COASTAL STRATEGY TOPIC PAPER

Final Draft
FEBRUARY 2002

Table of Contents

	Pg
1. Introduction	**8**
1.1 Objectives of Topic Study	8
1.2 Approach	9
1.3 The Role of planning in Coastal Zone management	9
1.4 The Coastal Zone	9
2. Legal and Administrative Issues	**14**
2.1 International Trends in Coastal Zone Management	14
2.2 Convention on Biological Diversity	14
2.3 Agenda 21	15
2.4 United Nations Convention on the Law of the Sea	15
2.5 Related Legislation	15
2.6 Regional Measures : the Mediterranean	16
2.7 The European Union	19
2.8 National Law and Practice	20
3. Natural Coastal Resources	**22**
3.1 Geology and Geomorphology	22
3.2 Hydrology	25
3.3 Coastal Habitats	26
3.4 Protection Status	33
3.5 Threats	34
4. Historical and Cultural Resources	**36**
4.1 Coastal Heritage	36
4.2 Protection Status	38
4.3 Threats	38
5. Coastal Uses	**42**
5.1 Tourism and Recreation	42
5.2 Agriculture	49
5.3 Aquaculture	53
5.4 Fisheries	58
5.5 Shipping	59
5.6 Mineral Extraction	68
5.7 Infrastructure	74
5.8 Oil Exploration	81
5.9 Other Uses	84
6. Coastal Development	**86**
6.1 Demand for Development	87
6.2 Coastal Development within Local Plans	94

7. Current Planning Policies **102**
7.1 Temporary Provisions Scheme 102
7.2 Structure Plan Policies 106

8. Strategic Direction **114**
8.1 Emergent Issues 114
8.2 Proposed Strategy 118
8.3 Zoning Scheme for the Coastal Zone 121
8.4 Conclusion 126

Appendix A Barcelona Convention and its Protocols
Appendix B The Main National Legislation and Legal Bodies
Appendix C Legal Protection Afforded to Natural Resources
Appendix D Development Applications within the Coastal Zone (1994-1998)
Appendix E Structure Plan Policies relevant to the Coastal Zone

List of Tables

	Pg
Table 1 : Land area within the coastal zone	12
Table 2 : Main geological and geomorphological formulation	23
Table 3 : Main Threatening Activites to coastal habitats	35
Table 4 : Excavations/salvages resulting from surveys	37
Table 5 : Facilities at Malta Freeport	60
Table 6 : Official Bunkering Sites in the Maltese Islands	62
Table 7 : Marina Berths in the Maltese Islands	66
Table 8 : Potential for development of Marina facilities	68
Table 9 : Salt pan areas identified by the coastal zone survey (1989)	74
Table 10 : Planning Applications submitted per year	87
Table 11 : Development Categories	88
Table 12 : Development Applications within the coastal Zone	90
Table 13 : Number and area of applications submitted within the coastal zone	92
Table 14 : Number and area of applications permitted within the coastal zone	92
Table 15 : Development per Local Plan Area	94
Table 16 : Area requested for development within the coast per Local Plan	95
Table 17 : Area of permitted development within the coast per Local Plan	95
Table 18 : Current Zoning for Development within the Coastal Zone	103

LIST OF MAPS

Map 1	Coastal Zone (Preliminary)
Map 2	Protected Areas, Important Ornithological Sites
Map 3	Cultural Heritage
Map 4	Underwater Pipelines and Cables
Map 5	Oil Exploration Blocks and Drilling sites
Map 6	Terrestrial Coastal Uses
Map 7	Coastal Marine Uses
Map 8	Demand for Development (1994-1998)
Map 9	Granted Development (1994-1998)
Map 10	Temporary Provisions Schemes within the Coastal Zone
Map 11	Level of development within the coastal zone

LIST OF GOVERNMENT AGENCIES CONSULTED

Agriculture Department
Armed Forces of Malta
Civil Protection Department
Drainage Department
Environment Protection Department
EneMalta Corporation
Fisheries Department
Health Division
Lands Department
Local Councils Department
Maltacom p.l.c
Malta Development Corporation
Malta Freeport Corporation
Malta Maritime Authority
Malta Tourism Authority
Museums Department
National Aquaculture Centre
Oil Exploration
Police General HQ
Water Services Corporation
Works Division

This paper has been compiled by **Michelle Borg**, who may be contacted at the Planning Authority (email:michelle.borg@pa-malta.org)

1 Introduction

1.0.1 One of the main topics within the Structure Plan Review process is the coast. The current Structure Plan contains a number of policies that call for the protection of the coastal environment and the need to prepare a coastal management plan that looks at safeguarding natural resources and public enjoyment within the coast.

1.0.2 The purpose of this Topic Paper is to identify issues for the Structure Plan Review process and to provide a strategic direction towards sustainable development within the Maltese coast, within the broader concept of Coastal Zone Management.

