. The classic text is *The Reflective Practitioner* (1983), but *Educating the Reflective Practitioner* (1987) is also useful.

7 It is difficult to assess whether this situation has changed in the UK, but the recent financial difficulties that organizations such as the Community Forests face, which work with communities as a matter of course and have considerable experience in methods that might be classed as more 'interactive', rather indicate that further progression towards more sophisticated methods and basis for including communities in decision-making in the UK is not likely to occur in the immediate future.

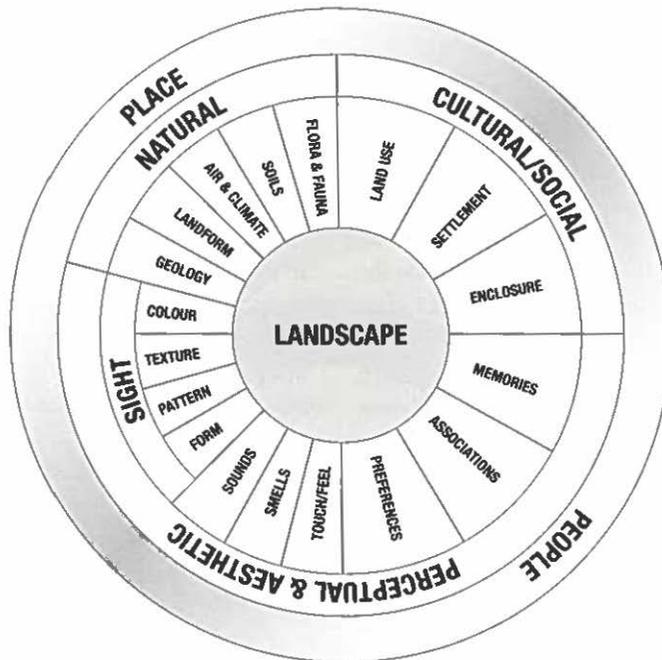


Figure 9.1: The multi-dimensional nature of landscape.

Source: Swanwick & Land Use Consultants, 2002

international policy requirements⁸. It is thus important to consider the whole population as a potential resource and to improve knowledge and skills in all areas of the community.

One of the major areas now beginning to emerge, particularly within the European context, is interdisciplinary landscape research (Tress *et al.*, 2006). The relationship between research and much landscape policy and practice has in many countries been a weak one. This characteristic is not restricted to the landscape discipline, but

seems to affect a number of disciplines related to the built environment. There seems to be increasing overlap in disciplinary terms. The European Landscape Convention provides a useful springboard here. While it is encouraging multi- and inter-disciplinary working, it has also helped to reveal the different research cultures across European countries as well as the enormous variety in policies relating to landscape, particularly in relation to landscape protection. Community participation is also revealed as an area where understandings, research and practice vary enormously across Europe.

⁸ See Valentine & Formosa (2006) for information on this issue in relation to Malta and on conceptual and practical attitudes to capturing detail in mapping.

In theoretical terms it is useful to conceive of projects in terms of a series of feedback loops or systems within a framework to achieve a particular aim, where there

is constant movement towards that aim of some sort. A number of theoretical frameworks relating to landscape planning are helpful here. Carl Steinitz's Framework Model (Steinitz, 1990) relies on a number of stages where key questions are asked. The model can work in either direction and has a series of feedback loops or a cyclical design, so that questions can be returned to and new information can be fed into the process. Ahern's (1999) model also provides clear feedback mechanisms to form an *'iterative/continuous process of evaluation and goal'* with interdisciplinary and public input at every point of the process. Ahern's model (Figure 9.3) is specifically geared towards an ecological approach as is Steiner's (2000) approach, which also provides for many feedback routes. Van Buren & Kerkstra (1993) provide a *Framework Concept* using an ecological approach based on hydrological units defined by surface topography and subsurface hydrology. What all these have in common is the recognition that such processes are not linear; landscape planning, whether there are specific sustainability objectives or not, deals with potentially complex landscape change and any methodology needs to deal with the difficulties of scale, complexity and uncertainty through good feedback mechanisms and a process that is cyclical and flexible but recognizes that overall aims are important. Steinitz's framework suggests the importance of asking the right questions. His framework also puts considerable emphasis on who is making the decisions. Steiner's approach puts education and citizen involvement right at its centre and Ahern has adaptive implementation, management, monitoring and education as the key components following the development of a landscape plan.

9.6 Developing an intelligence system

As has been suggested, there are now a number of useful conceptual approaches or frameworks which can be referred to when planning the landscape. There is also now an understanding

in landscape policy circles of the importance of gathering information about landscapes, primarily to create some kind of baseline understanding against which landscape change can be monitored. The biologist E.O. Wilson has been a key influence on the awareness of the need for research, and understanding species, to providing a baseline for ecosystem management and conservation. The focus of Wilson's work was the world's fauna and flora or its biodiversity. He suggested that *"biologists are close to travelling blind"* because *"the biology of more than 99 percent [of species] remain unknown"* (Wilson, 1992: 313). In landscape, there is a similar need to gain fundamental information in many countries about the components and processes that relate to the ecological, social and cultural considerations of landscapes. However, it is also worth considering that much of what we do not know now, is not because we have never known it, but because we have simply forgotten such understandings. There is therefore also the issue of how culturally we can *relearn* what was known in the past that may be useful to us in the future.

'Intelligence' is not a term commonly used except in relation to a person's academic ability or in relation to national security. However the concept is useful in thinking about what is needed to support decisions that politicians, practitioners, academics and ordinary people have to make concerning the future sustainability of the landscape. An illustration of what is meant by intelligence can be provided by returning to E.O. Wilson: *"merely the attempt to solve the biodiversity crisis offers great benefits never before enjoyed, for to save species is to study them closely, and to learn them well is to exploit their characteristics in novel ways"* (Wilson, 1993: 306). Within this sentence, Wilson provides us with the idea of survey, analysis, understanding, and application of that understanding for new solutions or the identification of ecosystem services.



Figure 9.2: The Intelligence Cycle.

Source: Joint Chiefs of Staff, 2001

So 'intelligence' is much more than information or information gathering: it has been defined as "the product resulting from the collection, processing, integration, analysis, evaluation, and interpretation of available information" (Joint Chiefs of Staff, Department of Defense, 2001). The intelligence process is a method where "information is converted into intelligence and made available to users" (*ibid*). It is made up of six interconnected actions: planning and direction, collection, processing and exploitation, analysis and production, dissemination and integration, and evaluation and feedback. It provides a product that can be used by decision-makers – in military terms – for tactical, operational and strategic planning. It has been compared to a jigsaw puzzle where planning is required to collect the pieces, evaluation to

determine the relevance and value of the pieces, collation to group the pieces together, analysis to establish the relationships between the pieces, and interpretation and perceptiveness to make sense of the picture that emerges and to try and fill any gaps (Crime and Misconduct Commission, 2007).

If this concept is translated into a landscape-relevant method it is possible to see the similarities between this and stages in a traditional science-based research methodology (Table 9.1). However adapting the concept to landscape applications provides a possible framework that is perhaps more useful for the construction of integrated approaches to solving landscape problems than the 'scientific' research example, in particular, in relation to intelligence construction where a number of potential stakeholders

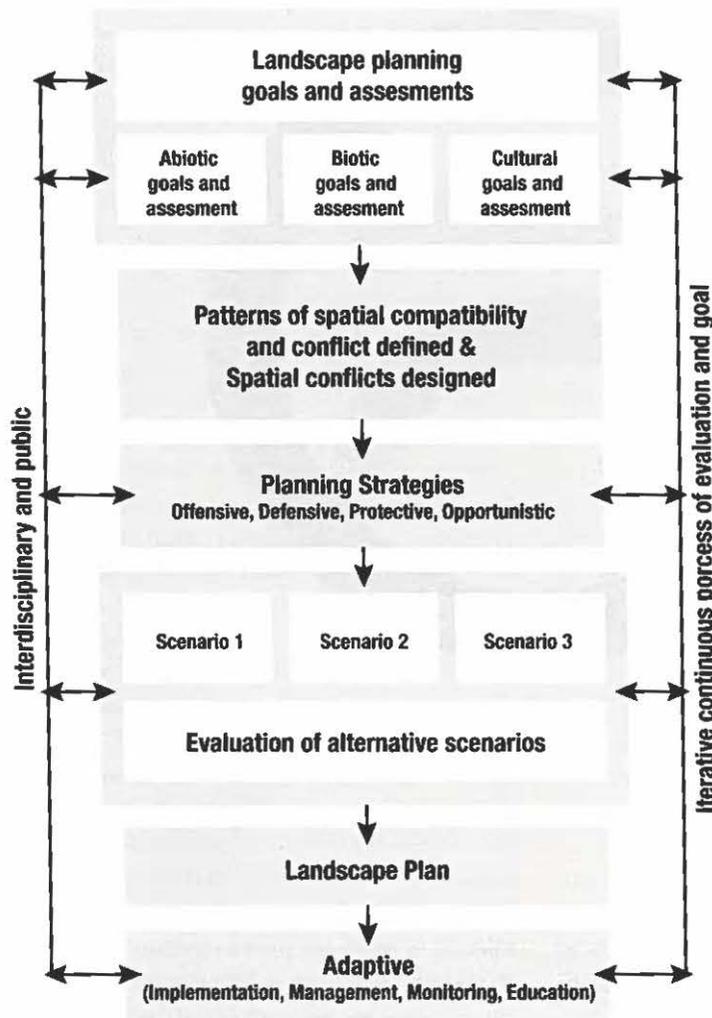


Figure 9.3: Ahern's Framework Method for Sustainable Landscape Ecological Planning.

Source: Ahern, 1999

could participate in the process, including the determination of the brief, the creation of data, the processing of the information and the evaluation of the outcomes. It is emphasized that the intelligence process is not a linear one, but is iterative cyclical, multidimensional, multi-directional and interactive with the analysis stage as the most important in adding value to the original input and creating a transformed product that is useful to decision-makers and others (*ibid*) (Figure 9.2). Such thinking then demands a number of methods that could be used at the

various stages. It is important that policy-makers and practitioners accept that there is much to learn about landscape interactions and that approaches based on experimental methods of learning and understanding within a conceptual framework such as this can be a successful way of developing innovative policy and practice⁹.

9 See Olsen *et al.* (1998) in relation to the development of a learning-based approach to coastal management.

There are many interesting possibilities in the areas of landscape research and training in relation to small islands in the Mediterranean, however the following provides a brief discussion on two particular areas where there is particularly urgent need for the focus of researchers and practitioners. The first of these is in relation to climate change and the second is cultural landscapes.

9.7 Climate change as a positive driver in landscape planning in small Mediterranean islands

Most commentators writing in relation to the landscape provide a pessimistic viewpoint on the subject of climate change. However an alternative view can be advanced. In the UK, it is clear that understanding about climate change over the past few years has focused the public and political attention on landscape issues. This has not yet meant that much more finance has found its way to the agencies responsible for planning and managing the landscape, but it has increased debate about people's relationship with ecological processes and about protection of landscape. In southern Europe, climatic extremes are even more critical, but there has also been a long history of adaptation and mitigation of such change. Throughout Europe, government policy and raised public awareness have also had a positive effect on the content of professional training programmes and some are now emerging that include sustainability issues and responses to climate change.

In Mediterranean landscapes, water is the key concern to the sustainability of communities within the landscape. Climate change may have a range of impacts that are particularly severe, particularly in relation to the islands of the Mediterranean, including sea-level rise, storms

and desertification. The coastal landscape 'belt' is particularly important to communities in the Mediterranean; not only does it provide the basis for majority of the economic resources, but the character of the landscape and its communities relies heavily on the richness of the marine heritage and natural processes. The concept of *seascapes* has potential in such areas indicating a new emphasis on more integrated thinking along with Integrated Coastal Zone Management (ICZM). Seascape analysis has been pioneered in the UK by the Countryside Council for Wales (CCW) and is now used by a number of agencies including Scottish Natural Heritage (SNH) to help examine the impacts of developments such as offshore windfarms. The dynamic relationship between land and sea that has inspired and enthralled scientists, poets, musicians and many others is beginning to be reflected in policies and research. This is partly as a result of a growing realization of the possible impacts of predicted sea-level rise on valuable land areas which is a growing concern in many European countries. The focus is both from sea to land and from land to sea. There is a growing understanding that what goes on beyond the edge of the land is part of 'landscape' concern and therefore of cultural and natural value as recognized under the European Landscape Convention which specifically identifies '*inland water and marine areas*' under its scope in Article 2. In coastal areas human populations are often high and ecological balance is often fragile. There are some very difficult issues to be tackled in relation to climate change in such areas, given the prospect of species migration and ecological change, plus the possibility of areas of coastal land becoming inundated through sea-level rise and the likelihood of increasing storms. The conceptualization of 'landscape' in coastal areas as seascape is therefore particularly important.

In such areas, the unsustainable practices so commonly found in the Mediterranean such as

tourist-related construction for accommodation and leisure must be reassessed. Focusing at both a biotope level and at a landscape level is important so that local attitudes and the wider landscape impacts are considered. One new development may have a severe impact in a region where there is such ecological richness – more than half of the species in the Mediterranean are endemic and the 25,000 known species account for 10% of the known species in the biosphere¹⁰ – so it is important to consider the detail as well as the overview.

9.8 Cultural landscapes and sustainability

The term 'cultural landscape' is now commonly used particularly in relation to agricultural landscapes that exhibit traditional methods of cultivation. While there are many different conceptions and definitions of 'cultural landscape', in general it is regarded as an area where natural qualities of great value "co-evolved with human society" (Philips, 2001: 61). 'Cultivation' is the development or improvement of something, in other words, change. This understanding of cultural landscape is not well recognized within designations of cultural landscapes. In an analysis of what new cultural landscapes might be, Roe identifies that "mutual moulding" of landscape as a key component of the development of cultural landscapes (Roe, 2005, 2007c). Thayer also identifies the "unique role of sustainable landscape in relation to human experience", that is "we create

them and they create us" (Thayer, 1994: 324). There is a link between the concepts of a 'sustainable' and a 'cultural' landscape, that is, the temporal consideration. Cultural landscapes – at least the everyday type – develop over time, often over years of close association with a particular community or individual through cultivation or management of some kind. This develops not only familiarity, but a deep understanding of processes; the particular landscape takes on meanings and associations, and it becomes the setting for life. The changes in the landscape become an essential part of, or are seen to reflect, these life changes.

Many Mediterranean countries have wonderful examples of landscapes which can truly be labelled 'cultural', i.e. those that have been cultivated over centuries so that natural and human processes are so intertwined as to be indistinguishable. Methods of grazing and use of fire have constructed the ecological conditions in the climactic Mediterranean woodland and *maquis*. The region has been a canvas where many civilizations and cultures have left their mark, and it is still a hotbed of different identities, religions and peoples who have originated from many different countries and traditions¹¹. The Mediterranean example brings us to another conceptual issue which is much focused upon, that of the cultural-natural relationship in landscape. The idea that some perfect natural environment state can exist where humans are excluded is still very influential, for example in the way many 'special' landscapes are managed (e.g. wilderness landscapes, National Parks etc.). There is also a persistent belief that primitive cultures lived in absolute harmony in nature and that we should be trying to copy such cultures in order to right our own shortcomings in relation to sustainable environments. This

10 Benoit & Comeau, 2005. *A sustainable future for the Mediterranean Basin: the Blue Plan's Environment & Development Outlook* (London, Earthscan) in Conrad & Cassar, 2007. See also Delgado *et al.*'s (2007) analysis of the impacts of roads in Tenerife where endemic species are particularly vulnerable and road development may increase the spread of foreign invasive species.

11 See Conrad & Cassar's (2007) useful summary of the natural and cultural characteristics of the Mediterranean.

of course does not take into account the issue discussed above, that of societal change and the need to understand societal change in parallel with landscape change in order to have any possibility of achieving objectives related to sustainability. Understanding present societal change does not mean that we cannot learn from the methods, problems and successes of our predecessors. Buhagiar (2007) has researched the extraordinary water management strategies of cave-dwellers in Malta. Techniques for conserving scarce water supplies based on a sophisticated understanding and management of perched aquifers using excavated galleries and tunnels probably developed as a result of the influence of Muslims in the 11-13th centuries - this system is now all but forgotten, and the water supply at present is through boreholes and desalination (Riolo, 2001). The landscape at this time was almost completely lacking in woodland thus encouraging the use of natural caves as the basis for dwellings. The water management system meant that settlements and their fields had a perennial water source. Cave dwelling is commonly found in the Mediterranean, while water management systems such as this can be found in many countries with similarly challenging climates. In Syria, southeast of Aleppo, community action in conjunction with the International Centre for Agricultural Research in Dry Areas (ICARDA)¹² has resulted in the renovation of a number of *qanat* underground water systems which date from late Roman/early Byzantine period and show similarities to those found in Malta. New extraction technologies in Syria resulted in low flow in the *qanat* systems, which in turn resulted in lower revenues for the farmers relying on the *qanat* farm systems. As the young farmers leave the land, not only does physical maintenance of the *qanat* system not

occur, but the knowledge and community co-operation on which the system is also based, falls apart. In Malta, this water gallery system provided the means of sustenance at a time in a landscape that would otherwise not have been possible. In both Malta and Syria these features are evidence of systems of living and a close understanding of landscape which apparently changed as a result of technological development and could now be reassessed as potentially environmentally friendly systems for extracting and managing water. Although the need for a reliable clean water supply is well grasped politically in Malta, the impacts of existing water supply technologies such as desalination are still poorly understood, except that the impacts are environmentally adverse. It has been suggested that there is considerable heritage value for tourism development in reassessing or even restoring traditional systems (Wessels & Hoogeveen, 2008). While a return to such systems is unlikely to solve contemporary water supply problems completely in an island such as Malta, it does point to the importance of integrative and cross-disciplinary thinking and in understanding the variety of potential benefits that such intelligence could bring.

9.9 Conclusions

Sustainability has now become such a buzzword that it is commonly used to justify the most unsustainable policies e.g. growing fuel oil instead of food. There is also a considerable gap between behaviour and understanding, most clearly visible in relation to climate change. So-called constraints on our behaviour do not actually act as such and in spite of a plethora of methods, indicators and targets relating to developing more sustainable lifestyles, the actual change of behaviour is grindingly slow and belief that behaviour can be changed seems to be receding. Although there is now recognition that we need to

12 This work is described in full in Wessels & Hoogeveen (2008).

respond, and respond quickly to ensure some kind of sustainable future for both humans and other biota, there are still many difficulties that hamper our ability to respond to such needs.

This provides us with some explanation about the difficulties in developing research programmes that are relevant, robust and that will be used seriously by politicians and policy-makers in relation to providing more sustainable landscape plans. There appears to be a lack of intelligence on all sides; by researchers and practitioners, politicians and policy-makers. The researchers and practitioners need to communicate better and to develop more robust and integrated methods, and policy-makers and politicians need to understand what good research is, when it is needed, what to do with it when it is done and how to cope with research that finds the questions asked are unanswerable. All parties need to be able to see when further research is needed and accept that this is so.

The nature of uncertainty in relation to sustainability indicates that an ongoing process of research, public involvement and social learning is required. We cannot afford to learn only from past mistakes, sophisticated scenario-planning techniques allow researchers to provide visions and representations of future conditions that may help in developing dialogue. Practitioners need to learn reflective methods of learning. There was a period when relying on the 'expert' view was seen as undesirable, but we have now a more sophisticated understanding of the need for dialogue between experts - often acting as enablers and interpreters - and ordinary people - who often hold knowledge unavailable to experts. The tension between expert and indigenous knowledge is nowhere more obvious than in landscape issues. Therefore, we need to develop interactive methods which provide for the various different kinds of knowledge and understandings to be identified,

expressed and combined to improve social intelligence and social learning systems.

There is thus undoubtedly a need for more and better landscape research in relation to landscape sustainability, but perhaps what we need to consider is whether such research really provides us with *intelligence* that will help us address the key issues, or whether it can feed into some kind of intelligence system. Such a system could be developed to respond to a variety of scales and locations. It would include information on what exists, what is desirable and what is potential in relation to landscape. Such intelligence needs to inform the way we develop our practical approaches to landscape planning, design and management. It is here that education and training is important. But as we have seen, this should not only be considered in terms of professionals and landscape managers, but in relation to all stakeholders in the landscape - and that means all ordinary people as well. The ELC provides the starting point for such inclusive approaches - inclusive of all landscapes and all stakeholders.

As has been found by many eminent researchers, island landscapes provide rich pickings and opportunities for learning through study that includes ecological richness, endemism and biodiversity, cultural diversity and heritage, aesthetics and economic potential. There are over 6,000 islands and islets in the Aegean and Ionian seas and the Maltese Island group plus a number of larger islands including Corsica, Sardinia, Sicily, Crete, Rhodes, Cyprus and the Balearics (Conrad & Cassar, 2007). The islands of the Mediterranean demand new, more inclusive and innovative approaches to tackle the critical issues that many of them now face to ensure their landscape sustainability.

References

- Ahern, J., 1999. Spatial concepts, planning strategies and future scenarios: a framework method for integrating landscape ecology and landscape planning. In: J.M. Klopatek & R.H. Gardner, eds. *Landscape ecological analysis: issues and applications*. New York: Springer, pp.175-201.
- Antrop, M., 1993. The transformation of the Mediterranean landscapes: an experience of 25 years of observations. *Landscape and Urban Planning*, 24, pp.3-13.
- Antrop, M., 1998. Landscape change: plan or chaos? *Landscape and Urban Planning*, 41, pp.155-161.
- Arnstein, S., 1969. A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), pp.216-224.
- Baliunas, S. & Soon, W., 2002. Is Tuvalu really sinking? *Pacific Magazine*. Available: <http://www.pacificmagazine.net/issue/2002/02/01/is-tuvalu-really-sinking/> [Last accessed: 13th July 2010].
- Benson, J.F. & Roe, M.H., 2007. *Landscape and sustainability*. 2nd ed. Oxford: Routledge.
- Buhagiar, K., 2007. Water management strategies and the cave-dwelling phenomenon in late-medieval Malta. *Medieval Archaeology*, 51, pp.103-131.
- Calvo-Iglesias, M.S., Crecente-Maseda, R. & Fra-Paleo, U., 2006. Exploring farmer's knowledge as a source of information on past and present cultural landscapes: a case study from NW Spain. *Landscape and Urban Planning*, 78, pp.334-343.
- Coles, R.W. & Bussey, S.C., 2000. Urban forest landscape in the UK – progressing the social agenda. *Landscape and Urban Planning*, 52, pp.181-188.
- Conrad, E. & Cassar, L.F., 2007. *Coasts and conflicts: towards harmonisation and integration in the Mediterranean*. Malta: International Environment Institute.
- Cousins, S.A.O. & Ihse, M., 1998. A methodological study for biotope and landscape mapping based on CIR aerial photographs. *Landscape and Urban Planning*, 41(3-4), pp.183-192.
- Crime and Misconduct Commission, 2007. *What is intelligence?* Available: <http://www.cmc.qld.gov.au/asp/index.asp?pgid=10857&cid=5464&id=586> [Last accessed: 25th March 2010].
- Davidson, S., 1998. Spinning the wheel of empowerment. *Planning*, 1262, pp.14-15.
- Delgado, J.D., Arroyo, J.L., Arévalo, J.R. & Fernández-Palacios, J.M., 2007. Edge effects of roads on temperature, light, canopy cover and canopy height in laurel and pine forests (Tenerife, Canary Islands). *Landscape and Urban Planning*, 81, pp.328-340.
- Diamond, J., 2005. *Collapse: how societies choose to fail or survive*. London: Penguin Books.
- Eade, D. & Williams, S., 1995. *The Oxfam Handbook of Development and Relief, Vol. 1*. Oxford: Oxfam.
- Foster, J., Gough, S. & Grove-White, R., 2005. *Rethinking the natural capital metaphor: implications for sustainability planning and decision-making* [Undated draft working paper for ESRC Natural Capital Programme 'natural capital: metaphor, learning and human behaviour'].
- Francis, M. & Lorenzo, R., 2002. Seven realms of children's participation. *Journal of Environmental Psychology*, 22, pp.157-169.

- Hobbs, R.J. & Lambeck, R., 2002. An integrated approach to landscape science and management. In: J. Liu & W.W. Taylor, eds. *Integrating landscape ecology into natural resource management*. Cambridge: Cambridge University Press, pp.412-430.
- Joint Chiefs of Staff, 2001. Department of Defense dictionary of military and associated terms. JP 1-02. Washington: US Government Printing Office. Available: <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA439918&Location=U2&doc=GetTRDoc.pdf> [Last accessed: 13th July 2010].
- Karjarla, M.K. & Dewhurst, S.M., 2003. Including aboriginal issues in forest planning: a case study in central interior British Columbia, Canada. *Landscape and Urban Planning*, 64(1-2), pp.1-17.
- Kirby, P., Lanyon, C., Cronin, K. & Sinclair, R., 2003. *Building a culture of participation: involving children and young people in policy, service planning, delivery and evaluation*. Research report. London: Department for Education & Skills, National Children's Bureau.
- Kizos, T., Spilanis, I. & Koulouris, M., 2007. The Aegean Islands: a paradise lost? In: B. Pedroli, A. van Doorn, G. de Blust, M.L. Paracchini, D. Wascher & F. Bunce, eds. *Europe's living landscapes: essays exploring our identity in the countryside*. Netherlands: KNNV, pp.333-348.
- Krizan, L., 2006. Intelligence essentials for everyone. *Directions Magazine*. Available: http://www.directionsmag.com/article.php?article_id=2301 [Last accessed: 13th July 2010].
- Makhzoumi, J. & Pungetti, G., 1999. *Ecological landscape design and planning: the Mediterranean context*. London: Spon.
- Margerum, R.D. & Born, S.M., 1995. Integrated environmental management - moving from theory to practice. *Journal of Environmental Planning and Management*, 38(3), pp.371-392.
- Nagarajan, P., 2006. Collapse of Easter Island: lessons for sustainability of small islands. *Journal of Developing Societies*, 22(3), pp.287.
- Odum, E.P., 2002. Landscape ecology of the future: a regional interface of ecology and socioeconomics. In: J. Liu & W.W. Taylor, eds. *Integrating landscape ecology into natural resource management*. Cambridge: Cambridge University Press, pp.461-465.
- Olsen, S.B., Tobey, J. & Hale, L.Z., 1998. A learning-based approach to coastal management. *Ambio*, 27(8), pp.611-619.
- O'Riordan, T. & Ward, R., 1997. Building trust in shoreline management: creating participatory consultation in shoreline management plans. *Land Use Policy*, 14(4), pp.257-276.
- Phillips, A., 2001. The nature of cultural landscapes: a nature conservation perspective. In: *The cultural landscape: planning for sustainable partnership between people and place - ICOMOS-UK Conference Papers 2000*. London: ICOMOS-UK, pp.46-63.
- Pretty, J.N., 1995. Participatory learning for sustainable agriculture. *World Development*, 23(8), pp.1247-1263.
- Riolo, A., 2001. Maltese experience in the application of desalination technology. *Desalination*, 136, pp.115-124.
- Roe, M.H., 2000. Landscape planning for sustainability: community participation in estuary management plans. *Landscape Research*, 25(2), pp.157-181.
- Roe, M.H., 2005. Community forestry and

- landscape identity: planning New Forest landscapes. *10th UNESCO Universities Heritage Forum*, Newcastle, April 2005. Available: <http://conferences.ncl.ac.uk/unescolandscapes/english/papers.php> [Last accessed: 13th July 2010].
- Roe, M.H., 2006. 'Making a wish': children and local landscape decisions. *Local Environment*, 11(2), pp.163-181.
- Roe, M.H., 2007a. The scale and scope of landscape and sustainability. In: J.F. Benson & M.H. Roe, ed. *Landscape and Sustainability*. 2nd ed. Oxford: Routledge, pp.1-11.
- Roe, M.H., 2007b. The social dimensions of landscape sustainability. In: J.F. Benson & M.H. Roe, eds. *Landscape and Sustainability*. 2nd ed. Oxford: Routledge, pp.58-83.
- Roe, M.H., 2007c. The European Landscape Convention: embodiment of landscape as cultural heritage? *Journal of Chinese Landscape Architecture*, 23(143), pp.10-15 (in Chinese with English abstract).
- Roe, M.H., 2007d. Feeling 'secrecy': children's views on involvement in landscape decisions. *Environmental Education Research*, 13(4), pp.467-485.
- Roe, M.H., 2009. Editorial: the times they are a-changin'. *Landscape Research*, 34(1), pp.1-6.
- Roe, M.H. & Benson, J.F., 2001. Planning for conflict resolution: jet-ski use on the Northumberland Coast. *Coastal Management*, 29, pp.9-39.
- Roe, M.H., Jones, C.J. & Mell, I.C., 2008. *Research to support the implementation of the European Landscape Convention in England*. Contract No. PYT02/10/1.16 [Research Project Report]. UK: Natural England.
- Rolè, A., 2007. The terraced landscapes of the Maltese Islands. In: B. Pedroli, A. van Doorn, G. de Blust, M.L. Paracchini, D. Wascher & F. Bunce, eds. *Europe's living landscapes: essays exploring our identity in the countryside*. Netherlands: KNNV, pp.405-420.
- Schön, D., 1983. *The reflective practitioner*. London: Temple Smith.
- Schön, D., 1987. *Educating the reflective practitioner*. San Francisco: Joicy Smith.
- Sillitoe, P., 1998. The development of indigenous knowledge: a new applied anthropology. *Current Anthropology*, 39(2), pp.223-252.
- Soini, K., 2001. Exploring human dimensions of multifunctional landscapes through mapping and map-making. *Landscape and Urban Planning*, 57(3-4), pp.225-239.
- Steiner, F., 2000. *The living landscape: an ecological approach to landscape planning*. 2nd ed. New York: McGraw-Hill.
- Steinitz, C., 1990. A framework for theory applicable to the education of landscape architects (and other environmental design professionals). *Landscape Journal*, 9(2), pp.136-143.
- Swanwick, C. & Land Use Consultants, 2002. *Landscape character assessment guidance for England and Scotland*. Edinburgh: Countryside Agency, Cheltenham and Scottish Natural Heritage.
- Thayer, R.L., 1994. *Grey world, green heart: technology, nature and the sustainable landscape*. New York: Wiley.
- Thompson, I.H., 1999. *Ecology, community, delight: sources of values in landscape architecture*. London: Spon.

Tress, B., Tress, G., Fry, F. & Opdam, P., eds., 2006. *Landscape research to landscape planning: aspects of integration, education and application*. Dordrecht: Springer.

UNCED, 1992. *Agenda 21*. Geneva: UNCED.

Valentino, C. & Formosa, S., 2006. National mapping on a small island: geographical information and cartographic development in Malta. *The Cartographic Journal*, 43(3), pp.251-257.

Van Buren, M. & Kerkstra, K., 1993. The framework concept and the hydrological landscape structure: a new perspective in the design of multifunctional landscapes. In: C.C. Vos & P. Opdam, eds. *Landscape ecology of a stressed environment*. London: Chapman & Hall, pp.219-243.

Wagner, M.M. & Gobster, P.H., 2007. Interpreting landscape change: measured biophysical change and surrounding social context. *Landscape and Urban Planning*, 8, pp.167-180.

WCED - World Commission on Environment and Development, 1987. *Our common future, 'The Brundtland Report'*. Oxford: Oxford University Press.

Wessels, J. & Hoogeveen, R., 2008. Renovation of Byzantine qanats in Syria as a water source for contemporary settlements. In: R.L. France, ed. *Handbook of regenerative landscape design*. Boca Raton: CRC/Taylor & Francis, pp.237-261.

Wilson, E.O., 1992. *The diversity of life*. Cambridge (MA): Belknap Press.

CHAPTER 10

Landscape - a new area for international cooperation that could benefit the Mediterranean region

Adrian Phillips

The landscape of the Mediterranean region is – like its climate, its food and its history – one of its distinguishing characteristics. The landscape is indeed the essence of this remarkable part of the world: the very word “Mediterranean” evokes images of sunlit scenes of pencil cypress, pantile roofs, olive groves and vine terraces. Yet the quality of the region’s landscapes has been greatly eroded in recent years and is in grave danger of further deterioration (Ogrin, 2005). This chapter summarizes recent developments at the international level around the concept of landscape and suggests that some of these might be used to help secure greater awareness of the value of the landscape assets of the region and the need to act to safeguard them for the future.

10.1 Landscape – concept and meaning

Few subjects have given rise to as much philosophical debate and writing as landscape (see for example Lowenthal, 1993; Schama, 1995). Because our understanding of it is culturally related, and linked to ideas of identity (Sassatelli, 2006), finding a shared language about it has not been easy. It is thus an elusive concept whose meaning is hotly contested, but rather than explore these fascinating philosophical avenues, it

may be more helpful to start with a legally accepted international definition, that adopted in Article 1a of the European Landscape Convention (the ELC – about which more later): “*an area, as perceived by people, whose character is the result of action and interaction of natural and and/or human factors*” (Council of Europe, 2000).

This definition embodies a number of important ideas. First, that landscape comes about from the action and interaction of natural and human factors – so it is where people and nature meet. Secondly, it follows that landscape must contain a record of past interactions – so it is where past and present meet. And thirdly, that landscape is both an objective reality (an area) and a subjective notion (one that is perceived by people) – so it is where tangible and intangible values meet. This view of landscape as a ‘meeting place’ may be helpful in understanding both the strength of the concept and the difficulties it presents.

Another idea which can be teased out of the Council of Europe definition is that it contains two concepts: there is *landscape*, which is a general notion of universal application; and there is *a landscape*, that is a particular entity that can be geographically identified. Thus one can speak of the importance of landscape in the Mediterranean region, and also of a Mediterranean landscape,

and indeed of many smaller landscapes within this region (for landscapes, like Russian dolls, can sit one within another in a lengthy hierarchy). It is important to note, for example, that the ELC – where the ‘L’ stands for landscape and not landscapes – is a treaty about the place of landscape in Europe, not about the landscapes of Europe (though clearly the former has a bearing on the latter). We will return to the policy implications of this.

10.2 Landscape at the international level

It is these complex and elusive characteristics of landscape – its ‘slipperiness’ – that help to explain why it has taken so long for it to emerge as a focus for international action. In particular, getting agreement among nations about landscape has been difficult. This is a result of several factors.

Our understanding of landscape is, as already noted, culturally-related. Thus one community will see values in the landscape that another does not. For example, to white Australians, the giant basolith in the middle of their continent is Ayers Rock, and a challenging climb; to the aboriginal peoples of the same country, it is Uluru- Kata Tjuta, a place of great cultural and religious significance which it would be deeply disrespectful to enter.

Landscape is a meeting ground, so it lacks a single discipline that can speak for it and argue for international action. In this it contrasts with, say, nature conservation, where there is an international community of people with a shared training and understanding which can make the case at an international level for protecting habitats and species.

Landscape is in large part appreciated subjectively, so it is hard (or impossible) to measure and compare

it. Whereas the objectives and performance of nature conservation can be expressed in numbers of species or areas of habitat, there are no real objective measures that can be used between nations about what is important, and what is not, in relation to landscape.

Landscape “is linked with fields which are of clear national importance, like regional planning, town planning, infrastructures and so on” (Lafarge, 2006). For this reason it has not, until recently at any rate, generally been thought of as a suitable topic for international competence.

However, these barriers to international action have been under attack in recent years. Gradually landscape has emerged as a topic that can be embraced in international law and policy. There are several components of this trend, including:

- The recognition of a landscape dimension in other areas of international action;
- The specific action of bridging the gap between nature and culture within the World Heritage Convention in Cultural Landscapes;
- The emergence of international policy instruments specifically relating to landscape protection; and
- The development in Europe of the world’s first treaty that addresses landscape *per se*.

10.3 The landscape dimension in other areas of international law

Landscape has found its way into international agreements on other topics in five different ways (Lafarge, 2006):

1. Some established international agreements contain particular provisions which relate to

landscape as well as to other issues (e.g. the Convention on the Protection of the Alps, 1991);

2. Some agreements address environmental assets which are components of the landscape (e.g. the Berne Convention on European Wildlife and Natural Habitats, 1971, the Ramsar Wetlands Convention, 1971, and the Birds and Habitats Directives of the EU, 1972 and 1991);
3. Some treaties relate to activities that affect the landscape (e.g. agri-environmental measures under the Common Agricultural Policy since the mid-1980s);
4. Others again allow for landscape issues to be addressed through particular measures, like protected areas (for example the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean, 1995); and
5. There are also agreements that require that landscape considerations be taken into account in undertaking planning processes, like land use planning and environmental assessment (e.g. EU measures about EIA).

10.4 Landscape and the World Heritage Convention

Though there are thus a number of ways in which landscape issues get picked up in other international agreements at the global or regional level, a direct focus on landscape as such has been missing. The successful incorporation of a cultural landscape category within the World Heritage Convention, achieved in 1992, therefore marked an important development in taking landscape to the level of international action. It is also directly relevant to the landscape crisis facing the Mediterranean.

For the first twenty years of its existence, the World Heritage Convention suffered from a paradox – it was the first international instrument, adopted in 1972, that brought together the protection of the natural and the cultural heritage, yet it was unable to recognize the value of landscapes of ‘outstanding universal value’¹, even though such places were the supreme expression of a close link between culture and nature. This paradox seemed to reinforce an “*implicit dichotomy between culture and nature in heritage discourse*” (Jones, 1993: 18). In other words, the convention embodied two separate world views of heritage – as culture and as nature. And although there exist some so-called ‘mixed World Heritage sites’ of great natural and cultural importance, such as Machu Picchu in Peru, or Ibiza in Spain, these have been classified as of outstanding universal value separately under both natural and cultural criteria.

By the mid-1980s, this dichotomy began to concern the World Heritage Committee, especially following the nomination by the United Kingdom of the Lake District as World Heritage site (Jacques, 1995), a place that seemed to merit consideration but which failed to meet the convention’s cultural and natural criteria as then interpreted. The Committee called for a review of the place of landscapes under the convention. As a result, in 1992 it adopted a new category of World Heritage site, Cultural Landscapes.

The Committee identified three types of Cultural Landscape:

- 1 This critical term is taken from the World Heritage Convention, which “*aims at the identification, protection, conservation, presentation and transmission to future generations of cultural and natural heritage of outstanding universal value*”. Criteria have been developed to help identify places that have this quality (UNESCO, 2008).

1. designed landscapes;
2. organically-evolved landscapes, with two sub-categories:
 - relict/fossil landscapes, where the evolutionary process ended in the past, and
 - continuing landscapes, where the evolutionary process is still underway
3. associative cultural landscapes (those with powerful religious, artistic or cultural associations) (UNESCO, 2008).

The treatment of landscape within the convention in this way does not wholly overcome the dichotomy between nature and culture as it regards landscape as “cultural”, (whereas arguably all landscapes have both cultural and natural elements). This formula was used by the committee because of the need to reconcile its detailed guidance, which is now set out in Operational Guidelines, with the wording of Article 1 of the Convention itself (Last, 2006). This article includes as places that qualify as “cultural heritage”, the “combined works of nature and of man”. There is no equivalent text under Article 2 (natural heritage), so the drafting of the Convention made it necessary to treat landscape as a kind of cultural site. Nonetheless, the introduction of World Heritage Cultural Landscapes offered a way of identifying and safeguarding landscapes of outstanding universal value, with important natural *and* cultural values, on behalf of the global community. As can be seen even in the brief descriptions of such sites from within the Mediterranean region (Table 10.1), cultural landscapes attain their outstanding universal value through interactions between nature and culture.

Though the introduction of Cultural Landscapes into the World Heritage Convention has undoubtedly helped to develop a greater awareness of landscape values and to protect some

very important places on the World Heritage list, it sets a very high standard by focusing on a select number of places of outstanding universal value. Because it deals only with those landscapes which are considered universally important, it has little to offer landscapes that achieve their significance at regional, national or local scales.

10.5 The emergence of national policy instruments for landscape protection

However, at the national level, many countries have adopted legislation to protect the best of their own landscapes and this effort has begun to receive international recognition, principally through the incorporation of landscape protection as part of the system of protected area categories developed by IUCN. This system is a method of classifying protected areas by the objectives for which they are managed. A first version of it was developed by IUCN's then Commission on National Parks and Protected Areas (now the World Commission on Protected Areas – WCPA) in 1978. A revised version of the protected area categories system was adopted by IUCN in 1994, and again in 2008. This is based upon:

1. an over-arching definition of a protected area as follows:

“A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature, with associated ecosystem services and cultural values” (Dudley, 2008).
2. six categories of protected area, each based on management objectives, as follows:
 - i. *a) Science and b) Wilderness Protection*
 - ii. *Ecosystem Protection and Recreation*
 - iii. *Conservation of Specific Natural Features*

Country	Cultural Landscape	Date inscribed	Brief description (source: UNESCO World Heritage web site)
Croatia	Stari Grad Plain on the Adriatic island of Hvar	2008	Practically intact since it was first colonized by Ionian Greeks from Paros in the 4th century BC. The original agricultural activity of this fertile plain, mainly centering on grapes and olives, has been maintained since Greek times to the present. The site is also a natural reserve. The landscape features ancient stone walls and trims, or small stone shelters, while the ancient geometrical system of land division used by the ancient Greeks, the <i>chora</i> , has remained virtually intact over 24 centuries.
Italy	Cilento and Vallo di Diano National Park with the Archeological sites of Paestum and Velia, and the Certosa di Padula	1998	The Cilento is an outstanding cultural landscape. The dramatic groups of sanctuaries and settlements along its three east-west mountain ridges vividly portray the area's historical evolution: it was a major route not only for trade, but also for cultural and political interaction during the prehistoric and medieval periods. The Cilento was also the boundary between the Greek colonies of Magna Graecia and the indigenous Etruscan and Lucanian peoples. The remains of two major cities from classical times, Paestum and Velia, are found there.
Italy	Costiera Amalfitana	1997	The Amalfi coast is an area of great physical beauty and natural diversity. It has been intensively settled by human communities since the early Middle Ages. There are a number of towns such as Amalfi and Ravello with architectural and artistic works of great significance. The rural areas show the versatility of the inhabitants in adapting their use of the land to the diverse nature of the terrain, which ranges from terraced vineyards and orchards on the lower slopes to wide upland pastures.
Italy	Portovenere, Cinque Terre, and the Islands (Palmaria, Tino and Tinetto)	1997	The Ligurian coast between Cinque Terre and Portovenere is a cultural landscape of great scenic and cultural value. The layout and disposition of the small towns and the shaping of the surrounding landscape, overcoming the disadvantages of a steep, uneven terrain, encapsulate the continuous history of human settlement in this region over the past millennium.
Italy	The landscape of Val d'Orcia	2004	The area constitutes part of the agricultural hinterland of Siena, redrawn and developed when it was integrated in the territory of the city-state in the 14th and 15th centuries to reflect an idealized model of good governance and to create an aesthetically pleasing picture. The landscape's distinctive aesthetics, flat chalk plains out of which rise almost conical hills with fortified settlements on top, inspired many artists. Their images exemplify the beauty of well-managed Renaissance agricultural landscapes. The inscription covers (i) an agrarian and pastoral landscape reflecting innovative land-management systems, (ii) towns and villages, (iii) farmhouses, and (iv) the Roman Via Francigena and its associated abbeys, inns, shrines, bridges, etc.
Lebanon	Ouadi Qadisha (the Holy Valley) and the Forest of the Cedars of God (Horsh Arz el-Rab)	1998	The Qadisha valley is one of the most important early Christian monastic settlements in the world. Its monasteries, many of which are of a great age, stand in dramatic positions in a rugged landscape. Nearby are the remains of the great forest of cedars of Lebanon, highly prized in antiquity for the construction of great religious buildings.
Spain	Aranjuez Cultural Landscape	2001	The Aranjuez cultural landscape is an entity of complex relationships: between nature and human activity, between sinuous watercourses and geometric landscape design, between the rural and the urban, between forest landscape and the delicately modulated architecture of its palatial buildings. Three hundred years of royal attention to the development and care of this landscape have seen it express an evolution of concepts from humanism and political centralization, to characteristics such as those found in its 18th century French-style Baroque garden, to the urban lifestyle which developed alongside the sciences of plant acclimatization and stock-breeding during the Age of Enlightenment.

Table 10.1: World Heritage Sites in the Mediterranean Region*.

* NB: there are other World Heritage Cultural Landscapes in places that have some of the characteristics of the Mediterranean (e.g. elsewhere in France, Portugal and Spain) but which are not usually considered as part of that region.

- iv. *Habitat and Species Management*
- v. *Landscape/Seascape Protection and Recreation*
- vi. *Sustainable Use of Natural Resources* (IUCN, 1994)

Categories I-IV may be thought of as more strictly protected than V and VI. In particular, Category V, or Protected Landscape and Seascapes, is intended to protect more humanized, lived-in landscapes. IUCN's definition of this category reads as follows:

"A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value, and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values" (Dudley, 2008).

Since the adoption of the present categories system by IUCN in 1994, there has been a growing interest in Category V as an approach to conservation that can complement and supplement the more traditional focus on strictly protected areas (what many countries designate as 'national parks' and 'nature reserves' in their national legislation). For example, IUCN has published guidelines for the management of Category V (Phillips, 2002), which set out detailed advice on how to identify areas suitable for this kind of protection, the management measures that can be put in place and the range of social, economic and environmental benefits that can ensue. When the Convention on Biological Diversity endorsed the six-category system of IUCN in 1994, this category was given additional recognition as a tool for biodiversity as well as landscape protection. Most recently, IUCN has published two technical volumes in a series on the values of Category V: on their importance to the conservation of agro-biodiversity - that is varieties of crops and livestock (Amend *et al.*,

2008), and on the spiritual, cultural and artistic values of such places (Mallarach *et al.*, 2008). Both quote case studies from the Mediterranean region. Further advice on the application of Category V was given in the 2008 guidelines (Dudley, 2008).

Indeed, the potential value of Category V as a means to identify and protect nationally important landscapes throughout the Mediterranean region is evident from the fact that several European countries – for example, Croatia, France, Italy and Spain – have already used this approach in national legislation and policy. In national legislation, these places are called by a variety of names like 'protected landscape', 'regional park', 'nature park' or 'regional nature park', but what they have in common is a focus on landscapes of particular quality, a concern with the relationship between human activity and natural and cultural values, and the aim of supporting traditional systems of land and water management that sustain biodiversity values and landscape quality.

10.6 The significance of the European Landscape Convention

Thus both the World Heritage Convention and Category V of the IUCN system of protected areas focus on individual landscapes, either of universal or national value. But neither addresses the idea that *all* landscapes matter, or that landscape per se is an important resource that needs to be understood, valued, protected, managed and even created. It is these gaps that are filled by the European Landscape Convention (ELC), the world's first landscape treaty adopted in 2000.

The origins of the ELC lie in two initiatives that arose independently in the early 1990s. One strand was the efforts to persuade the Council of Europe to develop a rural landscape convention,

an initiative that originated in the UK and France, and was supported by IUCN. The other strand was of more relevance to this chapter: a desire to build on the Mediterranean Landscape Charter (Sevilla Charter) adopted in 1993. The charter contains a detailed articulation of the situation of Mediterranean landscapes and also many suggested measures for landscape enhancement. It declares that... *"the landscape is a basic factor in matters relating to the environment, national and regional/spatial planning and the protection or management of the cultural or natural heritage..."*. It also offers a comprehensive definition of landscape as *"...the tangible expression of the spatial and temporal relationship between individuals and societies and their physical environment, shaped to varying degrees by social, economic and cultural factors. The landscape is, therefore, the result of a combination of natural, cultural, historic, functional and visual elements"*.

In March 1994, the predecessor of the Council of Europe's Congress of Local and Regional Authorities (CLRAE) adopted Resolution 256 (1994) on the 3rd Conference of Mediterranean Regions. This called on the CLRAE, *"to draw up, on the basis of the Mediterranean Landscape Charter... a framework convention on the management and protection of the natural and cultural landscape of Europe as a whole"*.

As a result, and after six years of detailed negotiation, the Member States of the Council of Europe adopted the text of the ELC at Florence, Italy in October 2000. In the preamble, the convention: (i) establishes the central role of landscape in terms of quality of life of people, the economy, social needs, cultural values and the environment; (ii) declares that people have a wish for, and a right to, a high quality landscape; and (iii) makes clear that the focus should not just be on the 'finest' landscapes but also on so-called 'degraded' landscapes and everyday landscapes. The text of the convention:

- offers a definition of landscape – *"an area,*

as perceived by people, whose character is the result of action and interaction of natural and and/or human factors";

- applies to the entire territory of countries (natural, rural, urban, and peri-urban);
- aims to protect, manage and plan/create landscapes, and organize European co-operation;
- sets out general commitments: to recognize landscapes in law, adopt landscape policies, enable public participation in landscape, and integrate landscape into other policy areas;
- sets out specific measures: to increase awareness of landscape, to promote training and education in landscape, to identify and assess landscapes, to adopt objectives for landscape, and to protect, manage and plan the landscape; and
- includes measures for international co-operation, in particular: mutual assistance and exchange of information; transfrontier landscapes; monitoring the implementation of the ELC; and a European landscape award.

The ELC has been adopted by most Council of Europe States (see Table 10.2). As of end January 2012, 36 States had signed and ratified, three had signed only and eight had done neither.

Because of its broad scope, the ELC marks a major development in the treatment of landscape at the international level. However the treaty suffers from several weaknesses. The experience of other conventions, such as those on World Heritage, Biological Diversity and Wetlands (Ramsar), is that three factors – a dedicated secretariat, a dedicated fund and an annual or biannual Conference of the Parties (a CoP) – are essential to success. But the ELC has none of these. It depends for secretarial support on the assistance of a very few staff at the Council of Europe who may have other duties as well. There

States	Signature	Ratification	Entry into force
Albania			
Andorra	23/3/2011		
Armenia	14/5/2003	23/3/2004	1/7/2004
Austria			
Azerbaijan	22/10/2003	30/08/2011	1/12/2011
Belgium	20/10/2000	28/10/2004	1/2/2005
Bosnia and Herzegovina	9/4/2010	31/01/2012	1/5/2012
Bulgaria	20/10/2000	24/11/2004	1/3/2005
Croatia	20/10/2000	15/1/2003	1/3/2004
Cyprus	21/11/2001	21/6/2006	1/10/2006
Czech Republic	28/11/2002	3/6/2004	1/10/2004
Denmark	20/10/2000	20/3/2003	1/3/2004
Estonia			
Finland	20/10/2000	16/12/2005	w1/4/2006
France	20/10/2000	17/3/2006	1/7/2006
Georgia	11/5/2010	15/9/2010	1/1/2011
Germany			
Greece	13/12/2000	17/5/2010	1/9/2010
Hungary	28/9/2005	26/10/2007	1/2/2008
Iceland			
Ireland	22/3/2002	22/3/2002	1/3/2004
Italy	20/10/2000	4/5/2006	1/9/2006
Latvia	29/11/2006	5/6/2007	1/10/2007
Liechtenstein			
Lithuania	20/10/2000	13/11/2002	1/3/2004
Luxembourg	20/10/2000	20/9/2006	1/1/2007
Malta	20/10/2000		
Moldova	20/10/2000	14/3/2002	1/3/2004
Monaco			
Montenegro	8/12/2008	22/1/2009	1/5/2009

States	Signature	Ratification	Entry into force
Netherlands	27/7/2005	27/7/2005	1/11/2005
Norway	20/10/2000	23/10/2001	1/3/2004
Poland	21/12/2001	27/9/2004	1/1/2005
Portugal	20/10/2000	29/3/2005	1/7/2005
Romania	20/10/2000	7/11/2002	1/3/2004
Russia			
San Marino	20/10/2000	26/11/2003	1/3/2004
Serbia	21/9/2007	28/06/2011	1/10/2011
Slovakia	30/5/2005	9/8/2005	1/12/2005
Slovenia	7/3/2001	25/9/2003	1/3/2004
Spain	20/10/2000	26/11/2007	1/3/2008
Sweden	22/2/2001	5/1/2011	1/5/2011
Switzerland	20/10/2000		
The former Yugoslav Republic of Macedonia	15/1/2003	18/11/2003	1/3/2004
Turkey	20/10/2000	13/10/2003	1/3/2004
Ukraine	17/6/2004	10/3/2006	1/7/2006
United Kingdom	21/2/2006	21/11/2006	1/3/2007

Table 10.2: The status of the ELC among States of the Council of Europe (January 2012).

Status as of: 31/01/12
Member States of the Council of Europe

Source: Council of Europe website, January 2012

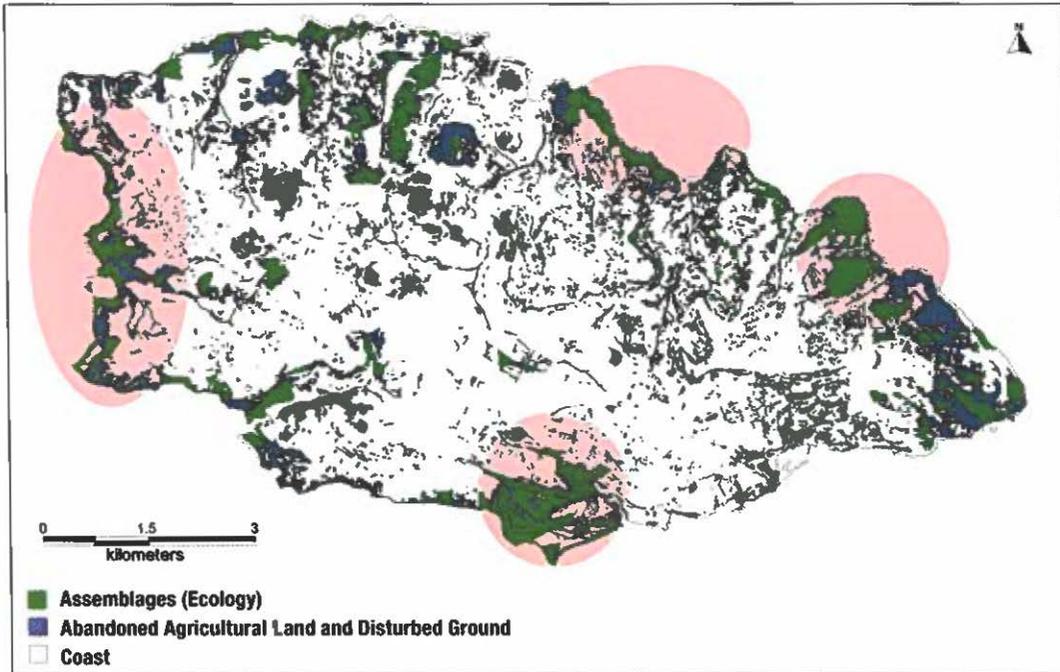
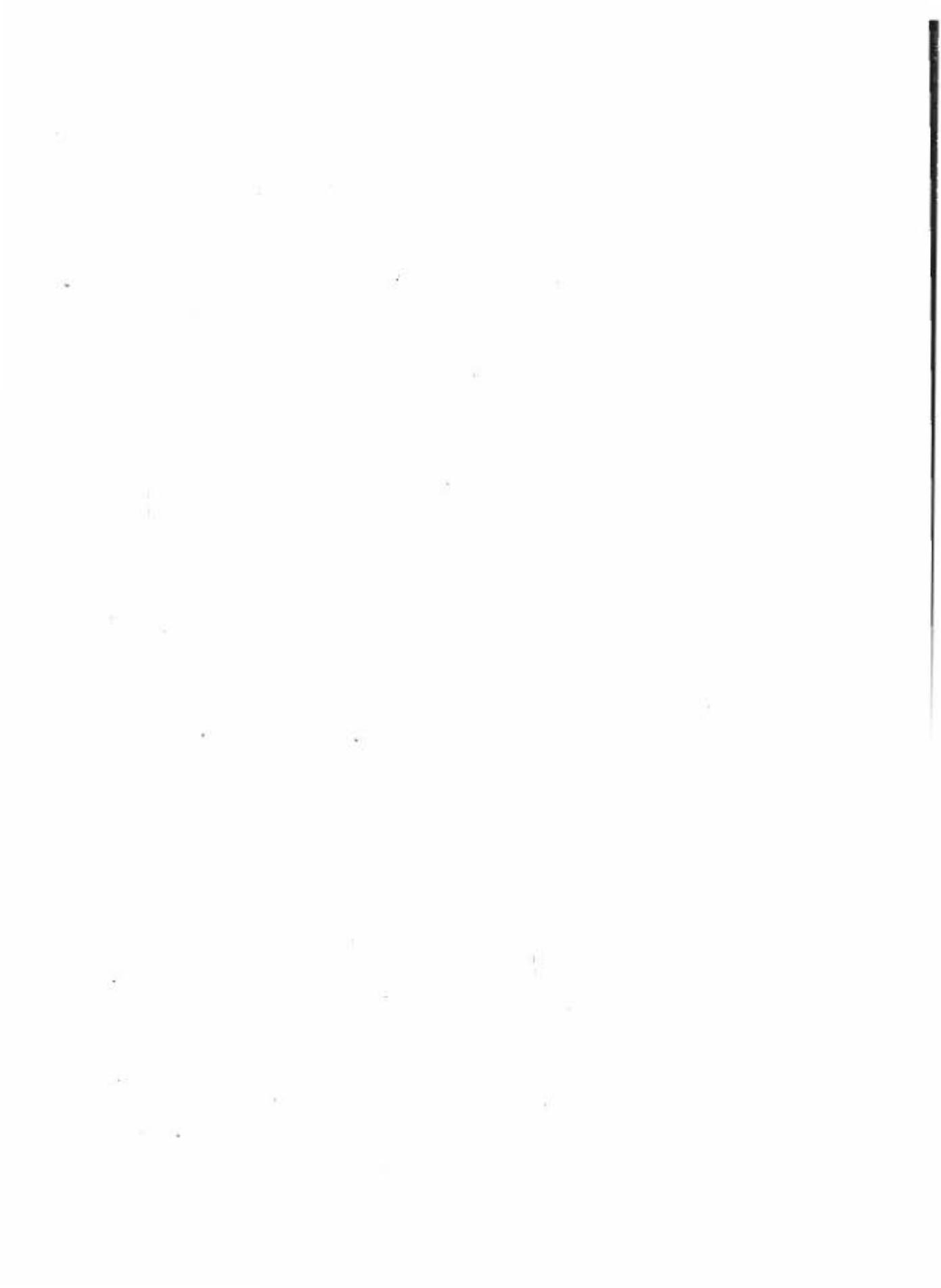


Plate 3.1: Map showing spatial relationship between ecological assets and agricultural abandonment/ disturbed ground in Gozo (with biodiversity hotspot sites and surrounding landscapes highlighted).



Plate 6.1: Location map of Gökçeada (photo: Google Earth, 2009).



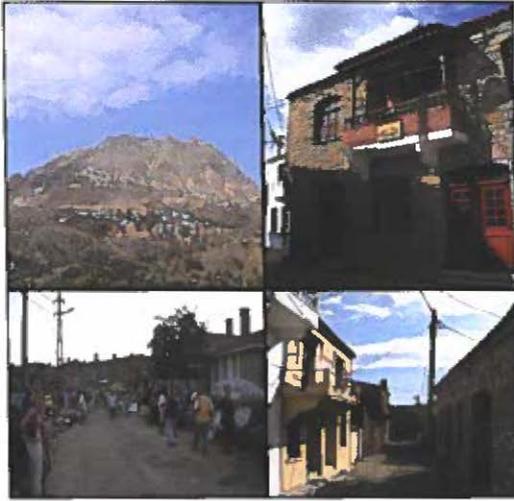


Plate 6.2: Views from Tepeköy village
(photo: Yetim Erdiç).

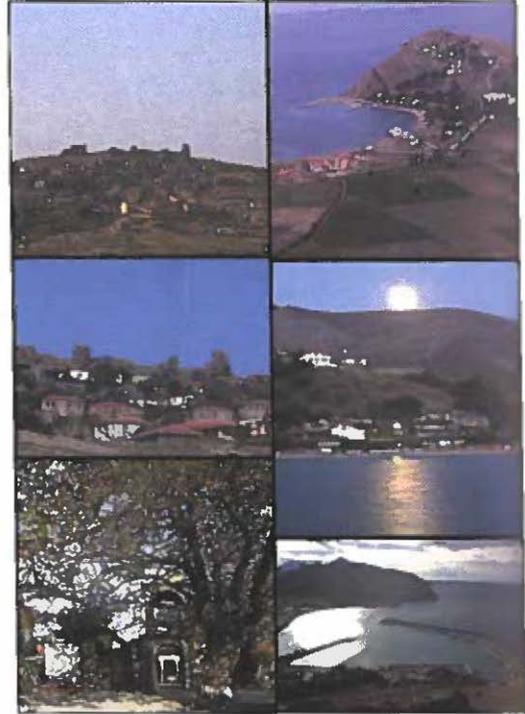


Plate 6.3: Views from Kaleköy
(photo: Yetim Erdiç).



Plate 12.1: Organized tourism beach on Mykonos,
Greece (photo: T.S. Terkentl).



Plate 12.2: The little fishing port of Skala Symkamnias in Lesvos, Greece (photo: T.S. Terkenli).



Plate 12.3: The port city of Mytilini, Lesvos, Greece (photo: T.S. Terkenli).



Clockwise from above:

Plate 12.4: The village and small port of Koufonissia, Greece (photo: T.S. Terkenli).



Plate 12.5: Barren rural land on Lesvos, Greece (photo: T.S. Terkenli).



Plate 12.6: View over the caldera, Oia, Santorini (photo: T.S. Terkenli).



Clockwise from above:

Plate 13.1: View of the new beach at Cala Maestra on the island of Montecristo that originated from the flash flood of 1992 (photo: S. Bambi).

Plate 13.2: *Ailanthus altissima* and *Capra aegagrus hircus* as examples of invasive species introduced by man on Montecristo island (photo: S. Bambi).



Plate 13.3: Giglio island: view of the Faro delle Vaccarecce with allochthonous pine wood plantation (*Pinus pinea*) (photo: L. Chelazzi).

Plate 13.4: Montecristo island: ruins of the monastery of S. Mammiliano with *Cistus monspeliensis* (photo: S. Bambi).



Plate 13.5: Pianosa island: Podere del Marchese built in 1930 and used as convalescent hospital for prisoners (photo: S. Bambi).





Clockwise from above:

Plate 13.6: Giglio island: view of the cultivations and terrace-cultivations of vines (photo: L. Chelazzi).

Plate 13.7: Il-Bejta tal-Fenek (foreground) with Bejn il-Kniemem ('Blue Lagoon') and Cominotto in the background (photo: G. Bonetti).

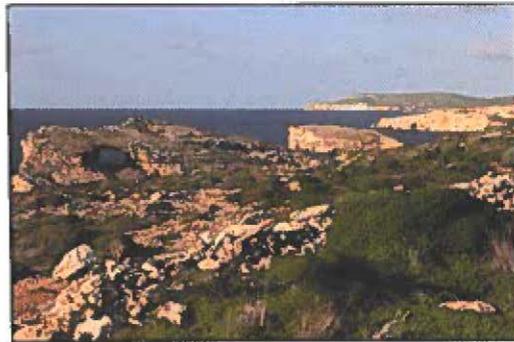


Plate 13.8: Garrigue landscape overlooking the western coast near Bejn il-Kniemem (photo: G. Bonetti).

Plate 13.9: The old chapel of Santa Marija, with the heavily degraded saline marshland in the foreground (photo: G. Bonetti).



Plate 13.10: Torre di Santa Maria, built in 1618 to defend the island's most strategic points (photo: G. Bonetti).

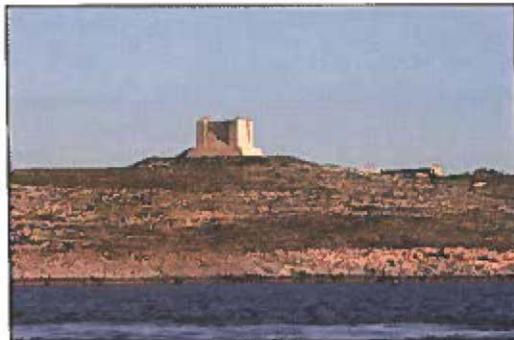
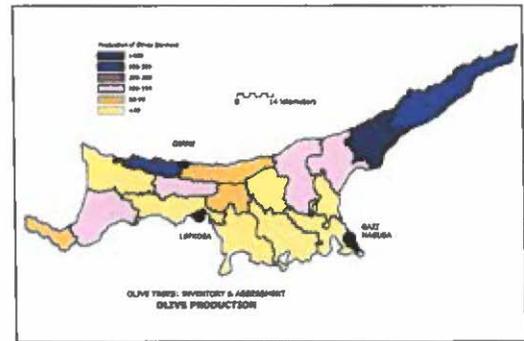
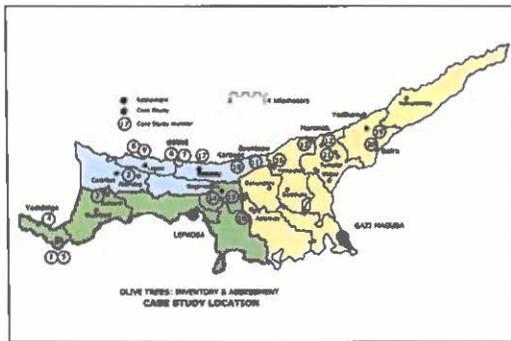




Plate 13.11: Il-Palazz, constructed in the 17th century and extended in the early 20th century (photo: G. Bonetti).



Clockwise from above:

Plate 15.1: Field study samples distributed according to the three administrative divisions of Nicosia, Kyrenia and Famagusta.

Plate 15.2: Spatial distribution of olive trees according to the three administrative regions and smaller administrative divisions.

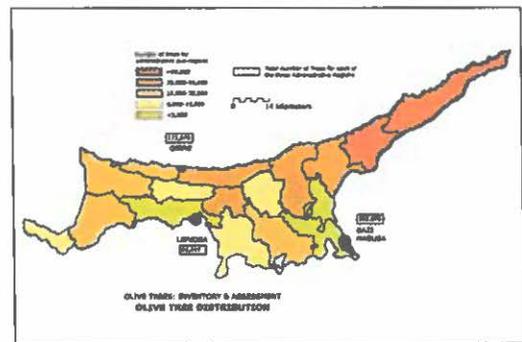


Plate 15.3: Spatial distribution of olive production in North Cyprus (tonnes) according to administrative divisions.

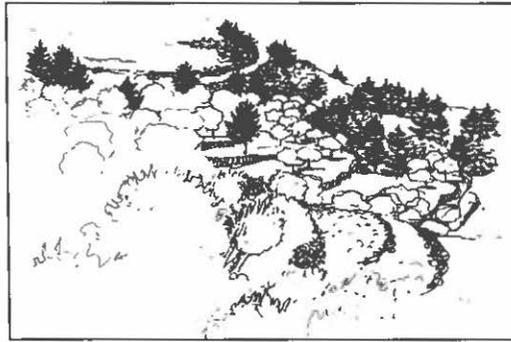
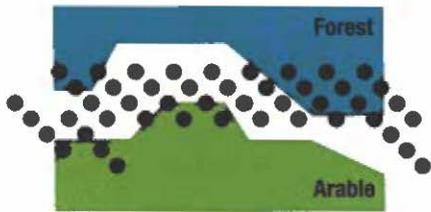


Plate 15.4: Olive landscapes in the upper foothills alongside the forest.

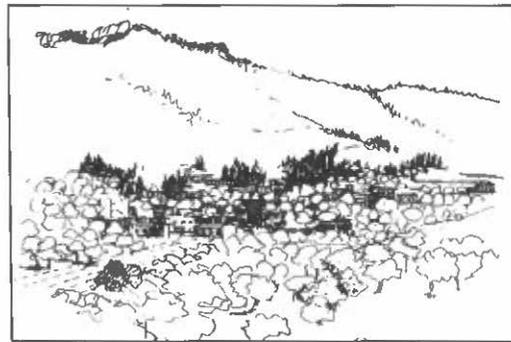
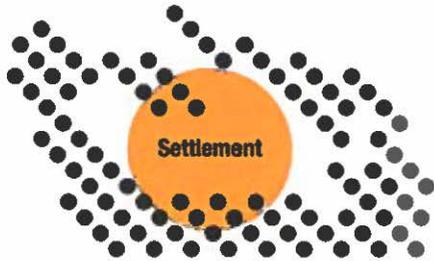


Plate 15.5: Olive landscapes in the vicinity of villages.

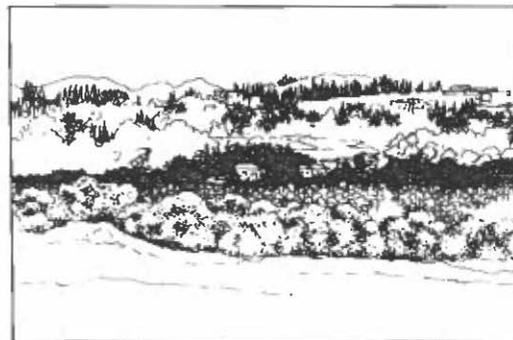
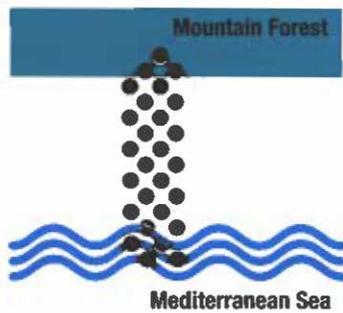


Plate 15.6: Olive landscapes in ravines.

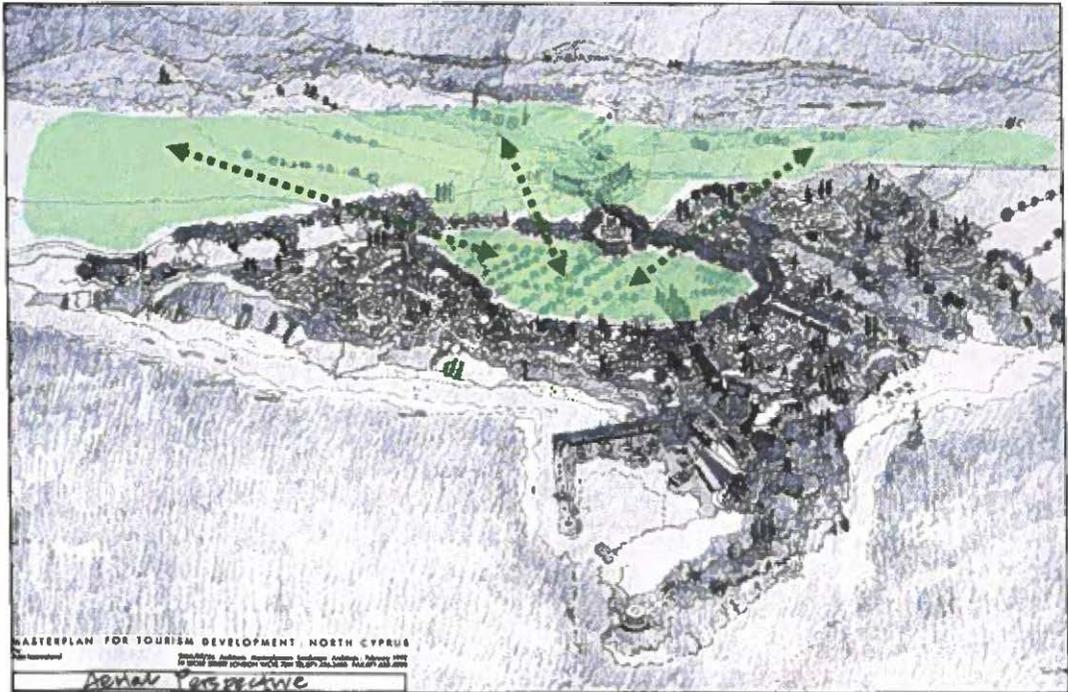


Plate 15.7: Integrating olive landscapes into contemporary development ensures local distinctiveness while protecting olive cultural landscape (highlighted). The Dik Burun Tourist Project along Cyprus' north coast (Makhzoumi, 1996).

is no budget or fund to support implementation, and, instead of a regular CoP, the parties have to oversee implementation through several pre-existing committees of the Council, which have other duties in the field of nature protection and cultural co-operation. Nonetheless the convention is now being driven forward through a series of technical meetings convened by the Council of Europe, which have recently adopted guidelines on implementation (Council of Europe, 2008).

To add further impetus and accelerate the pace of implementation, enthusiasts for the Convention have begun to supplement the official work by the Council of Europe with the development of three informal networks which enable other institutions of civil society to play their part in encouraging and supporting implementation of the ELC (Priore, 2006). They are:

- ENELC – a European network of representatives of local and regional authorities supporting the ELC²
- UNISCAPE – a network of European Universities working in support of the ELC³
- CIVILSCAPE – a network of NGOs in Europe working in support of the ELC⁴.

It is evident from a wide range of initiatives at the European and national levels that the ELC is already having an impact in promoting a greater awareness of the importance of landscape and its contribution to welfare throughout Europe.

10.7 Potential application in the Mediterranean region

The last part of this chapter seeks to draw from the above experience some lessons for application in the Mediterranean region. In this respect, the limited relevance of European measures is recognized: the EU directives, for example, apply only to Spain, France, Italy, Slovenia, Malta, Cyprus and Greece, and, Turkey apart, countries outside the geographical area of Europe are not affected by the ELC. Even so, the degree of international agreement that has emerged around landscape issues in recent years could provide an effective foundation for international action relating to landscape across the entire Mediterranean basin.

The need for this could not be greater. While the threat to the health of the Mediterranean ecosystem was the force behind the development of the Barcelona Convention in 1972 and its subsequent implementation, there has been an equally serious region-wide deterioration in the quality of the Mediterranean landscape. This has been due, in very general terms, to three broad factors:

- Depopulation and rural land abandonment;
- The pressures of development (industry, tourism, housing, transport infrastructure and so forth);
- Limited public awareness of the value of landscape (Ogrin, 2005).

To this list of past and current pressures, one must now add climate change and rising sea levels.

How can the recent experience at the international level of dealing with landscape be used to help address the effect of such problems? The following suggestions are offered as basis for discussion in the region:

2 For more information, see <http://www.recep-enelc.net/eng/index.php>

3 For more information, see <http://www.uniscape.org>

4 For more information, see http://www.landschapsmanifst.nl/content_fr.php?pageCode=6

1. To protect Mediterranean cultural landscapes of outstanding universal value: There is an urgent need to make more use of the Cultural Landscape measures of the World Heritage Convention. Whilst there are many World Heritage sites based on individual historic and archaeological monuments and sites in nearly every Mediterranean country, only a few countries – and all of them in Europe – have used the Convention to help identify and protect outstanding cultural landscapes (see Table 10.1). Not only would a more active role for the Convention in this way help to protect some of the most valuable landscapes, it would also serve to raise the profile of landscape generally in the region.
2. To protect nationally important landscapes as part of national protected area systems: There is likewise a need for action at the national level to make more use of the Category V protected area approach, so that nationally important landscapes are also identified and safeguarded. Compared to countries in northern, western and eastern Europe, those that border the Mediterranean (Spain, France and Italy apart) have done little in this regard. The starting point is the advice of IUCN that each country should undertake a national protected area system plan review and prepare a national plan for its protected areas, in which there should be a special place for Category V (Davey, 1998).
3. To raise the profile of landscape generally: Mediterranean countries that are parties to the ELC⁵ should urgently draw up national strategies to implement the main

principles of the Convention at the national level and commit themselves to active co-operation with other countries in the spirit of the convention. These strategies should be promoted widely within the countries concerned. In support of governmental action, local government, academic institutions and NGOs in these countries should participate respectively in the ENELC, UNISCAPE and CIVILSCAPE. There is, of course, no reason in principle why non-Council of Europe countries should not take similar measures at the national level.

4. To encourage region-wide collaboration in the field of landscape: Mediterranean countries should use established fora for regional co-operation to raise the profile of landscape issues, with particular focus on such issues as:
 - i. Landscapes of small islands,
 - ii. Coastal landscapes,
 - iii. Agricultural landscapes (including terraced landscapes),
 - iv. Forest landscapes, and
 - v. Landscapes around towns.

10.8 Conclusion

Landscape has been a neglected consideration at the international level, and its recent emergence into international discourse is long overdue. Developments in the World Heritage Convention, in IUCN's categories system of protected areas and – most importantly – the emergence of the ELC, represent an important shift in perspective and create new opportunities. The Mediterranean region, more than most, is in need of the support that this new emphasis on the importance of landscape could bring. International tools, such as the World Heritage Convention, the European Landscape Convention and Category V protected areas, could

5 Croatia, Cyprus, France, Greece, Italy, Malta, Slovenia, Spain, Turkey.

bring benefits at national and local levels by raising awareness of the importance of the landscapes of the region and improving understanding of how to protect, manage and plan them at a time when they are under unprecedented pressures.

References

Amend, T., Brown, J., Kothari, A., Phillips, A. & Stolton, S., eds., 2008. *Protected landscapes and agrobiodiversity values*. IUCN & GTZ Protected Landscapes and Seascapes Series Vol. 1. Heidelberg: Kasperek Verlag.

Council of Europe, 2000. *European Landscape Convention*. European Treaty Series No. 176. Florence: Council of Europe.

Council of Europe, 2008. *Guidelines on the implementation of the European Landscape Convention*. Strasbourg: Council of Europe.

Davey, A., 1998. *National system planning for protected areas*. Best Practice Protected Area Guidelines Series No. 1. Cambridge and Gland: IUCN.

Dudley, N., ed., 2008. *Guidelines for applying protected area management categories*. Gland: IUCN.

IUCN, 1994. *Guidelines for protected area management categories*. Cambridge and Gland: IUCN World Commission on Protected Areas with the assistance of the World Conservation Monitoring Centre.

Jacques, D., 1995. The rise of cultural landscapes. *International Journal of Heritage Studies*, 1(2), pp91- 101.

Jones, M., 1993. The elusive reality of landscape: concepts and approaches in research. In: J.M. Fladmark, ed. *Heritage: conservation, interpretation and enterprise*. London: Donhead Publishing.

Lafarge, F., 2006. Landscapes in international law and European law. In: M. Sassatelli, ed. *Landscape as heritage – negotiating European identity*. EUI Working Paper RSCAS No. 2006/05. Florence: European University Institute, Robert Schumann Centre for Advanced Studies.

Last, K., 2006. Heritage and identity: the challenge of landscapes to the nature/culture dichotomy. In: M. Sassatelli, ed. *Landscape as heritage – negotiating European identity*. EUI Working Paper RSCAS No. 2006/05. Florence: European University Institute, Robert Schumann Centre for Advanced Studies.

Lowenthal, D., 1993. Landscape as heritage: national scenes and global changes. In: J.M. Fladmark, ed. *Heritage: conservation, interpretation and enterprise*. London: Donhead Publishing.

Mallarach, J-M. ed., 2008. *Protected landscapes and cultural and spiritual values*. IUCN, GTZ and Obra Social de Caixa Catalunya Protected Landscapes and Seascapes Series Vol. 2. Heidelberg: Kasperek Verlag.

Ogrin, D., 2005. *Mediterranean landscapes – contribution to a better management*. Split: PAP/RAC.

Phillips, A., 2002. *Management guidelines for IUCN category V protected areas – protected landscapes/seascapes*. WCPA Best Practice Protected Area Guidelines Series No. 9. Cambridge and Gland: IUCN.

Sassatelli, M., 2006. Landscapes of identity: the European Landscape Convention and the construction of identity. In: M. Sassatelli, ed. *Landscape as heritage – negotiating European identity*. EUI Working Paper RSCAS No 2006/05. Florence: Robert Schumann Centre for Advanced Studies, European University Institute.

Schama, S., 1995. *Landscape and memory*. London: Harper Collins.

UNESCO, 2008. *Operational guidelines for the implementation of the World Heritage Convention*. Paris: UNESCO.

CHAPTER 11

The European Landscape Convention: a political project of relevance to Mediterranean Islands

Riccardo Priore and Damiano Gallà

11.1 The European Landscape Convention: a political project initiated by local and regional authorities

Reflecting growing social pressures, in recent years, European local and regional authorities' interest in, and commitment to, landscape protection and enhancement, have increased significantly. In this context, in 1993 the Mediterranean Regions of Andalusia (Spain), Languedoc Roussillon (France) and Tuscany (Italy) signed in Seville the Mediterranean Landscape Charter (also known as the Seville Charter). On this basis, the Council of Europe's Standing Conference of Local and Regional Authorities (CLRAE) adopted a formal resolution explicitly referring to the necessity of drawing up a European framework convention on the protection and management of natural and cultural landscapes continent-wide¹.

In response to these developments and as the body representing local and regional authorities at European level, in 1994 the Congress of Local and Regional Authorities (the institution which replaced the CLRAE within the Council of Europe) began preparing a draft international

convention devoted exclusively to the landscape. In 1997, the Congress approved a first draft, based on a preparatory document expressed in non-legal terms. Following the organization of a conference to consult central governments on the possible adoption of an international treaty entirely dedicated to landscape issues (Florence, 2-4 April), in 1998 the Congress approved a final draft Convention and recommended its adoption to the Committee of Ministers.

At the end of 1998, the Committee of Ministers requested an opinion on this document to the competent Council of Europe intergovernmental committees – i.e. the Cultural Heritage Committee (CC-PAT) and the Council of Europe Committee on Biological and Landscape Diversity (CO-DBP). CC-PAT expressed a positive opinion on the draft drawn up by the Congress on 17th February 1999; CO-DBP did the same on 19th April of the same year. Given the favourable reaction by the above-mentioned committees, at the end of 1999 a restricted intergovernmental group was created by the Committee of Ministers and entrusted with the preparation of a final text. The group met three times (twice at the end of 1999 and once at the beginning of 2000). Following the mandate by the Committee of Ministers, the group prepared a text based on the original draft Convention approved by the Congress in 1998.

¹ Resolution 256 (1994), paragraph V.6.

On the heels of this development and following the expression of official opinions by the Council of Europe's Parliamentary Assembly (May 2000) and Congress (June 2000), the Committee of Ministers adopted the European Landscape Convention on 19th July 2000.

The Convention was opened for signature to Council of Europe Member States on 20th October 2000 in Florence (Italy), at a ministerial Conference organized by the Italian Ministry for Cultural Assets and Activities and the Council of Europe Secretariat (Congress' Directorate), in co-operation with the Tuscany Region. After ten Council of Europe Member States had deposited the instruments of ratification, the Convention entered into force on 1st March 2004. As of end January 2012, 36 states had ratified the Convention: Armenia, Azerbaijan, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Georgia, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovak Republic, Slovenia, Spain, Sweden, the former Yugoslav Republic of Macedonia, Turkey, Ukraine, and the United Kingdom. Three States have signed but have not yet ratified the Convention, i.e. Andorra, Malta and Switzerland. Albania, Austria, Estonia, Germany, Iceland, Liechtenstein, Monaco and Russia have neither signed nor ratified the Convention. The large number of signatories to the Convention and the growing number of ratifications are confirmation of the political importance national governments ascribe to this European treaty. This great interest is probably rooted in the Convention's novel approach and its likely legal and political effects, both quantitative and qualitative, at local, regional, national and European levels. The Convention has thus far been either signed or ratified by 24 out of the 27 European Union Member States and it is in force in 23 of them.

The Convention is considered to be an international legal framework for a political project – conceived by local and regional politicians - aimed at sharing and consolidating a new approach to landscape issues continent-wide. It is the first international treaty to be exclusively concerned with all aspects of the European landscape. It applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban areas. It concerns landscapes that might be considered outstanding as well as everyday or degraded landscapes. The Convention proposes legal and financial measures at the national and international levels, aimed at shaping landscape policies and promoting interaction between local and central authorities as well as transfrontier cooperation for landscape protection, management and planning. As stated in the Explanatory Memorandum related to Resolution 178 (2004) of the Congress on the contribution of local and regional authorities to the implementation of the European Landscape Convention²:

"the Convention's entry into force will open the way to:

1. *the democratization of the landscape, by linking it to the local and regional communities directly concerned;*
2. *a new dimension for international public action to improve the quality of life of these communities throughout the organization's Member States.*

Reflecting its origins, the Convention pays particular attention to local and regional authorities, by:

- *referring explicitly to the subsidiarity principle and the European Charter of Local Self-Government (Article 4);*
- *committing the Contracting States to estab-*

2 Congress of Local and Regional Authorities, Council of Europe, Strasbourg, 2004 - Doc. CG (11) 12 Part II.

lishing procedures for local and regional authorities' participation in defining and implementing landscape policies (Article 5);

- requiring full local and regional authority involvement in identifying and assessing landscapes (Article 6).

Taken together, these provisions provide local and regional authorities with a strong legal incentive to exercise their institutional landscape responsibilities”.

11.2 Main innovations brought about by the Convention

During the 20th century, the authorities of most European countries took the view that only areas with outstanding cultural, natural or more generally aesthetic features could be regarded as 'landscape' and therefore qualify for special legal protection. In line with this view, 'landscape areas' enjoyed a system of legal protection designed to preserve their exceptional quality. On the other hand, areas devoid of outstanding landscape value received no legal protection at all for landscape purposes. They were regarded as 'non-landscape areas', so to speak. As they had no extraordinary landscape features, they were considered to be of no legal interest and therefore to deserve no special legal recognition or protection. The limitations of this approach were heightened by its lack of interest in the subjective aspects of landscape, which may be defined as individuals' perception of land and involvement in the changes it undergoes. This was never considered to be of any political or consequently legal interest. This conception of landscape, which might be described as elitist, is fully reflected in the definitions of landscape adopted by the legislation of many European countries, some of which is still in force today. They view landscapes in purely objective terms as a beautiful picture which should be preserved intact, completely disregarding its main characteristic,

which is its capacity for change, and above all the importance of people's perception of landscape and impact on it.

The limited scope of this conception of landscape - regarded as such only if it is of outstanding significance - is also reflected in a semantic distinction made in many official texts between landscapes with differing features: cultural landscapes - which are of historical and/or artistic value - are placed in a separate conceptual and practical category from purely natural landscapes. The European Convention does not refer to particular landscapes but, first of all, to a legal asset. The law should recognize and protect this asset as it recognizes and protects other environmental assets like air or water. Actually, the law protects air and water even when they are polluted and not only when they are of outstanding quality - nobody would ever suggest protecting air and water only when they are totally pure. It is important to distinguish the very concept of landscape, (conceived as a legal asset to be recognized and protected independently from its value or character), from concrete landscapes whose natural or cultural dimension should never be associated with the definition of the landscape concept.

Apart from various *ad hoc* measures taken in a limited number of countries and regions over the past few years, national and international legislation has taken a partial, incomplete and indirect approach to landscape. This is probably due to the confusion over the landscape concept but also to the doctrinaire view that the law must always have an ethical basis and must therefore operate by making direct value judgments. Admittedly, the lawmaker's task is to decide, through a democratic process, what is good and what is bad for human society. However that does not mean that the law should concretely determine what landscape is and what it is not, by imposing exclusive aesthetic

values. This 'directive' attitude is probably at the root of the partial, incomplete and indirect legal approach which has prevented landscape from becoming an independent concept, a legal asset and a subject of law.

In the Convention, the lawmaker's primary task is not to recognize the significance or beauty of different types of landscapes, or, worse, of a concrete landscape. The task of lawmakers is to acknowledge, and consequently protect, a complex asset, and this independently from its particular value. This asset is composed of the citizens' right to:

- establish a tangible and feeling relationship with the land;
- take part in determining the features of the 'product' of this relationship, i.e. the landscape they live in; and
- derive personal, social (both spiritual and material) benefits from the above-mentioned relationship.

This complex 'landscape asset' thus consists, in subjective terms, of people's capacity to establish a tangible and feeling relationship with the land, and in objective terms, of the areas perceived through this relationship. Landscape must thus become a legal concern primarily because of the relationship it generates between people and territory. The law will have to democratically empower all citizens to establish this kind of relationship with the areas they live in or visit. Then, once this relationship has been identified, recognized and protected, the law will have to protect those areas on the basis of the value assigned to them by the people who have formed the relationship. Even the type and the level of legal - and therefore practical - protection granted to these areas in landscape terms will have to be democratically decided with the population's aspirations in mind. The law will therefore perform just a watchdog function, ensuring that the landscape aspect of an area cannot simply be

struck off without due regard for the interests of the community concerned.

These procedures, as set out in the Convention, represent a revolution of public policies and measures related to town and spatial planning. Through the Convention, the landscape becomes a prime public interest, a key factor to start a brand new process to deal with land use and management. This process will be democratic, particularly in the sense that every citizen will benefit from quality landscapes, not only those who are privileged to live in or visit outstanding landscape areas. The law must meet this emerging social demand and above all ensure that every citizen can establish and enjoy a tangible and feeling relationship with their country's territory. Each local community must be asked to decide about its own landscapes so that landscapes throughout Europe can be protected according to their particular significance. The form and degree of protection will vary considerably, because of the need to allow for the type of landscape in question and for the citizens' democratically stated preferences. On the basis of the subsidiarity principle, public decisions on landscape issues will have to be taken at the level closest to the inhabitants. With this in mind, governments will have to equip local and regional authorities to devise and carry out, as part of their spatial planning policies, the measures required to allow citizens to help determine the landscape features of the areas in which they live.

11.3 Main provisions of the Convention

The provisions of the European Landscape Convention include two major innovations stemming from the new social, political and legal conception of landscape described earlier. First, the Convention applies to both ordinary and outstanding landscapes. It is intended to cover

all parts of European territory, from cultivated or natural rural areas to urban and peri-urban areas. It is not confined to either the cultural or artificial features or the natural features of landscape, but it covers them all, together with the relationships between them. Second, the Convention places the accent on people's involvement in the perception and changing appearance of landscape. It emphasizes the importance of heightening public awareness to encourage people to take part in decision-making likely to affect landscape in their local areas. Giving Europe's citizens the opportunity to play an active part in changes to their landscape is in fact a major democratic and environmental undertaking which may require very substantial human and financial resources. As landscape cuts across many different sectors of activity and European landscapes are immensely varied, this process can create an enormous number of jobs in industry, agriculture and the service sector.

The Convention gives a specific definition of *landscape* ("an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors") which falls into two easily identifiable parts, the first referring to the objective aspect of landscape, i.e. territory, and the second to the subjective aspect, i.e. people's perception of landscape. After listing the definitions - which also cover landscape protection, management and planning - the Convention states its primary aim, which is that each Contracting Party shall undertake to "ensure landscape protection, management and planning through the introduction of national measures and the organization of European co-operation".

To preclude implementation problems at national level, the Convention provides that "in its domestic legal system, each Party shall determine the best territorial level for implementing this Convention according to its own division of responsibilities and in conformity with the principle of subsidiarity". The competence

of public authorities will vary in relation to the value recognized in particular landscapes. On the basis of the subsidiarity principle, the competent authority should be the one closest to the citizens concerned. These authorities are, in most countries, the local authorities. However, some landscapes are legally recognized and protected for their regional, national, or even European value. In these cases local authorities will not have the right to take decisions concerning these landscapes and the competence for them will be attributed to the higher authorities concerned. With this in mind, landscape national and/or regional policies will have to be translated into specific measures which should be adopted at local level. These measures must include identifying and evaluating landscapes to allow the appropriate public authorities to draw up landscape quality objectives for the areas concerned, with due regard for the views expressed by local people. The range of specific measures must be based on campaigns to arouse public awareness of the value of landscapes and the dangers threatening them. Populations must be aware that the quality of landscapes represents one of the essential prerequisites for the development of the local economy. In practice, these awareness-raising activities will help people understand the results of the procedures for identifying and evaluating their landscapes and expressing their views appropriately when the competent public authorities set the landscape quality objectives.

It is clear that public involvement, first of all through assertive and constant stimulation of people's awareness then through their active involvement in official decisions relating to landscape, constitutes the central feature of the European Landscape Convention. Without this involvement, landscape would probably lose its principal function and become either the expression of decay and ugliness for the many, or an artificial paradise for a privileged few. In this respect, the Convention is, so to say, more than a legal text. It is a new democratic process which

can radically change the relationship of European populations with their places of life. The Convention requires the authorities concerned, with the landscape quality objectives in mind, to introduce procedures aimed at protecting, managing and/or planning landscape. The procedures will have to cover a very wide variety of landscapes, which means that they may entail strict conservation, protection, management or planning, or actually creating new landscapes. To allow for landscape diversity and different national approaches to landscape conservation, the Convention does not establish any particular means of action. This is a balanced solution because it takes account of individual countries' traditions, organization and practice in landscape matters. To underscore that it addresses landscape as such rather than the value placed on it, the Convention also provides for an acknowledgement of local and regional authorities' efforts to maintain everyday landscapes and promote local recognition of their environmental value. The Council of Europe Landscape Award will be therefore presented to local and/or regional authorities who have taken outstanding measures to improve the quality of their everyday landscapes. The final provisions of the Convention refer to the formal clauses that normally complete the Council of Europe's conventions.

11.4 From the design stage and establishment phase to concrete implementation

As stated in the Explanatory Memorandum of Congress' Resolution 178 (2004), in the beginning the proposal to produce the outline of an international treaty on the landscape was considered by an important number of States to be very difficult to fulfil. Fifteen years later, this lack of understanding seems to be behind us and it might perhaps be claimed that the dream is about to become reality. The Convention has finally

offered the foundation for a general consensus on what constitutes a 'landscape' and why the landscape is so important to European people. Probably as a consequence of their political objectives and proximity to citizens' everyday needs, elected local and regional representatives, assisted by an outstanding team of experts and officials³, have managed to secure agreement on the landscape among all those concerned, while avoiding interminable doctrinal disputes about the definition of landscape and whether it is the domain of the architect, the biologist, the ecologist or the nature conservationist, or exclusively the province of archaeologists, historians, cultural heritage conservators or others. Today, as an international treaty, the Convention sets forth clear, binding, principles committing the Contracting States to adopt policies and measures aimed at promoting landscape quality throughout their entire national territory, with the involvement of the people concerned. This is why the Convention is considered an international legal expression of a political project aimed at strengthening a new approach to landscape issues continent wide.

However, excessive enthusiasm is still not in order. The Convention's ratification by the vast majority of Council of Europe member States by no means set the final seal on governments' landscape activities.

3 Michael Dower (University of Gloucestershire – United Kingdom); Yves Luginbühl (University of Paris I - France); Michel Prieur (University of Limoges - France); Florencio Zoido Naranjo (University of Seville - Spain). Bengt Johansson (Ministry of Culture, Sweden) and Régis Ambroise (Ministry of Agriculture – France) also assisted the Congress in the drafting activities. Riccardo Priore, European officer, was in charge of the activities related to the Convention in the framework of the Council of Europe Secretariat General / Congress' Directorate from 1994 to 2004.

The work has just started and its completion is intimately bound up with the implementation of the political project of which the Convention is simply the authoritative legal expression. This project is undoubtedly an ambitious one; indeed some have even called it revolutionary. The terms are not unjustified, given that what is sought is a major shift in the relationship between public authorities, people and the character of the setting of their everyday life. For the project to succeed, Contracting States must ensure that, like a liquid flowing through a complex structure, the Convention's principles penetrate the innermost workings of society. Without the co-operation of national, regional and local authorities, but also education institutions and NGOs, the liquid in question could remain in its exalted European container, where it could be put on display by a small number of particularly proud, inspired or zealous civil servants or university professors. Yet this liquid is no magic potion, but simply a form of sap which, if it is to bring life, must be allowed to flow and become a resource accessible to all. This sap must course through the veins of the civil, administrative and institutional structures of the States that make up our continent. Based on the subsidiarity principle, it must reach the very roots of our complex society and inspire those who still treat their natural surroundings exclusively as a means of satisfying their own material interests rather than as an essential source of environmental balance, public health, cultural identity, sustainable development.

In this respect, when formulating his conclusions on the occasion of the Landscape Research Group Seminar dedicated to the implementation of the Convention (Sheffield, 19-20 November 2007)⁴, Adrian Phillips was right to note that

"we are at a critical stage in the history of the Convention.

The first stage, up to 2000, was about building up to the triumphal agreement at Florence: in effect, the design stage. Since then the second stage has involved a preoccupation with obtaining ratifications – you might call this the establishment phase. Now we are moving into the all-important implementation phase. And it is at this point that things can go wrong. There are two possible paths forward. In one, the ELC becomes increasingly important both at the national and international level. It is referred to more and more by governments. It actually influences the outcome of decisions on the ground. It is welcomed by communities throughout Europe and it really affects the lives of its citizens for the better. Along the other path, it founders in an atmosphere of frustration and indifference. We can't get governments to take it seriously, we can't engage properly with communities, landscape remains a second or third order issue in public policy, and we watch the landscapes of Europe deteriorate around us (...). We have to win the argument that landscape is a medium or context through which to guide development and change every bit as much as a resource to be protected, managed and created. If we can do that, then the builders of roads, power plants and new homes will see a full understanding of landscape as a way to get the right development outcome, not just as an obstacle to their ambitions. At the same time, we need to build alliances between landscape and areas that command high political and public attention, like health, education, biodiversity protection and coping with the effects of climate change and the switch over to a low carbon economy. We have to show how a better understanding of landscape will help achieve these broad societal goals".

11.5 Some urgent issues to address when implementing the Convention

The activities related to the monitoring of the Convention at intergovernmental level do not seem sufficiently oriented to a number of key questions.

⁴ For further information regarding the seminar, please consult www.landscape-research.org

Some give the impression that the Convention is just a central government (or intergovernmental) administrative matter, to be discussed among ministerial experts. This attitude could hamper or slow down an urgent political discussion on a series of crucial issues such as:

- the impact of the European Union's policies on the landscape dimension continent-wide;
- the division of public responsibilities with regard to landscape at national level;
- the support / supervision of local and regional authorities' action in the implementation process and the integration of the landscape dimension in regional and town planning instruments as well as in other public policies (regarding agriculture, energy, waste disposal, transport, infrastructure, etc.).

These issues should be tackled in more depth by the responsible national and intergovernmental monitoring bodies. The Convention does refer to the above mentioned issues, explicitly referring to the possible implementation in the EU territory, the division of responsibilities at national level and the role of local and regional authorities in the implementation process. Concerning the European Union, Article 14 sets forth that after the entry into force of the Convention, the Committee of Ministers of the Council of Europe may invite the European Community to accede to the Convention by a majority decision as provided in Article 20.d of the Council of Europe Statute, and by the unanimous vote of the States parties entitled to hold seats in the Committee of Ministers. This provision proves to be particularly appropriate as it is recognized that the spending of the EU (870 billion Euro in the period 2007-2013) can have a significant impact upon landscapes. However, even though 24 out of the 27 EU member states have either signed or ratified the Convention (and

have thereby committed themselves to recognize landscapes in their national legislation and in all policies that have an impact on the landscape, including those policies which draw on powers and funding from the EU), European landscapes do not figure prominently in the formal objectives which drive EU policies or in the criteria by which environmental impacts are judged within the EU. One could expect that the Council of Europe's Committee of Ministers might start considering the possibility of inviting the European Community to accede to the Convention itself as provided in Article 14. In preparation for such an invitation, the bodies entrusted with the monitoring of the Convention at intergovernmental level should urgently develop a dialogue with relevant organs of the EU (responsible for cohesion, regional and rural development, energy, infrastructure, transport, etc.) with a view to reaching a common understanding of how landscape considerations can be reflected in policies, and concerning the criteria by which environmental impacts are judged.

Concerning the share of public responsibilities regarding landscape issues at national level and the role of local and regional authorities, Article 4 of the Convention sets forth that each Contracting State shall implement the Convention, in particular Articles 5 and 6, according to its own division of powers, in conformity with its constitutional principles and administrative arrangements, and respecting the principle of subsidiarity and taking into account the European Charter of Local Self-government. Paragraph 23 of the Convention's Explanatory Report sets out that landscape is the concern of all and lends itself to democratic treatment, particularly at local and regional level. These provisions give a first, paradigmatic idea of the importance given by the Convention to local and regional authorities regarding its implementation. The importance of local and regional authorities is confirmed in the Preamble, where it is stated that the Convention is

signed having regard - *inter alia* - to the legal texts existing at international level in the field of regional planning, local self-government and transfrontier co-operation, in particular the European Charter of Local Self-government.

Regarding the European Charter of Local Self-government, it should be noted that the vast majority of the States which have ratified the Convention are also contracting parties of the Charter. The latter contains agreed definitions of the self-government and subsidiarity principles:

1. the first, defined as the right and the ability of local authorities, within the limits of the law, to regulate and manage a substantial share of public affairs under their own responsibility and in the interests of the local population;
2. the second indicating that public responsibilities should be exercised, in preference, by those authorities which are closest to the citizen. Allocation of responsibility to another authority should weigh up the extent and nature of the task and requirements of efficiency and economy.

With this in mind, after making reference in paragraph 27 to the extension of the scope of local authorities' official landscape action to cover the whole national territory, paragraph 34 of the Explanatory Report confirms that, on the basis of the principle of subsidiarity, responsibility for action relating to landscape lies with public authorities not only at national and international levels, but also at local and regional levels. The report also refers to the necessity that local and regional authorities, and groupings of such authorities, are guaranteed formal involvement in the implementation process at national level. It is subsequently stated that where local and regional authorities have the necessary competence, protection, management and planning of

landscapes will be more effective if responsibility for their implementation is entrusted to the authorities closest to the communities concerned. In this respect, by making express reference to Article 4 of the Convention, the Explanatory Report encourages the States to set out in detail the tasks and measures for which each level – national, regional or local – is responsible and to lay down rules for inter-level co-ordination of such measures, in particular where town planning and regional planning instruments are concerned.

As noted above, the requirement to implement both the self-government and subsidiarity principles in the implementation process at national level, is based on two fundamental provisions of the Convention, referring in particular to:

- the landscape definition (Article 1);
- the scope of the Convention (Article 2 - subject to the provisions contained in Article 15, this Convention applies to the entire territory of the Parties and covers natural, rural, urban and peri-urban areas. It includes land, inland water and marine areas. It concerns landscapes that might be considered outstanding as well as everyday or degraded landscape).

In order to implement these provisions, contracting States cannot rely solely on the action of competent central administration bodies. The latter would not be able to take care of (i.e. protect, manage and plan) the landscape dimension of the entire national territory. In the vast majority of European States, these bodies lack the necessary human, technical and financial resources, and, above all, they could hardly succeed to formulate – in accordance with Article 6.d and 1.c - landscape quality objectives that are an expression of people's aspirations with regard to the features of their surroundings. That is why, when implementing the Convention, Contracting

coordination of landscape policies for the local and regional authorities concerned;

- e. implement actions complementary to the work of the committees of experts responsible within the Council of Europe for monitoring the implementation of the Convention.

In reply to the Congress' recommendation, following an initiative by a group of Mediterranean regions led by the Region of Campania (Italy), on 30th May 2006, 22 local and regional authorities constituted in Strasbourg the European Network of Local and Regional Authorities for the implementation of the European Landscape Convention (RECEP-ENELC). This international body was officially constituted under the aegis of the Council of Europe's Congress, in the framework of the French Legislation (Alsatian / Mosellain Law).

RECEP-ENELC is a European non-governmental organization composed of public authorities. Its main objective is to support local and regional authorities at the scientific, technical, political and administrative levels, in their activities aimed at implementing the principles of the Convention within their own territories. Further to its formal constitution, RECEP-ENELC was registered in Strasbourg at the Administrative Tribunal⁶. More than 30 authorities from eight different European countries have joined RECEP-ENELC so far. As happened with the Convention, RECEP-ENELC was initiated by a number of Mediterranean regions. This is why Southern Europe is currently more represented in the network than other areas of the continent. With this in mind, one of the political objectives established by the network's

statutory bodies is to promote the accession of local and regional authorities from Northern and Central-Eastern Europe.

RECEP-ENELC assists and supports its members in carrying out their landscape responsibilities in accordance with the Convention's principles. It helps them to improve their decision-making capacities in their respective spheres in conjunction with central administration, particularly in the areas of planning and authorization procedures. Through the network, members have the opportunity to co-operate on landscape issues at a European level, by establishing direct contacts with international organizations, EU institutions, NGOs, universities as well as other public and private bodies interested in the Convention's principles. In this respect, RECEP-ENELC represents a political forum for dialogue between the politicians and the officials concerned, with regard to landscape related issues.

More particularly, in the framework of its programme of activities, RECEP-ENELC:

- promotes the development of the knowledge of the landscape concept established by the Convention and assists its members in its concrete implementation at territorial level, as well as in relevant discussions with central authorities;
- promotes and supports the organization of national and international conferences and organizes information meetings/training courses open to representatives of local and regional administrations;
- searches and starts programmes and projects financed by the European Union with regard to landscape issues and, if requested, takes an active part in them (as partner or associated partner);
- promotes implementation projects of Articles 5 and 6 of the Convention at na-

6 Registration of 17 October 2006, official reference: Registre des Associations - volume 84, folio 243.

tional level with the participation of central authorities and NGOs;

- assists interested local and regional administrations in the preparation of technical documents related to landscape identification and assessment, landscape quality objectives and the consequent decisions concerning landscape protection/management / planning.

In accordance with its Statutes, RECEP-ENELC organs are the General Assembly, the Executive Board, the Technical Co-ordination Board and the Scientific Committee. RECEP-ENELC's legal headquarters are based in Strasbourg. The operational permanent headquarters, including the head office, are situated in Florence, at the Medicean Villa Careggi. The Presidency – at this moment under the responsibility of the Catalonia Region (Spain) - is currently established in Barcelona.

Concerning current and future activities of RECEP-ENELC, it is worth mentioning that on the occasion of its fourth meeting (17.05.2010), the General Assembly, with reference to the period 2010-2012, established the following programming guidelines:

1. the recognition / reinforcement of the role of European local and regional authorities with regard to landscape at national level as a key issue of their public responsibilities; this objective will be possibly achieved through:
 - a. the development of the international character of the Network, by promoting the accession of new members belonging to different European States;
 - b. the promotion of the understanding/ implementation of the landscape concept definition set forth by the
- c. the adequate transposition of the Convention's provisions in the official documents regarding the landscape and other related issues being adopted at national level (laws, regulations, administrative documents, etc.);
- d. the organization/support of information initiatives (conferences, seminars, other meetings, etc.) on the Convention and other related issues, as well as of training programmes, notably at local / regional level, in order to enhance the awareness of interested communities, political leaders, civil servants on the importance of landscape quality with regard to well-being, local/regional identities and economical development;
- e. the reinforcement of the institutional dialogue / co-operation regarding the implementation of the Convention between, on the one hand, local and regional administrations/authorities and, on the other, competent central administrations/authorities of the States concerned;
- f. the promotion of the share of public responsibilities with regard to the landscape, respecting the principle of subsidiarity and taking into account the European Charter of Local Self-Government, as an implementation of Article 4 of the Convention;
- g. the establishment/further development of direct relationships between RECEP-ENELC Members/organs/representatives and the interested political/administrative representatives of the States' administrations in

European Landscape Convention by the authorities concerned at local and regional level;

- which the Convention is in force;
2. the formulation by local / regional authorities of landscape policies / strategies (including initiatives of transfrontier co-operation - in reference to Article 9 of the Convention), and the integration of the landscape in other policies, as an implementation of Article 5 of the Convention; in this framework, RECEP-ENELC will in particular:
 - a. support pilot projects for the implementation of Article 6 of the Convention within specific areas and promote the integration of landscape quality objectives in town and spatial planning, as an implementation of Article 5.d; in this respect, RECEP-ENELC, with the support of its Technical Co-ordination Board, will promote the necessary co-ordination between the projects in order to foster the exchange of information and the production of common knowledge and documentation;
 - b. promote the signature/implementation of formal agreements between the representatives of RECEP-ENELC and local/regional authorities interested in the achievement of public activities aimed at implementing the above-mentioned articles and/or other principles of the Convention within their territory;
 - c. recognize/award local and regional authorities, who are Members of the Network, that have instituted, policies/measures to protect, manage and/or plan their landscape, which have proved lastingly effective and can thus serve as an example to other territorial authorities; this objective may be achieved in co-operation with the Council of Europe and the authorities responsible for the implementation of Article 11 of the Convention (Landscape award of the Council of Europe) at national level;
 - d. further develop the capacities of local authorities whose institutional position is between municipalities and regions – i.e. counties, provinces, départements, cabildos, conselles, etc. - with regard to the implementation of the Convention's principles and, more generally, to landscape-related activities;
 3. the reinforcement/development of a co-operation with European institutions/bodies interested in working on the implementation of the Convention. This objective will be possibly achieved through:
 - a. the reinforcement of the co-operation with:
 - i. the institutions/bodies which, at the Council of Europe, within their respective responsibilities, contribute to the implementation process of the Convention. In this framework, RECEP-ENELC should strengthen its co-operation with the Congress of Local and Regional Authorities and the Parliamentary Assembly as well as establish a formal relationship with Steering Committee for Cultural Heritage and Landscape (CD-PATEP);
 - ii. the other European Networks for the implementation of the Convention (i.e. UNISCAPE - www.uniscape.eu and CIVILSCAPE - www.civilscape.eu), also through the organization of common activities; in this

framework, RECEP-ENELC will promote the setting up of a pan-European multilevel, cross-disciplinary co-operation system with the contribution of the European networks for the implementation of the Convention and the competent authorities of the Council of Europe;

- b. the establishment of direct relationships – both at the political and technical level - with the interested institutions / organs of the European Union. In particular, RECEP-ENELC will promote the co-operation with the following bodies: Committee of the Regions, European Parliament, European Commission and European Economic and Social Committee. The above-mentioned relationships / co-operation should focus on the following issues:
 - i. impact of EU policies on the landscape at the local and regional level;
 - ii. possible accession of the European Community to the Convention;
 - iii. opportunities of financial support for the initiatives taken by local and regional authorities with regard to the implementation of the Convention in the framework of the European Territorial Co-operation Objective/2007-2013 as well as other EU funding programmes related to landscape issues;
4. the support of the initiatives taken by the Members with regard to the co-operation with extra-European local and regional authorities interested in the Convention.