1.0.3 The delicate equilibrium that exists in the coastal environment (being the transition point between the land and the sea), coupled with the multiple activities that make use of these resources require a holistic approach for effective management. This necessitates a need to address the existing biological, physical, social and economic characteristics present within this identified geographical area. Consideration of the legal and administrative systems that are affecting this area is essential to identify the best practical mechanism for its strategic management. **Coastal zone management is the holistic process that aims to promote and maintain the sustainable development of a defined coastal area.**

1.1 Objectives of the Topic Study

1.1.1 The Coastal Strategy Topic Paper aims to identify the following factors:

- the current status of the coastal environment;
- the effectiveness of the current policy framework governing coastal resources and uses;
- the main issues within the coastal environment within the Maltese Islands that need to be addressed for the next 20 year period by the new Structure Plan.

1.2 Approach

1.2.1 The Topic Paper is mainly based on existing information and documentation as well as consultation undertaken with the relevant government agencies. It has been a prerogative to utilise the most recently published data and available information; where gaps exist, these are highlighted in the document. A study on ornithology was commissioned to provide updated information for coastal areas and additional data concerning development trends was generated within the Planning Authority.

1.2.2 Another element of this review covers legislation, policies and regulations, related to the coastal and marine environment on both the local and international levels. As Malta is currently seeking closer links with the European Union (EU) reference has been made to European Union policies and approaches relating to coastal zone management.

1.3 The role of planning in Coastal Zone Management

1.3.1 Coastal zone management is multidisciplinary and spatial planning is one tool that can assist in identifying a strategic approach towards sustainable development of the coastal environment. The management of the coastal zone is the remit of several agencies and institutions having jurisdiction over particular geographical areas or uses within the coast. Consequently, the main thrust of the Coastal Topic Paper is to identify those coastal issues that can be managed through the development planning process within the new Structure Plan. However it identifies those issues that would require management under a much wider national management strategy.

1.4 The Coastal Zone

1.4.1 Very broadly the coastal zone can be defined as ***"a geographical space incorporating land and sea areas within which the natural processes interact to create a unique dynamic system. It also incorporates those activities on land and at sea where human activities are directly influenced by or can influence the quality of the natural resources".***

1.4.2 Coastal resources have been exploited in various ways. Fisheries, transportation and recreation are three of the main industries, which exploit such resources worldwide and in the Maltese Islands. The increasing scale of

coastal development has led to conflict between such uses. Although some of these uses actually benefit from the presence of other coastal activities (such as power stations located within or in the proximity of ports), other uses are incompatible (such as desalination plants in the vicinity of effluent discharge points).

1.4.3 Being a nation state with a resident population of around 400,000, Malta's infrastructure needs have to be met by the limited space available. Power stations, desalination plants, ports and harbours all require a coastal location to operate effectively. To date, the accessible part of the coastline has been modified and extensively used by a variety of uses all competing for space and resources. Additionally over 1 million tourists require accommodation and recreational facilities, which over time have taken up considerable stretches of the coast, particularly hotels and beach concessions. The benefits obtained from such a location are limited and short-lived, since densely built-up coastal areas no longer provide the tourism product originally promoted.

1.4.4 The consequence of all this development has been the degradation of natural resources and conflict between users indicating that the need for a strategic direction for the Maltese coastline is evident. This is reflected also in the findings of the Public Attitude Survey carried out by the Planning Authority in 1999. The results show a general perception of the coast in the Maltese Islands as a recreational resource that needs to be protected both for this purpose as well as for environmental reasons. Measures to control uses in conflict with this recreational potential are also perceived to be lacking.

Identifying a boundary

1.4.5 An initial step in coastal zone management is to identify the geographical extent where management is to be implemented: a defined boundary is required. The delineation of this geographical space is mainly based on ecological, physical and socio-economic criteria present, which vary along different parts of the coast. Consequently there are variations in extent and width within different coastal zones.

1.4.6 As the coastal zone incorporates both the terrestrial and marine environments there is a need for both a seaward and landward boundary that identify the coastal zone. From an ecological point of view the inland boundary normally includes those habitats and ecosystems that are directly affected by the marine environment. The inland boundary normally also includes those areas for which management is necessary to control uses that have direct and significant impacts on coastal waters and extends inward to include all coastal resource areas and all major coastal issue areas. For a

boundary to be effective it should be easily discernible both in map form as well as on the ground as much as possible. This will facilitate interpretation of management objectives during the implementation phase.

1.4.7 The seaward boundary is also delineated on the basis of both ecological as well as administrative criteria. The claims made by each sovereign state over its coastal waters in accordance with the Law of the Sea (1982) usually direct the delineation of the seaward boundary of a particular coastal zone. This can be the territorial sea boundary (up to 12nautical miles) and may extend to 200nautical miles of the Exclusive Economic Zone.