11.7 Towards the setting up of a pan-European multilevel, multidisciplinary cooperation system dedicated to the Convention

In the explanatory memorandum of Resolution 178 of 2004, the Congress affirmed the conviction that *“drawing on the proposals of local and regional elected representatives in the Congress, the Council of Europe has secured acceptance for a path-breaking international treaty concerned with cultural heritage and sustainable development. As such it has made its mark in an area of great current importance and in doing so has reaffirmed its origins and its underlying identity and values. In order to send out a clear message to governments preparing to implement the European Landscape Convention, the Council must make it clear that from both environmental and cultural heritage standpoints, monitoring the Convention is one of its priorities”*.

In this respect, the Congress expressed the opinion that *“it would be regrettable if, after so much effort, the resources needed to implement the Convention were diverted to other initiatives that, while worthy of interest, might give governments the impression that the Council of Europe could not cope with its own success. Following its opening for signature, the underlying philosophy and conception of the Convention, not to mention its texture and structure, were soon put to the test in the face of widely varying attitudes towards how landscape in Europe was perceived and how it should be protected and enhanced. It is therefore gratifying to discover that the Convention has already started to have an impact on the activities of the national, regional and local authorities directly concerned. It has stimulated research and an interchange of information, modifications to certain regulations, new legislation, changes to existing practice, and the framing and implementation of original new policies and related measures. Equally, the provisions of the Convention will have to be interpreted in the light of the needs*

expressed at different national levels, particularly the regional and local ones. This probably underlies national governments' requests to the Council of Europe, even before the Convention's entry into force, to establish arrangements and programmes to promote co-operation in this rapidly expanding field".

Having prepared the draft European Landscape Convention, through the Congress, local and regional authorities already expressed their readiness to cooperate with the Council of Europe expert committees set up to monitor its application. In this respect, through Resolution 178, they recommended the setting up of a flexible, transversal, cross-disciplinary monitoring system able to ensure that decisions can be rapidly translated into practical action by the territorial authorities concerned, in a spirit of institutional co-operation⁷.

Concerning the question of the proper functioning of the monitoring system, at the Sheffield Seminar it was observed that *"a successful convention requires three things: a periodic Conference of the Parties; a fund; a dedicated secretariat. The ELC has none of these things. It is indeed seriously constrained by Article 10.1, which assigns responsibility for monitoring the implementation of the convention to existing committees of experts who report to the Committee of Ministers of the Council of Europe. This arrangement means that the level of political drive behind the convention and the high aspirations that it has engendered is very limited – one might cruelly liken this to a tanker driven by an outboard motor"*⁸.

Considering that it is unlikely that States will decide to create (at least in the near future) a

Conference of Contracting Parties, a fund and a dedicated secretariat (which in any case remain desirable achievements) a possible option forward could be the immediate building of a multilevel, cross-disciplinary cooperation system. Such a system could make the monitoring process at international level more effective by using existing resources. Its establishment would require the setting up of a permanent, official partnership between the competent Council of Europe bodies and the European associations (of local and regional administrations, universities, civil society, professionals, etc.) created over recent years with the aim of supporting the implementation of the Convention. This option recognizes that implementation of the convention cannot be left to the Council of Europe (which could hardly involve in its work EU institutions and European countries which are not members, in case they were invited to accede to the Convention). It would just have the advantage of effectively complementing the existing formal inter-governmental monitoring mechanisms.

As already highlighted, in parallel to these mechanisms, RECEP-ENELC, UNISCAPE and CIVILSCAPE and their respective Members (at present, more than 100 entities representing local and regional authorities, universities and civil society) are already committed to supporting the implementation of the Convention, in a co-ordinated manner. In this framework, they co-operate on specific projects and initiatives, exchanging information on a permanent basis. In order to make this process more effective, they are ready to coordinate their work with the activities carried out by the competent authorities of the Council of Europe. This would contribute to the setting up of a pan-European multilevel, cross-disciplinary cooperation system which could represent a first step to make the implementation phase as successful as the design stage and the establishment phase.

⁷ See Explanatory memorandum of Resolution 178 (2004) of the Council of Europe's Congress of Local and Regional Authorities – par. 37-41.

⁸ Adrian Philips, conclusions of the Sheffield Seminar.

11.8 A special context for the implementation of the European Landscape Convention in the Euro-Mediterranean area: Mediterranean Islands

(translated from Italian by Dr. Malcolm Borg)

Over past millennia, Mediterranean Islands have constituted extraordinary meeting places for the fusion of cultures and populations from different continents. This process, unique both in concentration and continuity, has characterized and transformed the landscape of Mediterranean islands; similarly, the polyhedral identity of island populations is generally tied to the complex character of their landscapes. One may therefore understand, in general terms, the importance of landscape for Mediterranean islands, both because of their externally recognizable characteristics, as also for the opportunities that are offered by the management of the landscape of island territories, through the implementation of the European Landscape Convention. Mediterranean islands play a central role in this ambitious European project addressing (one augurs) the consolidation of European identity and its diversity. The Mediterranean islands, with their concentration of diverse landscapes, often marked by small spaces with qualitatively diverse aspects, may play a crucial role in the valorization of European landscape and in reinforcing Europe's cultural and natural heritage.

Apart from the cultural dimension, there is also a sense of identity in the landscape, in the case of Mediterranean islands often characterized by limited boundaries and densely populated areas (particularly in the smaller islands). This sense of identity and belonging emerges as a highly important quality, linked to a feeling of pride amongst island populations, which is in turn connected to their ability to safeguard the quality of landscapes, and

to the hospitality afforded to outsiders. Considering the social opportunities offered by the quality of landscape, the Convention has amongst its objectives the consolidation or reconstruction of the relationship between population and the inhabited territory. The sense of belonging and the capacity for hospitality are two important themes that strongly characterize populations of Mediterranean islands, and which have marked the economic and spatial development of these areas – it is enough to think back to how this sense of belonging has at times been weakened or directly destroyed, by the imposition of exogenous, dominant development models, often perpetrated by continental territories characterized by faster rates of economic development. The imposition of such development schemes has at times rendered the populations of these small areas unaware of their territorial and landscape resources making them incapable of planning for sustainable development. The most evident mark of these processes in Mediterranean island territories lies in the heavy exploitation of coastal zones for housing and infrastructural development. This has in turn triggered the abandonment of internal areas and the fragmentation of territorial systems which had historically maintained the defining geographic characteristics of these areas - a sharp division between the landscape of urban centres, which are densely populated, and the landscape outside cities, in rural (or coastal) areas. In the full understanding of the Convention, the meaning of landscape is of the perceptions of populations of these two types of territories, and of how these are inhabited and transformed. It is above all through knowledge of their resources and through the desire to take care of the landscape dimension of their territories, that Mediterranean island populations can fully develop their capabilities for hospitality and economic exchange with other territories.

The landscape presents an opportunity for the islands of the Mediterranean to promote endogenous development processes, alternative

to and distinct from those pursued on mainlands, which demonstrate (in contrast to industrial and post-industrial models based on the distorted effects of globalization) the importance of the awareness of local resources, qualitative development and the valorization of local and territorial identities. In this context, the Convention intends to encourage local communities to assume a proactive role with respect to the transformation of landscapes, linking landscape policies and measures to the future development of specific territories. When considering the ability of landscape to captivate and involve local populations, the Convention's potential as explained is extraordinary. The social demand for quality landscapes may induce populations to identify themselves better with their territories and ultimately, to rediscover their characteristics, values and qualities. From this derives a resurgence of culture and sense of identity, and greater public participation in decision making. These are essential elements in developing conjoint and sustainable development policies. Apart from being a cultural and social function (as also, of course environmental), landscape "*is a positive resource which sustains economic activity and may contribute to new employment possibilities*".⁹ There is no doubt that communities which establish their development policies on the basis of landscape quality have understood the economic and durable benefits stemming from a vast spectrum of interconnected sectors (example: tourism, agro-industry, cultural, crafts, services).

Apart from the potential for the Convention to help Mediterranean islands sustain their socio-cultural and economic identity, it is also useful to consider how the Convention can be implemented within the particular administrative context of these islands. The condition of insularity has historically resulted in special administrative and

political statutes which have led to higher levels of autonomy and major exclusive competences in several islands. The latter may be both legal and administrative and are distinguishable from those in continental territories. With this in mind, although certain Mediterranean Islands may fall under the governance of other mainland states, they could have autonomous competences directed to management of the landscape, within their internal institutional framework. This in itself contributes to the subsidiarity ideal, enabling decisions to be taken at the level closest to the population concerned. It is also useful to consider the context of Mediterranean island states, which exercise total sovereignty over small territories, and where it is therefore possible to have public participation in landscape decision-making at the local level, whilst having coverage of the entire national territory. One should bear in mind that the implementation of the Convention, based on the principle of subsidiarity and on the European Charter of Local Self-Government, has to take place through a process of sensitizing the public, and through the participation of local communities in the formulation and development of landscape policies, thus enabling landscape interventions to be founded on the aspirations of the populations concerned with respect to landscape characteristics and people's living environment (defined by the Convention as '*landscape quality objectives*').

The opportunities for landscape planning & management deriving from the high level of autonomy enjoyed by certain Mediterranean islands, should not, however make us forget the need to extend the awareness-raising and sensitization process to the technical and political representatives involved in landscape policy-making; this would facilitate responsible decision-making by those authorities which are closest to the communities concerned. This is especially important in small society contexts, which may be especially susceptible to conflicts of interest,

9 *Preamble to the European Landscape Convention.*

with the latter potentially coming into play in discussions of improving landscape quality.

The proximity between government entities and actual island territories, a result of the relatively small land area concerned, can also facilitate the integration of the landscape theme in governance, not only nationally but also within various sectors. This relates to the Convention's provisions requiring integration of the landscape dimension within other policies which could have a direct or indirect relation to the landscape. The local level, and specifically small islands, can serve as a 'field laboratory' for these purposes, where we explore ways and means of building 'landscape' into participatory and awareness-raising processes, and into processes of territorial and urban planning. Such a process would be capable of providing for landscape quality, landscape change, and public aspirations relating to the characteristics of people's living space, to become priorities at the local and project planning level. This may have radical innovative effects in the governance of such territories, potentially rekindling both the interest and the ability of locals to play an active role in decision-making relating to the transformation of their territories. In taking the Convention's 'landscape' as a focal point for the formulation and implementation of sectoral policies, island territories may also be better placed to address a range of delicate and complex issues, such as depopulation and the management of the hinterland, the planning of tourist flows, the valuation of cultural and natural heritage and the sustainability of rural areas. This could be achieved through the participation of locals, who have a direct interest in these themes and who are ready to express themselves first and foremost in relation to the quality and future of the areas in which they live their daily lives.

In the context of the themes addressed and in particular with reference to the connection

between landscape and territorial governance, one could refer as an example to the initiatives launched by the *Consell Insular de Mallorca* (Council of Majorca), within the Spanish Balearic Islands¹⁰. The *Consell de Mallorca* believes that the European Landscape Convention provides a good opportunity for incorporating the landscape, its management and its protection into a new approach to spatial and urban planning policies and into a new understanding of spatial management - protecting the more precious landscapes, improving dilapidated areas, extending the notion of a landscape to encompass the whole territory, and understanding that its condition affects the quality of life of the people who live there - all these concepts play a key role in this approach to spatial planning policies. Within its scope of authority in matters concerning urban and spatial planning and the management of monumental, cultural, historic, artistic, architectural and scenic heritage, the *Consell de Mallorca* wishes to promote and develop an integrated coordinated landscape strategy, in accordance with the concept, ideas and objectives of the Convention. The *Consell de Mallorca* has formulated the foundations of a Majorcan landscape strategy or plan. The *Consell de Mallorca* believes that a Majorcan landscape strategy must act as a vehicle to change predominant development models, inspiring a new concept of spatial planning. The Convention affords various possibilities in the fields of spatial

10 The following text referring to the *Consell Insular de Mallorca*, is taken from earlier personal presentations and from the following volume: *Bases per una estratègia de paisatge de Mallorca. Desenvolupament del Conveni europeu del paisatge. Fonaments, criteris, objectius i línies d'acció* (The fundamentals of a Mallorcan landscape strategy. The development of the European Landscape Convention. Foundations, criteria, objectives and plans of action)/Authors: *Consell de Mallorca - Departament de Territori* (Council of Majorca - Territorial Department), Majorca 2009.

and urban planning, especially in relation to their corresponding instruments (guidelines and spatial plans). These possibilities can be further reinforced through the appropriate consideration of landscape values in the environmental and strategic assessment of plans and programmes. Within this context and that of Spatial Planning Act 14/2000, the report and regulations of the Majorca Spatial Plan, approved in 2004, include objectives that must be integrated, fostered and developed in accordance with the policies of landscape protection, management and planning established in the Convention, which the signatories undertake to fulfill. The *Consell de Mallorca* considers some landscape action plans to further the objectives of the landscape policies. These objectives constitute an open-ended proposal, aimed at laying the foundations for the establishment of solid landscape policies within the legal framework and scope of authority of the *Consell de Mallorca*:

1. to design specific, coordinated, global landscape policies;
2. to promote knowledge, awareness raising and public participation in matters concerning the landscape;
3. to protect and assess large scenic ensembles;
4. to improve, restore and/or reassess the landscape at trans-municipal levels;
5. to safeguard and manage rural landscape values in cooperation with the *Consell de Mallorca*'s agricultural policies
6. to promote public access to the landscape;
7. to put coordinated initiatives into practice and ensure international involvement in matters concerning the landscape.

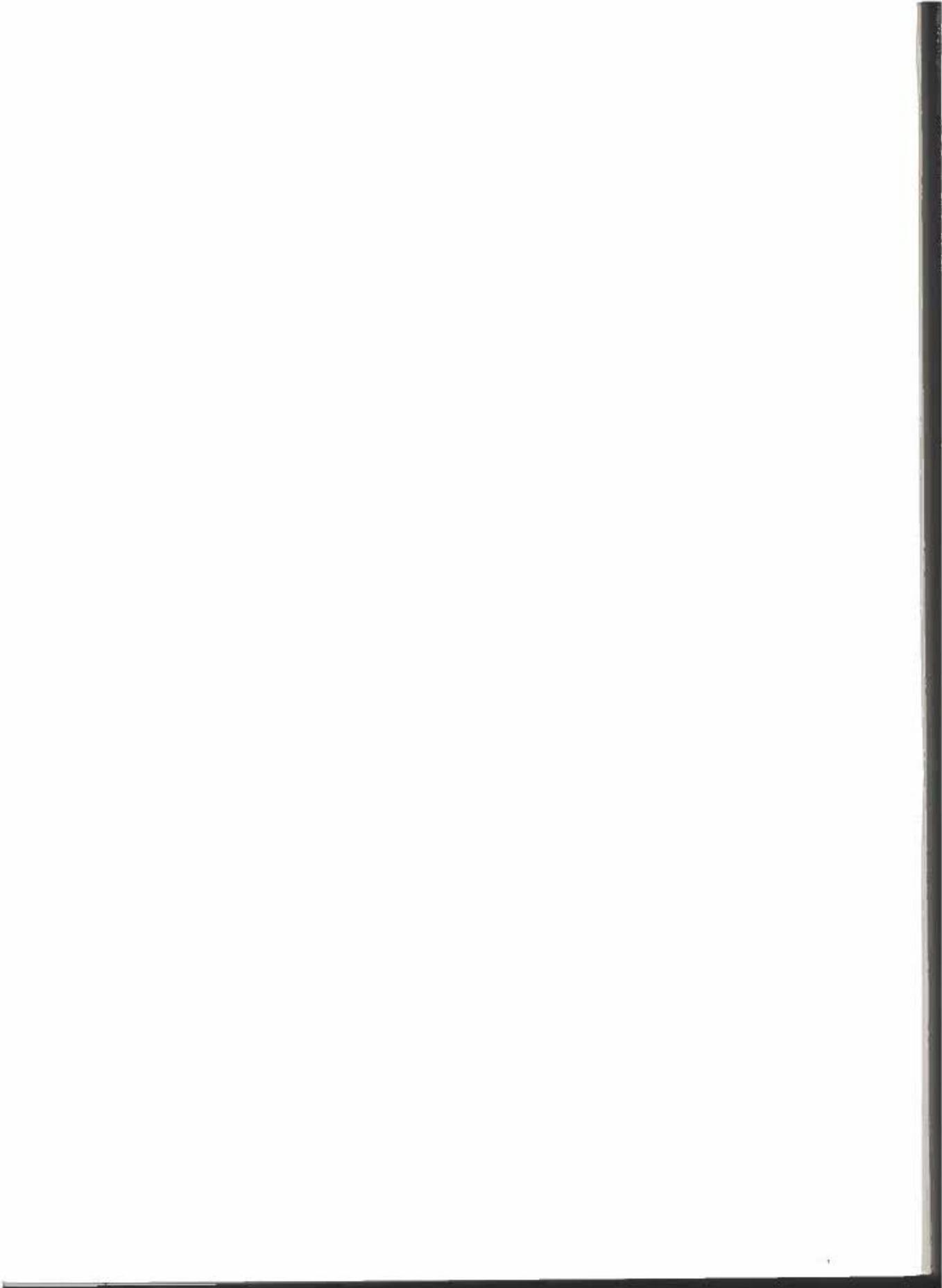
Finally, the foundations of the Majorcan landscape strategy contain proposals for interventions and a list of projects that develop the said seven objectives

and constitute models for the future. These proposed projects aim to improve the integration of landscape into some policies, in an experimental way, with possible direct or indirect impact on landscape (i.e. regional and town planning policies, cultural, environmental, agricultural, tourism, infrastructural, social and economic policies). These projects address different fields: uniting Majorca's metropolitan area; synergies between tourism and the landscape; the conversion of an obsolete industrial landscape; the rehabilitation of an area and creation of new landscapes; landscape restoration along highways and byways; landscaping redesigned roads; rethinking a traditional crossroads; a landscape at risk/ a landscape of opportunity; vantage points for viewing the *Pla de Mallorca*; the *Tramuntana* Mountains, a cultural landscape. The *Consell de Mallorca* has also put forth a proposal for the inscription of the *Serra de Tramuntana* (Majorca, Spain) on the UNESCO World Heritage List as a Cultural Landscape (Paris, 1972). In the framework of the said nomination for the inscription of the *Serra de Tramuntana* on the World Heritage List, the Department responsible for land use of the *Consell de Mallorca* (*Departament de Territori*) drafted in 2009 a Management Plan for the areas concerned, also referring to the landscape dimension, with the participation of more than 50 social and cultural nongovernmental entities. The *Consell de Mallorca* acknowledges that the declaration of the *Serra de Tramuntana* as a UNESCO World Heritage Site, under the category of Cultural Landscape, would bestow added value to the landscape of the areas concerned and all its components, with the aim of effectively guaranteeing its protection and proper management through international endorsement, along with the corresponding management plan and the landscape strategy outlined by the *Consell de Mallorca*, also implementing the provisions of the European Landscape Convention.

Although the theme being discussed here is essentially the Convention, which is a legal expression of political reform at the European

level, one cannot overlook the possible role that Mediterranean Islands can play with respect to non-European territories on the southern Mediterranean shore. This is especially significant at present, given the radical politico-social events that have unfolded in the Mediterranean throughout 2011. In the face of the rapid economic development of these regions and the gradual democratization of governmental institutions therein, Europe could support the countries of the southern Mediterranean coast in developing new sustainable development models geared at the appreciation and valorization of cultural, ecological and natural resources and of landscape qualities, by local communities. It is likely that such an application of the Convention in a non-European setting would create an opportunity to foster local-level economic growth that is compatible with the landscape and the environment, and to facilitate a development dynamic capable of stimulating local social and cultural identity. In this fascinating scenario, the Mediterranean Islands, with their strong historical qualities and distinct territorial and landscape characteristics, could be at the forefront of a new integration process, linking Europe with other continents which share the Mediterranean space. It is therefore opportune and desirable that central and territorial entities within Mediterranean Europe area drive efforts to improve landscape quality, and do so within the context of the Euro-Mediterranean Partnership (referred to as the Barcelona process), primarily through the Union for the Mediterranean, and through the tools and programmes administered by the European Union which are relevant to this Partnership. Whilst hoping and anticipating that such proposals become reality, in the meantime Mediterranean islands may autonomously propose landscape planning & management programmes which adhere to the principles of the Convention, and which may be effected through cooperation with other territories of the southern Mediterranean, tapping available opportunities

offered in this context by the *European Neighbourhood and Partnership Instrument* (ENPI), the *European Development Fund* (EDF – for cooperation on development), through the IV regional programme *Euromed heritage* and through the programme for Cross-Border Cooperation in the Mediterranean (ENPI CBC MED).



CHAPTER 12

Landscapes of tourism in Mediterranean small islands

Theano S. Terkenli

12.1 Introduction, study context and objectives

The Mediterranean region has been capturing the imagination and holding the interest of Westerners for over 500 years. Its landscapes have been glorified and immortalized in the arts. They have provided the stage and the means for countless, multifarious expressions of local life, and they have served as recreation settings, settings of seduction, exploration and play for millions of visitors, over this time period (Braudel, 1972-3; Cosgrove, 1998; Matvejevic, 1999). Initially, during its long tourism history, the Mediterranean attracted mostly Northern and Western European tourists. It has, nonetheless, been blessed with unique landscapes of global acclaim. Indicatively, "*the Mediterranean basin today attracts over two hundred million international tourists each year, making it the world's most popular travel region; travels are even more daunting taking into account domestic travellers, in these countries*" (Koutoulas, 2008: 41). While the Mediterranean region faces grave difficulties in 'catching up' socio-economically with the rest of Europe, as the premier tourism basin – in terms of tourist arrivals and receipts – it faces a series of challenges and concerns, in terms of sustainable future development. Small Mediterranean islands are perhaps the sites most affected, as well as most illustrative of such problems.

The characteristic features of the Mediterranean landscape derive from its unique summer-dry climate, including a dynamic geomorphological and tectonic history, spectacular island and coastal configuration, pronounced seasonality in plant and animal life and a tight link between the physical and the cultural (Houston, 1964; King *et al.*, 1997; Höchtl *et al.*, 2007). The distinctiveness of the symbolic Mediterranean landscape lies in the unique and complex interactions of a rich but fragile environment with the historical depth of variable human activity, over millennia. Given its physical and socio-economic fragility, as it enters the 21st century this landscape faces a multitude of interrelated, urgently pressing issues (Grennon & Batisse, 1989; Höchtl *et al.*, 2007), highly contingent on spatial, historical and social factors. This chapter examines and analyzes some of those issues that are tourism-related on small Mediterranean islands, with a spatial focus on the Cycladic islands of Greece. It does so, on the basis of a three-fold scheme, by revealing and discussing

1. assets and resources that have been over-exploited and spoiled;
2. problems and challenges, which have so far been underrated or neglected; and
3. potential that has been under-exploited or ignored.

The discussion will take place in the context and towards the general goal of good ('sustainable') landscape management/planning/protection. This endeavour also reflects the growing international – but especially European – interest in the landscape itself, in landscape policy and in landscape values, as well as the exponential growth in assessment and analytical methodologies in the recent past, and calls for concerted action to evaluate, protect and enhance the quality and multifunctionality of all types of landscapes, in all spheres of human life and activity (Klijn *et al.*, 1999: 12; Tress & Tress, 2001; Terkenli, 2004). The chapter proceeds from a presentation of the theoretical context and main issues concerning landscapes of tourism, with an emphasis on the Mediterranean, to the case study of the Cycladic islands of Greece.

Tourism has long been the most important industry in Greece, with all the positive and negative imprints associated with intense seasonal tourist inflows on its landscapes – and especially so in the islands, where these flows mostly tend to be directed. The case of Greek tourism starkly illustrates the repercussions of a Mediterranean destination's dependency on charter flights operated by tour operators. Indicatively, 75% of all West and North Europeans – and 58% of all international tourists – vacationing in Greece arrive on charter flights. *"One single tour operator – the Germany-based TUI and its subsidiaries – has been contributing significantly more than a quarter of all West and North European tourists vacationing in Greece. Greek hoteliers are facing a situation of oligopsony¹, with just one company supplying 28% of their clientele from twelve of the largest source markets, or 17% of all tourist arrivals"* (Koutoulas, 2008: 43–4). This dependency is the context of our ensuing

discussion of tourism impacts on Mediterranean landscapes, and particularly on the landscapes of the Cycladic islands of Greece. Tourism and recreation dependency becomes more acute in mass market-oriented resort destinations, and, although the Cyclades are not primarily package tour destinations, the scale at which tourism has developed there has led to all the symptoms of such dependency.

12.2 Landscapes of Mediterranean tourism revisited: a theoretical context

12.2.1 Island tourism

Landscapes of tourism are defined as the total physical and visual environments utilized by all tourism activities, including the whole tourism development, such as transportation, services, information, direction and all the developments that attract visitors to it (Gunn, 1979). More often than not, landscapes of tourism are characterized by insensitive usage of space and land in relation to tourism development. Such usage includes expensive rebuilding and/or expansion of infrastructures along the seashore and uncontrolled urbanization and substitution of pre-existing economic systems, causing spatial fragmentation and homogenization of landscape elements, often resulting in the loss of identity (Antrop, 1998; Terkenli, 2002). *"Sometimes the changes are so profound that it is possible to talk of tourism landscapes in which tourism dominates the uses of the land and the appearance of the area"* (Wall cited in Jafari, 2000: 347) (Plate 12.1). This definition will be adopted here, for our purposes, in order to define landscapes of tourism in our study.

1 The control of the tourism market by a small number of stakeholders.

Much research has been targeted towards island tourism, principally due to the widespread

dependence of island economies on tourism. Most of this research has focused on tropical, subtropical and mid-latitude examples, where tourism tends to concentrate for reasons relating to climate and landscape. Besides, as 70% of present-day holidays globally are coast-oriented (Perry, 1997), islands hold a special appeal to visitors. Properties of insularity inscribed in landscapes worldwide may be summarized into a set of geographical attributes or relationships, such as isolation and distance from the mainland or other secondary centres (measured in various ways), enclosure by the water element and limited resources and/or development potential (Codaccioni-Meistersheim, 1988). Thus, regardless of particulars, islands, in general, tend to display certain commonalities, in terms of quantifiable characteristics (limited areal extent, isolation from major decision-making and economic nodes of activity, constrained resource bases and/or cultural amenities or legacies) (Baldacchino, 2004; Gillis, 2004) and non-quantifiable ones (experiential and psychological qualities that verge on the sublime, the romantic, the elusive, the hidden, the idyllic, the faraway, etc.).

In addition, islands also constitute a prime target of tourism research for several reasons. As 'traditional' economic activities fail to be sustained in the context of global competition, small islands tend to rely increasingly on tourism for their economic sustenance. Thus a cycle of dependence begins, rendering them extremely vulnerable to monocrop economic hazards. Tourism tends to become their dominant activity, highly dependent on metropolitan centres of tourism demand and organizational structures, with serious economic, physical and socio-cultural repercussions. The influx of a large number of visitors in small areas leaves a much more pronounced imprint on them and makes for more striking change in local landscapes, as opposed to cases of more expansive or heavily populated territorial units. Besides, island landscapes are much more convenient to

study, often serving as physical laboratories for tourism research (Codaccioni-Meistersheim, 1988). Their small and restricted areal extent, however, is also more prone to contribute to negative tourism consequences on local sustainable development. Notwithstanding the widespread and longstanding scientific inability and reluctance to arrive at a consensual definition of 'sustainable development', a clarifying mention of the term should perhaps be made at this point. According to Briassoulis (2006), the essence of contemporary discourse definitions of local sustainable development lies in self-sufficiency, reduced environmental and social vulnerability, low dependence on crucial resources, as well as the ability of the place to reinforce its productive base by investing locally. As will be shown in the following case study, often these conditions for, and parameters of, sustainable local development are regrettably unattainable, in the case of small Mediterranean islands.

12.2.2 Tourism and the landscape

All landscape aspects and elements – human and natural – are involved in tourism development (Williams, 1997; Lickorish & Jenkins, 2004; Vogiatzakis *et al.*, 2008). At the basis of any ensuing discussion vis-à-vis the landscape, however, stands its environmental nature. Cohen (1978) identified four major factors contributing to the decline of environmental quality under tourism pressure: tourism intensity, the resilience of the ecosystem, the time perspective of the developer and the transformational character of recreational development. These latter factors stand out as critical development parameters in sustainable island tourism and landscape management. They all play out in the landscape, in significant and often irreversible ways. Landscapes of tourism, whether 'natural' or highly developed, are identified as 'background tourism elements' (BTE) (Jafari cited in Briassoulis, 2002: 1066-67). Landscapes

of tourism, moreover, through promotion, sustenance and transformation of their specific functions, are among the most significant cultural grounds, on which much of today's socio-cultural difference and identity construction is generated and 'development' negotiated (Terkenli, 2000). On the basis of their imageable and tangible/experiential character, landscapes constitute a most significant geographical medium in the analysis of relationships that develop between tourist and visited location (Terkenli, 2004). These relationships are obviously highly complex, as well as place-, time- and culture-contingent; they represent specific socio-cultural perceptions and attitudes, illustrative of specific historical times. Thus, the case-study approach is imperative in any such analysis – hence the Cycladic case, in this piece of work.

Besides the widely acknowledged significance of the visual in landscape production, (re) presentation and consumption, landscape definition through an observer/user is central to landscape constitution. Contextual landscape interpretation cannot be detached from questions of positionality and situatedness: the relationship with its observer/user is an indispensable and quintessential part of the whole tourism experience. As the image or representation of a place, landscape represents the first and most enduring medium of contact between tourist and prospective or consumed place of travel. Through acquired visual mementos, it becomes a traveller's lasting memoir. Furthermore, the connection between landscape and tourism extends to the pleasure sought in the experience, a component that has become central to, and predominant in, twentieth- and twenty-first-century forms of tourism. This connection represents an intricate link between landscape and pleasure/seduction and attraction. It highlights the significance of the human emotional component in the relationship of the visitor with the tourism landscape (Terkenli,

2004). This emotional component, as we shall see in the case study, plays a central role in the development of the tourist-landscape relationship, especially in the case of island tourism, articulated in feelings of remoteness, isolation, solitude, dreaminess, romance, and so forth.

Landscapes represent mirrors of human activity on the environment and – more generally – on space. They highlight a whole array of underlying – more or less obvious – physical and socio-economic geographical activity and change. High impact alterations of land use and seasonally intense geographical concentrations of tourists, in conjunction with out-of-scale and often environmentally degrading or incongruous tourism infrastructure, often result in surpassing the landscape's carrying capacity. Such spatial impositions lead to variable change in the pre-existing landscape, among which, most significant for further tourism development, is the loss of place and landscape identity. Consequently, not only are most criteria for sustainable development thus not met, but also dependent political economies are fostered, leading to various sorts of crises, at scales ranging from the landscape to the national. A crucial question, then, to be addressed in the second part of this chapter is formulated as follows: to what degree and in what ways are the various physical and human elements of Mediterranean small island landscapes susceptible to the array of adverse impacts of the tourism industry?

12.2.3 The Mediterranean setting

Before delving into the case study, however, the broader areal context of the study needs to be presented and discussed. There exist many territorial metaphors of the Mediterranean, 'the sea between land', that match plural geographical interpretations of an area which, despite some unifying characteristics, is actually quite fragmented (Plate 12.2). Statistically, it has been

the premier tourist basin in terms of international arrivals for centuries. It was, however, in the late 19th century, that painters 'invented' the Mediterranean landscape as a dream 'beyond', while the French geographer Vidal de la Blache provided a synthetic interpretation of the unity and diversity mainly of the rural Mediterranean landscapes, essentially a 'created' geographical, unitary vision of the Mediterranean (Claval, 2007). Claval, an astute observer and scholar of the Mediterranean himself, writes:

"For a long time, the Mediterranean was mainly conceived as a useful container for dealing with history or politics... As shown by Vidal de la Blache, Mediterranean peoples always had to solve the same problem: How to cope with the long summer drought? Their genres de vie responded to this question and explained the diversity of the Mediterranean humanized landscapes. As conceived by Vidal de la Blache, the unity of the Mediterranean was rooted in nature and did not change with time. The reality described by his followers was different; Mediterranean landscapes had a history. It meant that the idea of the Mediterranean as a fundamental geographical unit was also a historical construct" (Claval, 2007: 20-21).

While the West seems to have re-interpreted 'the Mediterranean', in the course of the past one or two centuries, in order to consolidate its Graeco-Roman historical hearth, more recently geographers have dissected it into a series of Mediterranean geographies. As regards tourism, the Mediterranean has been viewed either from a regional, mainly quantitative perspective, in terms of its economic or structural features, or from a symbolic cultural perspective, in terms of its psychological and metaphorical features (Minca, 1998). Tourism research abounds in the first case, as opposed to the latter. The myth of *Mediterraneity*, according to Minca, inspires contemporary tourists' existential expectations, tinged by a desire for the exotic and nostalgia for

a purportedly unitary and ancient cultural space. It implies the simultaneous existence of a mythical Mediterranean tourist space, equally and mutually constitutive of the real Mediterranean tourist space with the myth of 'Mediterraneity':

"The Mediterranean Basin, in fact, is a place where imagined and idealized spaces interact with real space through an endless and intriguing dialectical process which presents the geographer with fascinating territorial dilemmas ...[while the] mythical Mediterranean idea, commented Muscara... implies the existence of an idealized unitary region where the climate is warm and sunny, where the foundations of Western culture can be found, and where the people are friendly and relaxed" (Minca, 1998: 258, 260).

Mediterranean island landscapes share with islands around the world certain similarities, such as insularity, already addressed above. Moreover, as all coastal areas of the Mediterranean region, they are physically protected from certain climatic extremes, to which islands elsewhere may be exposed, meanwhile acquiring many of the physical characteristics of the coastal regions of the three continents converging in the Mediterranean. In the introductory chapter of their recent publication on Mediterranean island landscapes, Vogiatzakis *et al.* (2008: 6) describe some of the processes imbuing these landscapes with common features: *"Over the past few decades, changes in agricultural practices, especially the increase in animal husbandry, have resulted in biodiversity loss. Moreover, tourism has led to migration from rural to urban areas and to increased pressure on coastal ecosystems"*. They postulate that, although such issues are common throughout the Mediterranean basin, they are amplified in the islands, due to insularity and specific constraints. *"Socioeconomic problems, for example, are often compounded by the fragility and vulnerability of the islands. Consequently, Mediterranean islands experience greater difficulty in achieving a comparable level of development and*

standard of living when compared with the European mainland" (Vogiatzakis *et al.*, 2008: 6).

Problems, dangers and potential vis-à-vis the Mediterranean island landscape abound, and they are highly interrelated and intricately interwoven. Among factors and forces inducing physical and socio-economic transformation on Mediterranean islands, tourism stands out as one of the major and most predominant ones, since it has been widely viewed as the only activity capable of reviving local economies (Ioannides *et al.*, 2001; Kousis, 2001). Its impacts on the Mediterranean island landscape have also been widely identified (Rackham & Moody, 1996; King *et al.*, 1997; Vogiatzakis *et al.*, 2008). However, they have, so far, not constituted a major area of interdisciplinary research. This chapter addresses this shortcoming, with the aid of the following case study.

12.3 The Cycladic islands of Greece: a case study

The Cycladic islands of Greece are an island group in the Central-Southern Aegean region, comprising 24 main islands and a number of smaller islets and rock outcrops in the sea. The Cycladic island landscapes constitute the cultural images of this region, the visible and symbolic expressions of human-environment relationships formed over a historical period of millennia (Doumas *et al.*, 1999). Obviously, there does not exist a single Cycladic landscape type, representative of the whole region; it varies in time, place and social context, while its production and reproduction – in terms which are actual, metaphorical, iconic or symbolic – occur at all geographical scales ranging from the local to the transnational and global (Plate 12.3). There is, however, a predominant set of landscape features, both human and physical, that tend to be encountered to a very high degree throughout most of the Cyclades.

Among the distinctive physical characteristics of the Cyclades, we may highlight its striking horizontal and vertical geomorphological configuration, which, together with its fascinating palaeogeography, creates a unique insular geography. While the geomorphology is diverse (with volcanic rocks predominating), the climate is typically Mediterranean (hot dry summers and cool, mild, rainy winters), with some local variations. Most importantly, we may point to its dire water regimes, mainly brought about by prolonged summer drought. The combination of these two characteristics creates the need to manage natural resources with great care – especially water, soil and vegetation, which tend to be very vulnerable to depletion. Specifically, the practice of terracing the land, mainly for agricultural, but also for constructional purposes, has been a century-old human response to such environmental challenges. Indeed, perhaps the most striking feature of the Cycladic landscape is the great interface of interaction between the physical and the human realms (King, 1997) and its spectacular expression in the landscape through distinctive and elaborate schemata of environmental and natural resource perception; evaluation and management by the human groups that have inhabited this part of the world since prehistory is eloquently engraved in its present-day landscape. The vegetation, also typically Mediterranean, consists mainly of pine-oak forests and Aegean sclerophyllous, evergreen species, forming phrygana (maquis) scrublands. According to Wascher, the major landscape types found in the area are Mediterranean lowlands, dominated by sediments, and especially Mediterranean hills, mainly rocks, together with small expanses of arable land, scrubland and permanent crops (Kizos *et al.*, 2007).

Their intricate insular geography, in conjunction with their geographical location, has historically rendered the Cyclades into a space of

communication, trade and intercultural exchange. If we could derive certain common and distinctive human-induced features of the Cycladic landscape from other descriptions of the Mediterranean world (Houston, 1964: 2-7), we may, then, refer to a) a long local tradition of urban, small-town life, characterized by political/ ideological and cultural progressivism and a strong orientation towards commerce and maritime commerce, in contrast to b) the harsh conditions of inland rural life, characterized by inwardness and meagre self-sufficiency, coming together in the c) traditionally underdeveloped coastal landscapes, where, in the past, livelihood used to depend on fishing. It is precisely the latter that now represent the most symbolic landscape images of Greek island tourism, the pure expression of the 3 or 4Ss (sea, sand, sun and sex) in tourism attraction, to which we turn in the next section. Despite significant internal variations, the most significant contemporary trends in Cycladic human geography may be summarized as follows: a) the overturn of the demographic depletion of the islands, and b) the rise of their Gross Regional Product (GRP) over and above the regional and national average, due to development and tourism (Greek Statistical Service, 2001). Consequent impacts on the islands' human geography and landscape have been the explosion in transportation and communication systems and networks, as well as the corresponding proliferation of a wide spectrum of infrastructures and construction, in general – in support of the spread of urban characteristics, in all aspects of local life.

12.3.1 Assets and resources over-exploited and/or depleted

From this brief introduction to the area under study, it becomes obvious that there is no single Cycladic island landscape, but rather a series of symbolic Cycladic landscapes, depending on the position and situation of the landscape viewer/

analyst. For example, the landscape of the Cyclades may be conceived as a cultural image of tourist consumption for the visitors, as a home ridden with problems for the local populations, or as a cultural hearth for the rest of the Greeks. The Cycladic landscape as a national symbol and as a cultural and family hearth is constructed in collective Greek imagination with an orientation towards a historical past. Thus, it becomes an anachronistic construct: a homeland, laden with vestiges of an ancestral land and a rich cultural (historical, archaeological or sacred/ religious) heritage. According to this myth, it is perceived as an essentially uninhabited landscape during most of the year, while, during holidays and especially summer, it becomes 'vacationland', the playground of both Greek and international tourism (Tsartas, 1989; Terkenli, 2001). These perceived qualities of the Cycladic landscape are mainly derived from its visual characteristics. They have also been expropriated and exploited for various 'development' purposes, often with negative impacts on visual qualities and undermining the very essence of the landscape that attracted development here, in the first place.

Post-war economic decline and population depletion are now in the process of being reversed, in most of the Cyclades. This reversal is mainly due to tourism development. Initially, it was islands with a cultural heritage, in the form of archaeological, religious, or generally historical interest that attracted most visitors – both foreign and local. During the 1970s and 1980s, however, these islands were transformed into the tourist havens of Greece, through their establishment as conventional summer tourism destinations. The Cyclades constitute the essential stereotype of an island tourist paradise: 'perfect' physical environment (warm, sunny, beautiful beaches), ancient history interwoven into long-standing 'traditional' ways of life, and hospitable, friendly locals inviting visitors to enjoy an easy way of life

(Plate 12.4). Tourism has boosted the economies of the Cyclades, changing their main income bases from agricultural to tertiary-service activities, stemming population outmigration and creating conditions for new construction and development, in the form of tourism infrastructures – catering to the boom in charter/organized air transportation systems (Williams, 1997; Minca, 1998; Lickorish & Jenkins, 2004) – or in the form of second-home development. Kizos *et al.* describe the unequal development of contemporary tourism and its impacts on the Aegean Islands, as follows:

“Seasonally, approximately 3.5 million tourists visit, almost exclusively in summer; mostly by charter flights (67% in 2001); and this fact causes intense seasonal changes in transport frequency and environmental pressures. Spatially, most of the beds (250,000 in total) are found on a small number of islands... In addition to tourists, holidaymakers in general are very important economically and in terms of land use, since the amount of new housing is one of the most intense problems confronting the landscape and the environment. The local economy has benefited greatly from building works, and the consequent rise in land prices, but this development is temporary, whereas the environmental and social impact is permanent” (Kizos *et al.*, 2007: 341-2; Tsartas, 1989).

The negative impacts of tourism growth and development are witnessed in several aspects of life. As the life cycle of the tourism product starts to come to a close, previously thriving tourism destinations reach a point of stagnation or declining demand. For instance, with regard to economic revenues, the drop in business generated by the withdrawal of tour operators from some of these island resorts *“has directly impacted the income of thousands of tourist businesses and households in the Aegean, as most businesses did not manage to substitute these losses with tourist traffic from other market segments”* (Koutoulas, 2008: 44). With regard to urbanization and development

impacts on the landscape, according to Kizos *et al.*, rural landscapes of the islands have recently suffered great abandonment, since, except for sheep husbandry, agriculture has been severely curbed, principally due to cheap imports from the mainland into a formerly closed island market: *“Sheep have increased over the last decades (although sheep farmers have decreased) and are grazed at high densities, which has resulted in overgrazing and erosion. Local demand is satisfied to only a limited degree and for few products: most food has to be imported, especially for tourists”* (Kizos *et al.*, 2007: 340) (Plate 12.5).

As far as the urban landscapes of the Cyclades are concerned, the first and most direct cultural image of place identity to a visitor is in the landscape's visual composition and articulation. Preservation efforts have, at least nominally, concentrated on the unique visual character of the Greek island landscape. Based on a comprehensive typology of vernacular elements of Cycladic domestic and townscape architecture (Sancar & Koop, 1995), an architectural survey of such elements was undertaken on the Cycladic island of Serifos, Greece. This comparative survey between the more traditional hilltop community of Hora and the modern, touristy port community of Livadi reveals a marked emphasis on visual landscape elements, in the domestic architecture and the townscape of Livadi, elements that seemingly preserve the character of the local landscape (Terkenli, 2000). Specifically, the architectural and townscape elements of Hora by and large conform to the representative Cycladic types, in all aspects of house and townscape form, function, construction materials, etc. In contrast, mostly architectural and townscape variables that preserve only the visual character of vernacular or folk ways of building and situating in space, in Livadi, conform to the representative Cycladic types. In the category of visually significant landscape elements, townscape features predominate, as they cater best to the visual

character of sight-seeing, i.e. the siting of houses and location of churches and public buildings in the urban landscape, 'traditional' uses of streets, street surface materials that preserve the 'look' of the town, and semi-public/private spaces at the interface of the private with the public domain – places of socializing, people-watching, resting, playing and performing various exchanges, in the context of daily life (Terkenli, 2000). On the other hand, wide varieties of features associated with ancient construction techniques, indigenous materials and subtle local particularities, as well as with the functional role of specific spaces and objects, have disappeared as no longer essential in serving daily needs or catering to the tourist image of the village.

For purposes of attracting tourists and sustaining local social needs, the Aegean facade of the islands' urban landscape, thus, tend to be retained, but all that is considered superfluous in modern life and tourism tends to be dispensed with. Modern use of space necessitates easier and faster accessibility, which requires efficient visual space appropriation and prioritizing of the profane over the sacred, both literally and metaphorically. Thus we encounter motor bikes parked in centuries-old sacred sites, American Express offices in narrow stone-paved island alleys, and advertisements of 'traditional local pottery' - made in Maroussi near Athens and sold all over Greece (Terkenli, 2000). Garish advertisements and announcements, trademark signs of tourism, mostly in English, the lingua franca of tourism, abound. In some of these tourist resorts, Greek is often no longer even understood in shops and tourism-catering services (i.e. on the islands of Mykonos and Santorini) (Plate 12.6).

The Cycladic landscape has been much romanticized in recent decades as an idyllic island paradise, isolated and free from the demands of modern life, blessed with perfect climate and characterized by its small-scale, intimate settings

ideal for romantic adventures, in the land of the Greek gods (Terkenli, 2000). The four Ss (sea, sand, sun and sex) collectively constituted a powerful pole of tourism attraction for the Aegean from onset of the industry, in the 1960s. Landscape elements, both natural (the sea, the beach, sunshine) and human-made (such as the whitewashed cubic houses in real or imitation stone-paved streets), exemplify and reinforce such images of the Aegean and are preserved and highlighted in popular culture (i.e. motion pictures *Shirley Valentine* and *Summer Lovers*). Meanwhile, as will be elaborated below, these islands also constitute their inhabitants' homes. They thus need to have convenient street access, modern sanitary systems, and other contemporary amenities.

12.3.2 Problems and challenges so far underrated and/ or neglected

If there exists a certain "authenticity in the direct and genuine experience of a place" (Relph, 1976: 64), in many of the Cyclades, this sense of place identity that develops from everyday home life is currently in danger of being lost to tourism. This context of everyday life lies in the diversified landscape where people meet, associate, play, work, assemble politically, worship, and live all matters of life. The cultural landscape of the Aegean is in danger of being transformed into a theatre of life staged for tourist purposes, made into a spectacle, embellished with qualities that pander to foreigners' tastes and images that the tourism industry promotes for the Aegean. Places are imbued with elements that are designed and planned for the convenience of the visitor, rather than to meet the priorities of locals. The prime consideration is that places are more aesthetically pleasing, more accessible and palatable to mass tourism taste. The sense of intimacy that characterizes a place that people repeatedly invest with personal and collective value is becoming

obsolete, a problem that has, so far, not received adequate attention and appropriate resolution.

For instance, fewer and fewer Cycladic town streets still host diversified inputs from their inhabitants, and therefore encourage a continuing dependence on 'traditional' forms of architecture and townscape. Most have rather become the exclusive domain of the automobile, facilitating fast and uninhibited access by the visitor to all points of interest. In the study on the island of Serifos mentioned above (Sancar & Koop, 1995), behavioural analysis of regular everyday activity in open urban spaces points to changes instilled by tourism in Livadi, in contrast to Hora, which continued to exhibit more traditional behaviour patterns. In general, Hora exhibits a far greater richness of individual and collective activity than Livadi, where outdoor public space functions have become much more specialized with the onset of tourism (Sancar & Koop, 1995). Even though Hora has, in more recent decades, changed somewhat, due to substantial outmigration, behaviour mechanisms here are still more diverse and show a more colourful lifestyle than corresponding ones in Livadi.

In global comparative terms, tourism has, on the whole, a positive impact on Greek life and especially on the Greek economy. Outmigration from the Aegean, of disquieting proportions in the past, has been somewhat curbed in recent decades, due, in part, to an increase in employment opportunities offered by tourism demand. In some ways, however, the disappearance of alternative (primary and secondary) economic venues for the Aegean islanders is a direct outcome of the expansion of the tourist industry. In this way, globalizing and homogenizing forces of mass tourism are not only affecting the home realm of local societies, but the work domain as well. Tourism entrenches patterns of economic dependence in struggling island societies, both in economic/environmental

and in social/demographic terms. These, in turn, help reinforce and sustain tourism continuity, and, in so doing, they create new cultural landscapes, albeit ones which are more artificially staged, homogeneous and commercialized. They obliterate organic geographical distinctiveness and help perpetuate a vicious cycle of commercial and cultural interdependencies. Moreover, tourism's stronghold in the work realm of local life (monopoly economies) indirectly eliminates relationships of mutuality and reciprocity in social life - in the form of communal bonds. Thereby, the industry undermines the unique sense of place and home that arise from and are forged over centuries, through the performance of common tasks and rites. Tuan (1982) additionally observes that as important to the forging of such ties are those numerous unstructured occasions when people are simply in each other's presence. Such social group cohesiveness, even if circumstantial, used to serve mutual community interests, formed out of necessity, and characterized the social life of Cycladic communities in the past. Today, even if seasonally, it seems to be in the process of disappearing in the context of local everyday life. Increasingly, whole families spend their summers in various forms of tourist-catering employment, with hardly any time for rest or socialization. Consequently, a certain placelessness characterizes these tourist destinations (Relph, 1976). In these places, passers-by engage in various forms of consumption and hurry on through the townscape, rather than intimately and functionally relating with it, in the many ways that created it in the first place. Such changes in the Cycladic landscape, 'invisible' so far, have only recently begun to be acknowledged and investigated.

For the locals, then, the landscape of the Cyclades has been the quintessential representation of their home, a representation that feeds on existing social networks, family roots and bonds to place

and traditional ways of life. Tourism folklore aside, however, traditionality translates into marginality, articulated on the basis of insularity and underdevelopment. This was one of the findings of a study on cultural images of the Aegean, conducted through Greek elementary-education textbook analysis (Raptis & Terkenli, 2000). The study revealed images of the Aegean landscape as distinctly peripheral, made up of marginalized places or vacation resorts and images of the past – as the cultural landscapes of childhood memory, the family hearth or the collective old country. Similar disjunctions between commonly-held ideas and local images of Cycladic landscapes were revealed by iconological postcard analysis of urban landscapes of the Aegean, pointing to significant differences between tourists' and residents' images of the urban tourist landscape (Stefanou, 2000).

Equally occasionally unnoticed have been environmental threats and landscape conservation problems requiring urgent attention. Nature conservation in the Aegean has mainly been implemented through the development of the Natura 2000 network, whereby, since the 1990s, most areas worthy of protection have gradually been identified. However, although several such sites exist in the Aegean – and the Cyclades, in particular – the process of actual management and protection planning is still embryonic. Nonetheless, *“it is already being used as a means of exerting pressure for the protection of the environment. Many locals regard protection as a series of bans; especially where building permits and agriculture are concerned, and consider them as a call to war; for they want to keep unchecked building rights, even in core areas”* (Kizos et al., 2007: 343). Kizos et al. (2007: 343) also point to other important environmental issues on the islands, including water and waste management. An example of the former is water shortages, especially on the smaller Cyclades, where water availability is naturally low; during the peak tourist season, these problems are

exacerbated. Drinking water is delivered daily by container ships to Santorini in the summer, while the smaller Cyclades struggle with desalination projects. Inefficient or nonexistent recycling of most resources – a traditional practice in the past – is the norm, even in developed and trendy tourist destinations, such as Mykonos. High tourism concentrations in certain much frequented landscapes, such as popular beaches, produce enormous pollution problems, while most urban settlements do not have adequate waste disposal systems. Most liquid waste tends to end up in the sea, while most solid waste is collected in huge dumps and landfills, often located in some of the most aesthetically valuable natural areas of the islands. Finally, energy generation is another major issue for most of the Cyclades: *“Few islands are connected to the national grid, and oil-fired power stations operate on most of the rest, producing expensive power which is subsidized. Renewable energy production is restricted to solar domestic water heating and small wind farms”* (Kizos et al., 2007: 343).

12.3.3 Under-exploited or ignored potential

It has been adequately documented that, mainly through various transnational companies, international tourism has contributed directly towards the extension of metropolitan dominance over weaker destination peripheries. In this way, it has been shown to lead to a loss of self-reliance for small islands and local communities or regions around the world (Britton, 1982; Bianchi, 2002). The dominance of group tourism in Greece is mainly attributed to the influence of tour operators who find comparative advantages in the Greek market; they control the tourist market as oligopsonists, by offering competitive tourist packages at low prices, resulting in a tourism revenue retention rate of approximately 40%. Consequently, several sea-tourism resorts and even whole regions have been approaching or reaching their carrying capacity,

with all consequent negative impacts (Chiotis & Coccossis, 2000). Organized group tourism, as well as sea-based tourism, however, still represents the most significant component of Greek tourism, thus further entrenching highly seasonal trends in spatial concentration and impact (Briassoulis, 1993; Pettifer, 1993; Chiotis & Coccossis, 2000).

Since the early to mid-nineties, however, the balance between international and domestic tourism on the Cyclades has been changing. Domestic tourism has been increasingly growing in relation to international tourism and so has weekend tourism that targets not only coastal areas, but mountainous or inland locations as well (Terkenli, 2005). Domestic tourism patterns tend to spread more into the off-season, depending more on road transportation systems and on easy access from the main urban centres of the country. They represent under-exploited potential in Greek tourism development, which has just barely been tapped into. Whereas up to now international tourism has been most significant and is well developed (over 75% of tourists in Greece in 1989 were of foreign origin), the trend has since been partly reversed in favour of domestic tourism – although such developments are extremely difficult to measure in quantitative terms.

This trend, in turn, has contributed to a widespread shift towards alternative forms of tourism (agrotourism, ecotourism, cultural tourism, convention tourism, etc.), with distinctively different cycles of seasonality. Present plans generally call for sustainable and quality tourism, rather than the continued growth of 4Ss tourism; however, the extent to which this strategy can be implemented remains to be seen. Behind the growth of alternative forms of tourism in rural Greece are local networks or cooperatives that play a significant role in tourism development. These networks include partnerships of various sorts among tourism stakeholders, in terms

of tourism planning (i.e. intra-regional top-down initiatives or development investments), policy/ administration (i.e. national institutions or organizations) and/ or trade (i.e. farmers' cooperatives or networks of cultural/ natural paths). Fairly common in developed countries – and increasingly so in some developing countries – partnerships are increasingly advocated as a part of 'good governance', together with wider community participation and empowerment in tourism-related decision making (Bramwell & Lane, 2000). Bramwell (2004) suggests that there is growing recognition of the potential benefits of collaborative tourism planning that includes various industry segments, public sector agencies, and (rather less often) other groups in civil society, while there is perhaps less appreciation of the substantial problems associated with shared decision-making. In fact, to a significant degree, authenticity in tourist landscape planning may be achieved and safeguarded through community participation, an emerging critical social factor in decision-making concerning the shaping of space, place and landscape as a context of high-quality life (Briassouli, 1997).

Perhaps the most common forms of alternative tourism are agrotourism and ecotourism, highly interconnected (sale of local forest products, hiking, olive picking, etc.) and highly beneficial to landscape preservation and management. Agrotourism, for instance, is relatively new to the Cyclades. It is not yet as developed as other more familiar types, but it is growing fast, for both foreigners and Greeks (Kizos *et al.*, 2007). According to Kizos *et al.* (2007), on many Cycladic islands there is a growing demand for traffic-free tracks and footpaths, permitting the enjoyment of rewarding, interesting, stimulating and/or special-interest activities (e.g. bird-watching). Such activities have inevitably contributed to landscape-related actions in the context of local policy initiatives, i.e. to conserve, signpost, clean

and repair old paved footpaths, etc. Although few and sporadic, these initiatives lead to a more widespread landscape awareness and promotion of landscape, as well as directly contributing to the preservation of traditional landscape forms, functions and meanings/values for both locals and tourists. *"Policy initiatives are only recently beginning to emerge, in response to growing concern about the future of deteriorating landscapes... The main lesson about the footpaths' example is that, once old landscape elements acquire new functions (due to new values regarding the landscape or activities in it), they have better chances of preservation"* (Kizos et al., 2007).

According to the same source, archaeological sites and monasteries are similar examples of new functions and values for older landscape elements. Ancient sites and monuments are famous features of the islands, and the monasteries draw thousands of Greek visitors, especially for religious festivals and celebrations (Kizos et al., 2007). On the other hand, diminishing agricultural incomes and the explosion of tourism in former subsistence rural economies have generated opportunities for hobby and part-time farming (Kizos et al., 2007). For instance, organic agriculture and animal husbandry have been increasing:

"especially for permanent crops such as olives, and lately for vegetables. However, organic production does not involve less irrigation or lower grazing densities, and so it can not be viewed as the sole solution to the environmental problems of the islands; particularly, when water scarcity, and soil erosion and degradation are taken into account. Finally, the Aegean Islands do supply a number of speciality products...these products are sought by locals, Greek consumers and tourists, and have attracted the interest of major producers" (Kizos et al., 2007: 341).

In conclusion, bottom-up networks and partnerships of mutuality and reciprocity nowadays emerge as most promising venues for the future

development of various forms of tourism in the Cyclades, provided these initiatives overcome structural or functional barriers and constraints inhibiting tourism growth. Alternately, top-down limitations and national, international or inter-regional institutional networks and constraints seem to pose insurmountable obstacles to, or deliberately antagonize incoming tourism, binding it in unfavourable terms to networks of dependency or competition – unless met with bottom-up resistance and action. Most significantly, however, these recent trends in alternative tourism growth and development in the Cyclades are directly, as well as indirectly beneficial to their landscapes. They represent the most organic, effective and beneficial means to the preservation of both their cultural and natural elements and to their multifunctional sustainable management and use.

12.4 Concluding remarks

Present-day landscapes are undergoing rapid transformation, brought about by a new cultural economy of space (Terkenli & d'Hauteserre, 2006). As a result of rising incomes, standards of living and leisure time as well as improved transportation and communication systems and the growing need within Western societies for contact with nature and environmental sustainability, present-day landscapes acquire a more pronounced public good character. In this context, island landscapes acquire a central position in collective – or at least Western – imagination and appeal. In Western tourist markets, Mediterranean islands have encapsulated these qualities of seduction and appeal for centuries and continue to do so readily, on the basis of their easy accessibility and general familiarity (not too exotic, not too unfamiliar). All is not well in paradise, however.

With increasing dependence on instant interconnections and image flows, landscapes in

their visual/pictorial, experiential and symbolic capacity, become, by nature, the most visible and eloquent expressions of variable and changing human-environment relationships. Though multifunctionality and sustainability have been inherent qualities of the cultural landscape for the best part of human history, and though technological capacity for intervention in both has been much enhanced in recent times, landscape multifunctionality and sustainability are both now endangered. Older forms of landscape organization and use have given way to divisions of space and landscape schemata which are much more temporary, tentative and fluid.

In the Cycladic islands of Greece, these new landscape schemata have been accompanied by increasing specialization and loss of richness, in terms of diversity and complexity, not only of meaning and value but also of activities and functions. Their permanent inhabitants find themselves in an unfavourable position, leading to the depletion of their most valuable rural/natural economic resource, but also to the loss of the basis of tourism attraction in their landscapes. This loss, as regards both the physical and the cultural aspects of landscape, at present requires fast and concerted action. The losses are manifold - in terms of tourist product, in terms of their rural basis of productivity, in terms of environmental and cultural resources and in terms of their inhabitants' sense and everyday reality of home life. With their limited human, environmental and infrastructure resources, these islands are, by nature, simply unprepared and unable to host and cater to large numbers of visitors. The first and foremost victim of such development is their landscape - a grave loss, largely irreversible and very difficult to reconcile.

Sustainable, integrated landscape management, thus, now more urgently than ever before, needs to address, combine and connect a large number of diverse landscape functions, such as ecological

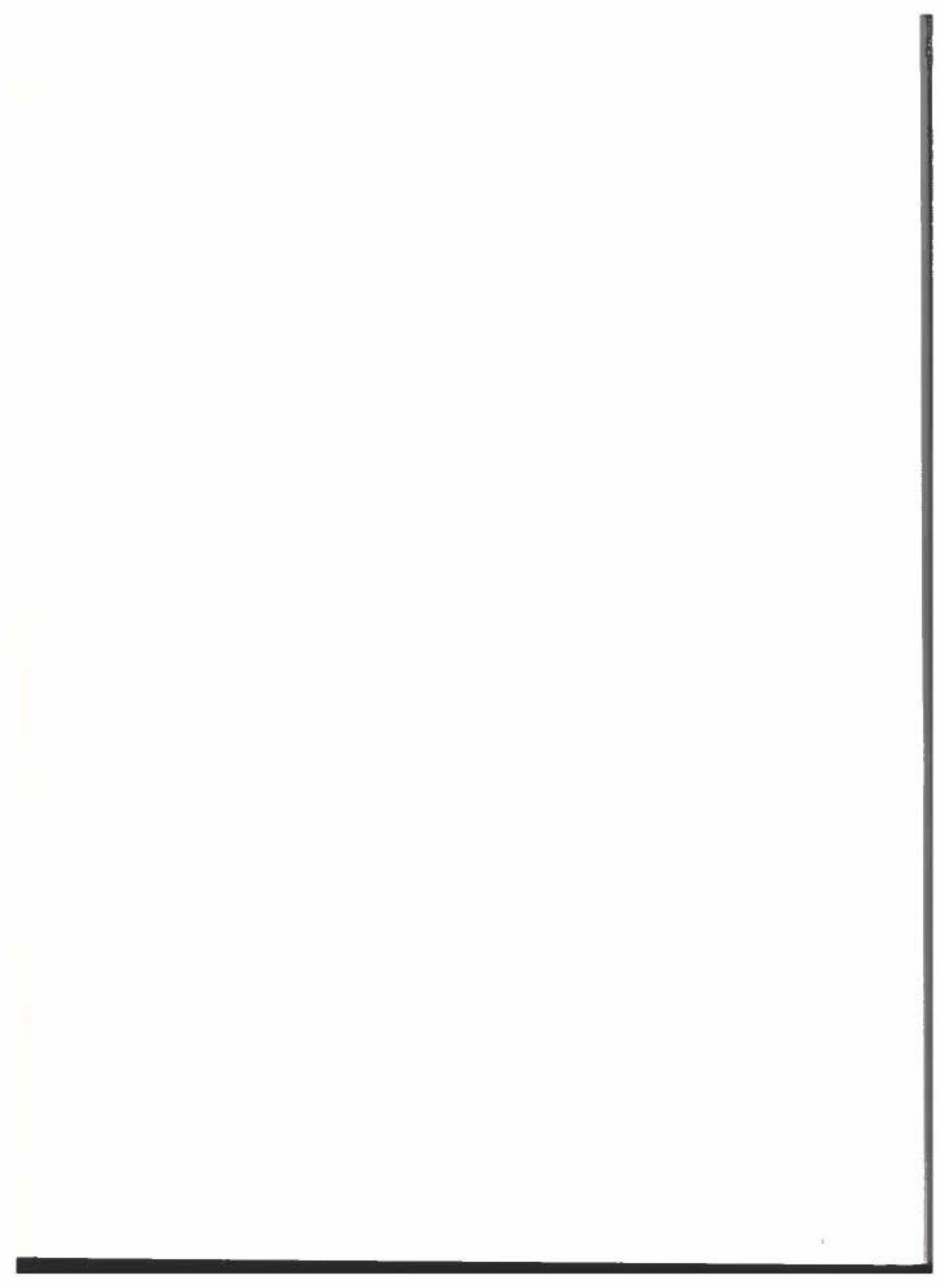
stability, economic viability, expression of place identity, recreational activity, historical dynamics and so on. This remains quite a daunting task, but one that offers exciting challenges for related disciplines and practitioners, at all levels. All of the latter need to plan, manage and protect landscapes in sustainable ways that are appropriate, both temporally and spatially to the needs of modern society, without compromising the cultural inheritance that made the Cyclades a unique place. What are harder to negotiate, however, are changes in human ways of thought and action deemed central and foremost to any landscape change or articulation. These are already appearing to be more difficult than changes in landscape, especially at a time when changes are occurring at a global scale and at long-term time-frames beyond individual grasp. They are, nonetheless, met by a growing recognition in social as well as in bio-physical scientific circles of the contextualized, positional character of all forms of knowledge and experience (Norton, 1996), which the recent resurgence of interest in all types of landscape addresses in parallel with the growing urgency for change in attitudes towards it.

References

- Antrop, M., 1998. Landscape change: plan or chaos. *Landscape and Urban Planning*, 41, pp.155-161.
- Baldacchino, G., 2004. The coming of age of island studies. *Tijdschrift voor Economische en Sociale Geografie*, 95, pp.272-283.
- Bianchi, R.V., 2002. Towards a new political economy of global tourism. In: R. Sharpley & D.J. Telfer, eds. *Tourism and development: concepts and Issues*. Clevedon: Channel View Publications, pp.265-99.
- Bramwell, B., 2004. Partnerships, participation, and social planning. In: A.A. Lew, C.M. Hall & A.M. Williams, eds. *A Companion to Tourism*. Oxford: Blackwell, pp.541-54.
- Bramwell, B. & Lane, B., eds., 2000. *Tourism collaboration and partnerships: politics, practice and sustainability*. Clevedon: Channel View Publications.
- Braudel, F., 1949/1995. *La Méditerranée et le Monde Méditerranéen à l'Époque de Philippe II*. California: University of California Press.
- Briassoulis, H., 1993. Tourism in Greece. In: W. Pompl & P. Lavery, eds. *Tourism in Europe: structures and developments*. London: CAB International, pp.285-301.
- Briassoulis, H., 1997. Sustainability indices: a critical bibliographical review (in Greek). *Topos*, 12(97), pp.55-76.
- Briassoulis, H., 2002. Sustainable tourism and the question of the commons. *Annals of Tourism Research*, 29(4), pp.1065-1085.
- Briassoulis, H., 2006. Golf resorts and local societies: conditions of sustainable co-existence (in Greek). In: Large tourism investment in eastern Crete: development and sustainability, Seteia, Crete, 27th February 2006.
- Britton, S.G., 1982. The political economy of tourism in the Third World. *Annals of Tourism Research*, 9(3), pp.331-58.
- Chiotis, G. & Coccossis, H., 2000. Tourist development and environmental protection in Greece. In: H. Briassoulis & J. van der Straaten, eds. *Tourism and the environment: regional, economic, cultural and policy issues*. Revised 2nd Edition. Dordrecht: Kluwer Academic Publishers, pp.331-343.
- Claval, P., 2007. About rural landscapes: the invention of the Mediterranean and the French school of geography. *Die Erde*, 138(1), pp.7-24.
- Codaccioni-Meistersheim, A., 1988. *Insularité, insularisme, illeite: quelques concepts opératoires. Cahier No 1, L'Europe des Isles, Institut de Développement des Îles Méditerranéennes (IDIM)*. Ajaccio: University of Corse Pascal Paoli.
- Cohen, E., 1978. Impact of tourism on the physical environment. *Annals of Tourism Research*, 5, pp.215-37.
- Cosgrove, D., 1998. Cultural landscapes. In: T. Unwin, ed. *A European Geography*. London: Longmans.
- Doumas, C., Lambrinouidakis, V., Mendoni, L. & Simantoni-Bournia, E., 1999. *Archaeological atlas of the Aegean: from prehistoric times to late antiquity*. Athens: Ministry of the Aegean.
- Gillis, J., 2004. *Islands of the mind: how the human imagination created the Atlantic world*. New York: Palgrave-Macmillan.

- Grenon, M. & Batisse, M., eds., 1989. *Futures for the Mediterranean Basin: the Blue Plan*. Oxford: Oxford University Press.
- Greek Statistical Service, 2001. Athens: EYSE. Available: <http://www.statistics.gr/portal/page/portal/ESYE> [Last accessed: 13th July 2010].
- Gunn, C., 1979. Landscape assessment for tourism. In: *Our National Landscape: a Conference on Applied Techniques for Analysis and Management of the Visual Resource*. Incline Village, Nevada, 23-25 April 1979. USDA General Technical Report, Pacific Southwest Forest and Range Experiment Station 1979, No. PSW 35, pp.409-414.
- Höchtel, F., Terkenli, T.S. & Plieninger, T., 2007. Editorial: the European Mediterranean Region in the focus of landscape research. *Die Erde*, 138(1), pp.1-6.
- Houston, J.M., 1964. *The Western Mediterranean world*. London: Longmans.
- Ioannides, D., Apostolopoulos, Y. & Sonmez, S. eds., 2001. *Mediterranean islands and sustainable tourism development: practices, management and policies*. London: Continuum Publishers.
- Jafari, J., ed., 2000. *Encyclopedia of Tourism*. London: Routledge.
- King, R., Proudfoot, L. & Smith, B., eds., 1997. *The Mediterranean: environment and society*. London: Arnold.
- Kizos, T., Spilanis, I. & Koulouri, M., 2007. The Aegean Islands: a paradise lost? Tourism as a driver for changing landscapes. In: B. Pedroli, A. van Doorn, G. de Blust, M.L. Paracchini, D. Wascher & F. Bunce, eds. *Europe's living landscapes*. Wageningen, Zeist: KNNV Publishing.
- Klijn, J.A., Berthe, F., Wijermans, M. & Ypma, K.W., 1999. Landscape assessment method at a European level: a case study of polder landscapes. Report 173. Wageningen: Winand Staring Centre.
- Koussis, M., 2001. Tourism and the environment in Corsica, Sardinia, Sicily and Crete. In: D. Ioannides, Y. Apostolopoulos & S. Sonmez, eds. *Mediterranean islands and sustainable tourism development: practices, management and policies*. London: Continuum Publishers, pp.214-233.
- Koutoulas, D., 2008. The Mediterranean tourism market. In: N. Hazendonk, M. Hendriks & H. Venema, eds. *Greetings from Europe: landscape & leisure*. Rotterdam: OIO Publishers.
- Lickorish, L.J. & Jenkins, C.L., 2004. *An introduction to Tourism*. Athens: Kritiki.
- Matvejevic, P., 1999. *Mediterranean: a cultural landscape*. Berkeley: University of California Press.
- Minca, C., 1998. Mediterranean metaphors and tourist space: a theoretical approach. In: S. Conti & A. Segre, eds. *Mediterranean geographies*. Roma: Societa Geographica Italiana & CNR, pp.257-274.
- Norton, A., 1996. Experiencing nature: the reproduction of environmental discourse through safari tourism in East Africa. *Geoforum*, 27(3), pp.355-373.
- Perry, A.H., 1997. Recreation and tourism. In: R.D. Thompson & A.H. Perry, eds. *Applied climatology: principles and practice*. London: Routledge, pp.240-248.
- Pettifer, J., 1993. *The Greeks: the land and people since the War*. London: Penguin Books.
- Rackham, O. & Moody, J.A., 1996. *The making of the Cretan landscape*. Manchester: Manchester University Press.

- Raptis, N. & Terkenli, T.S., 2000. The role of elementary education in the construction of cultural geographies: the case of the oblivion of the Aegean. In: *Proceedings of the International Conference on Sustainable Development in the Islands and the Roles of Research and Higher Education*. Rhodes, 29 May- 4 April 1998. Namur: Prelude.
- Relph, E., 1976. *Place and placelessness*. London: Pion.
- Sancar, F.H. & Koop, T.T., 1995. Proposing a behavioural definition of the 'vernacular' based on a comparative analysis of the behaviour settings in three settlements in Turkey and Greece. *Journal of Architectural and Planning Research*, 12(2), pp.141-165.
- Stefanou, J., 2000. The contribution of the analysis of the image of a place to the formulation of tourism policy. In: H. Briassoulis & J. van der Straaten, eds. *Tourism and the environment: regional, economic, cultural and policy issues*. Revised 2nd Edition. Dordrecht: Kluwer Academic Publishers, pp.229-237.
- Terkenli, T.S., 2005. Human activity in landscape seasonality: the case of tourism in Crete. *Landscape Research*, 30(2), pp.221-239.
- Terkenli, T.S., 2000. Landscapes of tourism: a cultural geographical perspective. In: H. Briassoulis & J. van der Straaten, eds. *Tourism and the environment: regional, economic, cultural and policy issues*. Revised 2nd Edition. Dordrecht: Kluwer Academic Publishers, pp. 179-202.
- Terkenli, T.S., 2001. Towards a theory of the landscape: the Aegean landscape as a cultural image. *Landscape and Urban Planning*, 57(3-4), pp.197-208.
- Terkenli, T.S., 2002. Landscapes of tourism: towards a global cultural economy of space. *Tourism Geographies*, 3, pp.227-254.
- Terkenli, T.S., 2004. Tourism and landscape. In: A.A. Lew, C.M. Hall & A.M. Williams, eds. *A companion to tourism*. Oxford: Blackwell Publishing, pp.339-348.
- Terkenli, T.S. & d'Hautesserre, A.M. eds., 2006. *Landscapes of a new cultural economy of space*. Dordrecht: Springer.
- Tsartas, P., 1989. *Social and economic impacts of tourism development on the Prefecture of Cyclades and especially on the islands Ios and Serifos, during the period 1950-1980* (In Greek). Athens: EKKE.
- Tress, B. & Tress G., 2001. Capitalising on multiplicity: a transdisciplinary systems approach to landscape research. *Landscape and Urban Planning*, 57(3-4), pp.143-157.
- Tuan, Y.F., 1982. *Segmented worlds and self: group life and individual consciousness*. Minneapolis: University of Minnesota Press.
- Vogiatzakis, I.N., Mannion, A.M. & Pungetti, G., 2008. Introduction to the Mediterranean island landscapes. In: I.N. Vogiatzakis, G. Pungetti & A.M. Mannion, eds. *Mediterranean island landscapes: natural and cultural approaches*. Landscape Series Vol. 9. New York: Springer, pp.3-14.
- Williams, A., 1997. Tourism and uneven development. In: R. King, L. Proudfoot & B. Smith, eds. *The Mediterranean: environment and society*. London: Arnold.



CHAPTER 13

Evolution and management of landscapes on Mediterranean minor islands: case studies from the Tuscan Archipelago (Italy) and Comino (Malta)

Alex Camilleri, Isabella Colombini and Lorenzo Chelazzi

13.1 Introduction

Environmental management relies on comprehensive understanding of the relevant site context, for the purpose of identifying appropriate objectives and strategies to address local issues. In the case of small inhabited islands of only secondary importance on a national/regional scale, insular conditions, degree of affinity with the mainland and specific local factors combine to shape the physical environment and its socio-economic milieu. Intertwined macro- and micro-scale issues, physical isolation and self-containment present both opportunities and difficulties for sustainable management of minor Mediterranean islands. This contribution seeks to explore some of the underlying geographic, natural, historic and socio-economic aspects, using the Tuscan Archipelago in Italy and the island of Comino in Malta as case studies.

13.2 The Tuscan Archipelago (Arcipelago Toscano)

13.2.1 Geographical context

The Tuscan Archipelago is located between Tuscany and Corsica, and consists of seven main islands and various minor islets. The main islands are, from

north to south, Gorgona, Capraia, Elba, Pianosa, Montecristo, Giglio and Giannutri (Figure 13.1 and Table 13.1). Gorgona, Pianosa, Montecristo and Giannutri are wholly incorporated within the Tuscan Archipelago National Park, established by a Presidential Decree dated 22 July 1996, whilst Capraia, Elba and Giglio are currently only partly within the confines of the Park.

The Archipelago is noteworthy among the numerous island groups that surround the Italian coast, for various reasons, including: (i) its location at the interface between different Mediterranean climates and ecosystems, and (ii) its accessibility from the mainland, which favoured the historic establishment of urban settlements and complex travel routes, as well as the development of intensive touristic activity in more recent times. In fact, it is strategically located along the maritime commercial and touristic routes of the Tyrrhenian Sea, especially those between Corsica, Sardinia and the Italian peninsula. The ensuing flows of human activity should not be underestimated when evaluating the varied range of environmental and settlement patterns on the individual islands, namely:

1. pristine conditions with extremely limited human interference on Montecristo;
2. increasingly serious environmental

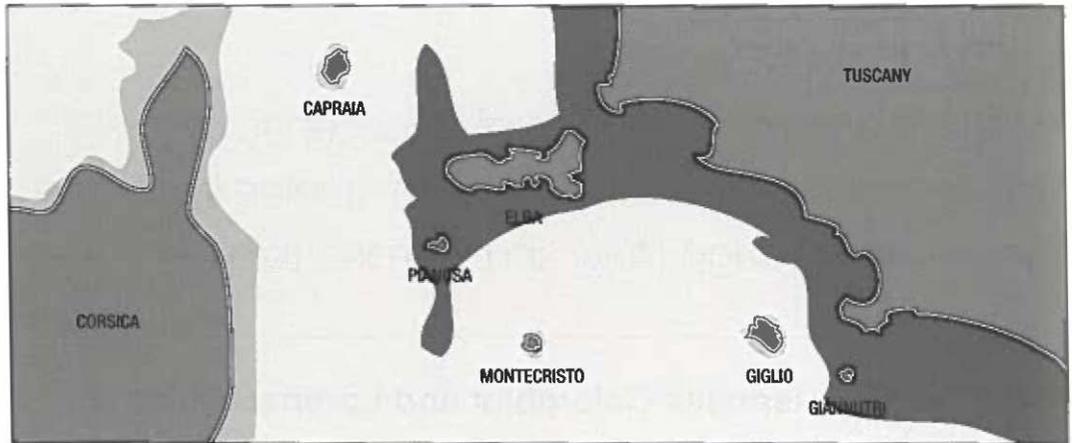


Figure 13.1: Tuscan Archipelago: Present-day dry land (dark grey), and extent of Würm landmasses (areas delimited by present 100 m bathymetric contour, light grey).

Source: Modified from Bossi *et al.*, 2000

3. intermediate situations with a precarious balance due to development in a delicate context, as seen on Capraia and, on a smaller scale, on Giannutri (the latter only supports a small number of private houses and a landing strip for small aircraft);
4. indeterminate land uses arising from the after-effects of abandonment of previous facilities, as on Pianosa; and
5. controlled land use scenarios, as in the case of the still-active prison establishment and agricultural colony on the island of Gorgona.

This account does not analyze, except marginally, the situation on Elba. The environmental issues relevant to this island are altogether different from those in the others, as a result of its closeness to the mainland, and of its larger size. This has led to its numerous urban settlements, its well-developed road network, and its diversified economy.

13.2.2 The origins and geology of the Archipelago

The geological complexity of the islands provides particular evidence of the events that led to the formation of the Tuscan Archipelago (Ambrosetti *et al.*, 1979), which dates back to the Triassic (230-240 My). Following divergent movements, the lithosphere became progressively thinner, to the extent that it broke into two large plates, the proto-European and the proto-African plates. The complex alternation of divergent and convergent movements of these two landmasses relative to each other led to the formation of the Alps and then to the northern Apennine range, to which the development of the Tuscan Archipelago is intimately linked. Around 10 million years ago, melting of rocks occurred and the resulting magmas rose toward the land surface, triggering a series of volcanic eruptions that formed the base of the island of Capraia (between 9 and 4.5 My). In other cases, the magmas remained trapped at a certain depth within the Earth's crust, where

Island	Width (km)	Length (km)	Perimeter (km)	Area (km ²)	Max. height (m a.s.l.)	Inhabitants (no.)	Pop. density (no/km ²)	Province
Gorgona	1.5	2.15	10	2.23	252	300*	135	Livorno
Capraia	4.0	8.0	30	19.3	445	380	20	Livorno
Elba	18.0	27.0	147	223.5	1019	35000	157	Livorno
Pianosa	4.6	5.8	26	10.2	29	5*	<1	Livorno
Montecristo	3.5	3.5	16	10.4	645	3*	<1	Livorno
Giglio	4.0	8.7	28	21.2	496	1400	66	Grosseto
Giannutri	0.5	2.6	11	2.6	93	20	8	Grosseto

*The number of inhabitants on Gorgona includes the approx. 50 residents and the prisoners. Pianosa is inhabited by prisoner-workers from the prison at Porto Azzurro (Elba), whilst Montecristo is only inhabited by the national forestry service (*Corpo Forestale dello Stato*) wardens who manage the island.

Table 13.1: Data about the main islands of the Tuscan Archipelago.

their slow cooling formed the granitic masses that today emerge at Monte Capanne (Elba) and on the islands of Montecristo and Giglio. These magmatic events were also associated with the development of significant metamorphic phenomena that affected pre-existing rock formations and led to current configuration of the island of Gorgona.

During the oscillations in sea level resulting from glacial and interglacial periods, the whole of the Tuscan Archipelago was affected by submergence and emergence phenomena. At the start of the Pliocene (circa 5.2 My), sea level rise toward the Apennine range created numerous new islands that were connected again to the mainland as a result of sea level retreat at the end of the Pliocene (circa 2 My) (Lanza, 1984). The formation of Pianosa, the youngest island in the Archipelago, made up of sedimentary rocks and seashell accumulations, dates back to this period. During the Würmian glacial period (circa 75,000-11,000 years ago), the sea level dropped to as much

as 100m below the current level and Elba was joined to the mainland and to Pianosa, leaving only Gorgona, Capraia, Montecristo, Giglio and Giannutri as islands (Ambrosetti *et al.*, 1979) (Figure 13.1). Subsequently, the sea level started to rise again slowly, until it reached the current level, thereby producing an archipelago of seven islands.

The Tuscan Archipelago presents a mineralogical and minery heritage of considerable importance, known and exploited economically since ancient times. Whilst the island of Elba is undoubtedly the most important and best-known area, mineral deposits also occur on the islands of Montecristo, Giglio and Giannutri (Carobbi & Rodolico, 1976; Orlandi & Pezzotta, 1996). On Elba, on the basis of geological layout and mineralogical characteristics, it is possible to distinguish two main typologies of iron-bearing deposits: haematite and magnetite. Some of the intrusive plutonic formations of the Archipelago are crossed by aplitic layers within which one finds

crystals of tourmaline, topaz, beryl, garnet and other more or less rare species. On Giglio, one can find pyrite lenses and small veins of multi-metal sulphides. Such mineralization, similarly to what is encountered in southern Tuscany, can be traced back to the hydrothermal phenomena of the final phase of Appenninic orogenesis. The superficial alteration of the pyrite mass has produced a limonitic and alunitic covering layer from which alum used to be extracted in the past.

13.2.3 Climate and hydrology

The climate of the Tuscan islands is predominantly determined by a Mediterranean-type atmospheric circulation system, characterized by an alternation of air masses of tropical origin in summer and others of maritime polar origin in winter, with intermediate spring and autumn seasons. On Elba, the well-developed orography and the presence of some high peaks result in a more complex climatic regime. The total solar radiation, as measured on the stations on Elba and Pianosa, is equivalent to 375 and 351 cal/cm²/g respectively. These are very high values, higher than those for mainland Tuscany and other coastal centres of southern and insular Italy. Elba's average annual temperature hovers around 15°C, and is related to the mild winter and temperate summer seasons (mean winter and summer temperatures: 8-9.5°C and 22-23°C respectively). However, at Monte Capanne, altitudes higher than 1000m frequently result in a lowering of temperature to below 0°C, whilst the higher temperatures are mainly relevant to the coastal zones, located at lower altitudes and under the sea's constant influence. The annual thermal variations, which are of about 16°C and vary according to altitude and distance from the sea, are less than those registered at the same distance from the coast in mainland Tuscany. All in all, there is a rise in temperatures from North towards South.

Rainfall patterns follow a typical Mediterranean trend and are relatively homogeneous across

the whole territory, peaking in autumn-winter and reaching their minimum period in summer. Around Poggio Elba, one of the stations with most rainfall, orographic precipitation adds to cyclonic rainfall patterns and amounts to a total of 940 mm annually, in contrast to 556 mm at the city of Portoferraio. The mean rainfall, calculated for the time period between 1957 and 1996, has shown an alternation of very rainy periods and others of extreme drought. Evapotranspiration rates are generally higher than rainfall rates, with a consequent water deficit in summer and a recharge of hydrological resources in winter. The issue of water resource availability is common to all the islands of the Archipelago, due to the restricted aquifers and the limited extent and ephemeral/torrential character of its surface water flow. In fact, the modest size of the watersheds and the steeply sloping watercourses are the main factors that lead to extremely rapid water accumulation and flash floods after high-intensity rainstorms of even short duration. For example, in September 1992 heavy rainfall and a sea tornado caused a torrent that descended from Colle dei Lecci on Montecristo island and carried 40,000 tonnes of material into the sea in a single night, forming a 40m-deep, 100m-wide beach at Cala Maestra (Plate 13.1).

13.2.4 Floristic aspects

The level of knowledge concerning flora is not homogeneous across the islands of the Tuscan Archipelago (Paoli & Romagnoli, 1976; Arrigoni & Di Tommaso, 1981; Filipello & Sartori, 1983; Foggi & Grigioni, 1999); however on the basis of current knowledge, the floristic diversity of the islands, based on the number of species of vascular plants, can be summarized thus (Fossi Innamorati, 1983, 1989, 1990, 1994; Bocchieri, 1995; Garbari & Borzatti von Loewenstern, 2005) (see also Figure 2). An analysis of the endemic taxa indicates that these are predominantly sub-specific or are

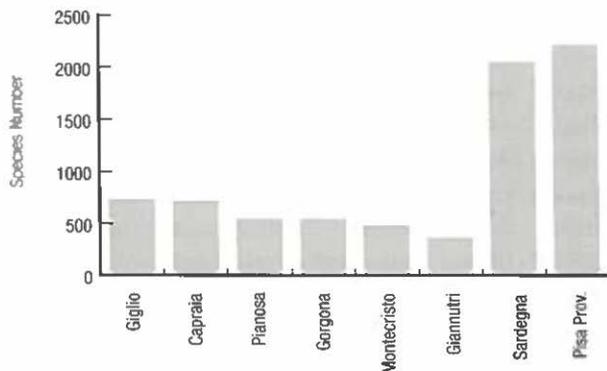


Figure 13.2: Species number of vascular plants in the minor islands compared to those of Sardegna island (24090 km²) and of the Pisa province (2444 km²).

species that are only weakly differentiated from the corresponding species on Sardinian-Corsican or Tyrrhenian lands, illustrating the bridging of the Tuscan Archipelago with the Sardinian-Corsican landmass and the Italian mainland. Generally, analysis of the individual islands' flora identifies Capraia and Montecristo as belonging to the Sardinian-Corsican domain, and the other islands to the Ligurian-Tyrrhenian domain of the Italian peninsula.

Among the plant species present in the Tuscan Archipelago, one also encounters invasive exotic species with a potential for competition with the native flora, which therefore tend to create new interactions and equilibria in the overall vegetation patterns as niche space is filled. The species that has proven to be most invasive in the archipelago is *Ailanthus altissima*, especially on Montecristo and Capraia (Plate 13.2). Also locally invasive are *Carpobrotus acinaciforme* and *Agave americana* in the coastal areas, *Opuntia ficus-indica*, some species of *Acacia* and various other exotic ruderals. Widespread among these are *Oxalis pes-caprae* in the olive groves and *Senecio mikanioides* in the uncultivated meadows and within the garrigues.

On the basis of their geographic and phytoclimatic position, the islands of the

Archipelago are predominantly characterized by evergreen Mediterranean sclerophyllous vegetation types that are more or less xerophytic. In fact, on average, the low height of the islands is not conducive to significant variations in the vegetational characteristics. Human interference along the centuries has drastically reduced the original forest cover in favour of degradational seres, cultivated lands, afforested areas and ornamental gardens. The current vegetational situation in the Tuscan Archipelago is a mosaic of predominantly human-influenced typologies: (i) zonal vegetation, determined mainly by local climatic conditions and more or less modified by human action, and (ii) azonal vegetation, determined mainly by the particular ecology of the site (Plates 13.3 and 13.4).

The evergreen sclerophyllous high woodlands are all that is left of the original forest; these are rare and occupy limited areas due to repeated fires followed by grazing. The maquis and low matorral-like evergreen woodlands are the degradational seres of the evergreen forest. On Montecristo, the intensity of grazing by feral goats has resulted in abnormal dominance of the unpalatable *Erica arborea*.

After repeated fires, followed by erosion and runoff-induced denudation, higher levels of degradation

are reached, characterized by infiltration of sun-loving species. Thermophilous coastal woodlands (*Myrto-Pistacietum lentisci*, *Phillyreo angustifoliae-Juniperetum turbinatae* and *Teucrio-Juniperetum phoeniceae*) are present on all the islands; they often occupy coastal slopes and conserve characteristics associated with human absence. The destruction of the evergreen sclerophyllous forest cover, frequently accompanied by land degradation and soil erosion, favours the establishment of numerous sun-loving species with a low-maquis or garrigue aspect. Among these, two groups can generally be distinguished: silicicoles and calcicoles. The calcicole groupings, usually highly xerophytic, often belong to the phytosociological associations *Rosmarinetea*, whereas the silicicoles often correspond to the *Cisto-Lavanduletea*. In an area where the potential climax is made up of woody species, the therophytic meadows represent the last stage of the anthropogenic degradation cycle caused by eradication, cultivation, fires and repeated intensive grazing.

Cork oak woodlands (*Quercus suber*) are present on Giglio, Gorgona and Capraia, apart from Elba, where the species is thought to be native (Gatteschi & Arretini, 1989). The cork oak is present as a dominant tree in the heath and *Arbutus unedo* maquis, or else is found together with the holm oak in the *Viburno-Quercetum ilicis* association. Deciduous broad-leaved woodlands are hardly present in the whole Archipelago and are represented by chestnut groves that were probably planted in place of the original mesophytic holm oak copses. The chestnut tree was introduced into the Archipelago in ancient times (Gatteschi & Arretini, 1989), and chestnut woodlands are currently present on Giglio and Gorgona as small localized populations. Currently, pine woodlands (*Pinus pinaster*, *P. pinca* and *P. halepensis*) are present on Capraia, Giglio, Gorgona, and Pianosa. On Montecristo, one finds *P. halepensis* and *P. pinca*, and on Giannutri only *P. halepensis*. It is likely that none of the pine species is native to the

Archipelago. Their widespread distribution arises from the afforestation projects of the 20th century, mostly carried out between 1950 and 1970.

Analysis of the important habitats and plant communities from a landscape perspective cannot be dissociated from what we have seen about the vegetation types present in the Archipelago and the general trends in the vegetation cover. Overall, forest habitats are scarce and frequently damaged by fire. Over the centuries, the use of much of the territory for grazing and the resident populations' need for firewood resulted in the almost complete disappearance of the forest cover by the start of the 20th century, with serious soil deterioration throughout. In more recent times, the strong decline in grazing and the progressive abandonment of extensive agricultural lands have inverted the declining trend in forest cover. However, the fire risk remains, especially as a result of increased touristic-recreational use in summer.

The coasts of the Tuscan Archipelago are predominantly rocky and prone to the effects of marine aerosols. Beyond the maximum level reached by marine waves, the first vegetation is necessarily composed of a few halophytic species of lithophiles and aerohaline chasmophiles. Due to the coastal morphology of the islands, beach dune systems are rare and, where existent, the psammophytic vegetation of the coastal dunes was mostly destroyed or impoverished due to human impact. Today, such vegetation is absent from Gorgona, Capraia, Montecristo, Giannutri and Giglio. Only Pianosa retains some more or less degraded relics of this vegetation type. In all instances, the psammophiles of the more landward dunes and hind-dunes are missing. As we have seen, the islands of the Archipelago are practically devoid of perennial water resources and consequently freshwater vegetation made of floating-root hydrophytes and marshland helophytes and hygrophytes is extremely rare. One rare example

in the *Stagnone di Capraia* (Foggi & Grigioni, 1999; Foggi *et al.*, 2001).

Notwithstanding its insular fragmentation, the Tuscan Archipelago acts as a bridge between the Sardinian-Corsican floristic domain and the Italian peninsula. Sardinian-Corsican character is most evident in the westernmost islands; similarly, the easternmost islands are affected more by peninsular influences. Nevertheless, the phytogeographical evaluation of these islands is overshadowed by the profound modifications inflicted by human impact. Indeed, the original forest communities have been almost all completely eliminated, with drastic changes in the environmental and landscape context. This has had important repercussions on the undergrowth vegetation (nemoral, mesophytic and sciaphytic flora), which has been largely displaced and substituted by sun-loving low shrubs and herbaceous plants. In parallel, the islands' vegetation has suffered from the influence of invasive exotic species, introduced deliberately or accidentally by the human agency.

13.2.5 Faunistic aspects

The terrestrial and freshwater-aquatic invertebrate fauna of the Tuscan Archipelago is composed of five main elements:

1. endemic species derived from Palaeotyrrhenic, Sardo-Corsican, western Mediterranean and northern Appenninic populations;
2. elements of Sardo-Corsican biogeography;
3. elements of western-Mediterranean distribution;
4. relicts of particular ecological situations; and
5. frigidophilic elements (evidence of Quaternary displacement toward south-west during the last glaciations).

In terms of invertebrate populations, the main islands of the Archipelago are easily grouped into two distinct clusters, one (Elba, Pianosa, Gorgona and Giglio) with predominant Tyrrhenic-Appenninic affinity, and the other (Capraia and Montecristo) with greater Sardo-Corsican affinity (Baccetti B., 1976; Bernini, 1976; Dallai, 1976; Gardini, 1976; Giusti, 1976; Marcellino, 1976; Minelli, 1976). In the islands with greater environmental diversity and greater spatial extent and/or altitude (Capraia, Elba, Montecristo and Giglio), the presence of heterogeneous environmental conditions (a marked zonation into altitude bands) and the primary presence of numerous springs and small water bodies has permitted a colonization by invertebrates of extremely varied biogeographical origin and environmental typology. In this context, the relative proximity to the mainland and the 'stepping stone' effect have rendered the Tuscan Archipelago one of the richest and most diverse island areas in the western Mediterranean (*cf.* other islands of the Tyrrhenian basin and circum-Sicilian islands).

The Tuscan Archipelago's herpetofauna consists of 5 species of anuran amphibians and 12 species of reptiles (1 tortoise, 7 lizards, 4 snakes); none of these is endemic. Five species have a pan-European distribution, four have an Appenninic distribution, three have a Tyrrhenian distribution, another three are of Euro-Centroasian distribution, and the last two species have a holo-Mediterranean distribution. According to recent studies (Zuffi & Bonnet, 1999), *Vipera hugyi* was imported into Montecristo in relatively ancient times. The island with most species (3 amphibians, 12 reptiles) is Elba; in terms of size, it is much larger than the others and consequently has greater habitat diversity.

From an ornithological perspective, the islands of the Tuscan Archipelago harbour numerous species of particular importance at both national

and community level (Tellini Florenzano *et al.*, 1997). In total, the islands of the Archipelago are the nesting site of circa 70 species which make up 40.6% of the species that breed regularly in Tuscany. The total number of wintering species is 75, equivalent to 43% of the wintering species in Tuscany. Yet the greatest importance of the Archipelago from an ornithological perspective is its role during migration, especially in spring. In fact, for successful migration toward their summer stations in Europe, many bird species from sub-Saharan regions depend on habitat integrity and food availability along their migratory route. This has been demonstrated by studies carried out between 1988 and 1999 by ornithologists from the *Istituto Nazionale della Fauna Selvatica* on Giannutri, Montecristo and Capraia, and ecologists from the *Istituto per lo Studio degli Ecosistemi del C.N.R.* on Montecristo (Baccetti *et al.*, 1990).

According to current knowledge, the islands of the Tuscan Archipelago support at least 32 different mammalian species, and species richness is similar to that encountered in other Italian minor islands (Amori *et al.*, 1993; Spagnesi & Toso, 1999), except for the Artiodactyla which are particularly well-represented here. All the ungulate species present in the islands have been introduced by man. These interventions started off in ancient times, probably for pastoral purposes, as in the case of the Montecristo goat, and continued up to recent times, mainly for hunting purposes. In some instances, as in the case of the Montecristo goat, such introductions have heavily influenced the evolution of the islands' phytocoenosis. The origin of the Montecristo goat (*Capra aegagrus hircus*) population is not known with certainty. Some authors link it with the introduction of the Asiatic *Capra aegagrus*, at the time of its domestication in the Neolithic, from the Middle East into the Mediterranean islands, from the VII-VI millennium B.C.

onwards. Some of these populations, including that of Montecristo, are thought to have survived till today, reinforced by later (and even relatively recent) introductions. Other populations, as in the case of Giglio and Capraia, disappeared in historical times. The repeated introduction of new stock on Montecristo is probably the underlying reason for the genetic variation of this population, which is higher than in some domestic breeds. Furthermore this population exhibits morpho-phenotypic similarities to the populations of Crete and the Aegean Islands and to the Asiatic *C. aegagrus*. The changes in the Montecristo goat throughout human history are poorly documented. Nevertheless, it appears that the population, which was the target of hunting activity and poaching, was rather small until the 1950s, when it was even thought to be in danger of extinction. In the 1970s, after it had been protected from hunting and poaching, the population started to increase and was estimated at 270-350 head by the mid-1970s, and at 770 head in 1992. In recent years, the population has been kept under control through culling operations conducted by the *Corpo Forestale dello Stato* in collaboration with the *Istituto Nazionale della Fauna Selvatica*.

13.2.6 Human impact

In the Tuscan islands, notably Elba and Pianosa, the environment has been influenced and modified by man at least since the Copper Age (IV-III millennium B.C.). Greek literary sources, from the 8th century B.C. onwards, considered the Tuscan Archipelago as a water resource. In effect, as inferred from the study of old shipwrecks in the upper Tyrrhenian Sea, the islands of the Archipelago had a role as 'navigation assistants'. Colonizers and navigators from Greece or Asia Minor (especially between the 8th and 6th century B.C.), needed a series of resting places where they could find food and water. Between the 9th and 8th century B.C., after the Etruscans started developing

cities instead of villages, Elba appears to have been progressively depopulated. Subsequently, the islands of the Archipelago were assigned individual names (Elba was called Aethalia, Capraia Aigilon, etc.) and their geographical significance became firmly established. Iron resources on Elba were exploited by mainland Populonia and no important permanent settlement was established on the island, since the coast between the Italian mainland and Corsica was an 'Etruscan lake'. Matters changed considerably in the 5th century B.C. when, with the progressive waning of the Etruscan maritime power, the major city-states of Magna Graecia and Sicily started venturing into the Tyrrhenian Sea. This new situation forced *Populonia* to fortify the coast, including Elba and the minor islands, by constructing a network of strategically-located small fortifications that would guarantee control over the mercantile routes whilst also defending the landing places and mineral extraction sites. This effectively closed off and militarized the islands, since the fortresses were laid out in a manner that provided complete visual coverage over the whole tract of sea surrounding the islands. Even on Capraia, Gorgona, Montecristo and Giglio the landing points were strengthened. This period, which coincided with intense shipbuilding, construction and metalworking activity on the mainland, saw very intense environmental impact due to continuous and extensive logging at the expense of the wooded areas that were present on all the islands.

Even after the advent of Roman military power (3rd-2nd century B.C.), the Tuscan islands' fortifications were retained, to protect the Etruscan coast against attacks from Carthaginian bases in Sardinia. However, between the 3rd and 1st century B.C., the islands' fortified and strategic aspect became less important. The fortresses became nuclei around which new agricultural settlements were developed, and Elba became self-

sufficient in terms of food resources. In the case of the other islands, the situation was more complex. The islands, relatively rich in water but spatially restricted, could only satisfy the needs of limited human communities, and they continued to play only a minor role as steppingstones in the system of Tyrrhenian sea-routes. This phase lasted until well into the first half of the 1st century B.C. Meanwhile, the fortresses were progressively abandoned in favour of more open coastal settlements. From the 1st century B.C. onwards, imposing and luxurious maritime villas were constructed on the islands - at least three on Elba, two on Pianosa, and one each on Capraia, Gorgona, Giglio and Giannutri. The maritime villas were originally intended for use as country-houses, and they were equipped with baths, gardens, gymnasia and coastal bathing facilities. In order to generate some income, they also reared a number of valuable species of fish which would then be sold in nearby markets.

This situation did not last long and the maritime villas, too costly to run and maintain, especially on the minor islands, were soon abandoned. The extractive and metalworking industries also declined and the coastal landscape saw the development of new inhabited agglomerations. On the Tuscan islands, as in the case of all Roman Italy, people sought to live in settlements that, even if too small to be considered as cities, still had their places of worship, markets, and social life. Sites of this type have been identified around the re-utilized maritime villas on Elba, Capraia, Pianosa and Giglio. These new settlements, between the 1st and 3rd century A.D., were at the centre of the important goods trade and played an important role in the islands' transition into late antiquity.

Thriving mercantile activity declined rapidly with the onset of the Vandalic incursions of the mid-5th century A.D. The communities survived and were christened, and the islands (formerly a country retreat) became places of meditation and worship.

A first community of Basilian monks established itself on Capraia in the latter half of the 4th century and other monasteries were set up on Gorgona, Montecristo (Plate 13.4) and Pianosa.

The monks gave a new look to the island landscapes. Near the coast, they developed fishing-related structures, whilst in the islands' interior they built churches and oratories, and terraced the land to create orchards, vineyards and olive groves. After the long, dark early-mediaeval phase (6th-10th century), an important revival came with the Archipelago's entry into the sphere of influence of the maritime Republic of Pisa, except for the island of Capraia which formed part of the Genoese dominions. The 11th century saw the return of Elba's dual role, as a military outpost for the control of the Tyrrhenian Sea and (together with Giglio) as a mineral resource extraction site. The clashes between Genoa and Pisa for maritime supremacy in the Mediterranean culminated in the battle of Meloria, in 1284, which saw the total rout of the Pisans. Thereafter, the inhabitants of the Tuscan Archipelago, who had remained faithful to Pisa, faced a new phase of decline between the 14th and 15th centuries which even degenerated into a state of famine. This led to the almost total depopulation of the islands. The Archipelago then became the property of numerous feudal lords who from time to time would decide to sell the islands. Meanwhile, intent on keeping Spanish power at bay, France sought the help of Barbarossa, who ransacked the islands twice in ten years and took many islanders into slavery. With the rise of Cosimo I de Medici, who was determined to defeat the pirates, Elba experienced a new phase of prosperity but this was not shared by the other islands, smaller and remoter, which continued to face piratical raids. In 1561 after several attempts, the Order of Santo Stefano was founded, when pope Pius IV came to power. The Order had rules similar to those of the Gerosolimitan Order, aimed at fighting the Turks and Mediterranean pirates especially in the Tyrrhenian Sea where Cosimo had recently founded the new city of Livorno (Leghorn).

After the 1553 assault, Pianosa never recovered and remained almost completely uninhabited. During the 18th century, the Archipelago was claimed by various European powers, and experienced an alternation of French, Italian, Spanish and even English masters, until in 1803 Elba and some of the minor islands became part of Napoleonic France. As from 1814, Napoleon changed Elba's set-up, upgrading its public infrastructure and constructing palaces and villas, with the islanders' approval. In the same period, the landscape of Pianosa was transformed as an attempt to render it more amenable to cereal cultivation.

Meanwhile, Capraia registered a sharp drop in population from 1800 inhabitants in 1790 to 500 in 1817, and a freeport and a tobacco manufacturing enterprise were established to address the problem. In 1856, the Lorena transformed Pianosa into a prison, thereby creating Italy's first agricultural penal colony and necessitating the construction of numerous ancillary structures that radically changed the landscape particularly in the south-eastern part of the island near the small inhabited area (Plate 13.5). After the unification of Italy, other similar colonies were established on Capraia and Gorgona. During this period, a lighthouse was constructed on Giannutri, which had remained uninhabited for numerous years and there was an unsuccessful attempt to establish agricultural activity on the island. Their status as a penal agricultural colony had a profound effect on the future landscape of the three islands, especially because other interventions and public access were limited, at least until the establishment of the National Park of the Tuscan Archipelago in 1996. On Capraia, the prison was closed down in 1986 and all the structures, which remained state property, were abandoned. In November 2008, the Italian Supreme Court (*Corte Suprema di Cassazione*) has decreed that the estates (1500ha, almost 78% of the whole island) and buildings that once belonged to the now-disused penal

colony, and which are Government property, are to be allocated for civil use under the ownership of the individual residents of Capraia, and that the property is to be managed by the island's commune. On Pianosa, the penal colony was closed down and reopened as a high-security prison at the start of the 1990s after the construction of cumbersome structures. Its definite closure in 1998 was followed by years of abandonment and institutional conflicts on the island's fate. On the other hand, the penal colony on Gorgona is still functional and highly productive in terms of both agriculture and fish-farming.

The islands of Giannutri, Montecristo and Giglio had an entirely different fate. Giannutri came under private ownership in the early 1900s; it then changed ownership repeatedly and was practically abandoned, until in the 1960s, it was affected by land parcelling and villa construction and the development of an airstrip for small aircraft, which resulted in considerable environmental destruction. Montecristo was acquired in the mid-19th century by the English botanist G. Watson Taylor who, apart from constructing a villa and its ancillary facilities, created a sort of botanical garden and introduced numerous alien species into the islands including the tree of heaven (*Ailanthus altissima*). After becoming a hunting reserve of the Italian royal family, in the 1960s it was threatened by pressures for the development of an exclusive touristic nautical club. It then passed under the stewardship of the *Corpo Forestale dello Stato* instead, and was declared a land-based Nature Reserve and a European Biogenetic Reserve, and eventually it was incorporated into the National Park. In the case of Giglio, the end of the 18th century and the cessation of corsair raids brought about more socio-political stability, which favoured demographic and economic recovery. The economy came to depend on the resumption of agriculture (especially viticulture) (Plate 13.6), the commencement of mineral

exploitation at Campese, and the reopening of granite quarries. After closure of the pyrite mine in 1962, tourism (Giglio's mainstream activity today) took off. This island, the only one among the minor islands to have historically consolidated settlements (Giglio Porto, Giglio Castello and Campese) is nevertheless completely dependent on the mainland. Tourist influx, which is ten times greater than the resident population, has resulted in considerable urban sprawl, at an even higher rate than the rest of the province of Grosseto. Currently, the demand for local products has acted as an incentive for the resumption of viticulture for the production of wine of certified local origin (*Denominazione di Origine Controllata*, DOC), which in turn has reinstated a small fraction of the island's old terraced vineyards.

13.2.7 Management issues

Whilst, from a strategic perspective, the Tuscan Archipelago should be considered as a single system (the *Parco Nazionale dell'Arcipelago Toscano*), the positions and roles of the individual islands present different characteristics that are not only geographical but also historic, landscape-related and institutional. Furthermore, the northern islands, which form part of the province of *Livorno* (Leghorn), are closely linked in terms of both access arrangements and resource planning, whereas the islands of Giglio and Giannutri have a greater relation with the events on the nearby coast of the mainland province of Grosseto. The current landscape aspect of the Tuscan islands is the product of profound historic transformations, which occurred more or less rapidly along the centuries till today, and which eventually became stabilized.

The management of these islands requires particular attention, taking into account three fundamental factors: (i) the naturalistic aspect, (ii) the historical and landscape aspect, and (iii) the economic aspect, which depends on the first two. Whilst, in theory,

the Archipelago's almost complete inclusion in a national park guarantees nature-, landscape- and heritage-oriented management of the land territory, certain management initiatives (even some of those implemented with Community assistance) are highly questionable. One example is the rat (*Rattus rattus*) extermination campaign, targeted very narrowly at the improved reproductive success of some marine or rupestral bird species and based on the use of baits that contain second-generation anticoagulants such as brodifacoum (Anon., 2007). In fact, this substance is mainly administered not through the distribution of closed plastic packets but rather through high-altitude discharge from helicopters. The direct and indirect effects on other vertebrates are not fully clear, whilst nothing at all is known of the effects on other terrestrial (worms and arthropods), marine and coastal fauna. Other doubts arise with respect to interventions carried out (once again, as part of the project for conservation of marine or rupestral birds) on the arboreal vegetation, especially the phasing out of *Aleppo* pines in order to reinstate the natural character of the island of Pianosa without taking into account its history (the island has been inhabited for the last 5000 years) and its landscape which, even if currently abandoned, is conspicuously agricultural.

There is an evident trend towards basing the islands' economy predominantly on tourism, as in the case of the whole coastal stretch of the nearby mainland. This drive, especially in spatially constrained contexts such as that of the Tuscan islands, should be oriented towards the safeguarding of local natural and landscape characteristics, and should be regulated accordingly. The main critical factors of concern identified within the Archipelago can largely be traced back to touristic activity that is geared toward unsustainable quick-income economic investment, and which overlooks the predominantly non-renewable nature of the physical resources that make up the site environment and landscape. Such tourism, especially that based on beach activity, is characterized by seasonal exploitation of resources.

The provision of lodging is a supplementary activity to tourism, comprising primarily agrotourism and bed-and-breakfast accommodation; seasonally concentrated demand favours the charging of higher tariffs. A distinction should be made between seasonally-intensive beach tourism that tends to overwhelm the islands during peak months, and cultural-naturalistic tourism which is spread over longer periods and is less spatially intensive. Tourism activity requires infrastructure (road network, accommodation, urbanization, etc.) and services (internal connections, links with the mainland, potable water supply, wastewater treatment, waste collection and disposal, fire-fighting services, health services, wardening and site monitoring, etc.) which if concentrated in a restricted time period become intensified to the point of invasiveness and unsustainability. Conversely, cultural-nature tourism that is more diluted over time can be sustained at the same scale, in a manner that is less environmentally-impacting and more easily controlled.

If the sustainable management of this territory is to be guaranteed, in the first place site managers should be full-timers, unhindered by fashionable amateur-environmentalism and ideological conditioning, and professionally knowledgeable about the initiatives required to promote naturalistic/cultural tourism and sustainable maintenance of these particularly delicate environments. Moreover, any strategy adopted would be more successful through effective consultation and involvement of both the scientific community (which needs to avoid partisan/sectarian fanaticism) and the entrepreneurial community (which in turn must avoid short-sighted avidity) in site management. The management of these environments must also bear in mind that, in recent decades, these islands have been characterized by partial or total abandonment due to the cessation of designated land uses, followed by repopulation episodes, with consequent alteration of both economic activities and site integrity and function. These changes may consequently necessitate

(for example) the reactivation of agriculture in degraded areas, the implementation of reforestation programmes, bans on the introduction of extraneous plant and animal species, and controls on invasive species that are already present (e.g. *Ailanthus altissima* and *Rattus rattus*).

As indicated earlier, the islands of the Archipelago are characterized by different degrees of integrity which vary from almost pristine conditions to situations with heavy human interference. In our opinion, it is precisely this variation which determines the different grades of vulnerability and threat. The islands of Gorgona and Montecristo have the strong advantage of having a powerful and dominant managing entity, the Ministry for the Interior and the *Corpo Forestale dello Stato* respectively, which besides managing the territory, also control the tourist influx (limited to 1000 persons per year on Montecristo). Capraia and Giglio are special cases because they are administratively autonomous communes (*Comune di Capraia Isola*, and *Comune di Isola del Giglio*); this autonomy, together with the National Park set-up, provides a reasonable guarantee that the overall site management is geared toward compatible development. For example, on the island of Capraia, which has an extremely limited road network (800 m), there are communal development planning constraints which seek the restoration and re-utilization of abandoned buildings that used to form part of the prison complex. On the other hand, the situation on Giannutri and Pianosa is less promising, irrespective of ownership (the former is predominantly private property whilst the latter is exclusively state-owned). The main threats presently affecting Pianosa can be termed as incompetence, conflicting interests and avidity on the part of administrators and tourism operators. At the end of the 1980s, use of the island as a prison was phased out shortly after the completion of cumbersome and costly works to turn it into a

high-security prison. The end of its use as a prison brought about numerous conflicting proposals for new uses (monastic community, research centre, resumption of agricultural activity, station for photovoltaic and wind-driven energy generation, etc.). However, proposals that are being more warmly supported, especially by the town council that has jurisdiction over the island (*Campo nell'Elba*, based on the island of Elba) and by the relevant tourism operators, are the plans for touristic exploitation; it should be borne in mind that even today, up to 250 persons per day are allowed to access the island, despite the lack of services. At the end of September 2008, the national mass media announced the possible designation of Pianosa as a prison facility for incarcerated mothers with infants of pre-school age and for the reuniting of prisoner couples. Essentially, and particularly in the case of Pianosa, indecision about what would be a suitable use of the island is fuelled by fragmented responsibilities, further compounded by private interests. This situation renders futile all the *ad hoc* interventions that are undertaken sporadically (e.g. restoration of buildings), effectively favouring the general degradation of the island itself.

13.3 The island of Comino (Kemmuna)

13.3.1 Geographical context

The Maltese Islands are located in the central Mediterranean, 93 km south of Pozzallo in Sicily and 288 km from Tunisia. They consist of Malta (246.51 km²), Ghawdex/Gozo (65.79 km²), Kemmuna/Comino (2.76 km²)¹, and a few uninhabited islets:

1 The names Gozo, Comino and *Cominotto* are old, established Italian versions of the islands' Maltese names (Ghawdex, Kemmuna and Kemmunett).

Selmunett/Il-Gzejjer (St. Paul's Islands, 0.10 km²), Kemmunett/Cominotto (0.10 km²) and Filfla (0.06 km²). The coastal perimeters are well-indented: Malta 183.99 km, Gozo 53.74 km, Comino 12.18 km, Selmunett 2.28 km, Cominotto 1.87 km, Filfla 1.02 km.² The Archipelago constitutes a tiny island-nation with a population of 433,598 (Vella, 2008) concentrated within a total area of 316 km². The extremely high population density (1,372 persons per km²) is unevenly distributed. Circa 400,000 are concentrated on Malta and about 30,000 on Gozo; only 4 people live on Comino (density: 1.4 persons per km²) despite its strategic position between Malta and Gozo. The island of Malta hosts most of the main towns and commercial centres, and most of the national infrastructure including 3 large harbours and an international airport. Gozo's peripheral location and smaller economic base render it largely dependent on Malta, but it is an important touristic/recreational destination and is served by an efficient car ferry service.

The environmental context of Malta and Gozo is altogether different from that of nearby small islands, due to intense economic activities, numerous urban settlements, well-developed infrastructure, high traffic flows, and a high population density³. In contrast, Comino's negligible population and limited economic activity mean that its natural environment still outweighs human presence throughout much

-
- 2 Direct measurements (Mapinfo), other figures quoted in official statistics indicate 136 km for Malta and 43 km for Gozo, without any indication for Comino and the smaller islets.
 - 3 Compare the above figures with analogous statistics for nearby central Mediterranean islands: Pantelleria (7,788 persons in 83.02 km² = 94 ab.km²) [Comuni-Italiani.it, n.d.], Lampedusa (5,500 residents in 20 km² = 275 ab.km²) [lampedusavillaggi.com, 2008] and Linosa (420 persons in 5.4 km² = 78 ab.km²) [Bickel, 2002], and with the details provided for the Tuscan Archipelago in Table 13.1.

of the year. However, its popular beaches are accessed by frequent pedestrian ferries from both Malta and Gozo and the peak influx of day-trippers and private boats results in overcrowding in the island's most popular site in summer. Vehicular access to Comino is uneconomical; however, the island does have a rudimentary road network and a ro-ro quay for *ad hoc* shipment of vehicles to serve the island's few establishments and limited infrastructure.

13.3.2 Origins, geology and landform

The Maltese Archipelago is part of the Pelagian platform between Sicily and Tunisia, and is physically connected to the Hyblean plateau of Sicily by a submerged ridge that separates the Sicily Channel from the Ionian Basin (Admiralty Surveys, 1988). The islands are composed of sedimentary rocks formed on the ancient seabed between the late Oligocene and late Miocene, and have a simple stratigraphical ('layer-cake') structure with occasionally sharp transitions between different strata due to variations in seabed conditions. Five main geological formations can be distinguished (Oil Exploration Directorate, 1993), listed in order of decreasing age:

1. Lower coralline limestone, a thick layer (>140 m) of hard limestone containing fossilized corals and algae;
2. *Globigerina* limestone, a yellowish fine-grained limestone, 20-200 m thick, formed from microscopic foraminiferan shells;
3. Blue clay, a 20-70 m layer of marl;
4. Greensand, a very thin (1-10 m) sandy layer;
5. Upper coralline limestone, similar to lower coralline limestone, and usually limited to thin hill cappings but occasionally exceeding 150 m in thickness (Pedley *et al.*, 2002).

These main formations are subdivided into

members, which may differ considerably in composition, physical properties and erosional characteristics, especially the Globigerina limestone members and the coralline limestone members. Only upper coralline limestone and blue clay are of significance on Comino, the former making up its entire land surface and the latter contributing to its erosional patterns.

Uplifting of these sedimentary formations from the seabed, as well as the predominant SW-NE tilt of Archipelago, is related to the tectonic movements associated with the Pantelleria rift system which shaped the central Mediterranean. More specifically, Comino's insularity and anomalous SE-NW tilt is derived from another set of parallel faults sandwiched between two 'master' faults - Great Fault that cuts across Malta and the South Gozo Fault that follows Gozo's southern coastline. Tectonic movements broke the land between these two principal faultlines into smaller *horste* and *gräben* that shaped northern Malta's landscapes. The two deepest *gräben* were submerged below sea level [also in view of sea level rise (G. Debono, pers. comm., 2004)] to create two flooded channels, thereby detaching Comino's landmass from the nearest mainlands. Tectonic tilting produced a gently sloping shore along the island's northern/northwestern sides; these lowlands rise gently towards a ridge that lines the southern coast, and the opposite extremities of the ridge plunge directly into the sea as high cliffs on both the west-facing and east-facing coasts, known respectively as *Il-Mazz* and *L-Irdum ta' Kemmuna* (Camilleri, 2004b).

Since Comino's landmass (including *Cominotto*) was significantly depressed by tectonic activity, most of its rock strata are well below sea level. Thus, only the three topmost members of the upper coralline limestone are encountered, and its surface is much less varied than Malta and Gozo. The low crests of the rolling landscape on the island's interior (and the

highest point on *Cominotto*) represent Comino's last surviving outcrops of the hard topmost layer (*Gebel Imbark* member), which has been weathered away elsewhere. Consequently, the *Tal-Pitkal* member (the next, moderately friable and grainy sub-layer) covers practically the whole land area and reaches a thickness of circa 75 m (the maximum recorded in the entire Maltese Archipelago) near the eastern cliffs. Its weak physical properties mean that from an erosional and aesthetic point of view, Comino's coasts are among the most intricately sculpted in the whole archipelago. In contrast, exposure of the chalky *Mtarfa* member (the lowermost of the 3 geological members, just visible around the sandy beach at Santa Marija as a result of valley incision) had little effect on the island's geomorphology. Small but well-developed karstic tunnels and sinkholes are known on the island (Hyde, 1955) and on the surrounding seabeds; the submerged features are important diving attractions. Deeper below sea level, under the east-facing sea-cliffs, the underlying clay formation has a destabilising influence on the brittle coralline limestone above, and slippages of the clay layer, combined with cliff retreat following mechanical pounding by sea-waves, contribute significantly to the rock falls that, with catastrophic collapse patterns⁴, formed the elaborate boulder screes at *L-Irdum ta' Kemmuna*. The stabler parts of the screes are an important habitat for endemic rupestral vegetation as well as inaccessible refuges for the local fauna and avifauna.

Tilting of the island also influenced surface runoff patterns, forming three small but locally-important valley systems that descend gently toward the northern coasts; the proportion of runoff that

4 In the late 1980s, massive rock-falls brought down a 15-storey-high cliff face at *Ta' Prexxa* and a subsequent sea storm transported this material, in bulk, to the nearby inlet of *Il-Mixta*, infilling 2 sea caves and creating a new pebble beach.

flows to other parts of the island is negligible. The most elaborate system opens into Santa Marija bay, and has four tributaries which drain over half of Comino's surface; its largest tributary (Il-Wied l-Ahmar) supports most of the island's cultivable land. The valley systems continue northward even below the current sea level, and the sunken valley mouths (*rias*) form sandy bays with pocket beaches and picturesque headlands; their summer-season popularity and appealing natural settings were key drivers for touristic development, which has been concentrated at Santa Marija and San Niklaw since the 1960s. One valley system in the extreme west of the island, now reduced to a small but well-defined watercourse known as Il-Wied ta' Skalanova (Camilleri, 2004a), was originally more extensive until its thalweg was truncated by a large coastal sinkhole, by eastward cliff retreat and by a complex interplay of tectonic and erosional activity that reduced its lower segments into an open sea-channel. As most of the valley was depressed to sea level, its unprotected western flank was exposed to the open sea. Cliff retreat and accelerated local erosion along numerous joints ultimately perforated the former valley sides in multiple locations, leaving *Cominotto* and two other steep-sided stacks detached from the main island. Whilst insignificant in terms of land area, *Cominotto* and the main stacks are dominant features in the coastal landscape, and the shallow sea channel (Bejn il-Kmiemen) is also the island's most popular attraction due to its unique scenery and clear waters (Plate 13.7). It is extensively marketed as the 'Blue Lagoon'; this label, coined in the 1960s during the first drives to promote mass tourism, has persisted and has almost extinguished even local usage of the indigenous place-name. The 'Blue Lagoon' is a national-level attraction, advertised for peak-season recreation in scenic settings (but hardly ever for the landscape and site character *per se*), and the activities encouraged *in situ* are shoddily geared towards run-of-the-mill beach exploitation rather than valorization of the site integrity.

The island also contains Quaternary deposits consisting of fossilized soil, conglomerate or sand derived from reworked erosion products of the parent rock formations. These occur either as laminar crusts especially along the southern coast or as more substantial valley infills. Generally considered as having palaeontological value (as traces of ancient landscape configurations, and as fossiliferous evidence of past climatic and ecological regimes), they also have a practical relevance in view of their friability and consequent proneness of the terrain to mechanical wear and anthropogenic erosion. Some of the more extensive deposits coincide with heavily-trampled locations all around the 'Blue Lagoon'.

13.3.3 Climate and hydrology

The Maltese Islands have a Mediterranean-type climate similar to that of southern Italy, with the added strong influence of the surrounding open sea. In practice, there are two major seasons: the hot and dry summer, and the shorter cool and moderately rainy winter. Spring and autumn are poorly-defined transitional periods. Average annual temperature is 18°C, although monthly averages typically vary between 12°C and 31°C in the shade. Temperatures peak in July and August, with diurnal values of well over 30°C. Winter temperatures are usually mild (10-20°C at daytime), and cold weather is relatively rare. The climate is very sunny, the daily average being 5-6 hours of sunshine in mid-winter and over 12 hours in mid summer. Precipitation is limited (500-600 mm annually) and is practically absent in June-August; almost 75% occurs during October-March. Orographic effects are unimportant. The islands are rather windy, in terms of both frequency and intensity; the *majjistral* and *grigal* (equivalent to the Italian *maestrale* and *grecale*) are notorious for frequently attaining gale force (MaltaWeather.com, 2008; Government of Malta, 2008). During such storms, Comino is completely

cut off and its exposed, windswept topography compounds its desolate and inhospitable feel, further contributing to the exclusively seasonal nature of all its mainstream activities. In view of the island's large perimeter-to-area ratio (4.41 km¹, compared to 0.81 km¹ for Gozo and 0.74 km¹ for Malta), airborne sea-spray is significant even in the island's interior, leading to accelerated corrosion of old buildings and the presence of maritime species well away from the coast. This effect is also observed in much-larger Gozo (Mifsud *et al.*, 2002), and is hardly surprising on Comino.

Two main aquifers are associated with the Maltese Islands' layer-cake structure: (i) the high-level perched aquifers, which soak the porous upper coralline limestone as the underlying clay aquiclude prevents further percolation, and (ii) the mean sea-level aquifer, which resides in porous rock strata at sea level, actually floating on the underlying seawater-saturated zone. In Comino and parts of northern Malta, the blue clay layer is below sea-level, resulting in a single aquifer of intermediate character. Notwithstanding this aquifer, only one insignificant seepage point (Il-Qattara, inaccessibly located in the eastern cliff) occurs on Comino, and groundwater is only accessible via pumping from boreholes. In Malta and Gozo, the aquifers have been seriously depleted, contaminated and salinized by anthropic activity, and are at risk of not meeting the standards of the Water Framework Directive (Malta Environment and Planning Authority, 2006). There are indications that only Comino's aquifer meets both the qualitative and quantitative standards in question, probably due to:

1. natural potential for aquifer recharge, as the island is composed of highly-permeable upper coralline limestone;
2. minimal urbanization and mostly unsurfaced roads (insignificant impact on natural runoff-to-percolation ratios);
3. minimal private pumping, from just one

or two boreholes, in contrast to thousands of boreholes on Malta and Gozo;

4. discontinuation of pumping from public boreholes on Comino (still extant but dilapidated); and
5. very limited extent and intensity of cultivation, with trivial agrochemical input.

Nevertheless, there are other pollution sources on the island comprising a vast, decrepit 1980 pig farm and its ancillary sewerage system⁵, together with dumping and incineration sites on open rocky land, and an old sewerage system (serving the hotels and public toilets) crossing the island from west to east along the whole northern coast. Whilst these are of limited magnitude compared to analogous polluters on the mainland, the sewerage system at *Santa Marija* on Comino is directly associated with at least two pollution incidents. Local residents (S. Vella, pers. comm., 1999) have reported a chronic contamination of one of the island's few wells [probably corresponding to the 'excellent-quality spring' recorded in historic texts (Abela, 1647)], and an acute sewage overflow onto nearby fields also occurred in 1994 after the main sea outfall was blocked by material forced into it by a northeasterly gale.

Surface runoff patterns have already been outlined above. Due to gentle land tilt, limited extent of catchment areas, natural permeability of the substratum which favours percolation, and relative absence of artificial impermeable surfaces, water flow through the valleys is limited and of short

- 5 The pig farm is in the process of being decommissioned, and its operations are to be relocated to mainland Malta. The permit for the new facility in Malta has been issued and envisages the physical removal of the sea outfall and its ancillary infrastructure, and a clean-up of nearby degraded land. The abandoned farm per se will be closed off, but its actual dismantling still needs to be addressed.

duration even after heavy rains, in contrast to the often-violent flash-flood patterns encountered in Malta and Gozo. This accounts for the observed cultivation in the valley-beds, general absence of well-defined watercourses, and low incidence of runoff-induced erosion along valley thalwegs.

High temperatures and evapotranspiration rates, low precipitation, unavailability of even ephemeral water resources, prolonged exposure to sun and wind, poorly-sheltered topography, and airborne salinity all contribute to:

1. Comino's arid aspect;
2. the predominantly low-profile, xerophytic nature of its main vegetational communities;
3. the barren character of most of its potentially-cultivable fields;
4. progressive abandonment of formerly cultivated sites, and failure of later agricultural reclamation schemes; and
5. slow recovery of ecosystems degraded by inconsiderate intervention (localized scars caused by vehicular trampling and trenching have been observed to remain poorly colonized by native vegetation for several years).

The only notable exceptions are two low-lying coastal sites at Santa Marija and San Niklaw, where the interplay of ephemeral valley runoff, sub-surface seawater intrusion, and possibly sub-surface discharges from the sea-level aquifer, produces a moist marshland substratum colonized by hygrophytic vegetation and non-xerophytic halophytes.

13.3.4 Floristic aspects

The Maltese Islands' habitat types can be conveniently grouped into three main categories: general seral communities composed of more or less xerophytic vegetation, specialized habitats that

occur in localized areas with particular edaphic or microclimatic conditions, and increasingly ubiquitous anthropically-degraded land. The seral communities, starting from the climax, are summarized as follows:

1. Mediterranean sclerophyll woodland, dominated by holm oak (*Quercus ilex*) with subdominant *Pinus halepensis*. Felling since ancient times reduced this habitat to a few tiny clusters in northern Malta. No natural traces are known on Comino; the linear pine monocultures observed on the island date back to nationwide afforestation projects undertaken in the 20th century, which adopted a quantity-oriented standard approach with little adaptation to the specific local ecological context.
2. Various types of maquis, generally resulting from degradation of former woodlands or succession on semi-sheltered garrigues/steppes. Oleo-Ceratonion archaeophytic maquis is favoured by secondary succession around formerly cultivated olives (*Olea europaea*) and carobs (*Ceratonia siliqua*). Comino supports a small copse of very old olive trees at Il-Hazina, which is specifically listed in the local *Trees and Woodlands (Protection) Regulations of 2001*⁶ (Planning Authority, 2001). Afforestation projects introduced additional olive trees on derelict terraced fields, but these have assumed a stunted garrigue aspect. A localized high maquis containing carob, fig (*Ficus carica*) and pomegranate (*Punica granatum*) trees thrives along the main cultivated valley

6 Legal Notice 12 of 2001 has been superseded by Legal Notice 200 of 2011, and ancillary Government Notice 473/11 defines the sites (including the 2 already-protected sites on Comino) more precisely on a map base.

bed, favoured by sheltered location and valley-bed humidity, and nurtured by resident farmers. Elsewhere on the island, maquis is very sparse and (except for a patch of *Pistacia lentiscus* matorral in one of the island's most exposed locations) is limited to individual carob and fig trees (and their limited undergrowth) scattered in the garrigue landscape.

3. Various types of garrigues, composed on low xerophytic shrubs (Plate 13.8). These occupy most of Comino, and constitute its main physiographic subclimax. The *Teucrium fruticans*-*Euphorbia melitensis* garrigue and *Anthyllis hermanniae*-*Thymra capitata* garrigue are the more-widespread sub-types, whilst another garrigue dominated by *Erica multiflora* and *Periploca angustifolia* occurs on sloping land near the south coast. The various garrigues merge into each other with no well-defined cut-offs. Notwithstanding their overall abundance, the garrigues are showing progressive decline in recent times (both on a national scale and on Comino), largely due to unmitigated interventions (especially vehicular trampling and trenching operations in the case of Comino) on what is still widely regarded as barren wasteland. The shrubs' poor resilience to anthropic disturbance also implies that natural regeneration is typically slow and is overtaken by indirect impacts such as establishment of informal tracks, subsequently converted into permanent access routes. The thyme garrigues also have an economic importance, as a primary resource for grazing of honey bees (a large bee farm, registered in 2004 as an organic farm with around 200 boxes, is based on the island, which also has the added advantage of being pesticide-free) (Calleja, n.d.).

4. Steppes with only herbaceous vegetation. On Comino, rocky steppes are an increasingly common product of anthropic degradation of garrigues or prolonged dereliction of former agricultural land, and are mainly characterized by herbaceous/therophytic species (e.g. *Urginea pancration*, *Asphodelus aestivus*, *Ferula communis*).

The specialized habitat types that are particularly relevant to Comino are:

1. Rocky coasts, with a progressive transition from the bare supralittoral zone, via the sparse *Crithmo-limonietum* (occasional *Limonium melitensis* and *Arthrocnemum macrostachyum* specimens), to denser clumps of halophytic *Inula crithmoides*, *Senecio bicolor* and the endemic *Anthemis urvilleana*, and eventually maritime garrigue ecotones intermediate between coastal vegetation and garrigue (e.g. *Cichorium spinosum*). These are relatively pristine, except near coastal developments and in localized spots degraded by haphazard trenching works for infrastructural connections between Malta and Gozo.
2. Rupestral communities (indicator species: *Capparis orientalis* and the endemic *Darniella melitensis*), which dominate the sheer cliffs and screes at Il-Mazz and L-Irdum ta' Kemmuna. These are relatively intact, due to physical inaccessibility.
3. Coastal dunes, with various locally-endangered psammophytic species previously known from *Santa Marija*; most were obliterated when a road was ploughed through the site in 1990-91 for access to a new slipway, and today only rudiments survive, dominated by

the pioneer species *Cakile maritima*, *Sporobolus arenarius*, *Echium arenarium* and one-off clumps of *Pancratium maritimum*. Old *Tamarix africana* trees that dominate the beach right up to the shoreline are still in relatively good condition (despite pointless hard-pruning in the 1980s) and are specifically identified in the above-mentioned *Trees and Woodlands (Protection) Regulations*. All the other beaches on Comino are too small and exposed to support any vegetation.

4. Saline marshes, which in the Maltese context, only occur as shallow depressions just above sea level, usually in valley mouths where humid conditions of seasonally-varying salinity result from the interplay of freshwater runoff and seawater intrusion. An important marshland existed at Santa Marija, richly colonized by *Phragmites australis* and *Vitex agnus-castus*. This was a prime site for bird-ringing, until its bulldozing in 1990-91 to make way for a makeshift camping site. This significant impact was followed by site disturbance and invasion by exotic species (notably *Ailanthus altissima* from a nearby landscaped garden), and practically all the former vegetation has been eradicated. The former existence of another tiny marshland at San Niklaw was inferred from 1957 aerial photography (Anon., 1957); its place is now occupied by a hotel outbuilding and its immediate hinterland is overrun by *Arundo donax*.
5. Freshwater habitats - freshwater springs, small permanent streams (and their associated riparian woodland), and natural freshwater ponds are rare in Malta and Gozo, and are usually associated with the perched aquifer.

They are completely absent on Comino. An artificial pond was excavated by a local resident and kept continuously filled with freshwater to attract birds for hunting; the last surviving specimens of *Phragmites australis* were transplanted from the Santa Marija marshland into this pond, where they are thriving (and were thus saved from local extinction).

6. Humid habitats along the island's two main valley beds (recognizable from more or less dense growth of *Arundo donax* reeds), with other localized humid spots corresponding to seasonal seepage points on the valley sides and cliff faces (recognizable through very localized growths of hygrophytes such as *Adiantum capillus-veneris*).

A land-cover survey carried out in 1999 (Cassar *et al.*, 1999) indicates a mosaic of:

1. various garrigue assemblages, which occupy extensive tracts and form the most dominant landscape element on the island's interior;
2. halophytic communities along the coastal cliffs and rocky shores;
3. specialized vegetation in restricted pockets with a localized microclimate, especially along the valleys;
4. developed or disturbed land; and
5. hybrids of the above, generally corresponding to ecotones or, more commonly, to habitats undergoing transition toward degradation, dereliction or recovery.

An indicative species list compiled by Lanfranco (1996) and subsequent on-site updates (Lanfranco, 1999), identifies a total of 291 species, distributed within the various categories as follows: garrigue & rocky ground (n=87), rocky coast & rupestral

(n=34), maquis (n=6), marshland & humid places (n=7), sand dunes (n=12), cultivated & fallow land (n=26), steppe (n=20), disturbed ground (n=52), ubiquitous (n=29), other/unclear (n=18). Some of the records, based on older reports, were not confirmed during more recent surveys, and in the case of dune and marshland species (e.g. *Polygonum maritimum*) local extinction appears plausible. The flora present on the island also includes various species that are rare or even threatened at national level (e.g. *Putoria calabrica*, *Orobanche cernua*, *Linum bieme*, *Linaria pseudolaxiflora*, *Hedysarum sphaerosissimum*, *Daucus lopadusanus*, *Hymenolobus velliceri* subsp. *sommieri*, *Althaea hirsuta*, *Senecio pygmaeus*, *Desmazeria pignattii*), whilst one species (*Valantia hispida*) is only known from Cominotto. Other species/assemblages favoured by human interference are increasingly present on Comino:

1. Exotic species deliberately introduced for landscaping and embellishment. These include *Eucalyptus* sp. planted by a local farmer on marginal land which would normally be colonized by local vegetation. More invasive species include *Ailanthus altissima* (planted in a small garden near the island's only chapel, from where it has overrun the surrounding marshland and arable lands), *Carpobrotus edulis* and *Agave americana* (from hotel gardens) and *Acacia saligna* (from afforestation).
2. Non-exotic species native to Malta/Gozo but alien to Comino, at species and/or assemblage level, e.g. widespread afforestation with *Pinus halepensis* in the 1980s, roadside planting of *Nerium oleander* on garrigue, and an unnatural mix of trees planted at Il-Wied l-Ahmar by amateur volunteers. Whilst, *prima facie*, the species may not be invasive, the projects pay little attention to: (a) the local ecological and landscape character, seeking to replicate mainland vegetation instead, and (b)

strict control of the sources of the genetic stock used. We question whether this should be considered as environmental improvement or as unscientific tampering (even if well-meaning) with island ecosystems and landscapes.

3. Opportunistic species that grow spontaneously on degraded habitats, including: (a) species indicative of perpetual disclimaxes (e.g. *Cynara cardunculus*, *Dittrichia viscosa*), (b) ecological pests disseminated accidentally via translocation of soil and construction waste, which become established as a plagioclimax on degraded land and hinder proper succession (e.g. *Nicotiana glauca*, *Ricinus communis*, *Glebionis coronaria*), and (c) miscellaneous ruderal weeds (e.g. *Oxalis pes-caprae*).

13.3.5 Faunistic aspects

Knowledge of Comino's invertebrate fauna is far from exhaustive. However, the island is known to host species that are rare, or even endangered, nationally - e.g. the arthropods *Hedychridium dimorphum*, *Lacombia urbanii*, *Philanthus triangulum*, *Smicromyrme viduata*, *Acinopus picipes* and *Strongylognathus insularis* and the endemic mollusc *Trochoidea spratti* form *perplanata* (Schembri *et al.*, 1987; Schembri & Sultana, 1989). An indicative survey of terrestrial molluscs identified 23 species on the island (Thake, 1984), compared to the whole archipelago's estimated 70 species (Malta Environment and Planning Authority, n.d.).

The very limited herpetofauna of Comino mirrors the situation in the Archipelago as a whole: 1 endemic anuran (*Discoglossus pictus pictus*), 4 species of snake, and 1 Pelago-Maltese endemic lizard species (*Podarcis filfolensis*). Distinct subspecies of *P. filfolensis* occur on Filfla (*P. f. filfolensis*), Malta/Gozo/Comino (*P. f. maltensis*), Il-Gebta tal-General

off Gozo (*P. f. generalensis*), Lampedusa/Linosa (*P. f. laurentimeuelleri*), Selmunett (*P. f. kieselbachi*), and Cominotto (still unnamed). Lizards of unknown status were also observed on a stack near Cominotto. It is assumed that allopatric speciation on Comino was interrupted by accidental anthropogenic transportation since ancient times, and a similar threat is currently posed to the genetic diversity of the Cominotto population due to increased berthing of recreational boats along the islet's coast. Comino's mammalian diversity is also limited. The wild rabbit (*Oryctolagus cuniculus*) is particularly abundant on Comino's garrigues and also occurs on Cominotto (where burrows and faecal pellets are ubiquitous) due to habitat availability and minimal hunting. There are indications that the population was even greater until World War I (Savona Ventura, 1982), and at least two 16th century maps are indicatively illustrated with abundant wild rabbits (Lafreri, 1551; Ghajnsielem.com, n.d.). The rabbit populations appear to be in equilibrium with the island's vegetation, although they do pose a problem on cultivated land to the point of requiring fencing around the main fields. Some interbreeding with escaped domestic rabbits appears to have occurred even in the case of the Comino population (introduction of rabbits 20 years before WWI is reported), affecting its genetic pool and exposing it to occasional disease outbreaks. Due to the lack of natural terrestrial caves, bat populations (e.g. *Pipistrellus pipistrellus*) are small and mainly inhabit derelict buildings.

Comino is important ornithologically, with at least 4 of the *circa* 20 breeding birds of the Maltese Islands being present, namely *Puffinus yelkouan* (50-80 heads), *Calonectris diomedea* and *Monticola solitarius* within its cliffs, and *Calandrella brachydactyla* (Coleiro, n.d.) in the garrigues. *P. yelkouan* colonies are also recorded from the cliff on Cominotto (Testa, n.d.). The falcon *Falco peregrinus* is also a former breeder on the island, and the owl *Asio flammeus* was nesting in 1983 (Birdlife International, 2008). The island is an important observatory for migratory birds especially

in spring, including birds of prey (e.g. *Falco vespertinus*, *Circus aeruginosus*, *Milvus migrans*, *Otus scops*), trans-Saharan passerines seeking refuge during bad weather, and various others (e.g. *Ardea purpurea*, *Upupa epops*, *Oenanthe hispanica*) among the *circa* 370 species recorded in the whole Archipelago. The former marshland at Santa Marija, bulldozed beyond recovery in 1990-91, was an important bird habitat and ringing station. Hunting, notoriously an issue in Malta and Gozo, is illegal on Comino and is *de facto* negligible.

Comino has a significant infestation of rats (*Rattus rattus* and *R. norvegicus*), introduced accidentally in historic times. By 1925, these were already sufficiently numerous to damage agricultural crops; anecdotal reports indicate a surge in the early 1980s, following the establishment of a large pig farm and poor monitoring during the related ferrying of animal feeds from Malta). The rats' invasive presence is readily perceptible during night-time camping and barbecue activities; the rats are further attracted to the beaches by public refuse bins. Rats have also invaded the more vulnerable islet of *Cominotto*, where the significant presence of rat faeces on almost-inaccessible cliff ledges seems to coincide with the absence of bird nesting sites; the incongruous presence of refuse-collecting facilities on *Cominotto* and berthing of small seacraft could be important contributory factors. Domestic mice (probably *Mus musculus*) are also recorded. In contrast to Malta and Gozo, other invasive animals (e.g. feral cats) are absent on Comino, although there are reports that hedgehogs from Malta or Gozo were released into the wild to control cockroaches that infested a local isolation hospital (described below) (Savona Ventura, 1984). A pair of exotic gazelles was introduced in the early 20th century and bred successfully, but these were rapidly extirpated by prisoners stationed on the island during World War I (Busuttill & Borg, 1925). More recently, a local farmer released a few exotic bird species (e.g. pheasants, bobwhites) into the wild; some of these appear to be thriving and even breeding on the island.

13.3.6 Human impact

Scant Bronze Age shards, isolated Phoenician and Roman burials, and Punic/Roman amphorae and earthenware pipes indicate that Comino saw the same succession of colonists as Malta and Gozo, but the absence of important monuments suggests that human habitation was very limited throughout antiquity. Notwithstanding the relative absence of human settlements, it is likely that these periods entailed drastic environmental changes that permanently shaped Comino's landscape. Archaeological evidence from Malta indicates that unsustainable deforestation of the primeval woodland cover was already at an advanced stage in prehistoric times, leading to gradual replacement with a predominant garrigue subclimax. Furthermore, local extinction of native trees (e.g. *Cercis siliquastrum*), and changes in the relative abundance of indicator species (e.g. terrestrial molluscs), also occurred. It is likely that Comino also suffered from such irreversible resource exploitation. In more recent centuries, vegetation (even garrigue species) on Comino and *Cominotto* was frequently collected for use as firewood.

Little is known about Comino's early mediaeval history, with one important exception. Documentary evidence in a mid-13th century Pisan portolan indicates that Comino's historic chapel at Santa Marija (Plate 13.9) already existed at the time. Partly reconstructed in later mediaeval times, it is remarkably well-preserved as a very rare example of mediaeval church architecture. There is also documentary evidence of a later chapel built at San Niklaw, but only the placename has survived in this case. By 1418 (during Aragonese rule), increased piracy had rendered the island extremely unsafe for habitation and also endangered navigation between Malta and Gozo, so it was decided to construct a watch-tower on Comino, but the plans fell through and the island remained unprotected for a further 200 years. The

tower, one of the most imposing in the Archipelago (Plate 13.10) and the costliest of all to construct (Sammut-Tagliaferro, 1993), was built in 1618 by the Knights of the Order of St John. Officially named *Torre di Santa Maria* but popularly called *It-Torri ta' Kemmuna*, it is Comino's most prominent landmark and is flanked by a lower contemporary outbuilding known as *Il-Palazz* (Plate 13.11). The island's proneness to piratical raids had deterred human settlement for centuries, but the tower put an end to the problem, and 1647 documents indicate that the island became attractive for new agricultural ventures and was extensively cultivated for fodder. The island acquired an even more secure feel in 1716-1761, when numerous small coastal fortifications were constructed on the nearest shores of Malta and Gozo, and two more were provided on Comino itself [a battery at *Il-Mixta*, and a redoubt at *Santa Marija* (Spiteri, 1994)]. Ancillary roads connecting the fortifications were developed, and farm buildings were constructed as shown on almost contemporary maps (De Boisgelin, 1804); some still survive in a bad state of repair. Lower-key vernacular structures scattered across Comino's landscape (old corbelled huts, dry-stone soil-retaining walls, rock-cut sties, reservoirs, etc.) are probably contemporary. Whilst restoration of well-documented historic buildings (chapel, tower and battery) have received adequate attention in recent times, comparably old vernacular heritage items have been allowed to deteriorate or have even been put to damaging use.

7 The Comino redoubt is poorly documented and is the subject of controversy. Some sources indicate it as having been constructed in 1761 and having since been destroyed; others indicate that part of the old building housing the Comino police station is its remnant. Others even doubt its construction or overlook its existence, whilst some authors just confuse it with the better-known battery on the other side of the island.

During the Maltese rebellion against the brief 1798-1800 French rule, the tower was temporarily used as a prison. During subsequent 19th century British rule, Comino was leased to a succession of private individuals, initially as a hunting reserve and later for farming. Clandestine activities in the surrounding sea (smuggling, dynamite-fishing and incoming vessels with potential epidemic risks) triggered the construction of a marine police station at Bejn il-Kmiemen in 1852 (Ghajnsielem Local Council, nd). After it fell into prolonged disuse, this landmark building was eventually restored and sensitively converted into a public convenience facility in 1990-91. Around 1912, an isolation hospital for plague and cholera victims was established at *Il-Palazz*, purposely extended to accommodate its new use, and a cemetery was constructed nearby. The hospital was later closed down after a brief period of use for wounded soldiers from the Dardanelles battle. The tower was again used as a temporary prison during World War I, functioning briefly as a penal agricultural establishment and leading to the decimation of the wild rabbit population through extensive hunting by prisoners. *Cominotto* also received attention during the British period, when two potential environmental hazards were located on the islet, namely gunpowder storage, and (before World War II) storage of petrol by British Petroleum (Farrugia Randon & Farrugia Randon, 1995). An old dilapidated building on the coast and scant traces of a ruined metal structure on the islet's highest point are all that remain from these activities, both of which were luckily inconsequential. Between 1918 and 1960, Comino was leased as an agricultural colony, and boreholes for mechanized pumping of groundwater are recorded on contemporary maps. Many of the Maltese and Gozitan workers settled on the island as full-time residents, and ancillary services [e.g. a bakery, an all-purpose shop, an elementary school and a basic postal service (Anon., 1955)] were established to meet their needs, mostly within

the island's largest building (*Il-Palazz*) which thus evolved into a small self-contained hamlet. A direct sewer connection to a basic sea outfall near Wied Ernu (now no longer operational) was also provided. Population censuses (Boffa, 1966; Farrugia Randon & Farrugia Randon, 1995) indicate 33 persons in 1881, 43 in 1891, 65 in 1926, 32 in 1964, and just four at present; the current population consists of a single family (two middle-aged brothers and their two aunts) and is not viable. Following depopulation, most marginal agricultural plots fell into disuse and are currently colonized by steppic vegetation.

In 1960, the colonial Government terminated the agricultural lease and offered Comino on a 150-year emphytheusis to a development company with the aim of committing the whole island for tourism development. A hotel was constructed at San Niklaw, together with a group of bungalows and restaurants at Santa Marija, and permits were issued (but never implemented) for a third tourist complex at Bejn il-Kmiemen (Malta Environment and Planning Authority archives). Both services were heavily geared toward seasonal beach tourism, and the pocket beaches at San Niklaw were modified and turned into a private facility reserved for hotel guests. Ancillary infrastructure, including new roads and quays, and a basic sewerage network, inclusive of pumping station and sea outfall, was developed. In 1975, following non-conformity with contractual terms, the Government took back most of the island except the hotel and bungalow surroundings (Farrugia Randon & Farrugia Randon, 1995), although it later made some contractual concessions. Both the hotel and the bungalow cluster (and their ancillary facilities) were significantly extended in the 1980s and early 1990s, only partly with the required permits (Malta Environment and Planning Authority archives), and the surrounding garrigue was fenced off. The touristic development had a very significant impact on the

island's environment through urbanization of the coastal landscape, introduction of exotic species for landscaping, demands for waste disposal, introduction of some vehicular traffic, sewage generation, and changes to the local lifestyle and economy. Moreover, viability of the venture itself is severely limited by locational constraints (high transportation, operational and maintenance costs, seasonal demand, complete isolation in bad weather, double insularity vis-à-vis tourist travel, absence of any nearby economic base), and the repeated changes in ownership (Farrugia Randon & Farrugia Randon, 1995) appear to reflect economic difficulties. Past attempts to diversify the product and move away from beach tourism took the form of extravagant construction of tennis courts (in 1990, involving tearing of a coastal hillside and re-engineering of the coast to provide flat land), a development which again lacked integration into its environmental context and did not seek to capitalize on the unique setting. Indirect impacts also result from sub-standard practices observed in the past (e.g. bad waste management practices, haphazard vehicular trampling, *ad hoc* dumping of surplus materials on garrigue, illegal development of facilities and outbuildings, discharge of reverse osmosis plant effluent into an enclosed inlet, etc.).

Independently from the hotel activities, Bejn il-Kmiemen became an increasingly popular destination ('Blue Lagoon') for numerous boat cruises and ancillary mass-tourism day-trips from Malta, attracted by aggressive marketing of the site's unique character but not at all geared toward its valorization, and with little regard for the site's carrying capacity. Ever-increasing demand also meant that cruise boats not only increased in number but also in size and capacity, regardless of the site's physical constraints and of the shallow seabed near the official jetty built before the 1960s. Numerous *ad hoc* mooring points were illegally constructed along the

rocky coast further to the north, with individual cruise operators even claiming exclusive use of specific spots without title [the situation is so overstretched that some operators are increasingly targeting Cominotto, as space on the Comino side of the channel is saturated]. In very recent years, ancillary run-of-the-mill beach services (e.g. fast food kiosks, hiring of umbrellas and sunbeds) also started mushrooming on site, often without the required permits but still rendered profitable by a combination of demand, hard-selling tactics, strategic placing of structures that practically renders their use inevitable, and the prolonged lack of any determined enforcement clampdown. Illegal hiring of sunbeds on Cominotto also entailed ancillary transportation by boat, and site modification to accommodate berthing and makeshift walkways (for comfortable access along the islet's rough coast). Apart from adding a rundown and overcrowded feel to this unique location during the peak months, all this also introduced various impacts on the landscape, upon which all these activities ultimately depend. Such impacts included concreting of the rocky coast, mechanical wear of the rock surface caused by trampling *en masse*, littering, noise, temporary parking of service vehicles on garrigue, etc. Even on Cominotto, increased visitor numbers in recent years have formed new scars in the landscape, worn out by intensive trampling. The recent creation of a cordoned-off bathing zone, off-limits to boats, has locally reduced congestion but, implemented without a framing holistic management context, it has also shifted environmental pressures onto hitherto pristine locations 'round the corner'. One of the main casualties was the secluded inlet of Il-Bejta tal-Fenek (just below the tower), increasingly crowded by boaters and progressively losing its unspoilt remote feel; this site is also being marketed directly as the newly-coined 'Crystal Lagoon'. Paradoxically, the site's physical inaccessibility was not regarded as a self-regulating opportunity but rather as a constraint

to be overcome, and a relatively low point in the cliff was deliberately torn down (using heavy machinery) to favour unhindered access, turning another scenic spot into a landscape blemish and opening it to unsustainable anthropization.

The 1970s saw the implementation of new Government projects, starting with attempts to bring the island under cultivation (with a focus on hay and fruit trees), partly through mechanized ripping of rocky garrigue at Il-Wied l-Ahmar to enable reclamation of wasteland'. Afforestation was also undertaken. Following devastation of the pig-breeding industry on Malta and Gozo by outbreaks of African swine fever and foot-and-mouth disease in 1978, a huge isolation farm sufficient for about 7,000 pigs⁸ was constructed in the remotest corner on Comino. Apart from its extensive land take (totally disproportionate in scale with the island's size), this also introduced ancillary demands (water and electricity supply, transformer station, new roads, a deep-water ro-ro quay at Wied Ernu for ferrying of service trucks, and a pig-sewage treatment plant and sea outfall), giving rise to serious environmental conflicts that were further intensified by haphazard waste disposal, land contamination through substandard incineration (on garrigue, and using old tyres as a fuel), parking of trucks on garrigue, etc. The sea outfall (and its non-operational treatment plant) is still a major source of pollution within an otherwise pristine and scenic seascape. A 1987 proposal for asphaltting Comino's unsurfaced roads caused political controversy in view of concerns over environmental impact and wastage of public finances, and was shelved. However, another wave of public works arrived in 1990-91, and the Santa Marija marshland and sand-dune (and part of the rocky coast) were bulldozed to make way for a rudimentary camping site, a new access road and a

8 In 1982, 6508 Comino-bred pigs were sent to Malta, and 375 to Gozo, to re-establish healthy stock in the main islands.

new slipway. Pointless surfacing of the island's tracks was also undertaken, using unconsolidated stone dust and gravel; this led to widespread edge-effect overflows (especially airborne dust, and runoff-induced erosion/sedimentation) onto nearby habitats, not to mention the short duration of the surfacing. Infrastructural works in connection with several Malta-Gozo connections (power cables, telecommunications and pipelines) that pass through Comino are a further source of impact, as a result of poorly-mitigated trenching operations that permanently scar the rocky landscape and involve uncontained trampling by heavy plant on the surrounding terrain.

13.3.7 Management issues

Comino's environmental context needs to be seen in the light of: (i) the environmental characteristics, pressures and issues that are relevant to the Maltese Archipelago in general, and which have repercussions on the island, and (ii) the particular circumstances of the island itself, as distinct from mainland Malta and Gozo. In this regard, the island's present situation can be traced back to the following factors:

1. *Mass tourism and peak-season activity.* Vast numbers of day-trippers choke Comino's 'lagoons' (*sic*) during the peak season and exceed its carrying capacity on 3 fronts: (i) physical capacity - the site is packed with bathers and cruise boats competing for limited space; (ii) psychological capacity - a net sense of crowding overshadows the unique setting and sense of place; and (iii) environmental capacity - clear signs of deterioration and physical damage are increasingly evident.
2. *Insularity.* All in all, this has acted as an important buffer against the widespread environmental changes observed in Malta and Gozo. On the other hand, islands are

generally more vulnerable ecologically. Furthermore, self-contained infrastructure and poor mainland connections do entail a few disproportionate impacts. Comino has no less than 3 sub-standard sewage outfalls (of which 2 are currently functional), 2 large potable water reservoirs, an extensive network of rudimentary roads, numerous landing quays (at least one in every accessible bay, each with its own ancillary road connection) and 2 helicopter pads (one disused) serving what is ultimately minimal demand. Insularity was also the main justification for locating the Islands' largest pig farm here, with all its consequences, and a fourth relevant factor is costly transportation of bulk waste to Malta or Gozo, which has prompted *in situ* disposal regardless of the island's sensitive environmental context.

3. *Strategic geographic position between Malta and Gozo.* Infrastructural works for inter-island connections use Comino as a stepping stone, with consequent impacts including trenching works and construction of a major electricity distribution centre on the island. In the 1970s, the island was also threatened by rumours of possible plans for the construction of a Malta-Gozo bridge passing through Comino (with foreseeable disastrous impacts on the island and on the affected coasts of Gozo and Malta)⁹; these appear to have died out except for occasional press articles.
4. *Geological, hydrological and topographical constraints.* The island's fragile geology is

particularly prone to both anthropogenic impact on the rock surface and secondary erosion of denuded land. In addition, resource absence and exposure to wind and drought limit agricultural sustainability and cast doubts on the wisdom of past land reclamation projects that only achieved habitat degradation as a net result.

5. *Short-sighted active promotion of urbanization and conventional beach tourism.* Large tourism developments dominate two of the island's three main bays, and a third facility failed to materialize only due to financial difficulties. Such development had, if at all, a marginal input into the national economy, offset by negative socio-economic impacts on Comino (quasi-total depopulation), serious impact on the natural environment and coastal landscape, and obligations to provide and maintain ancillary infrastructure at public expense.
6. *Remoteness.* This has at least 2-fold implications. It engenders a no-man's-land attitude toward the island environment. Apart from prominent landmark buildings such as the tower, valorization and public appreciation of cultural and natural assets is poor, and their restoration and management is a low priority. Some historic buildings are in imminent state of collapse as a result. In the absence of a full-time on-site professional warden service, remoteness also hinders timely monitoring and enforcement of rampant abuse (e.g. at Bejn il-Kmiemen), by complicating the required logistics.
7. *Various ad hoc or involuntary interventions,* such as introduction of invasive pest species, miscellaneous edge-effect

⁹ The 1970s debate on the possible development of a bridge or tunnel between Malta and Gozo actually re-surfaced briefly in 2011, and preliminary exploration of feasibility is in progress.

disturbances around existing land uses (including old structures used by the small local community or by public departments— e.g. *Ailanthus altissima* invasions around the chapel and *Il-Palazz*, trampling & dumping around all accessible buildings, and notably an extensive scrapyards near *Il-Palazz*), deforestation in ancient times and sub-optimal afforestation in more recent times, and public works of questionable necessity (e.g. expensive road surfacing despite negligible traffic, bulldozing of important marsh and dune to accommodate low-priority uses), etc.

The above situation is not entirely unexpected, considering the persistent absence of any holistic management plan and the lack of any definite commitment towards the island's effective conservation as an overriding priority at least until 1990. Other general nation-wide issues such as poor controls and enforcement, *laissez-faire* mentality, low placing of the environment on the national and local agenda for a prolonged time, and poor awareness of sustainability and vulnerability issues are also relevant. In 1990, the Structure Plan for the Maltese Islands (Planning Services Division, 1990) formally identified Comino and its surrounding seas as a Rural Conservation Area and Candidate Marine Conservation Area respectively (thereby introducing a blanket policy disincentive for urban development), and introduced new policies that protect natural habitats (including those that also occur on Comino) and minor islets (including *Cominotto*) against incompatible land use. Legal Notice 144 of 1993 (Planning Authority, 1993) formally declared Comino as an area where all hunting is prohibited; this designation was retained in subsequent updates despite challenges by a local resident. Specific parts of the island were also included in a schedule of sites protected by the Development Planning Act of 1992. Government

Notice 729/95 protects the old tower and battery as historic monuments (Planning Authority, 1995), Government Notice 401/96 protects the marshland and dune remnants at Santa Marija for their ecological and scientific importance (Planning Authority, 1996), and Government Notice 827/02 protects *Cominotto* and its nearby stacks as sites of ecological and scientific importance (Planning Authority, 2002). Since 2003, the whole of Comino (including *Cominotto* and the other stacks) is also a Special Area of Conservation and Special Protection Area under the Natura 2000 network [Legal Notice 257/03 (Malta Environmental and Planning Authority, 2003) and ancillary Government Notices (Malta Environment and Planning Authority, 2005), subsequently fine-tuned by more updated versions]¹⁰. Key action points for environmental management were also identified in some detail and were effectively translated into strategic policy especially in the Gozo and Comino Local Plan prepared by the Malta Environment and Planning Authority (2006). These formal designations have been successfully used as reactive legal tools for regulating new development and land-use permits. Nevertheless, the impossibility of allocating full-time resourcing to the environmental management project for the island has effectively hindered completion of the equally-important next phases of the project, *viz.* measures for proactive improvement, and there are as yet no tangible time frames for implementation. Territorial competence is also an issue. According to the Local Councils Act of 1993, Comino is nominally within the municipality of Ghajnsielem in Gozo but is not under the town council's jurisdiction (Department

10 Legal Notice 257 of 2003 (which designated Natura 2000 sites) has since been superseded by Legal Notice 311 of 2006, and ancillary Government Notice 112/07 specifically identifies Comino (and its surrounding islets/stacks) as both a Special Area of Conservation and a Special Protection Area.

of Information, 1993); other sectoral remits are administered by various competent authorities with no formal over-arching body other than an *ad hoc* steering committee lacking proper resourcing and executive powers.

13.4 Conclusions

Comparison of the environmental contexts of the Tuscan islands and Comino immediately highlights some common factors:

1. overall predominance of Mediterranean climatic regimes, reflected in partly analogous ecological climaxes and subclimaxes;
2. parallel alternations between historic events, as would be expected from offshore island archipelagos strategically located in a frontier zone;
3. strong influence of insularity and peripherality relative to the mainland, providing an important buffer against environmental problems that affect the mainland, but also creating local complications and particular insular needs and issues;
4. a precarious balance between human activity and limited natural resources, with conflicts further magnified by their concentration within a small-island context;
5. subtle ecological imbalances caused by anthropically introduced pests;
6. economic dominance of conventional summer-oriented tourism, exploiting local assets and attractions but oblivious to the islands' environment and carrying capacity; and
7. late development of environmental awareness and management relative to the emergence of site problems.

There are also evident differences, such as:

1. geological origins and rock types, and presence or otherwise of extractable minerals;
2. topography and hydrology;
3. species diversity and detailed ecology;
4. population statistics;
5. island size;
6. net geographical separation from the mainland; and
7. type and scale of economic activity.

However, the simplistic contrast between the Tuscan Archipelago and the Maltese island of Comino should not be overemphasized to the extent of overlooking individual island characteristics. At least at face value, the situation on Comino appears comparable to precarious or indeterminate situations on Giannutri and Pianosa, but conspicuously different from both the tightly-controlled contexts of Montecristo and Gorgona, and the more populous and administratively autonomous Giglio and Capraia. Many issues are ultimately tied to an intricate mix of site-specific factors, both natural and anthropic, that include precise geographic location, island size and perimeter-to-area ratio, topographical morphology of the coast and hinterland, geological make-up and erosional properties, hydrological resources, local ecology, exploitation patterns throughout history, historic development of demographic and economic patterns, infrastructural aspects, and public attitudes towards the environment. A major challenge for competent management of such island environments is the need to address the relevant issues and vulnerabilities with a combination of clear vision and detailed adaptation to the specific local background, avoiding blind application of generic quick-fix solutions as if they were situation-independent. In turn, this must be reinforced with proper knowledge and determination.

Other factors and problems common to both Tuscan and Maltese contexts arise from the management approach itself rather than from site circumstances and constraints. These include:

1. unclear aims and priorities;
2. short-sighted economic decisions outside a proper environmental framework, and narrow-minded sectoral approaches that address one need at the expense of various overriding considerations;
3. fragmented sectoral remits, and indecision/conflict on territorial competence;
4. too many vested interests, and lack of commitment to eradicate established uses that are manifestly unsustainable;
5. poor resourcing and slow implementation that is either perpetually overtaken by other developments or is at the mercy of influent stakeholders;
6. token protection due to very weak policy enforcement;
7. *bona fide* amateur efforts with insufficient professional guidance, often resulting in counter-productive results; and
8. notwithstanding formal protection, a generally pervasive mentality whereby environmental concerns remain subservient to conventional economic exploitation in all but few exceptions such as Montecristo and the physically inaccessible Maltese islet of *Filfla*.

Indeed, one of the main challenges in meeting environmental management needs is that of overcoming and redressing the often-serious limitations inherent in the traditional administrative backdrop. Optimization of the operational framework is among the most important guarantees for successful implementation, otherwise a recurrence of *ad hoc* or abortive interventions with limited effectiveness

(at best) or negative repercussions (at worst) are bound to predominate. An optimized set-up, backed by thoroughly evaluated plans and high-level commitment, is well-poised to systematically address the identified action points through structured project management.

Management strategies for such small island contexts need to be based on the guiding principles of safeguarding the local natural and landscape characteristics, directing economic exploitation towards the valorization of local assets, phasing out practices that are inappropriate or even illegal, and ensuring that activities fit sustainably within the natural parameters and constraints posed by their siting. Perhaps the most difficult economic challenge is that of progressively steering major activities, such as tourism, away from poorly-sustainable quick-income investment and intensive use, which overlooks the fact that the environment and landscape are not renewable resources. There should also be a break from seasonally-concentrated use that overwhelms the islands during the peak months, and a re-orientation towards less invasive ecotourism activity spread over longer periods. Full-time professional site managers without vested interests, and proper administrative set-up and resourcing are ultimately also required to devise and implement sufficiently detailed and well-informed management plans. Within this structured framework, there should also be scope for effective consultation and involvement of, but also unselfish participation and contribution by, legitimate stakeholders.

References

- Abela, G.F., 1647. *Della descrizione di Malta isola nel Mare Siciliano con le sue antichità ed altre Notitie*. Facsimile ed. 1984. Malta: Midsea Books.
- Admiralty Surveys, 1988. *Mediterranean Sea (Maltese Islands): channels between Malta and Gozo (Gozo), scale 1:25 000*. UK: Admiralty Charts and Publications.
- Ambrosetti, P., Carboni, M.G., Conti, M.A., Costantini, A., Esu, D., Gandin, A., Girotti, O., Lazarotto, A., Mazzanti, R., Nicosia, U., Parisi, G. & Sandrelli, F., 1979. Evoluzione paleogeografia e tettonica nei bacini Tosco-Umbro-Laziali nel Pliocene e nel Pleistocene Inferiore. *Memorie della Società Geologica Italiana*, 19, pp.573-580.
- Amori, G., Angelici, F.M., Frugis, S., Gandolfi, G., Giropali, R., Lanza, B., Relini, G. & Vicini, G., 1993. Vertebrata. In: A. Minelli, S. Ruffo & S. La Posta, eds. *Checklist delle specie della fauna d'Italia*. Bologna: Fascicoli 110, pp.84.
- Anon., 1955. *Map of Comino*. Available: http://www.ghajnsielem.com/places/Comino_old_maps.html [Last accessed: 13th November 2010].
- Anon., 1957. *Aerial photographs*. Malta: MEPA Mapping Unit.
- Anon., 2007. *Progetto Life Natura "Isole di Toscana: nuove azioni per uccelli marini ed habitat"*. Quaderni del Parco, Vol. 1, pp.65 [technical document].
- Arrigoni, P.V. & Di Tommaso, P.L., 1981. *Carta della vegetazione dell'isola di Giannutri*. Progetto finalizzato "Ambiente" AQ/1/130. Roma: C.N.R.
- Baccetti, B., 1976. Notulae orthopterologicae. Il popolamento dell'Arcipelago Toscano. In: AA.VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano*. *Atti del XX Congresso della Società Italiana di Biogeografia*, 5, pp.523-540.
- Baccetti, N., Chelazzi, L., Colombini, I. & Fallaci, M., 1990. Primi risultati di uno studio delle abitudini alimentari di alcuni passeriformi durante la migrazione primaverile. In: *Quarto Congresso Nazionale della Società Italiana di Ecologia*. Arcavacata di Rende, Cosenza, Italy, 28 October - 1 November 1990.
- Bernini, F., 1976. La famiglia Oribatelidae nell'Arcipelago Toscano. In: AA. VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano*. *Atti del XX Congresso della Società Italiana di Biogeografia*, 5, pp.429-507.
- Bickel, H., 2002. *Il piccolo porto di pescatori dell'isola di Linosa*. Available: http://www.celeste-ots.it/celeste_files/isolesiciliane/isole_siciliane_3.htm [Last accessed: 13th November 2010].
- BirdLife International, 2008. *Important Bird Area factsheet: Comino Island, Malta MT 002*. Available: <http://www.birdlife.org/datazone/sites/index.html?action=SitHTMDetails.asp&sid=189&m=0> [Last accessed: 13th November 2010].
- Bocchieri, E., 1995. La connaissance et l'état de conservation de la flore en Sardaigne. *Ecologia Mediterranea*, XXI, pp.71-81.
- Boffa, C.J., 1966. *The islets of Comino and Filfla*. Malta: Lux Press.
- Busuttil, V. & Borg, T., 1925. *Dizzjunarju enciklopediku, Vol 5*. Malta: E. Lombardi.
- Calleja, E., not dated. *Malta*. Available: <http://ressources.ciheam.org/om/pdf/b50/05002153.pdf> [Last accessed: 13th November 2010].
- Camilleri, A., 2004a. *It-toponomastika ta'*

References

- Abela, G.F., 1647. *Della descrizione di Malta isola nel Mare Siciliano con le sue antichità ed altre Notitie*. Facsimile ed. 1984. Malta: Midsea Books.
- Admiralty Surveys, 1988. *Mediterranean Sea (Maltese Islands): channels between Malta and Għawdex (Gozo), scale 1:25 000*. UK: Admiralty Charts and Publications.
- Ambrosetti, P., Carboni, M.G., Conti, M.A., Costantini, A., Esu, D., Gandin, A., Girotti, O., Lazzarotto, A., Mazzanti, R., Nicosia, U., Parisi, G. & Sandrelli, F., 1979. Evoluzione paleogeografia e tettonica nei bacini Tosco-Umbro-Laziali nel Pliocene e nel Pleistocene Inferiore. *Memorie della Società Geologica Italiana*, 19, pp.573-580.
- Amori, G., Angelici, F.M., Frugis, S., Gandolfi, G., Groppali, R., Lanza, B., Relini, G. & Vicini, G., 1993. Vertebrata. In: A. Minelli, S. Ruffo & S. La Posta, eds. *Checklist delle specie della fauna d'Italia*. Bologna: Fascicoli 110, pp.84.
- Anon., 1955. *Map of Comino*. Available: http://www.ghajnsielem.com/places/Comino_old_maps.html [Last accessed: 13th November 2010].
- Anon., 1957. *Aerial photographs*. Malta: MEPA Mapping Unit.
- Anon., 2007. *Progetto Life Natura "Isole di Toscana: nuove azioni per uccelli marini ed habitat"*. Quaderni del Parco, Vol. 1, pp.65 [technical document].
- Arrigoni, P.V. & Di Tommaso, P.L., 1981. *Carta della vegetazione dell'isola di Giannutri*. Progetto Finalizzato "Ambiente" AQ/1/130. Roma: C.N.R.
- Baccetti, B., 1976. Notulae orthopterologicae. Il popolamento dell'Arcipelago Toscano. In: AA.VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano*. Atti del XX Congresso della Società Italiana di Biogeografia, 5, pp.523-540.
- Baccetti, N., Chelazzi, L., Colombini, I. & Fallaci, M., 1990. Primi risultati di uno studio delle abitudini alimentari di alcuni passeriformi durante la migrazione primaverile. In: *Quarto Congresso Nazionale della Società Italiana di Ecologia*. Arcavacata di Rende, Cosenza, Italy, 28 October - 1 November 1990.
- Bernini, F., 1976. La famiglia Oribatelidae nell'Arcipelago Toscano. In: AA. VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano*. Atti del XX Congresso della Società Italiana di Biogeografia, 5, pp.429-507.
- Bickel, H., 2002. *Il piccolo porto di pescatori dell'isola di Linosa*. Available: http://www.celeste-ots.it/celeste_files/isolesiciliane/isole_siciliane_3.htm [Last accessed: 13th November 2010].
- BirdLife International, 2008. *Important Bird Area factsheet: Comino Island, Malta MT 002*. Available: <http://www.birdlife.org/datazone/sites/index.html?action=SitHTMDetails.asp&sid=189&m=0> [Last accessed: 13th November 2010].
- Bocchieri, E., 1995. La connaissance et l'état de conservation de la flore en Sardaigne. *Ecologia Mediterranea*, XXI, pp.71-81.
- Boffa, C.J., 1966. *The islets of Comino and Filfla*. Malta: Lux Press.
- Busuttil, V. & Borg, T., 1925. *Dizzjunarju enciklopediku, Vol 5*. Malta: E. Lombardi.
- Calleja, E., not dated. *Malta*. Available: <http://ressources.ciheam.org/om/pdf/b50/05002153.pdf> [Last accessed: 13th November 2010].
- Camilleri, A., 2004a. *It-toponomastika ta'*

- Kemmuna. *L-Immara*, 8(1), pp.34-43.
- Camilleri, A., 2004b. The landforms of Kemmuna. *Archipelago*, 1(6), pp.163-178.
- Carobbi, G. & Rodolico, F., 1976. *I minerali della Toscana*. Accademia La Colombaria, Serie Studi. Firenze: L. Olskchi Editore.
- Cassar, L.F., Camilleri, A. & Stevens, D., 1999. *Land cover map of the Island of Comino (Kemmuna): 1:5000*.
- Colciro, C., not dated. *Birding in Malta*. Available: <http://www.camacdonald.com/birding/euMaltsiteguide.html> [Last accessed: 13th November 2010].
- Comuni-Italiani.it, not dated. *Comune di Pantelleria*. Available: <http://www.comuni-italiani.it/081/014/> [Last accessed: 14th March 2011].
- Dallai, R., 1976. Ricerche su Collemboli. Le piccole isole dell'Arcipelago Toscano. In: A.A.VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano. Atti del XX Congresso della Società Italiana di Biogeografia*, 5, pp.509-522.
- De Boisgelin, L., 1804. British Map, dated 1804. Available: http://www.ghajnsielem.com/places/Comino_old_maps.html [Last accessed: 13th November 2010].
- Department of Information, 1993. *Noti dwar it-fassil tal-konfini tal-lokalitajiet*. Malta: Government Printing Press.
- Ente Parco Nazionale dell'Arcipelago Toscano, 200-. *Piano del Parco*. Available: <http://www.islepark.it> [Last accessed: 14th March 2011].
- Farrugia Randon, S. & Farrugia Randon, R., 1995. *Comino, Filfla and St. Paul's Island*. Malta: S. de Bono Printing Press Limited.
- Filipello, S. & Sartori, F., 1983. La vegetazione dell'Isola di Montecristo (Arcipelago Toscano). *Atti Ist. Bot. Lab. Critt. Univ. Pavia*, 6(14), pp.113-202.
- Foggi, B. & Grigioni, A., 1999. Contributo alla conoscenza della vegetazione dell'Isola di Capraia (Arcipelago Toscano). *Parlatorea*, 3, pp.5-33.
- Foggi, B., Grigioni, A. & Luzzi, P., 2001. La flora vascolare dell'Isola di Capraia (Arcipelago Toscano): aggiornamento, aspetti fitogeografici e di conservazione. *Parlatorea*, 5, pp.5-53.
- Fossi Innamorati, T., 1983. La flora vascolare dell'Isola d'Elba (Arcipelago Toscano). *Webbia*, 36, pp.273-411.
- Fossi Innamorati, T., 1989. La flora vascolare dell'Isola d'Elba (Arcipelago Toscano). *Webbia*, 43, pp.21-267.
- Fossi Innamorati, T., 1990. La flora vascolare dell'Isola d'Elba (Arcipelago Toscano). *Webbia*, 45, pp.137-185.
- Fossi Innamorati, T., 1994. La flora vascolare dell'Isola d'Elba (Arcipelago Toscano). *Webbia*, 49, pp.93-123.
- Garbari, F. & Borzatti von Loewenstern, A., 2005. Flora Pisana: elenco annotato delle piante vascolari della provincia di Pisa. *Atti della Società Italiana di Scienze Naturali Memorie B*, 112, pp.1-125.
- Gardini, G., 1976. Materiali per lo studio dei Tenebrionidi dell'Arcipelago Toscano. In: A.A.VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano. Atti del XX Congresso della Società Italiana di Biogeografia*, 5, pp.385-396.

- Gatteschi, P. & Arretini, C., 1989. *Indagine sui rimboschimenti dell'Arcipelago Toscano*. Firenze: Giunta Regionale Toscana.
- Ghajnsielem.com, not dated. *Old maps of Comino*. Available: http://www.ghajnsielem.com/places/Comino_old_maps.html [Last accessed: 14th March 2011].
- Giusti, F., 1976. I molloschi terrestri, salmastri e di acqua dolce dell'Elba, Giannutri e scogli minori dell'Arcipelago Toscano. In: AA. VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano. Atti del XX Congresso della Società Italiana di Biogeografia*, 5, pp.99-355.
- Government of Malta, 2008. Government of Malta official electronic portal. Available: <http://www.gov.mt> [Last accessed: 13th November 2010].
- Hyde, H.P.T., 1955. *The geology of the Maltese Islands with special reference to water supply and the possibilities of oil*. Malta: Lux Press.
- Lafreri, A., 1551. Lafreri Map, dated 1551. Available: http://www.ghajnsielem.com/places/Comino_old_maps.html [Last accessed: 13th November 2010].
- Lampedusavillaggi, 2007. *Lampedusa per i naviganti*. Available: http://www.lampedusavillaggi.com/lampedusa_naviganti.htm [Last accessed: 13th November 2010].
- Lanfranco, E., 1996. *List of plant species recorded from Comino* [Unpublished report].
- Lanfranco, S., 1999. *Report of on-site survey of Comino biota* [Unpublished report].
- Lanza, B., 1984. Sul significato biogeografico delle isole fossili, con particolare riferimento all'arcipelago Pliocenico della Toscana. *Atti della Società Italiana di Scienze Naturali del Museo Civico di Storia Naturale di Milano*, 125, pp.145-158.
- Malta Environment and Planning Authority, not dated. *Overview of local biodiversity*. Available: <http://www.mepa.org.mt/biodiversity-localoverview> [Last accessed: 20th March 2011].
- Malta Environment and Planning Authority, 2003. *Environment Protection Act, 2001 (CAP. 435) Development Planning Act, 1992 (CAP. 356) - Flora, Fauna and Natural Habitats Protection Regulations*, 2003. L.N 257 of 2003. Available: <http://www.mepa.org.mt/LpDocumentDetails?syskey=%20337> [Last accessed: 20th March 2011].
- Malta Environment and Planning Authority, 2005. *Development Planning Act (CAP. 356) Environment Protection Act (CAP. 435) Flora, Fauna and Natural Habitats Protection Regulations*, 2003. G.N. 223 of 2005. Available: <http://www.mepa.org.mt/LpDocumentDetails?syskey=%20493> [Last accessed: 20th March 2011].
- Malta Environment and Planning Authority, 2006. *Gozo and Comino Local Plan*. Malta: MEPA.
- Malta Environment and Planning Authority, 2006. *State of the Environment Report 2005 (Sub-report 7: Waters)*. Malta: Malta Environment and Planning Authority, p.81.
- MaltaWeather.com, 2008. *Malta's climate*. Available: <http://www.Maltaweather.com/climate.shtml> [Last accessed: 20th March 2011].
- Marcellino, I., 1976. Opilioni (Arachnida) dell'Arcipelago Toscano. In: AA. VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano. Atti del XX Congresso della Società Italiana di Biogeografia*, 5, pp.413-428.

- Mifsud, C.R., Stevens, D.T. & Baldacchino, A.E., 2002. *Strategic action plan for the conservation of Maltese coastal and marine biodiversity, 2002-2003*. SAP-Bio Project Malta Report.
- Minelli, A., 1976. Planarie terrestri dell'Arcipelago Toscano. In: AA.VV., *Il popolamento animale e vegetale dell'Arcipelago Toscano. Atti del XX Congresso della Società Italiana di Biogeografia*, 5, pp.93-98.
- Oil Exploration Directorate, 1993. *Geological map of the Maltese Islands. Sheet 2: Gozo and Comino, 1:25,000*. Malta: Office of the Prime Minister.
- Orlandi, P. & Pezzotta, F., 1996. *Minerali dell'Isola d'Elba*. Bergamo: Edizioni Novecento Grafico.
- Paoli, P. & Romagnoli, G., 1976. La flora vascolare dell'Isola di Montecristo (Arcipelago Toscano). *Webbia*, 30, pp.303-456.
- Pedley, M., Clarke, M.H. & Galea, P., 2002. *Limestone isles in a crystal sea: the geology of the Maltese Islands*. Malta: PEG.
- Planning Authority, 1993. *Environment Protection Act (Act No. V of 1991) Birds and Wild Rabbit (Declaration of Protected Species and Nature Reserves) (Amendment) Regulations, 1993*. L.N. 150 of 1993. Available: <http://www.mepa.org.mt/LpDocumentDetails?syskey=%20440> [Last accessed: 20th March 2011].
- Planning Authority, 1995. *Planning Authority -Scheduling of Property - Section 46 of the Development Planning Act, 1992*. G.N. 729 of 1995. Available: <http://www.mepa.org.mt/LpDocumentDetails?syskey=%20889> [Last accessed: 20th March 2011].
- Planning Authority, 1996. *Planning Authority Scheduling of Property Section 46 of the Development Planning Act, 1992*. G.N. 401 of 1996. Available: <http://www.mepa.org.mt/LpDocumentDetails?syskey=%20210> [Last accessed: 20th March 2011].
- Planning Authority, 2001. *Environment Protection Act (CAP. 348) Trees and Woodland (Protection) Regulations, 2001*. L.N. 12 of 2001 (Government Gazette Supplement No. 17,044, Section B). Available: <http://www.mepa.org.mt/LpDocumentDetails?syskey=%20413> [Last accessed: 20th March 2011].
- Planning Authority, 2002. *Development Planning Act, 1992 (Section 46) Scheduling of Property*. G.N. 827 of 2002. Available: <http://www.mepa.org.mt/LpDocumentDetails?syskey=%20149> [Last accessed: 20th March 2011].
- Planning Services Division, 1990. *Structure Plan for the Maltese Islands: draft final written statement and key diagram*. Malta: Ministry for Development of Infrastructure.
- Sammut-Tagliaferro, A., 1993. *The coastal fortifications of Gozo and Comino*. Malta: Midsea Publications.
- Savona Ventura, C., 1982. The mammalian fauna of Comino and neighbouring islets. *Potamon*, 1(10), pp.137-139.
- Savona Ventura, C., 1984. Untitled correspondence. *Potamon*, 11(13), pp.83.
- Schembri, P.J., Lanfranco, E., Farrugia, P., Schembri, S. & Sultana, J., 1987. *Localities with conservation value in the Maltese Islands*. Valletta: Environment Division, Ministry of Education.
- Spagnesi, M. & Toso, S., 1999. *Iconografia dei mammiferi d'Italia*. Modena: Ministero dell'Ambiente, Servizio Conservazione della Natura, Istituto Nazionale per la Fauna Selvatica

"Alessandro Ghigi".

Spiteri, S.C., 1994. *Fortresses of the Cross*. Malta: Heritage Interpretation Services.

Tellini Florenzano, G., Arcamone E., Baccetti N., Meschini, E. & Sposimo, P., 1997. Atlante degli uccelli nidificanti e svernanti in Toscana (1982-1992). *Quaderni del Museo di Storia Naturale di Livorno, Monografia 1*.

Testa, R., not dated. *Breeding birds of Malta*. Available: http://members.fortunecity.co.uk/raymond_testa/photocollection.gif.html [Last accessed: 20th March 2011].

Thake, M.A., 1984. Land snails from Comino (Mollusca: Gastropoda). *The Central Mediterranean naturalist*, 1(3), 63-65.

Vella, A., 2008. Malta population on the increase. Available: <http://Maltarightnow.com/?module=news&t=a&aid=34260&cid=72> [Last accessed: 20th March 2011].

Zuffi, M.A.L. & Bonnet, X., 1999. Italian subspecies of the asp viper, *Vipera aspis*: patterns of variability and distribution. *Italian Journal of Zoology*, 66, pp.87-95.



CHAPTER 14

Some notes on the destruction of Malta's landscape

Jeremy Boissevain

14.1 Introduction

Malta has become a vast building site. Ever more luxury hotels, apartment complexes and villas are being built to accommodate putative increases of yet more tourists and local and foreign second homeowners. Because the political climate enables the subversion of planning legislation, there has been a steady assault on the country's physical and cultural environment. Slow to emerge, civic opposition is gradually managing to modify or block some of the mega building developments.

This discussion explores the background to the slow emergence of civic opposition to environmental destruction, the indigenous customs and attitudes that enable the despoliation of the landscape and the strategies civic activists employ to combat it. Several case studies illustrate the analysis.

14.2 Malta

The Maltese Islands, with a population of just over 410,000 crowded onto 316 square kilometres, is the most densely populated nation state in Europe. An annual influx of some 1.2 million tourists seeking accommodation and entertainment further increases the crowding. An appreciation of this high

density and small scale is basic to understanding the environmental problems of Malta.

The Maltese have been ambivalent about their landscape (Boissevain, 2001). Until the late 1950s, few people lived in the countryside. Farmers, even those with rural accommodation, usually returned to the villages at night. As in other Mediterranean countries, the countryside was considered dangerous and uncivilized. Residence in the village centre conferred prestige, for built-up landscape was associated with 'civilization' (Blok, 1969; Silverman, 1978). Except for farmers, hunters and bird trappers, Maltese showed little interest in the countryside. In the 1980s, public apprehension of the countryside began to abate. Encouraged by the interest expatriates and tourists showed in their rural landscape, Maltese gradually began to explore the countryside themselves.

Meanwhile, the country was caught up in a rampant building boom. Between 1957 and 1995, the total built-up land area of the island of Malta alone increased from 4.5% to 21% (Mallia, 2000: 17). By 2007, it had increased to 29.1% (MEPA, 2007). This building activity increasingly encroached on the agricultural land. New quarries, illegal building and dumping of construction waste began to consume or cover vast areas of the island's limited terrain.

In spite of the sustained onslaught on the country's landscape, it wasn't until the mid-1980s that environmental issues became politicized and environmentalists began to protest openly. In spite of being roughed up by politically-motivated elements within the police-force corps of the government party, environmentalists continued to demonstrate. They protested against uncontrolled building activity, rampant development of beach concessions, an illegally built tarmac plant and the massive allocation of government building plots on agricultural land, notwithstanding the large amount of vacant property (Boissevain, 1993: 153; Mallia, 1994: 695; Boissevain & Theuma, 1998: 101-102)¹.

The increasing activity of the environmental NGOs and growing public criticism of abusive building ensured that for the first time the environment figured in the manifestos of the parties contesting the 1987 elections. The Nationalist party that won those elections addressed the dire environmental situation. By 1992, Malta finally had a Structure Plan (1990), an Environment Protection Act (1991) and a Development Planning Act (1992) providing for a Planning Authority to administer and enforce the relevant legislation (Mallia, 1994; Boissevain & Theuma, 1998). In 1989, a number of prominent environmentalists formed the green political party *Alternattiva Demokratika*. Its affiliation to the European Federation of Green Parties ensured that Maltese environmental issues received a wider European audience. In the words of Malta's leading veteran environmentalist Edward Mallia, "in the year of

1993, the environment has become a fact of social and political life in the Maltese islands" (1994: 685).

14.3 Delayed civic engagement

At this stage it is relevant to enquire why had it taken so long for civil society to react to the escalating despoliation of the landscape. There are a number of reasons for this. The first, and perhaps most obvious, is that until very recently, the public knew very little about the countryside and were generally apprehensive about visiting it. They literally did not recognize its beauty and ecological importance. Hence they were indifferent to its destructive commercialization by the building and tourist industries.

A second reason for the slow emergence of the critical voice of civil society is the widespread acceptance of a hierarchy of infallibility. Malta is a hierarchically organized society. Many still believe that the views of persons who occupy superior positions should not be questioned. If a person is superior in rank or office, he is therefore right. This attitude is obviously partly derived from the subordinate position of the Maltese, dominated for centuries by feudal and colonial powers. It was also reinforced by the powerful position of the Roman Catholic Church, a hierarchical institution that demands obedience and does not tolerate questioning. State, church and political party, in the past and even if less evident, today, still mete out harsh sanctions for criticism and disobedience. It is safer to say nothing.

The third reason is Malta's small size and crowding. All persons form part of large personal networks of people they know, and of whom many also know each other. Unusual behaviour or ideas are quickly made known throughout this network. *Malta zghira imma n-nies maghrufa* -

1 The allocation of building permits despite a surplus of vacant properties is still on-going. The Malta Environment and Planning Authority (MEPA) approved 65,737 new dwellings between January 1998 and May 2008, although more than 43,000 properties are completely vacant all year round (Debono, 2008).

'Malta is small but the people are well known' - notes a popular saying. It points to the high degree of social visibility people in Malta have; it is difficult if not impossible to be anonymous. Most people do not want to see others stand out or rise above them. Those who ask questions and express new ideas are quickly set upon.

The final reason is the fear of reprisal or criticism, from family, neighbours, colleagues, political party, government, or the Church; this is ever present. It inhibits persons from standing up and disagreeing with, or even just questioning someone who is or may be more influential or powerful. This fear of others has muzzled the voice of civil society. But, very slowly, this fear is growing weaker. Fifty years ago, few dared to sign their own name to letters to newspapers criticising government agencies or officers. Now newspapers and various blogs carry many signed critical letters. But the fear is still present. It is not simply imaginary. All Maltese can provide concrete examples of persons they know personally or persons they have heard of, who have been severely punished for criticising a superior, government policy or influential persons. Common punishments include refusal to grant a permit, denial of deserved promotion, scholarship or contract, and the transfer of critical employees to different jobs (or else giving them no work to do). Critical news media are cowed by means of libel writs and withholding advertising. The harsh reaction of the Labour government in the 1970s and 1980s to those criticising its policies, such as the attack on environmentalists alluded to above, obviously also severely subdued the voice of civil society (see also Boissevain, 1993: 153; Mallia, 1994: 695; Boissevain & Theuma, 1998: 101-102). Such punishments are of course not unique to Malta, but in Malta the fear of retribution is pervasive. It is a characteristic of those who live in small-interrelated communities in face-to-face contact with each other (see Baldacchino, 1997: 116-124, 2008: 42-43).

14.4 Why is environmental destruction so prevalent in Malta?

Various Maltese governments, whether left or right, or blue or red, have invariably supported the widely held popular attitude that "more is better" - more building, more tourist arrivals, more hotels, more houses, more cars and more and more things in general. They have favoured the interests of the wealthy and particularly, the building and tourist industries. These industries prioritize profit making, if needs be at the cost of the quality of life and heritage of fellow Maltese. In the course of these activities, regulations are often flouted, bent and ignored. Illegal quarrying, building and land occupation persists. Moreover, as the debris and the litter of affluence increases, it continues being dumped all over the island - in the periphery of villages, along the shore, at the side of major motorways, in formerly picturesque valleys and along deserted country lanes in the heart of the island's glorious countryside.

Following the 1987 election, the new Nationalist government uncritically introduced free market principles. This speeded up the privatization and thus commodification of the environment and stimulated unrestrained consumerism. In the 1990s, the government moved to upgrade its tourist product by prioritising reputedly more affluent 'quality tourists' over the traditional 'sun, sand and sea tourists' that hitherto had been the industry's mainstay (Horwath & Horwath, 1989). Inadvertently, the new Master Plan set out the parameters for a serious escalation of conflict. Responding to the plan's recommendations, the government actively stimulated the construction of luxury hotels and housing for resident tourists. It urged excursions to the countryside in winter and spring, and it promoted diving, golf and visits to monuments and traditional religious festivals. It staged invented pageants and re-enactments of

historical military ceremonies. In short, the new policy actively commercialized Malta's history and its natural, social and cultural environment.

Unfortunately, government planners largely ignored the impact that the increased appropriation of environmental and cultural resources for luxury accommodation, golf courses, multiple swimming pools, beach concessions and marinas could have on the environment, and on public opinion (see also Ionnides & Holcomb, 2001). The new policy increased the destruction of the landscape and hampered access to the countryside. Not surprisingly, these developments provoked conflict. The environmental non-governmental organizations vigorously challenged the building projects and related developments designed to attract quality-cultural tourists.

Why, despite the strict planning laws administered by the Malta Environment and Planning Authority (MEPA), does this environmental destruction still persist? Besides the government's structural bias in favour of a free market economy, and the building and tourist industries in particular, there are a number of ingrained Maltese customs and attitudes that are also responsible for this destruction.

Here I list nine; there are undoubtedly more²:

1. The widespread south European custom of treating all public space as a no-man's land on which it is permissible to throw rubbish.
2. The strong family-centered attitude that holds that any action undertaken to benefit one's family is justifiable, and that others behave similarly. This attitude has been called amoral familism, and it

has left lasting imprints and deep scars on the landscape, and is widespread in Malta³. It leads to a disregard of the effects on others - neighbours, strangers, and future generations - of action undertaken to further the interests of self and family. It is part of the fabric of daily life in Malta. Among other things, it leads to indiscriminate dumping of rubbish beyond one's front door, for public spaces are regarded as no-man's land. It also accepts the illegal construction of buildings with total disregard for the laws and regulations established to protect the quality of life of others and the nation's environment. Amoral familism is opposed to the notion that individual rights and interests must sometimes be sacrificed for the common good. In short, it contradicts the principle that the state's building ordinances and zoning regulations should be obeyed because they are right and just.

3. The generally weak sense of heritage that furthers the destruction of national patrimony. The notions of heritage and

2 This section is largely based on Boissevain (2006).

3 The ethic of amoral familism is found throughout the Mediterranean region, the Middle East, Africa, Latin America and Asia. It is a reflection of the cultural and social importance attributed to kinship, especially where the state is unwilling or unable to protect its subjects against injustices. It exists in a particularly concentrated form in Malta because of the importance of the family and the close-knit, small scale, face-to face character of the islands and the legacy of alien domination. The concept of amoral familism was first explored by E.C. Banfield (1958). While his book's many critics disagreed with his argument that the underdevelopment of the Italian South was a consequence of amoral familism, few contested its widespread existence. See Silverman (1968) and Miller & Miller (1974) for critical discussions of the concept.

patrimony were foreign to most Maltese and Gozitans. Many - if not most - still look upon much of the country's natural and monumental heritage as having to do with others - the Knights, the British, il-Gvern (Government), the tourists - with 'them', not with 'us.' Slowly more people are beginning to explore the countryside on weekends (see Grima, 1997). For them, the countryside has taken on a new meaning that approaches a sense of patrimony. Generally speaking, this attitude is not shared by most villagers, or by residents in the working class districts of the towns and cities. Landscape as an intrinsic component of national patrimony is not part of Maltese culture at the grass roots.

4. The extreme importance all Maltese attach to owning a house. In the words of Maltese sociologist Godfrey Baldacchino (2007: 99):

"An own house is a major and safe investment; a source of family pride; a fortress to protect its owners against an all-intrusive society where privacy comes at a premium; an heirloom for the children... [I]n the choice between construction for private gain and maintaining a historic asset for the common good, the choice for the former is, usually, a foregone conclusion."

5. The pervasive system of patronage, clientship, nepotism and the real or imagined network of friends-of-friends reinforces the firm belief that influential friends and relatives in government or political party, can obtain building permits, regularize abusive building activities, influence the judiciary and obscure other contraventions, in return for loyalty, political support, favours or cash (Mallia, 1994: 698-701;

Mitchell, 2002). The very fact that illegal construction activities are so widespread, and that so few persons are successfully prosecuted and severely punished for these, validates this belief and encourages potential offenders to proceed without the necessary permission.

6. The country's somewhat muddled and archaic legal system makes it extremely difficult, if not impossible, for MEPA to successfully prosecute building offences and to remove illegal constructions, even if it had the resources to do so. The inability - or unwillingness - of the state to enforce its own building regulations encourages people to disregard them.
7. Fear of retaliation - such as burning or splashing paint on the front door - for reporting or testifying against illegal building or other activity leads to the Maltese version of Sicilian omertà: collusion through silence. Such fear also reflects the lack of confidence in the ability of the state to protect the rights of its citizens, and thus it underlines the need to cultivate influential protectors. Given the widespread ethic of amoral familism, there may even occasionally be some empathy with the offender: Halli lil kulhadd jimxi ghal rasu!! (Let everyone go his own way).
8. An electoral system that furthers the friends-of-friends syndrome. The many small multi-member constituencies generate intense pressure on politicians competing for votes in the same small pool of constituents. One way for candidates to obtain votes is to personally intervene with authorities on behalf of their constituents; examples I was given included urging a MEPA official to ensure that a favoured client obtains a permit to construct a house outside the

development zone, or to grant a permit retroactively to a client convicted for illegally adding an extra garage to his house. Acquaintances working within the planning agency have told me that political pressure on them is at times severe.

9. Finally, the Maltese custom of short-term planning combined with greed for quick profit, is a major cause of the destruction of the landscape. This short-term vision, in turn, is a consequence of the colonial legacy of looking to more powerful others to take care of long term problems, of the self-indulgence stimulated by amoral familism, and of the government's short planning span dictated by the five-year electoral cycle.

As Marx noted "*Geography (space) tends to become annihilated as a way of increasing the temporal flow of commodities*" (Hirsch, 1995: 15).

14.5 Defending the landscape

A look at some of the recent campaigns by the environmental NGOs will illustrate some of the points noted above.

14.5.1 The Hilton extension

In 1995, the Spinola Development Co. Ltd. submitted final plans to the Planning Authority to redevelop the Hilton hotel (see Boissevain & Theuma, 1998; Briguglio, 1998). The project involved a new 300-bed hotel, 250 luxury apartments, a 16-story business tower, the excavation of a marina and the construction of a breakwater. Alternattiva Demokratika, The Society for the Study and Conservation of Nature (SSCN), Moviment għall-Ambjent - Friends of the Earth, Graffiti and a local residents' action

group presented a series of well-documented briefs and press announcements. They argued that the marina excavation would destroy a unique fortification, pollute nearby sea grass meadows and popular swimming areas, that the Environmental Impact Statement (EIS) failed to examine the project's socio-economic consequences, that the public would be denied its legal right of access to the foreshore, and that the project would subject locals to five years of extreme inconvenience. They organized a press campaign and numerous demonstrations.

Despite these arguments and a confidential and extremely negative internal report prepared by the Planning Authority's Environmental Management Unit (Boissevain & Theuma, 1998), the supposedly impartial Planning Authority Board - on which the country's two fiercely partisan dominant parties were also represented - approved the project in June 1996. Four months later there was a change of government. The newly elected Labour Party had indicated that the environmentalists' allegations would be looked into. But when nothing happened, several activists of the newly formed umbrella group Front Kontra l-Hilton held a weeklong hunger strike in front of the Prime Minister's office. The Prime Minister then authorized the Ombudsman to examine the case and allowed the Front to examine the Planning Authority's Hilton files.

The Ombudsman concluded that no illegalities had been committed, but the government had taken bad administrative decisions "without due consideration to the national interest" (Ombudsman, 1997: 13). The Planning Authority rejected the Front's scathing detailed report on the files as 'simplistic' and the developers dismissed the Front as a 'handful of undemocratic fundamentalists' (Front Kontra l-Hilton, 1997a, 1997b; Planning Authority 1997).

The Front's analysis had nevertheless clearly demonstrated the degree of cooperation, even intimacy between the developer and the Planning Authority's own experts who had scrutinized the projects' plans. It was most instructive to read that the Director of Planning had instructed his staff to check the draft of a letter that the developer's architect was to send to the Planning Authority, to discover that the developer's legal advisor was also the legal advisor of the Planning Authority - although the latter maintained it had not consulted him on the Hilton project (Planning Authority, 1997: 32), to learn that the Director of Planning had persuaded the Director of Museums to overrule his department's previous 'strong objection' to damaging part of a fortification in order to excavate the marina (Front 1997a: 8), and to read the personal note the developer had added to the fax he sent to the Planning Authority case officer handling the project (who at the time was Chairman of the Fund Raising Committee of the Malta Hospice Movement): "Dear Chris, I gladly (sic) enclose a donation of LM 2,000 (EUR 4,750) for the Hospice movement which is so close to your heart. George" (Front Kontra l-Hilton, 1997a: 7-8).

The Hilton reopened in 2000 with its extension, marina and 21-story tower, renamed as Portomaso. Though defeated, the NGO campaign had exposed the way powerful developers operated, displayed government weakness in dealing with powerful developers, demonstrated what coordinated action could achieve and put the Planning Authority and developers on notice that in future it would again attack irregularities. No one was really surprised that the project was approved, for both political parties were patently in favour of it. Moreover, despite the activity of the NGOs and the publicity they garnered, there was not much public support for their campaign. The Hilton Hotel is located in the midst of Malta's greatest concentration of hotels and tourist amenities and local inhabitants were resigned to the congestion. Moreover, many

locals depended on the tourist industry for their livelihood. The case demonstrated that projects that are backed by important political interests tend to be approved by the ostensibly independent Planning Authority⁴. However, the campaign had united the leading NGOs and demonstrated that they could coordinate their technical briefs. The ad hoc organization they developed and the innovative protests they staged prepared them for subsequent campaigns.

14.5.2 The Munxar leisure complex

Around the same time, another confrontation concerned an Italian-Maltese project to develop an \$82 million leisure complex at Munxar point⁵. In contrast to the Hilton case, opposition to this project was successful. Munxar point is located alongside St. Thomas Bay on Malta's east coast. The location had so far been spared the garish developments that have scarred most of the northern coastline. It is a favourite bathing, picnicking and hunting area for inhabitants from inland villages, many of which have small sheds and boathouses along the bay's foreshore. Opposition to the

4 Nonetheless, important political interests do not always get what they want from the Planning Authority. There is a structural tension between the Malta Environment and Planning Authority and certain ministries whose own development projects are frustrated by MEPA's exercise of its mandated responsibility to protect the landscape. For example, in 1999, the Minister of Tourism lashed out at the then Planning Authority (PA) for refusing to approve, among others, the further construction of hotels and a golf course. The Planning Authority, he said: "*should not poke its nose in where it was not needed.... It was parliament that created the Planning Authority, that gave and delegated its powers. The same way it set it up, the same way could parliament substitute it or remove it*" (The Times, April 10, 1999).

5 For a more extensive account of the Munxar campaign see Boissevain, 2004: 243-247.

project began within days of the submission of the formal development application, in November 1995. Alerted by *Moviment għall-Ambjent* - Friends of the Earth (Malta) and a local councillor, *The Malta Independent* announced the proposed development with an article headlined 'Tourist village plans for Marsascala Beauty spot' (November 26, 1995). A week later, a popular local priest wrote an emotional letter pleading for the preservation of the Munxar area. He then set up an action group to fight the application. In four months, their activities generated over a hundred articles and letters to the press and a petition with 10,700 signatures. The environmental NGOs and the two opposition parties, the Malta Labour Party and the green Alternattiva Demokratika, supported them. Faced with this massive opposition, the consortium withdrew its application in March 1996.

14.5.3 Tuna farming

Between 1998 and 2002, a coalition of NGOs and AD waged a hard fought but unsuccessful campaign against Azzopardi Fisheries' proposal to the Planning Authority to establish a tuna-farming operation⁶. The scheme involved setting up giant tuna pens close to the Maltese coast. Its object was to catch small tuna, fatten them and ship them by air to the insatiable Japanese market. This potentially lucrative scheme involved well-connected local financial interests and, later, those in Korea, Japan, Spain and Croatia. The campaigners argued that the project threatened colonies of rare sea birds and sea grass, would jeopardize the livelihood of local fishermen, and that the stench from the food rests and excrement produced by the fish, would pollute nearby bathing areas and diving zones and thus harm the tourist industry and residents of the neighbouring villages who depended on that area

for their recreation. In the course of the campaign, Maltese clashed at sea with Spanish, Croatian and Sicilian fishermen, shots were fired at Maltese fishing boats and (illegal) Spanish spotter planes, and Sicilian and Maltese fishermen exchanged blows on shore. Through Alternattiva's contacts with the European Federation of Green Parties, the disputes were placed before the Italian, Spanish and European parliaments. Though the NGOs' joint submissions and those of the fishermen's co-operative slightly delayed the expansion of tuna farming in Malta, they were ultimately defeated.

By 2008, Malta's tuna ranching industry had become perhaps the world's largest. In 2007 it earned an estimated 100 million Euros by exporting some 11,000 tonnes of tuna to Japan. The tuna ranchers are currently being investigated by Green Peace, the World Wildlife Fund, the Malta Maritime Authority and the European Union for alleged 'tuna laundering' and fishing and ship-registration irregularities. In September 2008, the International Tuna Conservation Commission (ICCAT) attacked the Mediterranean bluefin tuna fishing and farming industries, calling for an immediate closure of the fisheries in view of a 'systematic failure' of the countries and companies involved to adhere to international law.

14.5.4 The Verdala golf course

The Verdala Golf Course saga illustrates more of the evolving tactics of the environmentalists⁷. In 1994, AX Holdings purchased the bankrupt Verdala Hotel and applied for planning permission to build an annex with 36 luxury apartments and to construct a golf course and clubhouse on land just

6 This section is based on Boissevain, 2004 and several other publications – see Note 1 at the end of the chapter.

7 For more details on the Verdala golf course campaign and extensive documentation see Boissevain (2003: 102–108, n.4).

below the hotel. It maintained that project would boost quality tourism, enhance the environment and create employment. The area would be landscaped and include vineyards that the farmers displaced by the project could cultivate.

The application triggered a ferocious ten year confrontation between AX Holdings (AXH) and the tourist industry and some twenty civic groups united under the umbrella of the *Front Kontra l-Golf Kors* (the Front). The Front argued that the island was too small to accommodate a second golf course, that over 100 full and part-time farmers would be displaced, that it contravened Structure Plan policy, that it would deplete the Island's severely limited water supply, and that the necessary pesticides, herbicides and fertilizers would pollute the aquifer. But their strongest argument was that the transfer to AX Holdings of former church land contravened the conditions of the contract transferring church land to the Malta government as stipulated in the *Ecclesiastical Entities (Properties) Act 1992*. The Front organized several demonstrations in Valletta. It lobbied members of the European Parliament. It briefed foreign environmental organizations and the press. It sent detailed dossiers condemning the proposal to key persons in Brussels and Malta; and together with the Progressive Farmers Union, it developed plans for an organic centre adjacent to the proposed site.

Regent International Hotels, a subsidiary of Carlson Hospitality Worldwide (USA), announced its intention to purchase a ten per cent stake in the Verdala Hotel and to manage it (*The Business Times*, April 4, 2001). The Chairperson of *Alternattiva Demokratika* wrote to the Chief Executive of Regent Hotels and to the President of the Carlson Leisure Group warning them against AX Holdings' questionable business practices since it had begun advertising the hotel as being adjacent to a non-existent golf course for which it had not yet acquired the land (*The Malta Independent Online* – www.independent.com.mt - August 31, 2001).

AXH and *Alternattiva* then threatened each other with lawsuits (*The Times (Malta) Online* – www.timesofmalta.com – November 1, 2001).

The number of NGOs supporting the Front increased steadily⁸. The Front organized an email petition and ninety-two farmers sent protest petitions to the Holy See, the President of Malta, the Archbishop and the Papal nuncio. AX Holdings sent a briefing document to the highest civil and ecclesiastical authorities. The opposition Malta Labour Party came out against the Verdala project. The Nationalist Minister for Tourism advocated two more golf courses and a Formula One track for Malta, arguing "*The environment is not the be all and end all of everything*"⁹.

The Archbishop finally climbed off the fence in 2002 and openly called for "*due respect for the nation's natural and environmental heritage*." On July 22, 2002 the Planning Authority held a public hearing on the Environmental Impact Statement prepared by AX Holdings' consultants; the hearing was conducted in English. This caused uproar, since most of the affected farmers spoke little or no English. The meeting was turbulent and inconclusive.

On September 9, 2004, the Planning Authority board turned down the Verdala golf course proposal on the formal grounds that could have been applied years before. Malta's environmentalists had won their longest and most fiercely fought battle to date. The stunned chairman of AX Holdings appealed the decision, but so far (September, 2008) the case has not re-emerged.

8 In February 2004 the Front Kontra l-Golf Kors was made up of several entities: see Note 2 at the end of the chapter.

9 David Lindsay reporting in *Malta Today* (3 June 2001) on his interview with Minister Michael Refalo on 27 May 2001.

14.6 Discussion

These four cases show that detailed planning procedures do not always guarantee protection to the environment. Decisions are made in a context of conflicting interests and overlapping networks of friends of friends. To my mind, the Hilton extension and Verdala golf course hearings were rituals staged to convince the public that their decisions were based on the advice of experts, that they included the voice of stakeholders, and that they conformed to planning and environmental regulations. The patent sloppiness of those concerned in ignoring the importance of presenting the arguments for the golf course and the EIS to the farmers threatened by the project in a language they could understand, demonstrate how little importance they attached to the hearing. Adrian Peace, who examined a planning sequence in rural Ireland, quite rightly called such public hearings "*modern theatres of control*" (Peace, 1993: 20).

Besides the four cases discussed above, environmentalists have mounted successful campaigns that blocked five other projects: the Gozo airstrip (1995-1996), the Xaghra l-Hamra golf course (2006-2007), the Siggiewi cement plant (1999), the Mnajdra temple landfill (2003-2004) and the Ramla l-Hamra villa complex (2007).

Furthermore, *Alternattiva Demokratika* and the environmental NGOs, as of September 2008, were still pursuing ten protests they lodged with the EU's Environmental Commission and MEPA regarding aspects of other on-going projects and activities – (i) the extension of the Development Zone boundary, (ii) the Fort Cambridge apartment blocks, (iii) the Ta' Cenc extension including villas and heritage park, (iv) the Midi consortium's massive Manoel Island and 'Tigne' Point projects, (v) the Pender Gardens multi-story apartment complex, (vi) the mega SmartCity township development, (vii) the 900

unit apartment complex on Xemxija Hill, (viii) the Mistra Bay disco, (ix) the Qala Creek hotel, marina and tourist village scheme, and (x) the alleged excessive export of farmed bluefin tuna¹⁰.

Of the nine major campaigns environmentalists mounted after 1995, they won seven and lost two. Furthermore they are still engaged in appealing another ten. This may well be a unique record of environmental success. Moreover, since 2005, two new and extremely active environmental NGOs – the Ramblers Association and *Flinkkien għall Ambjent Ahjar* (FAA: Stand together for a better environment) – joined the green movement. All this activity is striking evidence that the green voice of civil society in Malta is beginning to sound louder and that the politicians are, if grudgingly, taking note of it.

Indeed, much has changed on the environmental front in Malta since the 1970s. Civil society has made great strides and is making its voice heard. Pressure to protect the environment has not come from the government. Because of the way it is entangled with special interest groups and patronage and clientelistic networks, the government has been *reactive*, rather than *proactive* regarding the enforcement of its environmental policy. Pressure for change has come from *outside*, from the UN, EU and international NGOs, and from *below*, from local NGOs and grassroots action groups (Boissevain & Gatt, 2011).

Malta's membership of the European Union since 2004 has provided environmentalists with considerably more political leverage and

10 Up to the end of 2007, of all the new EU member states, Malta was facing the highest number of infringement procedures for breaking EU environmental rules, according to an EU report issued 3 July 2008 (Camilleri, 2008).

opportunities¹¹. Support from the European Union in some respects is a mixed blessing. Financial support and stewardship over certain tracts of land or monuments brings with it dependence and institutionalization. This engenders some loss of independence, as cooperation with the EU involves maintaining reasonably cordial relations with the government departments and that, in turn, inhibits an NGO's ability to vigorously attack or embarrass the political establishment and business corporations. This loss of mobilising capacity weakens it (Rootes, 2007: 2). Moreover competition for EU funds and government favour may also account for the apparent reluctance of many of the established ENGOs to form alliances with the more radical NGOs like *Graffiti*, and also *Alternattiva Demokratika* (Boissevain & Gatt, n.d.; Briguglio & Brown, 2008; Rootes, 2007: 14).

The ENGOs are making good use of these new possibilities to protect their landscape. Nonetheless, because of the nation's political culture, greed for quick profit and the prevailing amoral family-first ethos, the future of Malta's landscape still looks bleak. A necessary condition for a truly different attitude to the landscape is for most Maltese – and not just the middle class and more educated segment of society that at present mainly supports the green lobby¹² – to appreciate that the rural landscape is a national heritage every bit as important as the megalithic temples and the fortifications of the Knights.

Acknowledgements

I am most grateful to Michael Briguglio, Maria Brown, Louis F. Cassar and Caroline Gatt for taking the time to read this chapter and to send me their insightful and very helpful comments. Naturally I alone am responsible for errors of fact and interpretation.

Note 1:

Section 14.5.3 is based on Boissevain, 2004, and additional material from the following:

Alternattiva Demokratika: Media Release: August 2002, 09/09/02;

Business Times (Malta) Online [www.business-times.com.mt]: 11/07/01;

Friends of the Earth (Malta): Letter to Director of Planning, 03/05/00;

Malta Today Online [www.maltatoday.com.mt]: 15/04/01, 27/05/01, 19/06/01, 01/07/01, 02/09/01, 17/10/01;

The Malta Independent Online [www.independent.com.mt]: 08/04/01, 07/06/01, 27/06/01, 08/07/01, 02/09/01; 09/09/01; 14/09/02; 16/09/01; 23/09/01 29/04/02, 20/06/02;

Nature Trust: Press release 15/05/00, Newsletter no. 217, and 12/08/00;

Nature Trust and Marine Life Care Group: Press release 11/07/01;

L-Orizzont: 11/08/01, 20/06/02, and 14/07/02;

The Times (Malta) Online [www.timesofmalta.com]: 06/04/01, 30/04/01, 08/06/01, 23/06/01, 01/07/01, 03/07/01, 06/07/01,

11 Studies of the political role of environmental NGOs in Spain, Portugal and Italy also concluded that they could discuss some local problems more easily with the EU Commission than with their own governments. The EU, in turn, relies on NGOs for information on the adherence and implementation of environmental regulations (Aguilar Fernandez 2001: 273).

12 A recent survey found that although ENGO members come from all social strata, 61 % have an average to high socio-economic background (Briguglio & Brown, 2008: 11, Fig. 2).

11/07/01, 12/07/01, 15/07/01, 21/07/01,
22/07/01, 25/07/01, 27/07/01, 30/07/01,
04/08/01, 11/08/01, 19/08/01, 23/08/01,
26/08/01, 31/08/01, 04/09/01, 14/09/01;
18/10/01, 27/04/02, 21/05/02, 08/09/02.

The NGOs involved in the campaign were Din l-Art Helwa, Nature Trust/Marine Life Care Group, ECO Foundation, Moviment għall-Ambjent – Friends of the Earth (FoE) (Malta), and the Biological Conservation Research Foundation.

For more recent developments see:

<http://www.maltatoday.com.mt/2008/7/06/t1.html>; <http://www.maltatoday.com.mt/2008/08/06/t6.html>; <http://www.maltatoday.com.mt/2008/08/24/t9.html>; <http://www.maltatoday.com.mt/2008/09/03/t7.html>; <http://www.maltatoday.com.mt/2008/09/14/t2.html>; <http://www.timesofmalta.com./articles/view/20080930/local/ag-finds-enough-evidence-to-arraign-owners-of-trawlers>.

Note 2:

In February 2004 the Front Kontra l-Golf Kors was made up of: Progressive Farmers Union, Moviment għall-Ambjent-Friends of the Earth (Malta), Moviment Graffiti, Alternattiva Demokratika, Inizjamed, Move Organization, Zminijitna, Alternattiva Demokratika Zghazagh, International Animal Rescue, Azzjoni Pozittiva, Vegetarian Society, Pembroke Residents Association and Nature Trust (incorporating the previously autonomous Society for the Study and Conservation of Nature, Arbor, Verde and Marine Life Care Group). The following also supported the campaign: University Chaplaincy, Malta Organic Agriculture Movement, Kopin, the Farmers' Central Co-Operative Society, and Din l-Art Helwa.

References

- Baldacchino, G., 1997. *Global tourism and informal labour relations: the small-scales syndrome at work*. London and Washington: Mansell.
- Baldacchino, G., 2007. Jurisdictional capacity and landscape heritage: a case study of Malta and Gozo. *Journal of Mediterranean Studies*, 17, pp.95-114.
- Baldacchino, G., 2008. Studying islands: on whose terms? Some epistemological and methodological challenges to the pursuit of island studies. *Island Studies Journal*, 3, pp.37-56.
- Banfield, E.C., 1958. *The moral basis of a backward society*. New York: The Free Press.
- Blok, A., 1969. South Italian agro-towns. *Comparative Studies in Society and History*, 9, pp.121-135.
- Boissevain, J., 2001. Contesting Mediterranean landscapes. *Journal of Mediterranean Studies*, 11, pp.277-296.
- Boissevain, J., 2003. Confronting the tourist industry in Malta. In: R. Mursic & I. Weber, eds. *Mediterranean ethnological summer school, Volume 5: Piran 2001 and 2002*. Ljubljana: Department of Ethnology and Cultural Anthropology, University of Ljubljana, pp.95-113.
- Boissevain, J., 2004. Hotels, tuna pens and civil society: contesting the foreshore in Malta. In: J. Boissevain & T. Selwyn, eds. *Contesting the foreshore: tourism, society, and politics on the foreshore*. Amsterdam: University of Amsterdam Press, pp.233-260.
- Boissevain, J., 2006. *Taking stock after fifty years. Where to now?* Available: <http://www.maltatoday.com.mt/2006/03/26/speech.html> [Last accessed: 20th March 2011].

Ombudsman, 1997. Land development by Spinola Development Co. Ltd. (The Hilton Project). *Report on Case No. 1398*. Malta: Office of the Ombudsman.

Peace, A., 1993. Environmental protest, bureaucratic closure: the politics of discourse in rural Ireland. In: K. Milton, ed., *Environmentalism: the view from anthropology*. London and New York: Routledge, pp.188-204.

Planning Authority, 1997. *Hilton redevelopment project. Response to report from 'Front Kontra l-Hilton'*. Malta: Planning Authority.

Rootes, C., 2007. Introduction. In: C. Rootes, ed. *Environmental protest in Western Europe*. Oxford: Oxford University Press, pp.1-19.

Silverman, S., 1968. Agricultural organization, social structure and values in Italy. Amoral familism reconsidered. *American Anthropologist*, 70, pp.1-20.

Silverman, S., 1978. *Three bells of civilization: the life of an Italian hilltown*. New York: Columbia University Press.

CHAPTER 15

Olive multifunctional landscapes in Cyprus: sustainable planning of Mediterranean rural heritage

Jala Makhzoumi

15.1 Background

The Mediterranean is commonly identified as the 'region of the olive' (Polunin & Huxley, 1987). The association is understandable considering that the wild olive species, *Olea oleaster*, is native to the region (Meikle, 1977, 1985) and that the domesticated tree, *Olea europaea*, larger in size and abundant in fruit, is cultivated extensively in the Mediterranean. Olive groves blanket hillsides, pour into valleys and encircle villages; their distinctive silver-green mantle is integral to the perception of Mediterranean traditional rural landscapes. Sun, sea, and olive landscapes lie at the heart of Mediterranean tourism and continue to be used to promote local cuisines and healthy lifestyles.

Historically, olive landscapes constituted the backbone of traditional rural economies. Their cultivation evolved into a complex agricultural ecosystem that is multifunctional in that it combines agricultural, silvicultural and pastoral uses. The trees are cultivated for their fruit, olives, a staple food in the Mediterranean. Olive trees in turn shelter a variety of uses and activities. They are intercropped with other fruit trees, wheat and barley, serving as rich pasturelands for sheep and goats when fallow. As such, traditional olive landscapes are sustainable economically, because

they accommodate more than one function/use on the same land area, environmentally, because they are native to the region and well adapted to the characteristically hilly landform, hot climate, scarce water resources and poor soil conditions. The geographical range of olive landscapes ensures continuous, volumetric vegetative cover that modifies local climate, conserves water and soil and accounts for a distinct, much valued Mediterranean landscape character.

Beyond agricultural productivity and environmental sustainability, olive landscapes play an important role in sheltering Mediterranean wildlife, thus providing the ecosystem functions of the native Mediterranean forests that have long ago disappeared. In many ways, olive landscapes are a 'substitute nature', a unique landscape that has evolved to embody the symbiosis between nature and culture that is characteristic to the region. As such, traditional olive landscapes are at once a natural heritage and cultural heritage of the Mediterranean. This duality however hinders their future planning and management. As 'manufactured' landscapes they are sidestepped by nature conservation policies that prioritize on 'nature' and 'natural landscapes'. In Cyprus, for example, apart from *Forest Law and physical planning regulations* (Department of Town and Country Planning, 1996), *environmental protection*

is mainly based on the Law on the Protection and Management of Nature and Wildlife" (Delipetrou *et al.*, 2008). Olive landscapes, as indeed all traditional Mediterranean rural landscapes, are managed by the agriculture sector with emphasis on productivity at the expense of the non-tangible environmental, ecological and cultural benefits.

The indiscriminate application of north European planning and management is another problem. The damage done by the EU Common Agricultural Policy (CAP) is one example of failure to recognize the specificity of the traditional Mediterranean rural landscape and the role that these landscapes play in sustaining fragile mountain ecologies. The result is 'bulldozing' of 'the protective maquis vegetation to make room for large-scale intensively cultivated and irrigated olive plantations, causing erosion and destruction of a characteristically multifunctional landscape, together with its 'hard' and 'soft' landscape values (Naveh, 2008). Mediterranean rural landscapes are sidestepped by 'imported' nature conservation policies that favour protecting pristine 'nature' landscapes at the expense of traditional ones. Furthermore, although amendments have been made to recognize and protect cultural landscapes (IUCN category V), nature conservation and environmental planning in the southern and eastern Mediterranean continue to prioritize *either* on natural components *or* anthropogenic landscapes in isolation. In response, Pungetti argues for a "*de-anthropization of the plan*" to overcome the current trend that "*has confined environmental planning in Italy to territory and parks, without addressing it to the wider countryside and ecological systems*" (Pungetti & Romano, 2004: 110). An acceptance that traditional olive landscapes in the Mediterranean are part nature and part culture, and that the two are complementary and cannot be considered in isolation without compromising the integrity of the whole is the starting point for ensuring sustainable future development.

The challenge for sustainable future planning therefore necessitates a move away from established, compartmentalized assessment and management of traditional Mediterranean landscapes of which olive landscapes are a part. This chapter advocates a holistic landscape approach which broadens assessment beyond agricultural productivity to integrate the natural and cultural dimensions of rural landscape (Makhzoumi & Pungetti, 1999, 2008; Selman, 2006). A post-productive assessment of traditional landscapes is one example of an integrative planning model that expands conventional valuation of production activities in agriculture, farming and forestry to include *all* functions, i.e. tangible, production and non-tangible, environmental and cultural ones. The shift advocates alternative value systems concerning these functions, while encouraging "*new emerging value systems, defined by different stakeholders and perspectives*" (Pinto-Correia *et al.*, 2004). Another model is that of 'multifunctional landscapes', which combines sustainable development, agriculture and environmental policies on the one hand, material and spiritual values of landscape on the other (Brandt & Vejre, 2004). Brandt and Vejre argue that since the Enlightenment, western culture has moved towards the spatial segregation of land use functions into agricultural and silvicultural production and monofunctional land use to secure economic efficiency (*ibid*). The resultant diseconomies in the form of amplified environmental problems since the 1950s are now being recognized, with a resulting gradual shift away from functional segregation to functional integration. Three functionalities are integrated within the multifunctional model proposed by the authors (*ibid*): "*landscape ecosystem functionality*", reflecting the capacities of natural processes to maintain/change environments; "*land use functionality*", reflecting the capacities of socio-cultural processes to change environments; and "*transcending functionality*", reflecting social



Figure 15.1: Cyprus location map.

as landscapes with environmental and cultural roles, a natural and cultural heritage. This implies factoring environment and culture into the way we understand, articulate and reconcile conflicting social, economic and political interests and in forging our aspirations for healthy and meaningful lives.

To demonstrate the landscape model for planning and management, this chapter applies the holistic landscape planning model to a project in Cyprus (Makhzoumi, 1996, 1997). The project undertook a comprehensive field survey to determine the extent, character existing state and threats to olive cultivation in the northern part of the island (Makhzoumi, 2001). The landscape approach, we shall argue, has the potential to align planning and management of traditional olive landscapes with global priorities for sustainable development, biodiversity conservation and to recognize them as a natural and cultural heritage.

15.2 Traditional olive landscapes: North Cyprus case study

intentions to maintain or change environments through planning and management. Traditional Mediterranean rural landscapes are a living example of the multifunctional model, where ecosystem and land use functionalities have been integrated not through conscious planning but by traditional vernacular management practices that evolved over centuries. As such, the uniqueness of olive multifunctional landscapes should be celebrated as a template for sustainable future development. To achieve this necessitates two things. On the one hand, it requires a deeper understanding of their specificity as a unique land use system that is responsive to the Mediterranean geography and ecology. On the other hand, olive landscapes need to be valued holistically

With a land area of 9,251 km², Cyprus is the third largest island in the Mediterranean (Figure 1). Two mountain chains shape island geomorphology. In the north, the elongated Kyrenia Range (Pentadaktylos) runs parallel to the island's northern coastline with peaks of 1,000 meters. In the south-west runs the Troodos Range, with peaks of 2,000 meters, linked in the centre to the Mesaoria plain. The climate is characteristic of the eastern Mediterranean, with typically hot dry summers and short rainy winters. Annual average precipitation is 500 mm but varies considerably between the inland Mesaoria, and the peaks and the sea-facing foothills. This in turn influences density and composition of the spontaneous vegetation cover and land use. The island landscape

is predominantly rural, a mosaic of coniferous and oak forests in the peaks, dense maquis scrubland in the upper foothills and olive and carob cropping in the remaining open landscapes (Delipetrou *et al.*, 2008). Nicosia (Turkish Lefkosa), the largest city and the capital since the eleventh century BC, is located in the centre of the island. Harbour towns such as Kyrenia (Turkish Girne), Famagusta (Turkish Gazimaguza), Limasol and Pafos serve as the nucleus of coastal tourism and associated development and have become population magnets along the island's rapidly urbanizing coastline.

Ongoing conflict between Greek and Turkish Cypriots culminated in the occupation of the northern part of the island by Turkey in 1975. The Turkish Republic of North Cyprus (TRNC) comprises approximately a third of the island, is not recognized internationally and is marginalized politically. Economic and political isolation of the TRNC has indirectly slowed down development, leaving the extensive olive and carob cultivation, as indeed much of the traditional rural landscape, almost intact.

A pilot study was proposed with the aim of broadening valuation of traditional olive cultivation in the TRNC and proposing sustainable future management (Makhzoumi, 2001)¹. The survey plan was two-tiered: (i) assessment of the regional context, to establish extent and spatial distribution of olive cultivation in north Cyprus; (ii) assessment of local conditions, to determine morphological characteristics and prevailing management practices. Four specific objectives shaped the project:

- To assess the physical extent and spatial distribution of olive landscapes;
- To characterize them as landscapes, identify associated uses and management;
- To assess threats to traditional olive cultivation; and
- To propose guidelines for sustainable planning and management.

The first phase of the project involved a rapid regional survey of olive landscapes in the TRNC. Working with cadastral maps, GPS on-ground verification and rapid assessment, six olive landscape typologies were identified. These include:

- Olive cultivation in the plains (coastal and inland);
- Olive cultivation in the lower foothills (under 300 m.a.s.l.);
- Olive cultivation in the upper foothills (above 300 m.a.s.l.);
- Olive cultivation in and along ravines;
- Olive cultivation in village peripheries; and
- Olive cultivation in urban and suburban settings.

Statistics on olive agriculture were obtained from the Agricultural Statistical Census, Ministry of Agriculture (TRNC, 1999).

The second phase of the project, involved surveying samples of the six landscape typologies identified. Twenty-one case studies were selected to include all three administrative divisions in the TRNC (Nicosia, Kyrenia and Famagusta) and to ensure diversity in elevation, aspect (inland, seaward) and location (rural, urban) (Plate 15.1). A survey sheet was designed to guide assessment of five key areas of information: (i) general information concerning administrative region and plantation

¹ The project proposal was undertaken jointly with a local NGO, Middle East Environmental, and funded by UNDP, 1999-2001.

type; (ii) location in terms of longitude, latitude and elevation; (iii) characterizing olive orchards in terms of tree density, use and management; (iv) tree description and distribution; their spatial configuration; other tree species within the surveyed area; tree age, condition and the average distance between trees; and (v) individual tree data: tree height, girth circumference, crown diameter.

Survey findings are herein presented, grouped under three headings: first, the extent of olive landscapes in North Cyprus in terms of tree distribution and olive production; second, the morphological and ecological characteristics and management of olive tree landscapes; and third, identified threats.

15.3 The extent of olive cultivation

Olive tree cultivation in North Cyprus is considerable in terms of the extent of their geographical distribution, the total number of trees and olive production in tonnes². The highest concentration is in the coastal administrative regions of Famagusta and Kyrenia, respectively 288,870 trees and 122,670 trees, comprising 58% and 25% respectively of the total number of estimated olive trees in North Cyprus (497,637) (TRNC, 1999).

A more accurate distribution pattern emerges when considering the number of olive trees within the smaller, sub-administrative divisions

in Famagusta, Kyrenia and Nicosia (Plate 15.2). The highest concentration, by far, is in the Karpaz peninsula, Famagusta. The total number of olive trees in the two sub-administrative divisions of Yeni Eren Koy and Mehmetcik, is estimated at 177,670 trees. In second place are the three coastal sub-regions in east Kyrenia, Gecitkale and Yeni Iskele, which have a total of 53,370, 36,055 and 35,900 trees, respectively. With the exception of Degirmenlik, traditional olive cultivation in the southern, inland aspect of the Kyrenia foothills and the Mesaoria plain is limited; by comparison, the flat Mesaoria plain lends itself more readily to arable agriculture.

Olive production is another indication of the geographical extent of olive cultivation. Olive production according to administrative regions shows a similar pattern to that of tree distribution. The Famagusta administrative region leads, producing more than one million tonnes of olives (56.2% of the total production for North Cyprus), followed by Kyrenia (which accounts for 26% of olive production). The Nicosia administrative region contributes a mere 17%.

Distribution according to smaller, sub-administrative divisions (Plate 15.3) indicates that once again Mehmetcik and Yeni Eren Koy in Famagusta lead in terms of olive production with 480 and 399 tonnes, respectively. They are closely followed by West Girne sub-region, which produces 340 tonnes per year.

Comparing the distribution patterns of trees to that of olive production confirms that the administrative divisions with the highest concentration of olive trees were not necessarily the most productive. Degirmenlik, for example, had a proportionately high concentration of olive trees but a relatively low production rate. Similarly West Kyrenia had a third of the trees of East Girne but had a fourfold production of olives. Several

2 The physical extent of olive trees is estimated by recording the numbers of trees per administrative subdivision. Another indication of extent is olive tree density - tree/hectare. A third indication of extent is derived by comparing the total yield - kg/tree or tonne.

No.	Name	Elevation	Area	Admin Division	Associated Uses	Type	Density (tree/ha)	Age		Management				
								100	40-60	Seedlings	Understorey Cleared	Pollarded	Tilled	Irrigated
								1	2	3	4	5		
1	Lefke	152	4.208	1	Orchard /Garden	6	218	■	■					
2	Kalkanli	98.6	2.65	1	Arable /Pastoral	4	148	■	■			⊙	⊙	
3	Alemdag	430	2.4	2	Arable /Pastoral	3	50	■	■	■	■			
4	Yedidalga	25	5.738	1	Orchard /Garden	4	61	■		■	■	■	■	
5	Lefke	115	3.877	1	Orchard /Garden	6	92	■	■			■		
6	Zeytinlik	65	4.55	2	Orchard/Garden	6	127		■	■		■		
7	Dogankoy	56.4	4.23	2	None	6	126	■	■			■		
8	Lapta			2	None	1	70		■	■				
9	Lapta	500	5	2	Arable /Pastoral	3	60	■	■			■		
10	Karaagac	290	2.88	2	Arable/Pastoral	2,5	151	■	■		■	■		
11	Esentepe	17.38	2.5	2	Abandoned	4	68		■					
12	Mersinlik (a)	152	5.11	3	Arable/Pastoral	4,5	41	■			■	■		
13	Mersinlik (b)	31.4	150	3	Arable /Pastoral	1,4	85	■	■		■	■	■	
14	Minaretlikoy	114.6	1.25	1	None	1	184		■		■		■	
15	Yenicekoy	124	3000	3	None	1,5	86	■	■		■	■	■	
16	Yamackoy	370	1.8	3	None	3	127		■		■			
17	Catalkoy	30	3.6	2	Pastoral	1	70		■		■			
18	Aslankoy	77	2.5	3	Arable/Pastoral	5	108		■					
19	Yedikonuk	109	5	3	Arable/Pastoral	2	24		■		■			
20	Bafra	33.8	6	3	Arable	1	22	■			■	⊙	■	
21	Turnalar	200	2.5	3	Arable/Pastoral	2	64		■					
Average tree density (tree/ha) calculated for all 21 case studies							94							

Table 15.1: A summary of the characteristics of olive plantations in North Cyprus, based on the findings of the field survey.

- Positive indication
- ⊙ Positive indication, but not current.

Administrative Division:(1) Lefkosa; (2) Girne; (3) Gazi Magusa

factors account for these incongruities. In the case of Degirmenlik, for example, despite the extent of olive trees, it was noted that many of the orchards were abandoned, the trees in need of irrigation. Another reason for the incongruity is the relatively low population densities in North Cyprus. Considering that olive management and harvesting is labour intensive, the reduction in rural work force following partitioning accounted for poorly managed orchards and in many cases abandonment.

15.4 Characterising olive tree multifunctional landscapes

The landscape character of olive orchards depends primarily on landform and elevation, which in turn influence planting layout and overall density. Two broad methods of cultivation were identified. The first includes cultivation through seedlings, which follows an orthogonal layout established early in the last century along the northern coast. The use of olive seedlings makes it possible to control the distance between the trees, which ranges from 10 to 12 metres (as in 16.8 m and 17 m in coastal Girne, and 14 m and 15 m in Mesaoria). The second method of cultivation is through in-situ grafting of wild olive trees, which results in a less regular layout with smaller distances between the trees (as in most of the remaining case studies). This method was observed in older plantations as well as ones established in the lower and upper foothills.

Based on the field survey, characteristics of olive landscapes are summarized in Table 15.1. The average olive tree density in North Cyprus, calculated as the average for the 21 case studies, was relatively high at 194 tree/ha when compared to olive tree density in traditional plantations elsewhere in the Mediterranean which varies between 40-50 trees per hectare (tree/ha) (Beaufoy, 2001). Tree densities in TRNC oscillate between lower

tree densities found in the Karpas (22-24 tree/ha), which are a result of olives being interspersed with carob trees, and high tree densities found in and around settlements (218-127 tree/ha). It was noted that lower tree densities in many case studies resulted from the removal of olive trees to allow for more profitable arable cultivation.

The landscape character of olive orchards is also the result of landform. Within the flowing three-dimensional cover of olive trees that blankets the northern part of the island, five landscape character typologies were identified. These are described hereunder:

- **The coastal plain:** Olive trees in the coastal regions follow an orthogonal planting layout as they are generally grown from seedlings. Olive landscapes of this typology extend along the length of the northern coastline (case studies 6, 7, 8, 10, 11, 12 and 13). They are threatened from suburban encroachment and tourist development along the coastal road, which in turn raise land values.
- **The Kyrenia foothills:** Olive landscapes in the north-facing and south-facing Kyrenia Range foothills are extensive in area. The density of olive trees in the northern part of the Kyrenia foothills is higher than in the southern part. Here olive trees are established in conjunction with stone terraces. Tree and terrace combine to conserve the soil and maintain a critical ecological balance in marginal lands that are hard to utilize and increasingly threatened by erosion. Olive cultivation in the foothills comprises a two-tiered band, which includes settlements and their immediately adjoining olive plantations: an upper band that occurs about 300 m.a.s.l. (which includes the settlements

of Malidag, Agillar, and Ardahan to the east, Alemdag, Akcicek and Dikmen to the west), and a lower tier just above the Mesarya plain (that includes the settlements of Degirmenlik, Serdarli and Gonendere) (Plate 15.4)

- **The Mesaoria Plain:** The character of olive landscapes in Mesaoria comprises the length of the central plain from Famagusta Bay to the east, to the Bay of Morphou in the west. Olive tree densities here are generally low, the trees smaller in size and in poor condition in comparison to the other two previous zones. Olive cultivation concentrates in the immediate vicinity of settlements (Plate 15.5), as the majority of land in the central plain is utilized for arable agriculture. Olive tree concentration is more prominent in the eastern end of the plain, the western end being extensively utilized by citrus plantations.
- **The Karpas Peninsula:** The Kyrenia Range tapers down to hilly peaks not exceeding 200 m.a.s.l., which dominate landform in the Karpaz. This part of the island has the highest concentration of olive trees and is equally rich in native flora and fauna. Olive trees are widely spaced and mixed with equal numbers of carob trees and wheat cultivation.
- **Ravines:** Seasonal watercourses are a key feature of the island landscape (Plate 15.6). Linearity and climatic sheltering influence the character of olive landscapes in ravines. Case studies 2 and 3 are two of the largest olive landscapes established in seasonal watercourses.

Three dominant uses were found to be associated with olive multifunctional landscapes. The most common is arable agriculture, mainly of wheat and barley. Many olive trees were removed to enable mechanized harvesting of wheat and barley.

Pastoral uses were equally dominant. Mixed herds of sheep and goat, not necessarily of the orchard owner, graze the spontaneous vegetation in fallow arable lands within olive orchards surveyed. In the process, the herds check the advance of spontaneous vegetation and fertilize the orchard. A third associated use noted was intercropping with fruit trees. This is especially the case in olive cultivation in the ravines. Olive cultivation in and around urban and suburban areas had no associated use.

The management of olive plantations usually entails clearing of the understorey, tilling the land following harvesting, pollarding and, in some cases, as in Mesaoria, providing for open or drip irrigation (Table 15.1). The management of olive landscapes can be grouped into three categories: well managed (case studies 4, 14, 15), managed (3, 10, 12), and not managed (7, 21). Only a handful of the orchards surveyed were well managed.

Clearing the understorey is an important part of managing olive plantations. In the foothills, the understorey is typically of maquis species, which develops into mature woodland of pines and cypresses in the higher foothills if left undamaged (case studies 3, 9, 16). This demonstrates the flexibility of olive landscapes, their ability to play a dual role, managed agriculturally productive or unmanaged buffer zone/wildlife habitat for the protected forestland. Tilling is another management routine that controls the undergrowth and allows for greater water absorption. Tilling usually follows olive harvesting. Another management practice is pollarding which is variously undertaken to ensure healthy growth or to facilitate harvesting. The result is a 'stumpy' olive tree (case studies 5, 10). Pollarding as such accounts for the variations in the shape of olive trees in North Cyprus. In Mesaoria, pollarding is practised by cutting the trunk at 1.50 m above the ground level at an early stage in the development of the tree to promote low branching,

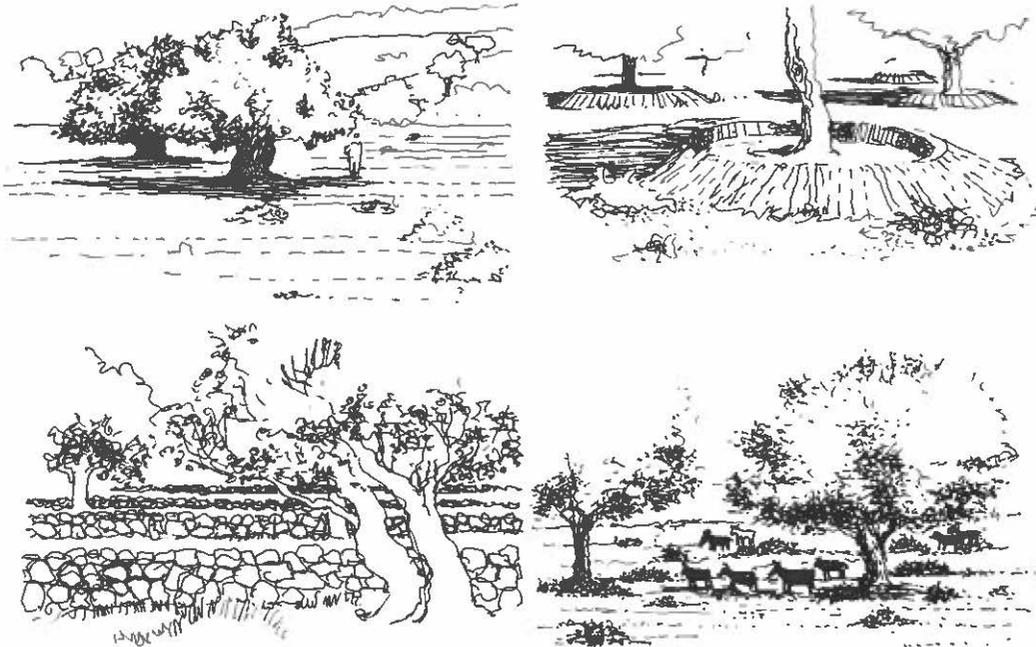


Figure 15.2: Management of olive landscapes (clockwise from top left): pollarding to facilitate harvesting; open irrigation; management through grazing; olive cultivation in the foothills in conjunction with stone terraces.

which in turn facilitates olive harvesting. Irrigation was recorded in three case studies (2, 5 & 14). It is limited to olive plantations in Mesaoria, which region is typically semiarid. Earth pans are created for the individual trees and are connected by open ditches in an effort to conserve water (Figure 15.2).

Cyprus was historically known for its cultivation of olive trees (Christadoulou, 1959; Thirgood, 1987; Hadjisavvas, 1992). Some remaining olive trees date from Venetian times, estimated at over 400 years in age. Several such ancient orchards were encountered during the field survey (case studies 2, 7, 13, 20). Short of counting the tree rings, there is no way of estimating, with accuracy, the age of a tree, unless historical records exist.

With olives, however, the hollowness of the trunk is one indication. In the present study, girth circumference and the extent of hollowing (established by measuring the inner circumference of the girth) were taken as a criterion in estimating olive trees that are more than a hundred years old (Figure 15.3). Many old olive orchards surveyed should be protected by the state as natural and cultural heritage of the island (case studies 2 and 13). Tree dimensions vary as a result of site conditions and management. Spot measurements were undertaken for most case studies.

To conclude, traditional olive cultivation in North Cyprus forms extensive landscapes that are responsive to terrain and aspect, multifunctional in

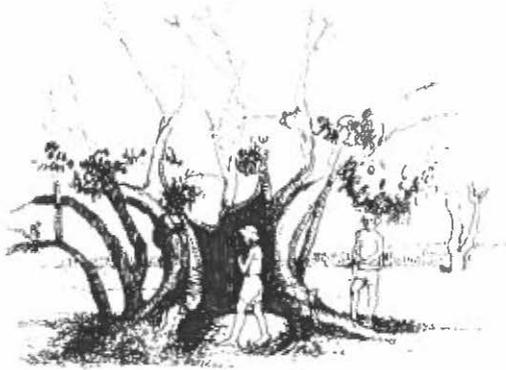


Figure 15.3: Olive trees estimated several hundred years old (case study 2).

use and management. The resultant diversity and distinctiveness in morphology and use sets them apart from commercially established olive cultivation that is increasingly replacing them on the island. Unlike commercial olive plantations, traditional orchards are not only productive agriculturally but also sustainable environmentally, protecting scarce soil and water resources, and ecologically, serving as a wildlife habitat that complements the role of protected forestland. Traditional olive landscapes as such are a living example of multifunctionality, a valuable natural and cultural heritage in them and as an asset in promoting tourism in the island (Makhzoumi, 1997).

15.5 Threats to olive multifunctional landscapes in North Cyprus

Landscapes of olive trees are increasingly under threat. This is confirmed by the decline in the total number of trees from 668,685 to 521,848 for the period between 1975 and 1995 which indicates an average loss of 7,342 trees per year (TRNC, 1999). The rate of loss in the decade 1985-1995 was 9,543 tree/year, almost double that for the period 1975-1985 (5,141 tree/year). Evaluating the root causes for the destruction of olive trees is the first step towards

their protection. While some of the causes are direct, such as competition from imported olives and restricted export of locally produced olives and olive oil, indirect causes include agricultural abandonment and piecemeal destruction of olive landscapes.

Abandoned olive orchards and landscapes were a frequent occurrence throughout the field survey. Abandonment was gauged differently for the six identified olive landscape typologies. In the upper foothills and mountains, abandonment was determined by the extent and maturity of invading spontaneous maquis species, mainly the mastic shrub, *Pistacia lentiscus*. In some instances, mature forest trees, pines and cypresses, were observed interspersed with the olives, as in Alemdag, Lapta and Yamackoy (case studies 3, 9 and 16 respectively). In the plain and the lower foothills, abandonment meant that the orchards were not tilled to remove overgrown weeds. A large number of olive trees in the Karpaz region had been inadvertently burnt in the process of clearing the land for arable farming. In the hot, dry Mesaoria, abandonment was noted by the absence of irrigation; orchards were drying out (case study 2). A dramatic example of abandonment is provided by the olive plantation at Alsancak which was used as a waste tip. Felling olive trees is prohibited by laws that date to the Colonial period (circa 1880), but these are often sidestepped. Trees were cut to

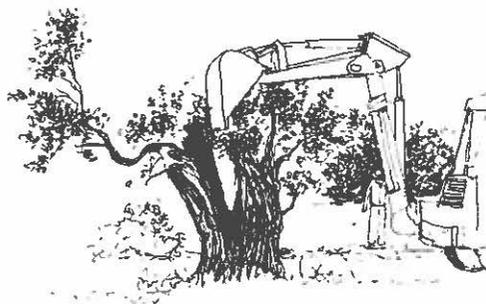


Figure 15.4: The piecemeal destruction of olive orchards in the Kyrenia coastal plain to accommodate suburban development.

produce coal in Arapkoy. Law enforcement requires resources that are not available at the local level. A more direct cause for the destruction of olive trees, as in the cases of Zeytinlik, Dogankoy and Qatalkoy (case studies 6, 7, 17 respectively), comes from rising land value to accommodate suburban housing, roadside commercial development and holiday villages. The piecemeal carving up of orchards is common practice in the suburbs of Girne, as well as along the coast to its east and west (Figure 15.4).

The root cause for olive tree destruction, however, is that they are no longer economically profitable. On the one hand, there are difficulties in the export of olives in view of the economic and political sanctions imposed on the TRNC. Limited outlets for local processing are another factor. The Zeyko Factory in Karakum was the only large-scale state buyer of olives for oil production that purchased olives from local farmers providing an incentive to continue managing olive landscapes³. In 1994, the Zeyko Factory terminated the processing of olive oil, leaving the local farmers

with no other marketing outlet for their produce. Competition from table olives and olive oil imported from mainland Turkey was another factor affecting the sale of local agriculture produce in general, olives in particular. The scale of agricultural production in Turkey, considerable government subsidies for farming and transportation to Cyprus, make it very difficult if not impossible for Turkish Cypriot farmers to compete. This affects local marketing of Cypriot olives, and olive oil directly. Cypriot interviewed farmers and individuals owning olive orchards, expressed their desperation and sadness that they had been forced to abandon their olive orchards because production was no longer profitable.

Declining marketability invariably undermines the value of olive trees and olive landscapes. Cultural perceptions of olive trees constitute yet another factor. On the one hand, Cypriots value the olive tree, appreciating that olive cultivation is intertwined with the island cultural history and integral to valued rural traditions. Senior farmers interviewed during the field survey explained that they continued managing their olive plantations strictly out of love and habit rather than for economic benefit, since there was none to be had. Others explained that if they could but ensure marketability of the produce, they would care for the olive trees as they would their offspring

3 The earliest record from the Zeyko Factory for the purchase of TRNC olives dates to 1975 and shows a total purchase of 63 tonnes. The latest record is in 1994, for 61 tonnes. A maximum purchase of 532 tonnes is recorded for the year 1989.

(Makhzoumi, 1997). Younger Cypriots, both rural and urban, do not always share these traditional valuations, nor are they willing to undertake the labour intensive management of olive orchards. Although ownership was not included in the field survey, almost all olive orchards are privately owned. The fact that the title for olive trees can be leased independently from land ownership should necessarily be factored into future planning strategies. Olive cultivation in the ravines is a case in point since seasonal water courses are generally state owned (case study 6).

15.6 Reconfiguring olive landscapes: strategies for sustainable future development

The study findings demonstrate that the multifunctional framework of traditional olive agriculture has been a key to its endurance over time. Vernacular Mediterranean rural farming practices, for example olive and carob agricultural systems, evolved to respond to geomorphological heterogeneity and to adapt to the environmental conditions of semi-arid ecosystems. The spatial and temporal overlap of silvicultural, agricultural and pastoral activities on the same land unit embodies sustainable use of natural and human resources. In addition, the findings demonstrate the flexibility of traditional olive landscapes over time, namely their ability to change from a productive ecosystem to a non-productive semi-natural one when left unmanaged. Applying a holistic landscape framework to the assessment of olive cultivation broadens their valuation, to include their environmental, ecological, cultural roles, and equally their multifunctional format, as integrative of the island's natural and cultural Mediterranean landscape heritage. Moreover, a holistic framework enables re-conceptualizing traditional olive landscapes by aligning them with

twenty-first century aspirations for sustainable development and biodiversity conservation. Reconfigured, traditional olive landscapes serve to inspire holistic, integrative use of resources in future planning and management in the island - "*mimicking functions of traditional rural landscapes*" argue Brandt and Vejre (2004), to combine production, recreation, biodiversity conservation with aesthetic and spiritual values within a multifaceted and sustainable framework, representing an alternative for the planning and management of the Mediterranean.

The developmental shift in the island away from rural economies and rural landscapes to service economies that prioritize on coastal tourism is in large part responsible for the degradation of traditional rural landscapes in Cyprus. Equally responsible are current planning and management policies that are compartmentalized, divided in terms of governance, i.e. separate ministries of agriculture, environment and tourism, and in terms of approach, prioritizing on 'nature' or 'culture', conservation or productivity. For example, the Agricultural Statistical Yearbook shows the value of olive trees as yield of olives (kg/tree) and production (tonnes). Prioritizing only tree productivity undermines the intrinsic value of olive trees and the role of olive multifunctional landscapes in protecting watersheds and in conserving soil resources in marginal lands that cannot accommodate other uses.

Efforts by the authorities to inject new life into the olive industry often fail because of a fragmented and compartmentalized approach. Strategies to improve olive production are also uncoordinated and fail to consider ecological and socio-cultural repercussions. Planning strategies are in the main top-heavy. The importation of cheap olive presses, for example, was perceived by local communities to produce inferior quality olive oil, just as olives from introduced cultivars were ill-favoured in comparison to native varieties. Nor

are environmental protection considerations integrated into long term planning. A holistic, integrated approach to olive cultivation is proposed by Beaufoy (2001) who classifies olive cultivation in North Cyprus into three broad categories. The first category, the largest, includes “*low-input traditional plantations and scattered trees, often with ancient trees and typically planted on terraces, which are managed with few or no chemical inputs, but with high labour input*” (ibid: 5), while the second and third categories become progressively more intensive in terms of management, and in the use of artificial fertilizers, pesticides and weed control with the objective of increasing production by means of irrigation, increased tree density and mechanical harvesting. The study recommends a “*change from production support to a flat-rate area payment unrelated to producing or yields*” – (ibid: 7) as well as the application of agri-environmental programmes to olive farming, which should be greatly expanded in order to deliver payments to all olive farmers in return for additional environmental services, under schemes designed to address specific environmental priorities in the region. The latter approach provides significant benefits in terms of the conservation of soil and water resources and of biodiversity and landscape values.

Safeguarding traditional olive landscapes necessitates, in addition, holistic, multi-faceted strategic planning. *Holistic* implies a broad approach, whereby the responsibility for policies targeting olive cultivation, as well as their actual management would involve all stakeholders, central government and local authorities, farmers and landowners, while *multi-faceted* implies an approach that values olive landscapes as sustainable food systems that provide non-tangible, environmental, ecological and cultural benefits. A multi-faceted approach also implies coordination among the different government agencies, i.e. the Ministry of Agriculture and Forestry, and the Ministry of Tourism and

Environment. Safeguarding does not imply preservation, which is not possible considering the extent of olive landscapes. Rather, it implies searching for narratives that reconfigure traditional rural landscapes within present and future needs and aspirations, which in the case of Cyprus can be tailored through a number of strategies:

- **Olive landscapes in the upper ranges:** In such areas olive cultivation is a complementary appendage to the protected forest. This is supported by the findings from case studies 3, 9 and 16, and the wealth of research encouraging innovative conservation approaches in the Mediterranean (Makhzoumi, 1996; Naveh, 1995). Olive trees in these locations provide the structural framework that serves as a habitat for native flora and fauna both in terms of extending the limits of the forest, but also, in conjunction with maquis scrubland, by providing connectivity that can sustain the island’s considerable wildlife.
- **Olive cultivation in the lower foothills:** In terms of encroaching urbanization and development, the lower foothills are the first line of defence in buffering development, for example in the Kyrenia region (Makhzoumi, 1996). Olive tree landscapes in the foothills play a central role in conserving the soil in hilly terrain and protecting against soil erosion that results from removal of native plant cover and destruction of olive cultivation. The environmental role of olive landscapes is even more critical in the south-facing Kyrenia foothills, where the vegetation is sparse and the climate is hot and dry. Here, olive multifunctional landscapes can accommodate green zones and hardy buffer plantations, with their characteristic

silver mantle providing a backdrop to urbanized coastal landscapes.

- **Olive cultivation in the ravines:** Ravines are an important morphological component of the island landscape. They have the potential to function as ecological corridors by linking the peaks and foothills to the coast thus enabling the movement of native flora and fauna. In addition to their ecological role, olive cultivation in the ravines protects these seasonal watercourses from encroachment and as riparian landscapes (case studies 2, 4, 11, 12 & 13). The role of olive landscapes is especially pronounced in watercourses in the vicinity of settlements and built environments (case studies 1, 5, 6 & 7). Rather than conventional parks that rely on ornamental plants and resource-intensive turf, olive landscapes in these vicinities could offer reprieve from congested built environments. Serving as 'ecological parks', olive landscapes are environmentally sustainable and reinforce the Mediterranean sense of place that is often absent in excessively developed, urbanized coastal parts of the islands. Similarly, olive landscapes in the periphery of villages (case studies 10, 12, 15 and 18), because they continue to be farmed, are living examples of productive amenity landscapes that are invaluable in alleviating settlement microclimate in the arid interior.

15.7 Olive tree landscapes as Mediterranean rural heritage

This study has repeatedly emphasized use of the term 'landscape' to broaden current perceptions and valuation of traditional olive cultivation. Olive landscapes embody the interaction of people with their environments over time in the Mediterranean.

Their aesthetic and cultural valuation in Cyprus encourages non-conventional approaches, for example, by integrating them into contemporary development. The latter would ensure protection while imparting local distinctiveness. Integrating olive landscapes, both at the local scale and the regional one (Makhzoumi & Pungetti, 1999), counters the homogenization of place that is increasingly affecting coastal landscapes in the Mediterranean. Olive trees and ancient olive groves commemorate the island's cultural history. Close to half of the field samples surveyed had olive trees that were estimated to be over 100 years old. The exceptional size and form of the olive trees in Kalkanli (case study 2), estimated at 300-400 years, warrant preservation in their entirety as national rural heritage of the island (Plates 15.7).

Direct measures to protect traditional olive landscapes should necessarily include grants and subsidies that enable farmers to continue to care for these traditional landscapes. Further surveys are also necessary to protect specimen trees, those over a hundred years old, ancient groves and olive orchards with exceptional scenic values. The allocation of funds to foster research into olive landscapes is equally required. It is essential to undertake genetic profiling of local cultivars, which will ensure that they are protected *in situ* and *ex situ* in seed banks. The extent of olive cultivation and the characteristic isolation of islands encourage such research.

Environmental educational campaigns and local community initiatives are essential ways of building long-term public awareness and appreciation. Changing lifestyles and globalizing influences are also impacting the relationship of Cypriots to olive cultivation. Formal and informal discussions throughout the survey confirm that valuation of traditional rural landscapes depends on age, education and affiliation. More than half the population in North Cyprus now lives in towns and cities. School children in many instances have

lived most of their life in urban settings. They have lost the attachment to rural landscape and are less aware of the distinctiveness of olive and carob traditional landscapes; nor are they aware of their value as a cultural heritage. Sensitizing people of all ages and backgrounds to the historical, cultural and environmental role of olive trees can play a central role in the protection of these landscapes. Architects, engineers and planners should be encouraged to preserve olive trees where and whenever possible, even within building sites and large scale developments. They too need to be informed of the environmental role that olive plantations play, both regionally and locally. Artists and artisans have the potential to bring attention to olive trees just as efficiently. Artists are typically more attuned to nature and have the ability to interpret what they experience and to articulate their perception and give it form, a skill which has the potential to trigger interest not only in olive trees but in the broader regional landscape.

References

- Beaufoy, G., 2001. *The environmental impact of olive oil production in the European Union: practical options for improving the environmental impact*. Brussels: EU Commission/EU Environment Directorate General.
- Brandt, J. & Vejre, H., 2004. Multifunctional landscapes: motives, concepts and perceptions. In: J. Brandt & H. Vejre, eds. *Multifunctional Landscapes Volume 1: Theory, Values and History*. Southampton, MA: WIT Press, pp.3–33.
- Christadoulou, D., 1959. *The evolution of the rural land use pattern in Cyprus*. London: Geographical Publications.
- Delipetrou, P., Makhzoumi, J., Dimopoulos, P. & Georghio, K., 2008. Cyprus. In: I. Vogiatzakis, G. Pungetti & A. Mannion, eds. *Mediterranean island landscapes*. The Netherlands: Springer-Verlag, pp.170-219.
- Hadjisavvas, S., 1992. *Olive Oil Processing in Cyprus*. Nicosia: Paul Astroms Forlag.
- IUCN, 1980. *World conservation strategy: living resource conservation for sustainable development*. Gland, Switzerland: IUCN/UNEP/WWF.
- Makhzoumi, J., 1996. *An ecological landscape design paradigm for the semiarid Mediterranean*. PhD thesis, University of Sheffield.
- Makhzoumi, J., 1997. The changing role of rural landscapes: olive and carob multi-use tree plantations in the semiarid Mediterranean. *Landscape and Urban Planning*, 37, pp.115-122.
- Makhzoumi, J., 2001. Olive trees: inventory and assessment. Nicosia: unpublished survey commissioned by ProAction in collaboration

with Middle East Environmental Ltd & United Nations Development Program.

Makhzoumi, J. & Pungetti, G., 1999. *Ecological landscape design and planning. The Mediterranean context*. London: Spon.

Makhzoumi, J. & Pungetti, G., 2008. Landscape strategies. In: I.N. Vogiatzakis, G. Pungetti & A.M. Mannion, eds. *Mediterranean island landscapes: natural and cultural approaches*. Landscape Series Vol. 9. New York: Springer, pp.351-375.

Meikle, R., 1977. *Flora of Cyprus, Volume 1*. Kew: Royal Botanic Gardens

Meikle, R., 1985. *Flora of Cyprus, Volume 2*. Kew: Royal Botanic Gardens.

Naveh, Z., 1995. From biodiversity to ecodiversity: new tools for holistic landscape conservation. *International Journal of Ecology and Environmental Sciences*, 21, pp.1-16.

Naveh, Z., 2008. Foreword. In: I.N. Vogiatzakis, G. Pungetti & A.M. Mannion, eds. *Mediterranean island landscapes: natural and cultural approaches*. Landscape Series Vol. 9. New York: Springer, pp.ix-xi.

Pinto-Correia, T., Haines-Young, R. & Parris, K., 2004. Values and assessment of multifunctional landscapes. In: J. Brandt & H. Vejre, eds. *Multifunctional landscapes. Volume 1. Theory, values and history*. Southampton: WIT Press, pp.273-276.

Polunin, M.E. & Huxley, A., 1987. *Flowers of the Mediterranean*. London: Chatto and Windus.

Pungetti, G. & Romano, B., 2004. Planning the future landscape between nature and culture. In: R. Jongman & G. Pungetti, eds. *Ecological networks*

and greenways. Concept, design, implementation. Cambridge: Cambridge University Press, pp.107-127.

Selman, P., 2006. *Planning at the Landscape Scale*. London: Routledge.

Thirgood, J.V., 1987. *Cyprus, a Chronicle of its Forests, Land and People*. Vancouver: University of British Columbia Press.

Turkish Republic of North Cyprus, 1999. *Agricultural structure & production*. Lefkosa: Government Printing Press.

CHAPTER 16

Sustainability Indicators in the Mediterranean: a tale of two islands

Stephen Morse

16.1 Introduction

"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to heaven, we were all going direct the other way - in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only."

Charles Dickens: A Tale of Two Cities

The foregoing quotation from Charles Dickens' famous book was first published in 1859. The two cities are London and Paris and the backdrop is the French Revolution. But this chapter will argue that the timeless words also have much resonance with the current state-of-play of Sustainability Indicators and Indices (referred to in this chapter generically as SIs); we are in the best and the worst of times, a season of light and a season of darkness. The chapter will explain this point by focusing specifically on two Mediterranean islands - Malta and Cyprus. Why these two places? The Mediterranean has many islands (Figure 16.1), and some of them are listed in Table 16.1. Malta and Cyprus are the only

two islands with a sovereign government (or two governments in the case of Cyprus); all the others are either regions or prefectures. This matters because many published SIs are only available at the national level, a point which will be returned to later. So if the nation state is the 'sustainability space', then Malta and Cyprus provide the only island examples that can be looked at in the Mediterranean, although admittedly the status of Cyprus is complex given that the island is still divided at the time of writing. Figure 16.1 shows the location of these islands within the Mediterranean. Both islands were occupied by the British for many years because of their strategic location in the Mediterranean.

The Republic of Malta comprises a group of three islands; Malta, Gozo and Comino. The largest of these, Malta, has a population density of 1,516 people per square kilometre. The Republic of Malta, often referred to simply as Malta, gained independence from the UK in 1964 and is both a member of the Commonwealth and the European Union (EU). Malta has adopted the Euro as its currency. The high population density and demands for development have placed a great deal of pressure on the environment. This becomes exacerbated during the tourist season as the Maltese islands are popular tourist destinations. Malta has an estimated GDP/capita (adjusted for Purchasing Power Parity) for 2008 of \$23,663.

Name	Country	Area (km ²)	Population	Population density (/km ²)	Political Status
Malta	Malta	246	373,000	1,516	Largest island of independent state
Majorca	Spain	3,640	778,000	214	Part of an autonomous community
Sicily	Italy	25,460	5,010,000	197	Autonomous region with special statute
Ibiza	Spain	577	111,000	192	Part of an autonomous community
Corfu	Greece	592	108,000	182	Prefecture
Djerba	Tunisia	523	60,000	115	Part of an governorate which is centred on the mainland
Cyprus	Cyprus	9,251	1,048,000	113	Independent state (but divided)
Kos	Greece	290	31,000	107	
Zakynthos	Greece	406	39,000	96	
Minorca	Spain	964	87,000	90	Part of an autonomous community
Rhodes	Greece	1,398	117,000	84	Part of a prefecture
Crete	Greece	8,312	624,000	75	Administrative division
Samos	Greece	476	34,000	71	
Sardinia	Italy	23,813	1,656,000	70	Autonomous region with special statute
Lefkada	Greece	303	21,000	69	
Chios	Greece	842	52,000	62	Prefecture
Euboea	Greece	3,655	218,000	60	Prefecture
Korčula	Croatia	279	16,182	58	
Lesbos	Greece	1,630	90,000	55	Prefecture
Kefalonia	Greece	781	37,000	47	Prefecture
Krk	Croatia	405	17,860	44	
Naxos	Greece	428	18,000	42	
Hvar	Croatia	300	11,459	38	
Lemnos	Greece	476	18,000	38	
Thasos	Greece	379	14,000	37	
Brač	Croatia	395	13,000	33	
Gökçeada	Turkey	279	8,875	32	
Corsica	France	8,681	275,000	32	Territorial collective
Icaria	Greece	255	8,000	31	
Pag	Croatia	285	7,969	28	
Andros	Greece	380	10,000	26	
Karpathos	Greece	301	6,000	20	
Cythera	Greece	278	3,000	11	
Cres	Croatia	406	3,184	8	

Table 16.1: Islands of the Mediterranean, ranked in terms of population density.

Source: Wikipedia: http://www.en.wikipedia.org/wiki/List_of_islands_in_the_Mediterranean



Figure 16.1: Some major Mediterranean Islands.

Cyprus, also a member of the EU and adopter of the Euro, is the third largest island in the Mediterranean, with a population density of 113 people per square kilometre, a tenth of the density of Malta. Cyprus is a divided island, with the internationally recognized Republic of Cyprus covering two thirds of the island and the Turkish-occupied area to the north covering most of the rest. The Turkish republic of North Cyprus is only recognised by Turkey, and hence the SIs referred to in this chapter are from the internationally-recognized Republic of Cyprus. Cyprus has a GDP/capita of \$28,673 (adjusted for Purchasing Power Parity, estimated for 2008), slightly higher than that for Malta. Cyprus gained independence from Britain in 1960 and became a republic in 1961.

In terms of wealth, measured albeit somewhat crudely as GDP/capita, then both Malta and Cyprus are amongst the poorer of the *Euroland* countries (Figure 16.2). But this is but one indicator of national performance, even if it is one which appears regularly when nations are compared. What other measures are available and what do they tell us? This chapter will explore some answers

to these questions and highlight some critical issues in the development and use of SIs.

16.2 The best of times

The adjective 'sustainable', meaning to continue or to last into the future, is liberally employed these days, especially when linked to development, broadly meaning to make things better. Thus sustainable development promotes a sense of being able to continue to improve and thus is a forever moving target rather than an endpoint. But what is meant by the simple and seemingly straightforward word 'better'? Does it mean 'better' in economic terms (income) as with the GDP/capita example mentioned above or should there be wider concerns of environmental and social 'betterment'? It is here that there tends to be much disagreement. Perhaps the most widely accepted and repeated definition of sustainable development is the following: "*development that meets the needs of current generations without compromising the ability of future generations to meet their needs and aspirations*" (World Commission for Environment and Development, 1987). However,

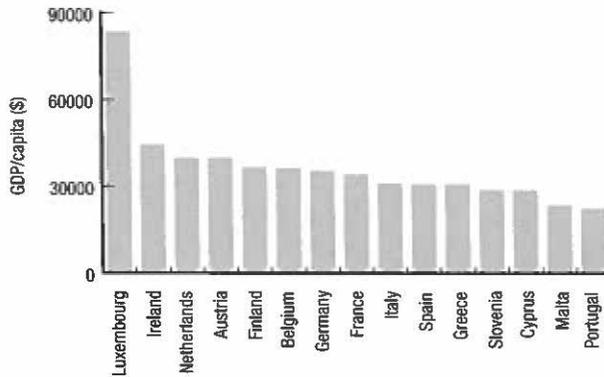


Figure 16.2: GDP/capita of 'Euroland' countries (\$ International, PPP, 2008).

Source: International Monetary Fund

this was not actually written as a formal definition and in the same publication we can read statements such as: "Sustainable global development requires that those who are more affluent adopt lifestyles within the planet's ecological means", and "Sustainable development can only be pursued if population size and growth are in harmony with the changing productive potential of the ecosystem" (World Commission for Environment and Development, 1987).

There are many ideas wrapped up in these brief quotations: affluence, lifestyles, population growth, productive potential, etc. But all of them are deeply subjective and value-laded. There are also variations on these themes. The Blue Plan organization, for example, often employs variants of the following for sustainable development in the Mediterranean: "Sustainable development is one that respects the environment, is technically appropriate, economically viable and socially acceptable, making it possible to meet the needs of the present without compromising the ability of future generations to meet their own needs" (Joanna Constantinidou, Coastal Area Management Programme for Cyprus, 1st Meeting of the Sustainability Analysis Activity at Agricultural Research Institute on 23 November 2006).

Note the emphasis here on economically viable and socially acceptable aspects in this definition. Even so, the notion that what is done now should

not damage the prospects for future generations to also improve their lives has become powerful. Presidents and Prime Ministers now repeat these words and governments the world over have pledged themselves to put the rhetoric into practice. Whether they really mean all this or whether the words are smokescreens for 'business as usual' is another, highly relevant, matter but at least a statement of intent is there. In that sense the current position can be regarded as the 'best of times'.

Even better than constant reaffirmation of the desirability of sustainable development is the realization that for it to mean something it must be possible to discern whether a given situation (current or projected) matches what is needed for sustainable development. This allows a litmus test as to whether the rhetoric is being put into practice, but how is this to be achieved? One obvious way of doing this is the development and use of Indicators of Sustainable Development or Sustainability Indicators (SIs). SIs are like signposts on a road and can be numerical (quantitative) in nature or more qualitative. A number of indicators can be pooled together into a single index.

It has been very encouraging to see the immense effort that has gone into generating new indicators and indices. A host of diverse organizations,

national, multinational, non-governmental and even private sector and individuals have taken up the challenge and come up with their own favoured set of indicators or indices. Indices such as the 'Environmental Sustainability Index' (ESI), 'Environmental Performance Index' (EPI) and 'Environmental Vulnerability Index' (EVI) can readily be accessed on the internet as well as in the white and grey literatures, and while nowhere near as ubiquitous as GDP, they do have a significant presence. At one level, this effort can be bewildering and confusing. So many organisations and individuals now claim that they have the answer, or at least one answer, to measuring progress along the sustainable development road, that it is becoming bewildering. But on the other hand it has to be a source of joy to see so much energy and creativity going into this problem from so many groups. It has to be a reflection of the importance of making sure that the human race is on the right road. While cynicism is understandable, especially when there is a price to pay for living sustainably, and politicians are not necessarily renowned for their long-term thinking which makes them less popular to an all too fickle electorate, it is nonetheless a cause for at least some joy to see some recognition that 'sustainable' is important. Surely this must be the beginnings of a spring of hope?

16.3 The worst of times

To put it bluntly, Sustainability Indicators and Indices have their problems (Bell & Morse, 2008), and in this writer's view, we have not yet managed to solve them nor seriously considered what needs to be done to provide solutions. These problems can make such tools all but useless and hence a waste of time (at best) and tools for deception (at worst). In other words, at best they don't help in keeping us on the right road, and at worst they can be employed by some to make sure that we stay on

one of the many wrong roads. What is meant by this statement?

There are data available for Malta and Cyprus which allow a comparison between them in terms of sustainable development, and indeed a comparison with other states. In a short chapter such as this, it is not possible to go into every nuance but instead will focus on some of the indices that are readily available. It needs to be stressed here that these indices certainly do not comprise the only information available and neither are they necessarily the 'best' (whatever that may mean). Such is the somewhat heated state of the SI literature these days that any focus on a few indices within a publication almost invariably seems to result in cries that this was the wrong choice as the indices are 'flawed' and others are 'better'! However, the selected indices can easily be accessed by the interested reader and are employed in major publications that are targeted at policy makers, managers and indeed the general public. In other words the indices are widely reported and have been designed to be consumed by a wide audience far beyond the often rarefied audience of technical specialists.

The indices selected are:

1. Human Development Index (HDI): created by the UNDP and often employed as a measure of 'quality of life';
2. Environmental Performance Index (EPI): sponsored by the World Economic Forum;
3. Environmental Sustainability Index (ESI): also sponsored by the World Economic Forum;
4. Environmental Vulnerability Index (EVI): created by the South Pacific Applied Geoscience Commission (SOPAC) and the United Nations Environment Programme (UNEP); and

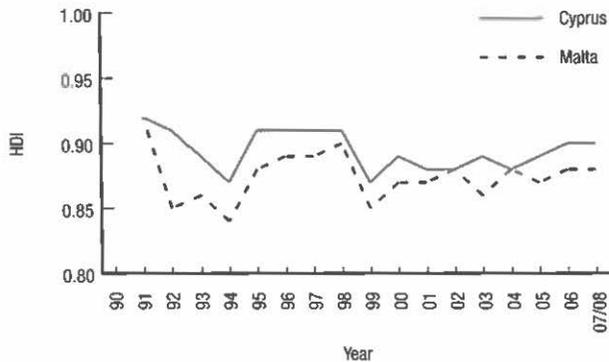


Figure 16.3: The Human Development Index for Malta and Cyprus from 1990 to 2007/08.

- Happy Planet Index (HPI): produced by Friends of the Earth and the New Economics Foundation. Both are non-governmental organisations.

First in the list is the Human Development Index, an amalgam of three components (education, life expectancy and income). HDI values are available for the majority of nation states since 1990 and the figures for Malta and Cyprus are shown as Figure 16.3. The index has only three components, roughly corresponding to education, life expectancy (a proxy measure of health care) and income (measured as GDP/capita) and these are averaged to yield the HDI for the country. The breakdown into the 3 components is shown in Figure 16.4. The HDI is often equated with a measure of the quality of life in that country, with higher values suggesting better quality of life. On that basis, the population of Cyprus has a higher quality of life than that of Malta. The gap between the two islands is especially apparent in terms of education and income. Life expectancy of the populations has become the same since the turn of the current century.

One other point needs to be made regarding the HDI graphs in Figures 16.3 and Figure 16.4. Note how some of the component indices in Figure 16.4 surge up and down over periods of

just a year. For example, the income index for both islands plummets in 1998. Some of these changes are not due to dramatic changes within the islands but due to the methodology. The HDI methodology has changed over the 18 years or so of its existence and it is this which can cause the index and its components to surge up and down like this. Admittedly, the UNDP is aware of this problem and does make it clear that comparisons over time are not really possible. However, the counter argument to this is that the HDI and its components, as presented in Figures 16.3 and Figure 16.4, are those published by the UNDP as 'headlines' in its documentation; these are the values that casual consumers of the reports 'see'. One has to be very careful about presentation of indices and how that dovetails with a sense of who is meant to be the consumer. If indices are being aimed at non-experts, as indeed is the HDI and all those discussed in this chapter, then it cannot be expected that the consumers will have the knowledge, time and indeed inclination to dissect the technical mechanics of the index. It is as likely that they will assume that the index creators know what they are doing and have created a 'fair' index. The HDI is fairly easy to dissect as it only has 3 components, but even so, some of the manipulations are quite technical (Atkinson and logarithmic transformation of GDP/capita for example). Creators of such

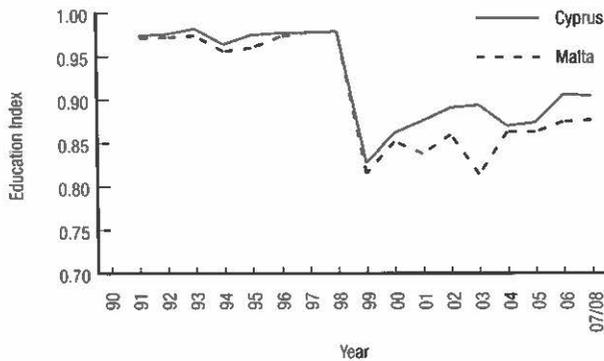
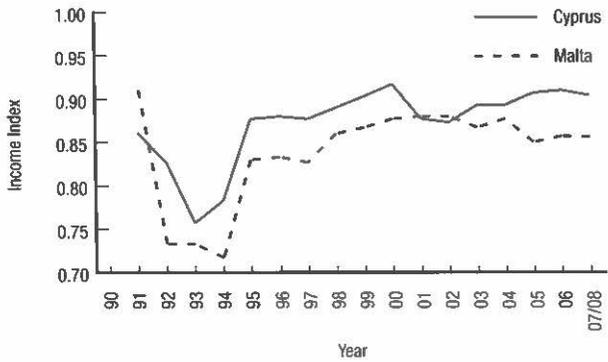
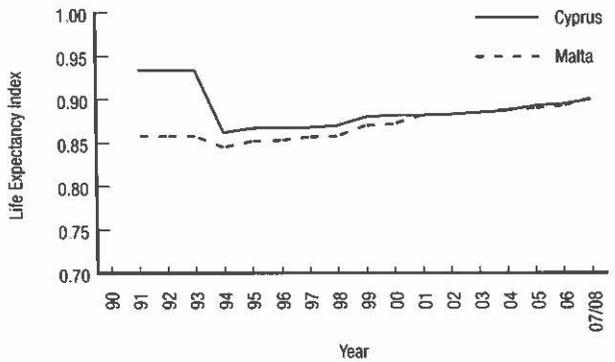


Figure 16.4: The HDI components for Malta and Cyprus (1990 to 2007/08).

indices cannot have it both ways; if they are created to help simplify a complex message for a wide audience of non-experts, then it cannot be expected that the same audience will be able and willing to pick apart the technicalities of the indices and discover their frailties.

Even within a relatively simple index such as the HDI, tensions already emerge. Because the HDI is an average of its three components, there is 'trade off'. A high HDI can be achieved by doing very well in two of the components (income and life expectancy for example) and badly in the third

(education, for example). Trade offs often emerge in discussions surrounding sustainability, but typically these take the form of the environment being traded against economic gain. Also, it must be noted that the HDI is only a measure of output or benefit. It says nothing about the cost of achieving that quality of life assessed as better education, health care and income. High values of the HDI can be obtained at a huge social and environmental cost (Morse, 2003). Uncontrolled mining or destruction of forests for agriculture will improve the income of the population but this cannot be sustained. Similarly, distorting the income distribution so that a relative few earn fortunes while everyone else is on a low wage could also push up average income per capita and may indeed be sustainable if maintained by force, but would hardly be equitable. So what do the other measures available say of sustainability in these two islands? Is there evidence to suggest that Cyprus has 'bought' a higher HDI by degrading its environment and/or society?

While other indices do exist, there is a dearth of good quality information available over time to allow comparisons to be made with the HDI since 1990 and hence test this hypothesis. Beginning with income equality, the Gini coefficient is perhaps the most widely employed measure of income equality (or inequality), and datasets are available at national scales even if there are problems of comparison as national circumstances and methodologies do vary. The Gini coefficient in essence measures the deviation of an income distribution within a population from a nominal 'ideal' where everyone has exactly the same income. In reality, of course, no society will have that, as some individuals (or households or families) will have much more income than others. Higher deviation from the line of equality will yield higher Gini coefficients, although it doesn't say anything per se about the form of the deviation. Interestingly the 2005 figures for both Malta and Cyprus are almost identical at 28 and 29

respectively (CIA, 2008). These figures compare well with Gini coefficients of 33 (Italy and Greece), 32 (Spain) and 28 (France) and 45 for the US - no suggestion here then of any significant difference in inequality of income distribution between Cyprus and Malta.

What of evidence of environmental degradation? There is an Environmental Sustainability Index (ESI), with a pilot study in 1999 and published values for 2000, 2001, 2002 and 2005. The ESI is sponsored by the World Economic Forum and created in partnership with the Yale Center for Environmental Law and Policy (YCELP), the Center for International Earth Science Information Network (CIESIN) of Columbia University and the Joint Research Centre of the European Commission. The methodology and data sets are far more complex than those of the HDI, but the index is based on the same scale of 0 to 100 with higher values representing better sustainability. The ESI for 2005 covers 146 countries in total and employs data sets for 76 variables which are aggregated into 22 'indicators'. The data sets cover a diverse range of variables, ranging from ambient pollution and emissions of pollutants, to impacts on human health and signing of international agreements. The variables span the pressure-state-impact-response (PSIR) framework often used for SIs, but as with the HDI, the choices over what to include are very much those of the ESI creators, although they do make a case for each variable.

An ESI is available for Malta in 2005, with a value of 47.13, but not for Cyprus. Even the figure for Malta is given with reservations, given that it is classified by the ESI creators as a small country (less than 5,000 km²) and thus the results may be subject to distortion. So why is there no 2005 ESI for Cyprus? There are many gaps in the datasets employed for the ESI, but its creators have not been slow in filling in gaps using regression analysis to 'predict' what a value should be. No reason is

provided for the omission of Cyprus and one can only assume that lack of data was the cause.

The Environmental Performance Index (EPI) is another complex index from the same stable as the ESI but this time comprising 25 indicators encompassing a wide range of issues such as sanitation, water quality and pesticide regulation and a varying range of weights (HDI components are weighted equally). The EPI has a scale of 0 to 100 with higher values deemed to be 'good' (better environmental performance). The EPI "...centers on two broad environmental protection objectives: (1) reducing environmental stresses on human health, and (2) promoting ecosystem vitality and sound natural resource management" (EPI Pilot Study, 2006).

This sounds ideal for a comparison of Malta and Cyprus but unfortunately the EPI is only available for 2008 and even then, ironically, only for Cyprus (value of 79.2). This time it is Malta which is omitted because of lack of data. A missing 2005 ESI for Cyprus and a missing 2006 EPI for Malta are unfortunate but illustrative of the central problems of indices - the continued need for good quality data. It is not even possible to take the 2005 ESI for Malta and compare it with the 2008 EPI for Cyprus; they are so different that any comparison would be meaningless.

One index, for which there are values for both Cyprus and Malta (thus allowing for a comparison), is the Environmental Vulnerability Index (EVI). The EVI is another complex index, this time produced by the South Pacific Applied Geoscience Commission (SOPAC), and the United Nations Environment Programme (UNEP). The EVI is available for 2005, and is based upon what its creators call 50 'smart indicators' spanning climate, volcanoes, earthquakes, extinctions, and vegetation cover, amongst many others. Higher values indicate greater vulnerability. There are still many missing data values from the countries

included in the data set, and not all variables will be relevant in all places (neither Malta nor Cyprus, for example, have volcanoes, although Malta is only some 100 km away from Mount Etna on Sicily). The EVI for Malta is 368 and for Cyprus it is 314. Thus Malta has ostensibly greater vulnerability than Cyprus, but why is this the case? There is no space in this chapter to explore possible answers in any detail but at one level this is not difficult to explain given that the population density on Malta is 1,516 people/km² while for Cyprus it is less than a tenth of this value at 113 people/km². This is a basic statistic but one which is so important in terms of pressure on the environment.

The ESI, EPI and EVI can all be seen as measures of environmental 'cost'. They help us to assess the downside of achieving a better quality of life. By that logic, Malta would appear to have the worst of both worlds - a lower quality of life and greater environmental vulnerability. But the fourth index included in this discussion is one of this author's favourites and also has the most imaginative name - the Happy Planet Index (HPI). Unlike the other indices, it is aimed directly at showing the environmental cost of achieving quality of life. The HPI was created by two major non-governmental organisations, the Friends of the Earth and the New Economics Foundation, and figures for both islands are available for 2006. Islands tend to do well in the HPI and the following quotation was (admittedly) a main inspiration for the theme of this chapter:

"Island nations score well above average in the index. They have higher life satisfaction, higher life expectancy and marginally lower ecological footprints than other states. Yet their incomes (in GDP per capita terms) are roughly equal to the world average. Even within regions, islands do well. Malta tops the Western World with Cyprus in seventh place (out of 24); the top five nations in Africa are all islands; as well as two of the top four in Asia. Even Bahrain, the island that scores lowest

due to its high ecological footprint, ranks above all the other gulf states."

The Happy Planet Index (2006).

Both Malta and Cyprus do very well in terms of the HPI, with Malta having the accolade of topping the western World league table. In basic terms the HPI is found as:

$$\text{HPI} = \frac{\text{Life satisfaction} \times \text{Life expectancy}}{\text{Ecological Footprint}}$$

It is described as the "ecological efficiency of delivering human well being". In effect the 'gain' (happy life expectancy) is expressed relative to a 'cost' (ecological footprint). Just as with the HDI, ESI and EPI, the scale is set between 0 and 100 with higher values suggesting a greater return on cost. However, unlike the other indices, the creators of the HPI have set what they call a "reasonable target" of 83.5 which they think countries should be able to achieve. The data for Malta and Cyprus are in Table 16.2.

However, in practice, the index's creators make various adjustments to the raw data, akin to the sort of adjustments made with the HDI to get values between 0 and 100; the value of 53.5 for Malta is thus not found by the simple arithmetic of $(7.5 \times 78.4) / 3.5$.

While life expectancy is similar for the two islands, Malta scores well by having a greater level of life satisfaction and a marginally lower ecological footprint. This result seems to overturn the HDI – EVI based conclusion given above, an illustration of just how fickle these indices can be. If one set of values doesn't generate the 'right' answer it is possible to start again with a different set of assumptions and generate new answers.

Where do the data for the HPI come from? The life expectancy and ecological footprint values are

readily available from published datasets, but where do the creators of the HPI obtain quantitative values for 'life satisfaction'? This seems like a highly subjective term and indeed it is. In the HPI they have been obtained from the wonderfully named 'World Database of Happiness', and the numbers relate to questions asked in national surveys such as:

"All things considered, how satisfied or dissatisfied are you with your life these days? Please tell me on a scale of 1 to 10, where 1 means very dissatisfied and 10 means very satisfied.

10 very satisfied
9
8
7
6
5
4
3
2
1 very dissatisfied"

Obviously all of the population cannot be questioned so the published scores in the database are for small samples, although just how small is not all that clear. Such surveys are also very ephemeral. Asking this question one day could generate a quite different answer from a day later, and indeed could vary over a matter of minutes. If the sample size is large enough and stratified correctly, then presumably it could be argued that all these personal factors add to variation but the mean or median could still locate the 'general feel' of life satisfaction in a population, but even here there must be doubts. The 'World Database of Happiness' only gives the averages without a measure of variation, and also, it can be argued, it is not difficult to imagine a broad influence operating on a population due to factors such as climate (winter vs summer), economic cycles or even the performance of national sports teams.

	Life satisfaction	Life expectancy	Ecological footprint	HPI
Malta	7.5	78.4	3.5	53.5
Cyprus	6.9	78.6	4	46

Table 16.2. Data employed in the calculation of the HPI for Malta and Cyprus.

Hence, the quality of these data has to be highly questionable, not so much in terms of whether the surveys were implemented correctly but in terms of whether the question is a realistic one to allow such extrapolation into national league tables.

So even from this brief foray into indices, a taste of the complexity can be gleaned. The simplest of those discussed, the HDI, has but three components and has been available since 1990. The others have only been published once or perhaps a few times, and constant problems of data availability and data quality are referred to in their respective documentation. The intentions may be good but that is not enough if the data are not there. The methodologies are also quite complex, building up as they do from dozens of disparate variables into a single index. Who decides what to include and how to include it? Well, it is the creators of the indices of course. There is a huge amount of value judgement in all of this, open to all sorts of political machination from interest groups and to anyone with an agenda to prove that the world really is the way they want to see it. It is not so much science as art, but can art be a good signpost for sustainability? This is why it can be argued that the current position with SIs is an epoch of incredulity – a season of darkness.

16.4 Discussion

This book is about sustainability in the Mediterranean. More specifically, it is about landscape as a space

within which sustainability can be assessed. The reader will come across many advantages and disadvantages to landscape as a sustainability space, and it certainly presents many challenges, but then again so does the nation state. As this chapter has shown, the nation state as a sustainability space has figured heavily in existing initiatives, and indeed does have some logic. After all, nation states by definition have at least some control over their policies of relevance to sustainable development, even if this may be seen as constrained by international agreements and the forces of globalization (Morse & Fraser, 2005). The nation state is a policy space and thus a match with sustainability space seems sensible. However, nation state boundaries are problematic:

- The borders do not necessarily coincide with ecosystem or even natural boundaries.
- Nation state borders are permeable to pressures such as pollution flows (in or out), population flows (immigration and emigration), impacts such as climate change and economic competition.
- The politics of nation states may work against longer term considerations of sustainability.

Landscape spaces would help circumvent two of these issues but would still be permeable.

SIs are an obvious and indeed popular way of putting assessment into practice, and sustainable

development means nothing at all unless it is possible to assess whether a society is on the right road or not. By definition, indicators are simplifications of reality – they try to capture some essence of what is important, some signposts for the sustainability road. Sustainable development is so complex, so encompassing and often so place-specific with regard to important issues that it is impossible to assess everything. Compromises have to be made, and compromises can involve all sorts of trade-offs between what is measurable, the resources required to measure and so on. The examples discussed in this chapter all have in-built compromises, some less obvious than others. At a basic level, the decision over what variables to include is a subjective and value-laden choice; the indices are what their creators think is important, even if they provide what would seem to the majority to be a reasonable justification. The indices discussed here also make the assumption that the nation-state is the appropriate sustainability space, even if in some cases, decisions are made to exclude certain countries because of their size or poor availability of data. The use of indicators within a landscape context will be no different and frankly no easier; the same pitfalls wait.

So are indicators useless when applied to sustainable development? Despite all the warnings given here, the answer has to be a resounding no – far from it. Indeed it is difficult to see an alternative strategy that would be workable. However, they have to be used with care. The examples given here raise two critical issues.

First, there is the issue of availability of relevant and good quality data. Time and again in the examples, it was shown how data availability limits assessment, and how the creators of the indices have tried to cope with that problem – sometimes by extrapolating values from other data (making good guesses!) and at other times by simply omitting the country altogether. The problem is

that governments often keep good datasets with regard to the economy or social welfare, and the HDI takes advantage of that, but can be quite poor in terms of coverage (spatial and temporal) and quality with regard to the natural environment and pressures acting upon it. What continues to be of concern is that while problems of data availability and quality are referred to time and again by those creating and using SIs, there seems to be little effort to really grasp this nettle. After all, measurements may not be of any use if just taken once, as that cannot provide a sense of change. However, repeated measurements over time and in many different places require resources and may not necessarily be the most glamorous or well-paid of professions. Researchers want to be able to publish regularly in top journals and this requires them to address new ideas and theories. While routine measurement of an environment over one or two years neatly fits into that demand, repeating this process routinely over many years may not be immediately appealing. Scarce resources often go elsewhere.

However, it is perhaps noteworthy that not all SI programmes are so top-down in nature as the ones discussed here. In recent years there have been various efforts to encourage the more local generation of indicators based on stakeholder participation. The following quotation has been taken from a report of the Maltese Commission for Sustainable Development (pages 12-13).

"Directly or indirectly, everybody is potentially affected by decisions related to sustainable development. Public participation in decision-making is therefore an essential feature of sustainable development... Public participation is important for two principal reasons. First, public participation is a good in its own right, empowering people both individually and collectively and reducing social exclusion and alienation. Second, decisions taken through participatory processes are sounder because they are based on a broader spectrum

of knowledge and are easier to implement because they are owned by a wider group of people."

The quotation sets out the most oft-quoted rationale for participation - empowerment and helping to make 'better' decisions. There is an additional advantage not often referred to but in many ways just as important, as participation provides the opportunity for those involved to undergo a learning process from each other and indeed be able to generate new knowledge. The indicators provide a founded basis for participatory learning, and while the end point may well be a set of indicators or even a single index, the process itself becomes a significant output (Bell & Morse, 2008).

Second, there is the 'so what?' factor. Collecting good quality data as a basis for excellent indices is one matter, even if it is problematic, but making use of that information to bring about change is something completely different. All the indices discussed here have the objective, expressed overtly or discretely, of naming and shaming. They are league-table based and the idea is to encourage countries to compare themselves with their contemporaries. Thus consumers represent a broad church of opinion leaders, policy makers, managers, pressure groups etc. who could bring pressure to bear on their politicians to do better. While poor performers can always question (of course) the assumptions behind the index and try and defend themselves by saying that 'if only the index was changed in this way then they would be doing so much better', league tables are a powerful means of presenting performance. There is evidence that some of the nation-state based indices do find their way into national presses and there is also some limited evidence that the resulting publicity can bring about change (Morse, 2008). But the use of indicators to influence policy is still a very new topic, ripe for further research. A European Union Framework 7 research project,

Policy Use of Indicators (POINT), has begun exploring this very issue in 2008.

Landscape based indicators will have exactly these same issues of data availability and use in policy to contend with. Indeed if the landscape crosses national borders, then these issues could well be compounded. The wide recognition that sustainability does matter is a substantial step forward, as indeed is the leap from theory and rhetoric to practice, but the challenges are, as physicists love to say about quantum mechanics, '*non trivial*'. Thus the present is both the best of times (a recognition of the importance of sustainability) as well as the worst of times (the immense challenge of putting sustainability into practice).

References

- Bell, S. & Morse, S., 2008. *Sustainability indicators. Measuring the immeasurable*. 2nd Edition. London: Earthscan.
- CIA, 2008. *The World Fact Book*. Available: <http://www.cia.gov/library/publications/the-world-factbook/> [Last accessed: 13th May 2011].
- Constantinidou, J., 2006. Coastal area management programme for Cyprus. In: Workshop Report of 1st Meeting of the Sustainability Analysis Activity. Agricultural Research Institute, Nicosia, Cyprus, 23 November 2006. Available: <http://www.cyprus.gov.cy/moa> [Last accessed: 13th May 2011].
- Dickens, C., 1859. *A Tale of Two Cities*. Available: <http://www.online-literature.com/dickens/twocities/> [Last accessed: 13th May 2011].
- Morse, S., 2003. For better or for worse, till the human development index do us part? *Ecological Economics*, 45(2), pp.281-296.
- Morse, S., 2008. On the use of headline indices to link environmental quality and income at the level of the nation state. *Applied Geography*, 28, pp.77-95.
- Morse, S. & Fraser, E.D.G., 2005. Making 'dirty' nations look clean? The nation state and the problem of selecting and weighing indices as tools for measuring progress towards sustainability. *Geoforum*, 36(5), pp.625-640.
- National Commission for Sustainable Development (Malta), 2006. *A sustainable development strategy for the Maltese Islands 2006-2016*. Unpublished third draft.
- New Economics Foundation. *Happy planet index*. Available: <http://www.happyplanetindex.org/> [Last accessed: 13th May 2011].
- South Pacific Applied Geoscience Commission (SOPAC) & the United Nations Environment Programme (UNEP). *The Environmental Vulnerability Index*. Available: <http://www.vulnerabilityindex.net/> [Last accessed: 13th May 2011].
- Veenhoven, R., *World Database of Happiness, Distributional Findings in Nations*. Rotterdam: Erasmus University. Available: <http://www.worlddatabaseofhappiness.eur.nl> [Last accessed: 13th May 2011].
- United Nations Development Programme. *Human Development Reports*. Available: <http://hdr.undp.org/en/> [Last accessed: 13th May 2011].
- WCED - World Commission on Environment and Development, 1987. *Our common future, 'The Brundtland Report'*. Oxford: Oxford University Press.
- Yale Centre for Environmental Law and Policy (YCELP) and the Centre for International Earth Science Information Network (CIESIN) of Columbia University, in collaboration with the World Economic Forum and the Joint Research Centre of the European Commission. *Environmental Sustainability Index*. Available: <http://www.yale.edu/esi/> [Last accessed: 13th May 2011].

CHAPTER 17

Future trajectories for Mediterranean islands: concluding thoughts

Elisabeth Conrad and Louis F. Cassar

The contributions presented in preceding chapters within this publication shed some light on the issues that Mediterranean islands need to address. The authors have highlighted the main challenges and constraints presently affecting island dynamics and which are relevant to the management of both ecosystems and landscapes. More importantly, perhaps, these chapters also offer insights into potential solutions and management options for the future, all in order to identify and successfully pursue some form of trajectory for sustainability. In this concluding chapter, we synthesize nine key premises that emerge from these chapters, as being fundamental considerations for the future development of Mediterranean islands.

Premise 1: A proactive approach to the conservation of Mediterranean biodiversity is needed.

There are two unambiguous realities concerning the biodiversity of the Mediterranean Basin. The first is that this is priceless and irreplaceable. The second is that we have to-date done a poor job at safeguarding this important heritage, and as a result, the long-term viability of many habitats and species has been severely undermined. Whilst there is little point in 'gloom and doom' reflections, it is important to

recognize that the protectionist approaches which have prevailed to-date have failed to adequately address the problem (Mora & Sale, 2011). That is not to say that there has been no progress, nor that protection is no longer useful or necessary – neither of these is true. Indeed, had it not been for the network of protected areas across the region, and for the various regulations in force which safeguard against species and habitat destruction, there is no doubt that the present state of biological diversity would be far more bleak. However, given the scale of the problem and the pervasiveness of threats, there is a need for the arsenal of conservation measures to be broadened. The approaches of landscape ecology and restoration ecology outlined in this publication (Chapters 2 and 3) will undoubtedly have a role to play – both to safeguard the natural assets that remain, to ensure the continued functioning of important ecosystem services, and to create 'new' or restore 'old' nature, for the benefit of both human and non-human life.

Premise 2: Critical thresholds must be recognized and respected.

Species and many systems have a 'point of no return'. When a species is exploited beyond a minimum viable population size, its population may be unable to recover. When a habitat is degraded beyond

a particular limit, functions and processes are altered fundamentally and irreversibly. Beyond a certain level of population density, economic advantages no longer apply (see Chapter 5). When social and economic dynamics reach a critical limit, the very defining characteristics of those systems may change. This is a key concern for resilience, i.e. the capacity of a system (ecological, social, economic or otherwise) to withstand shocks and undergo change without losing its essential structure and function (Walker *et al.*, 2004). As resilience declines, it takes progressively smaller disturbances to push the system into a different regime. Such thresholds present all manner of challenges for those working in the planning and management of Mediterranean islands - how much of a resource can be harvested sustainably? How much physical landscape change can we allow without undermining the fundamental character of a place? How much further can we continue along a particular development-driven trajectory before this becomes unsustainable? How can we define and quantify some measure of carrying capacity? Where exactly does the 'point of no return' lie? As difficult as these questions may be to answer, the crude reality is that thresholds *do* exist, and need to be better understood, and respected, if there is to be any semblance of sustainability. Where uncertainty or complexity make it difficult to accurately gauge thresholds, then perhaps a precautionary approach may be the wise and appropriate path to take - hardly a new idea, but one that merits emphasis.

Premise 3: The 'heritage' of Mediterranean islands should be preserved, in all its forms.

As noted repeatedly by the various authors in this volume, the Mediterranean has an incredible heritage, spanning numerous sites of both natural and cultural value. Indeed, there is arguably so much heritage, that it is simply taken for granted by the inhabitants of the

region! That, unfortunately, may also translate into lack of proper appreciation and care for that which is assumed to be just a part of the everyday landscape. The call to safeguard heritage is not an appeal for 'museum-type' landscapes, where the *status quo* is preserved for its romantic, nostalgic or aesthetic appeal. It is rather, a call for common sense to prevail - the destruction of priceless assets is in no way, shape or form compatible with notions of sustainability. The region's heritage also goes beyond that reflected in formal titles and designations, to encompass all tangible and intangible aspects of *Mediterraneanism* - after all, as Howard (2003: 1) notes, heritage is "*everything that people want to save*". Indeed, while there is much to be said for formal recognition of heritage features, it is also important that this does not result in other forms of heritage which are not recognized in the same manner, being sidelined. Similarly, it is important that in assigning 'labels' to heritage, we do not ignore that which cannot be easily labelled as nature or culture or some other established category. Makhzoumi's reflections on olive landscapes (Chapter 15) attest to this point, whilst also pointing to a keyword for heritage conservation in Mediterranean islands - *multifunctionality*. Within the small land area of island territories, there is often no possibility of setting aside large tracts simply for heritage protection (with the possible exception of any wilderness areas). Rather, landscapes need to be recognized as being multifunctional, with heritage, production, recreation and a multitude of other functions, integrated and interlinked within the same space. Management of these landscapes must thus focus on making these various roles as compatible as possible.

Premise 4: The public must be effectively involved in defining a future path for Mediterranean islands.

Several chapters within this publication have touched on the importance of involving the public in planning and decision-making processes, and of doing so

effectively, rather than simply as a token consultative gesture. Much as academic or political 'elites' may have valuable insights to contribute, it is ultimately the actions of the 'masses' that will determine what Mediterranean islands will look like ten, fifty or a hundred years down the line. It is also to the wider public that these islands ultimately 'belong', and the interests and priorities of their citizens must be central to any sustainable planning process, rather than being treated simply as obstacles to be overcome on some pre-determined path to development. The challenges are certainly substantial, not only in reconciling socio-economic interests with environmental thresholds and limits, but also in balancing the varied interests of the many stakeholders living on these islands – the 'myth' of there being a single, homogeneous community is precisely that – only a myth (Guijt & Shah, 1998). The involvement of the public in decision-making must, however, be seen as an opportunity rather than an obstacle, a unique chance to mould and shape a sustainable trajectory for islands, from the ground up, with the involvement of all. However, developing effective means for public involvement will require a better understanding and more 'honest' exploration of a variety of participatory options, moving beyond traditional forms of one-off consultation, and incorporating emerging insights from Participatory Learning and Action (PLA), and discourses of conflict resolution. Similarly, successfully mobilizing a public that may be more inclined to passivity or hostility (see, for example discussions in Chapters 7 and 14) will also require more fundamental analysis of the social fabric within islands, and a better understanding of ways in which social capital can be used and enhanced effectively.

Premise 5: Coastal areas merit, and indeed require, a coordinated management approach.

The coast has been amongst the most used and abused regions within island territories (and

indeed also within the mainland Mediterranean). Despite many decades of experience with coastal management, Integrated Coastal Zone Management (ICZM), Integrated Coastal Area Management (ICAM), Integrated Coastal Area and River Basin Management (ICARM), and a multitude of related approaches, there has arguably been little progress in resolving the conflicts that characterize this dynamic strip of land and sea. An ongoing problem, highlighted in Busuttill's discussions in Chapter 8, is the sectoral management of different coastal assets – fisheries, nature conservation, tourism, freshwater resources, and so on and so forth – without adequate appreciation of 'the bigger picture'. Although many coastal management plans and programmes have been formulated, these appear to remain subservient to more powerful sectoral interests, at least judging by their (lack of) tangible influence. Perhaps tourism merits a particular mention, given its disproportionately large impact on the coastal littoral (Chapter 12), an impact that is rather ironic when considering the somewhat fickle and very volatile nature of tourist preferences. The latter has become starkly apparent over this part year in countries such as Tunisia, Egypt and even Greece, where social and political upheaval has, at its worst, almost annihilated what was previously a flourishing tourism industry. Should we really be altering landscapes beyond recognition for an industry of questionable longevity? Some island territories may have other economic options. For some island territories with few other revenue possibilities, however, a simple shift away from tourism may not suffice. In either of these cases, a tourism industry that continues to destroy the landscape and the 'place' appeal that enabled the development of a tourism product in the first place, would be digging its own grave. This is where coordinated management must come into play – how can we sustain jobs, accommodate tourists and generate income, whilst safeguarding coastal resources

and processes, preserving ecosystem services, and ensuring a good quality of life for islanders? Can we perhaps bridge the 'ecological' and 'economic' roads to success discussed by Baldacchino in Chapter 4, or incorporate elements of both? In the case of some islands, perhaps this is too demanding a challenge. In many cases, however, there are at least some possibilities for finding a better balance than we have to-date, but this will certainly not happen through piecemeal short-sighted management approaches.

Premise 6: 'Intelligence' and knowledge, in its various forms, will underlie the sustainable management of Mediterranean islands.

Several authors contributing to this publication have made the point that the Mediterranean has been inhabited for a very long time. For management purposes, that history of interaction with nature, and its ongoing evolution in today's Mediterranean societies, translates into a priceless heritage of knowledge. Some of this knowledge is well documented and some is incorporated into scientific work, or into existing policies and plans. Beyond this body of recognized knowledge, however, lies a wealth of 'intelligence' that has perhaps been less well utilized and significantly less appreciated, including perceptual and experiential knowledge found amongst the wider public. In recent years, the almost automatic privileging of more scientific forms of knowledge has come to be questioned, particularly within environmental management domains (Raymond *et al.*, 2010). It is very significant, for example, that the European Landscape Convention now defines a landscape, as '*an area...as perceived by people*' (see Chapter 11), in essence putting lay knowledge on a par, in terms of value and significance, with that of technical specialists. Even if there are at times clear tensions between different forms of

'intelligence', the necessity of bringing together multiple forms of knowledge is nowhere more evident than in the management of landscapes, as pointed out by Roe in Chapter 9. This discussion is especially relevant given the likelihood of occurrence of phenomena such as climate change, expected to result in significant alterations across various Earth systems, that are also likely to be difficult to predict. Indeed, uncertainty has become almost matter-of-fact across social-ecological systems. Islands are amongst those territories that may be considered most vulnerable to changing global dynamics, given not only their small size and limited resources, but also their limited capacity to have a significant influence on the world scale. In this scenario of change, people's capacity for adaptation, the latter a corollary of resilience thinking, will likely determine their future developmental trajectories, and in turn, capacities for adaptation will depend crucially on 'intelligence' – effectively drawing on all available resources to the full. Even if vulnerable, perhaps islanders are amongst the best-placed to tackle these emergent challenges, particularly given their remarkable track record with innovation and adaptation.

Premise 7: Appropriate benchmarks and indicators for measuring progress are needed.

There is now a substantial body of work relating to Sustainability Indicators (SIs), with these being used at various scales to measure relevant driving forces and pressures affecting social-ecological systems, the state of the systems under study, the extent and nature of impacts being sustained, and the scale and adequacy of any policy, regulatory or other responses. The rationale for measurement, whether in quantitative or qualitative terms, is clear – it is difficult, if not impossible to assess progress without a benchmark and a means for gauging

change. Despite significant policy emphasis on the development and application of SIs, however, many difficulties with their practical use remain, as attested to by Morse in Chapter 16. Indeed, the overall policy influence of many suites of SIs would appear to be limited at best (Cassar *et al.*, in press). Nevertheless, and as Morse also points out, the relevance and usefulness of SIs is not in question, although critical issues must be addressed. Some of these relate to the design of SIs and the data used for their measurement. SIs suitable for mainland countries, for example, may be far less applicable to island territories which would in turn require indicators to address island-specific concerns. Other limitations have to do with the extent to which the findings generated by SIs are used to properly inform policy development. The former is perhaps a technical matter; the latter appears to have more to do with political will and priorities, and with the presence or absence of an adaptive management philosophy – the latter is, after all, one of the hallmarks of ecosystem management. To 'learn' as we go along, we have to assess what we are doing right and what we are doing wrong, and adjust accordingly – in this process, however, we must ensure that we are measuring appropriate variables, in a robust manner, and with the honest intention of using results constructively.

Premise 8: Pan-Mediterranean collaboration is a must.

The focus of this publication has been on Mediterranean islands, and their unique and distinctive qualities have been highlighted time and time again. However, as Baldacchino points out (Chapter 4), in this globalized era, all territories are interdependent. The future of Mediterranean islands will have as much to do with goings-on beyond their shores, as it will with developments within their territories. For that reason, and also because of their limited resource

capacities, the management of Mediterranean islands must draw on pan-Mediterranean collaboration to the maximum extent possible, particularly between the various island territories of the region. This is especially given that similar 'problem areas' affect several of the Mediterranean islands – issues with population excesses/losses, for example, or with freshwater management, issues with land availability and/or with conflicting land-use demands, issues with energy security, and general issues with trying to find some sort of sustainable developmental pathway. There is much to be said for learning from the experiences of those in the same boat. In some instances, collaboration is also a requirement if any solution is to be found, particularly where causal influences are transboundary in nature. Mediterranean states already have a remarkable example to emulate in this regard, that of the Barcelona Convention (Convention for the Protection of the Mediterranean Sea against Pollution), through which Mediterranean states came together, successfully, to safeguard against damage to a common shared resource. Phillips (Chapter 10) provides some pointers for future international collaboration within the region and beyond, in relation to landscape management. The examples of the UNISCAPE, CIVILSCAPE and RECEPT-ENELC networks, are indeed testament to the 'value added' which is derived through such alliances, which may also be considered as enhancing social capital at multiple scales.

Premise 9: The specific context of each Mediterranean island must be recognized, understood and 'celebrated'.

On a final note, it is important to emphasize that there is no 'one size fits all' solution to the management issues which Mediterranean islands need to tackle. This emerges clearly from the

various cases discussed in this book – whether Comino or the Tuscan archipelago (Chapter 13), Gökçeada (Chapter 6) or Cyprus (Chapter 15), or any other of the thousands of islands within the region, each has its particularities, products of its natural resource base, historical evolution and its people. General management principles are useful, as are regional policies or national-level initiatives that extend to island territories. Similarly, regional networks and international collaborations have a very pertinent role to play. The unique management setting of each individual island, must, however also figure prominently in tailoring the planning process to the requirements of each territory, both to address context-specific constraints and to draw on context-specific resources. Indeed, this uniqueness is something to be 'celebrated' as a contributor to the heterogeneity of Mediterranean islands and of the region as a whole.

References

- Cassar, L.F., Conrad, E., Bell, S. & Morse, S., in press. Assessing the use and influence of sustainability indicators at the European periphery. *Ecological indicators*.
- Howard, P., 2003. What is heritage? In: P. Howard, ed. *Heritage: Management, interpretation, identity*. London: Continuum International Publishing Group, pp.1-13.
- Guijt, I. & Shah, M.K., eds., 1998. *The Myth of Community: Gender issues in participatory development*. London: ITDG Publishing.
- Mora, C. & Sale, P.F., 2011. Ongoing global biodiversity loss and the need to move beyond protected areas: a review of the technical and practical shortcomings of protected areas on land and sea. *Marine Ecology Progress Series*, 434, pp.251-266.
- Raymond, C.M., Fazey, I., Reed, M.S., Stringer, L.C., Robinson, G.M. & Evely, A.C., 2010. Integrating local and scientific knowledge for environmental management. *Journal of Environmental Management*, 91(8), pp.1766-1777.
- Walker, B., Holling, C.S., Carpenter, S.R. & Kinzig, A., 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, 9(2), 5. Available: <http://www.ecologyandsociety.org/vol9/iss2/art5/> [Last accessed: 10th January 2012].

ABOUT THE AUTHORS

The editors

Elisabeth Conrad is a lecturer with the Division of Environmental Management and Planning of the Institute of Earth Systems (University of Malta) and also holds adjunct status with the Faculty of Integrated Science and Technology at James Madison University, Harrisonburg, Virginia. She graduated with a PhD from the Institute of Biological, Environmental and Rural Sciences (University of Wales, Aberystwyth), an MSc (Environmental Management) from Imperial College, University of London, and a BA (Hons) degree in Geography from the University of Malta. She has been involved in various environmental consultancy assignments, including the coordination of environmental impact assessments and the coordination of protected area management planning projects. She has also participated in several international research projects addressing issues ranging from coastal management to biodiversity conservation and sustainability indicators. Her research interests lie chiefly in social-ecological systems and related aspects, (including the involvement of people in biodiversity conservation, protected area management and public participation in environmental decision-making) and in landscape conservation, planning and management. She has edited and authored several publications in

these subject areas. Elisabeth is also an Associate Member of the Institute for Environmental Management and Assessment.

Louis F. Cassar, PhD, is a landscape ecologist and environmental planner by training. He is currently Director of the Institute of Earth Systems of the University of Malta, and also holds adjunct status of Associate Professor within the Faculty of Integrated Science and Technology at James Madison University, Harrisonburg, Virginia, where he was based as Fulbright Scholar on curriculum development and to teach courses in biodiversity conservation. Furthermore, he is a Member of the national Strategic Environmental Assessment (SEA) Audit Team. Louis F. Cassar has been involved in conservation since the mid-seventies, initially through local and international NGOs, and later professionally. For almost a decade, he served as scientific advisor on coastal management to the International Centre for Science and High Technology (ICS) of the United Nations (UNIDO). His experience in coastal management and conservation extends to various countries of the Mediterranean region, as well as to West Africa, South America and Southeast Asia. Between 2001 and 2007, he served on the Board of the national planning and environmental protection agency, and he has also participated and/

or led more than 130 environmental appraisal/impact assessment assignments, both in the Maltese Islands and overseas, with terrestrial ecology being the main focus. His research interests include landscape ecology (primarily corridor and restoration ecology), coastal management, participatory methods for stakeholder involvement in conservation, arid zone geomorphology and orthoptera (Insecta) of the circum-Sicilian island complex and the Maghreb.

Other chapter authors

Godfrey Baldacchino is Professor of Sociology and Canada Research Chair (Island Studies) at the University of Prince Edward Island, Canada, Visiting Professor of Sociology at the University of Malta, and Executive Editor of *Island Studies Journal* (ISSN: 1715-2593). His research interests include the sustainable development of island jurisdictions, environmental sociology and ecological economics. His recent edited books include: *A World of Islands: An Island Studies Reader* (Institute of Island Studies, Canada/Agenda, Malta, 2007); *The Case for Non-Sovereignty: Lessons from Sub-national Island Jurisdictions* (with D. Milne, Routledge, Oxford, 2008); *Remote Control: Governance Lessons from/for the Small, Insular and Remote* (with R. Greenwood and L. Felt, ISER Press, Newfoundland, Canada, 2009); and *Extreme Heritage Management: Principles and Practices from Densely Populated Islands* (Berghahn Books, New York, 2011).

Nur Belkayali is Assistant Professor at the Department of Landscape Architecture, Faculty of Forestry, Kastamonu University in Turkey. She is interested in landscape planning and economic valuation of natural resources. Belkayali obtained her PhD from Ankara University in Ankara, Turkey, in 2009, for determination of Yalova

Thermal Springs' recreational and tourism economic use value.

Jeremy Boissevain is Emeritus Professor of Social Anthropology, University of Amsterdam. After directing the CARE aid programmes in the Philippines, Japan, India and Malta (1953-1958), he studied social anthropology at the London School of Economics (PhD-1962). He subsequently taught at the universities of Montreal and Sussex and Amsterdam and held visiting appointments in Malta, Britain, the United States and Poland. His books and (co) edited works include *Saints and Fireworks* (1965, 1993), *Hal Farrug* (1969, 1980), *The Italians of Montreal* (1970), *Friends of Friends* (1974), *Beyond the Community* (1975), *Small Entrepreneurs in Changing Europe* (1981), *Ethnic Challenge* (1985), *Dutch Dilemmas* (1989), *Revitalizing European Rituals* (1992), *Coping with Tourists* (1996), *Contesting the Foreshore* (2004) and *Hal Kirkop* (2006). Translations of his works have appeared in Dutch, French, Italian, Spanish, Maltese, Polish and Japanese. In 2003 and 2009, he received awards respectively from the Maltese Council for Culture and Art for 'Pioneering work in the field of cultural anthropology and Maltese society at the local level', and from the Kirkop Local Council for 'Work amongst Kirkop residents'.

Salvino Busuttil is currently President of the *Fondation de Malte* and Vice-President of Eurocean, as well as Adviser to the Minister for Foreign Affairs in Malta. He represents Malta on the Board of the International Ocean Institute and of the International Centre for Advanced Mediterranean Agronomic Studies. He is a Member of the *Club de Monaco* and Professor Emeritus in Economics at the University of Malta. He has also served as UN Special Adviser to the Prime Ministers of the Bahamas and of St Vincent and the Grenadines, as Director of the UNESCO Division for Human Settlements and

the Environment, and as Coordinator of the UN Mediterranean Action Plan. He served for several years as Malta's Ambassador to Paris and Lisbon and was the Treasurer of the Independent World Commission on the Oceans and a member of its Ocean Economics committee. He has written extensively on Mediterranean Affairs and on the problematique of future generations and their environment, having led Malta's delegation to the 1972 UN Environment Conference in Stockholm.

Alex Camilleri graduated from the University of Malta as Bachelor of Science (1992), Post-Graduate Certificate in Education (1993), Post-Graduate Diploma in Environmental Management (1994), Master in Environmental Planning and Management (1996) and Diploma in Management (2002). He occupies the post of unit manager in the Environment Protection Directorate of the Malta Environment and Planning Authority, after joining the former Planning Authority in 1994. He has carried out studies on geology and airborne pollution in Malta, and has participated in ecological and landscape appraisal projects in Italy, Morocco and Tunisia. He has also delivered various lectures on environmental topics.

Lorenzo Chelazzi is a senior researcher at the Institute of Ecosystem Study of the Italian National Council of Research (ISE-CNR), with extensive field experience in Mediterranean, northern and eastern African countries; his particular areas of expertise relate to biodiversity, ecology of coastal ecosystems, conservation of natural systems and sustainable management of protected areas. He has authored more than 70 scientific papers in journals of international relevance.

Isabella Colombini holds a PhD in Ecology with a specialization in coastal environments. For the past 25 years, she has been contracted by the Italian National Council of Research and

the University of Florence to conduct various ecological studies in coastal areas (including wetlands and coastal lagoons) of Mediterranean and tropical regions. She has participated in several scientific expeditions in Somalia, Kenya and has worked in international research projects. She also has extensive research experience in changes in the community structure of fauna in response to environmental disturbance and is co-author of several scientific publications in international peer-reviewed journals and of book chapters.

Gordon Cordina, PhD, is co-founder and Executive Director of E-Cubed Consultants. He is a graduate of the University of Cambridge and the University of Malta. His main area of research interest is the sustainable growth and macroeconomic dynamics of small and micro economies. His research in this area varies from macroeconomic and growth patterns to econometric modelling to environmental sustainability. Dr. Cordina has served as Director General of the National Statistics Office of Malta, as Economic Advisor to the Malta Council for Economic and Social Development, as Head of the Research Department of the Central Bank of Malta and as Head of the Economics Department of the University of Malta. He has been involved in a number of local and international research projects and consultancy assignments with institutions including the EU Commission, Government ministries and authorities, NGOS and private sector entities.

Nadia Farrugia was an Assistant Lecturer in Microeconomics at the University of Malta. Her main research areas were small states studies, in particular economic vulnerability and resilience, economic growth and competitiveness. She was a PhD candidate at the University of Malta researching in economic vulnerability, resilience and endogenous growth conditions. Her most recent publications focused on composite

index construction, small states and economic resilience. (Sadly, Nadia Farrugia passed away before the finalization of this publication).

Damiano Gallà is a land-use planner, specializing in landscape. He studied spatial planning at the *Politecnico di Torino* and land-use policy at the *Politecnico di Milano*, with a thesis focusing on the implementation of the European Landscape Convention in Italy. He graduated from the *Alta Scuola Politecnica*, a biennial school of higher education. He was project manager of RECEPT-ENELC, the European Network of Local and Regional Authorities for the Implementation of the European Landscape Convention, between 2008 and 2010. He has taught '*storia del territorio*' at the University of Camerino, and has collaborated on various publications related to implementation of the European Landscape Convention.

Geoffrey Griffiths, PhD, has over almost 30 years experience in landscape ecology and resource assessment using remote sensing, GIS and field survey from many parts of the world. As a senior environmental consultant for 12 years with Hunting Surveys & Consultants he worked in the UK, Greece, Jordan, Israel, the Yemen, Zimbabwe, Kenya and the Sudan on land use mapping and resource management projects. He joined the Department of Geography at the University of Reading in 1994 where he is Senior Lecturer with research and teaching interests in landscape ecology and landscape character assessment. He helped to establish the Living Landscapes Project based at The University of Reading, a research and consultancy project to develop and apply techniques of landscape character assessment for sustainable landscapes. He is currently working on projects related to ecosystem services in Liberia, landscape mapping in Cyprus and protected areas and climate change in the UK. He is a fellow of the Royal Geographical Society and the British Ecological Society, former Chair of the

International Association for Landscape Ecology (IALE-UK) and a Trustee of the Earth Trust.

Isil (Cakci) Kaymaz has a PhD degree in Landscape Architecture from the Department of Landscape Architecture, Ankara University where she worked as a research and teaching assistant between 2002 and 2007. Her research interests involve environmental perception and preferences, particularly in urban landscapes. Currently, she is a researcher at the Centre for Environmental Studies, Ankara University.

Jala Makhzoumi is professor of landscape architecture at the American University of Beirut, Lebanon. Her research and practice focuses on community-inclusive nature conservation, urban greening and rural landscape heritage conservation. In her practice, she applies an ecological landscape design and planning approach to projects that include the Damascus Master Plan 2030, Erbil Greenbelt, and the conservation and revitalization of the historic holy towns of Kadhimia, Najaf and Karbala. Among her publications are *Ecological Landscape Design and Planning: the Mediterranean context*, co-author Dr Gloria Pungetti (London, EF & N Spon, 1999) and *Horizon 101* (Beirut, Dar Onboz, 2010), aquarelle paintings with reflections on the relationship between 'landscape' and the 'human condition'. Jala Makhzoumi is honorary fellow at the Cambridge Centre for Landscape and People, United Kingdom.

Steve Morse is Chair in Systems Analysis for Sustainability at the Centre for Environmental Strategy, University of Surrey, Guildford, UK. He has been involved in sustainable development projects and research for over 30 years, and his research interests are broad, spanning both the natural and social sciences. Steve is an author of more than 90 research papers and 15 books including *Sustainability: A biological perspective*

(Cambridge University Press: Cambridge) and *Indices and indicators in development: An unhealthy obsession with numbers* (Earthscan: London). He is a Fellow of the Royal Geographical Society (FRGS), the Higher Education Academy (FHEA) and the Institute of Biology (FIBiol CBiol) and a member of the Development Studies Association.

Adrian Phillips was Director General of the UK Countryside Commission (1981 to 1992) and then a professor at Cardiff University. He has written widely on conservation and landscape. Between 1994 and 2004, he chaired the IUCN World Commission on Protected Areas. He has served on the boards of the World Conservation Monitoring Centre and several key UK NGOs, including the National Trust.

Riccardo Priore, jurist, is a functionary of the Council of Europe (Directorate General I – Human Rights and Rule of Law). Between 1994 and 2000, he coordinated works involved in the formulation of the European Landscape Convention project, as well as intergovernmental negotiations related to this same project. He has promoted the constitution of European networks for implementation of the European Landscape Convention, through RECEPT-ENELC, UNISCAPE and CIVILSCAPE, and directed RECEPT-ENELC between 2006 and 2010. He has been involved in the teaching of landscape-related rights at the *Politecnico di Torino* and at the University of Camerino, and in the teaching of aspects relating to territorial rights at the University of Strasbourg. He has authored over 50 publications at European level relating to environmental law, landscape, and aspects relating to decentralization and local authorities.

Maggie Roe is Senior Lecturer within the School of Architecture, Planning & Landscape at Newcastle University. She joined Newcastle

University in 1994 following work in practice and research at the Graduate School of Design, Harvard University. She has experience on a wide range of multi-disciplinary research and consultancy landscape projects. Her research focus is generally on landscape planning and sustainability with a special focus on participatory landscape planning, cultural landscapes and landscape change. Recent research includes assessment of UK policy relating to the implementation of the European Landscape Convention (ELC). Maggie has worked in Europe, North and South America, Bangladesh, China and India. Research and project funding bodies she has worked with include ESRC, UNESCO, British Council/DfID, DEFRA, SNH, Natural England, English Nature, The Forestry Commission and the Environment Agency. She is a Director of the Landscape Research Group Ltd, and as Editor of the international peer reviewed journal *Landscape Research*, she has helped to focus attention within the journal onto cultural landscape issues and landscape ecology. She is currently working as part of an interdisciplinary team on a Valuing Nature Network project funded by the UK Natural Environment Research Council (NERC) examining 'Interdisciplinary methods to build a socio-ecological decision-making tool to inform marine governance and policy'.

Ilkden Tazebay is Professor of Landscape Architecture, at the Department of Landscape Architecture, Ankara University, Turkey. Her main areas of interest are sustainable development and landscape planning. She has published many articles and book chapters, and served on editorial boards and as a reviewer for numerous journals.

Ioannis Vogiatzakis, PhD in Physical Geography, is an Associate Professor in Environmental Conservation and Management Programme at the Open University of Cyprus (OUC). Before joining OUC he held posts and carried out research and teaching activities at the Universities

of Reading (UK), Cagliari (Italy) and Ioannina (Greece). His research interests include the ecology and biogeography of Mediterranean islands and mountains, predictive vegetation and habitat mapping using GIS and Remote Sensing, landscape-based approach to nature conservation delivery and the effectiveness of protected areas for biodiversity conservation.

Theano S. Terkenli is Associate Professor and founding member of the Department of Geography, University of the Aegean (1994 to date). She is a member of faculty and representative of the Department of Geography at the Interdepartmental Graduate Program in Tourism Planning, Administration and Policy of the University of the Aegean (1999-today). She graduated with a PhD in Geography from the University of Minnesota - Twin Cities, USA (1986-1993), with a Master's (MSc) in Landscape Architecture from the University of Wisconsin - Madison, USA (1983-1986) and with a BSc in Forestry and Environmental Sciences from the Aristotelian University of Thessaloniki, Greece (1978-1983). Her research, publishing and teaching specialties and interests include cultural geography, landscape geography and critical perspectives in tourism. Her publications include *Contemporary Mediterranean Geographies* (edited with Louis F. Cassar, Dordrecht: Springer, forthcoming), *Human Geography: Humans, Society and Space* (edited with T. Iosifidis and I. Chorianopoulos, Athens: Kritiki, 2007), *Landscapes of a New Cultural Economy of Space* (edited with Anne-Marie d'Hautesserre, Landscape Series, Dordrecht: Springer, 2006), and *Tourism Geography* (with N. Metaxidis and P. Raftopoulou, Athens: Educational Books Publishing Organization, 2003).

There is something about islands that is distinctive, a quality that makes them intrinsically different from their mainland counterparts. Islands are perhaps best seen as 'concoctions' - of unique biota, landscapes, social aspects, economic dynamics, political systems and a myriad other elements that together shape an island's sense of identity. The many islands of the Mediterranean Basin are excellent examples of this multi-faceted character. Rich in heritage, both cultural and natural, these environments are an ideal context within which to discuss the challenge inherent in crafting a sustainable future that balances ecosystem dynamics and social needs, and that rises to the demands of modern life while preserving that which has been shaped over millennia.

This collection of essays presents insights on various aspects of Mediterranean islands, on their defining characteristics and on the difficulties that these face within a region that is rapidly changing. Through a combination of thematic discussions and case studies, this publication shows that while the road to sustainability may well be a long and arduous one, Mediterranean islanders are well equipped to bring their innovation and enterprising spirit to the fore to meet the challenges that come their way.



Maltese National Commission for UNESCO



Institute of Earth Systems
University of Malta

ISBN: 978-99957-812-1-7



9 789995 781217