The Coastal Zone Boundary for the Maltese Islands

1.4.8 A coastal boundary for Malta has been identified on the basis of ecological, physical and administrative criteria, as illustrated in Map 1. Consequently there are variations in the coastal widths between one area and another. The inland boundary corresponds as much as possible to the boundary selected for the coastal habitats that have been scheduled through the Development Planning Act 1992, particularly for coastal cliffs where as far as possible, these have been delineated along the nearest continuous, easily discernible physical feature, usually carriageways and long stretches of rubble walls. Footpaths and tracks formed by trampling etc., have only been used where no other discernible features could be identified. Where no continuous physical features could be identified for delineation purposes, the boundary is determined as corresponding to the shortest distance between two (mutually) intervisible points at the extremities of other physically identifiable features. This is geared towards maintaining conformity with existing policies.

1.4.9 The existing planning regulations developed locally take into consideration most environmental issues within the planning process. Development plans and numerous policies regulate town-planning issues even within coastal towns, however a gap exists in the provision of adequate policies related to coastal issues. Subsequently the coastal zone boundary is significantly close to the coastline within coastal settlements and towns and is limited to the first road aligning the coast. In rural areas however, where planning policies are not so comprehensive, the boundary is predominantly characterised by ecological systems and extends further inland.

1.4.10 The seaward limit of 12nm has been chosen since national sovereignty extends to the territorial sea and under the Amendments to the Development Planning Act, 1997 the Planning Authority has jurisdiction to regulate development at sea.

1.4.11 The total land area of the Maltese Archipelago is approximately 315.4km2 excluding the small islets. The coastal zone as identified on the basis of the above-mentioned criteria incorporates a land area of approximately 61.8km2, making up 19.6% of the total land area (Table 1).

TABLE 1 : LAND AREA WITHIN THE COASTAL ZONE

	Land Area (km^2)	Coastal Zone Area (km^2)	Coastal Zone %
Malta	246.8	39.8	16.1
Gozo	65.8	19.2	29.2
Comino	2.8	2.8	100
TOTAL	**315.4**	**61.8**	**19.6**

1.4.12 The natural and cultural resources present within this land area as well as the coastal waters are reviewed in Sections 3 and 4 respectively. Coastal uses are covered in Section 5, which gives a perspective on the types of uses present within the Maltese coastline, their needs as well as the arising impacts on both resources and each other. These three chapters are intended to give an overall picture of the coastal zone and its status within the Maltese Islands.

1.4.13 The planning regulations that control development within the coastal zone are reviewed in Section 7, which highlights the adequacy or otherwise of the current spatial planning system for the coast. The final Section provides an overall assessment of the existing issues and proposes a strategic direction for development within the coastal zone in the Maltese Islands.

2 Legal and Administrative Issues

2.0.1 The development and implementation of a coastal planning strategy for the Maltese Islands depends on the legal framework within which it has to operate. This includes the international obligations Malta has to undertake as well as the local administrative set-up.

2.1 International Trends in Coastal Zone Management

2.1.1 The implementation of coastal zone management is covered by a number of international agreements targeting both general issues (such as sustainability) and more specific ones covering particular economic sectors and resources.

2.1.2 Malta is party to a number of international agreements which direct action towards the coastal and marine environment at a global and regional level. The three main documents focusing on sustainable development of the coastal and marine environment at a global level are the Convention on Biological Diversity, the related Agenda 21 and the United Nations Convention on the Law of the Sea.

2.2 Convention on Biological Diversity (Rio 1992)

2.2.1 The main legal instrument addressing coastal and marine resources is the Biodiversity Convention (CBD) adopted at the UN Conference on Environment and Development in Rio 1992. Aiming to adopt a broad approach to conservation it requires Contracting Parties to **adopt national strategies**, plans or programmes for the conservation and sustainable use of biological diversity, and **to integrate the conservation and sustainable use** of biodiversity into relevant sectoral or cross-sectoral plans, programmes and policies (article 6).

2.2.2 With respect to marine and coastal biodiversity, Parties to the Convention agreed on a program of action for implementing the Convention, known as the Jakarta Mandate on Marine and Coastal Biodiversity. It identifies **Integrated Coastal Area Management (ICAM)** as the most suitable framework for addressing human impacts on marine and coastal biological diversity.

2.3 Agenda 21

2.3.1 Adopted in Rio 1992, this non-binding document aims to guide countries implement the objectives of sustainable development. Guidance for the management of coastal and marine resources is given in Chapter 17, which deals specifically with Protection of the Oceans, Seas, Coastal Areas and the Protection, Rational Use and Development of their Living Resources. **ICAM is seen as the key tool to achieve such objectives.**

2.4 United Nations Convention on the Law of the Sea (Montego Bay 1982)

2.4.1 This Convention is an all-encompassing instrument that aims to regulate practically all marine activities in any marine area. Apart from establishing regulations relating to jurisdiction over maritime areas, the Convention puts an obligation on States to **protect and preserve the marine environment**. Contracting Parties are invoked to take all necessary measures to enforce the regulations adopted to prevent, reduce and control pollution of the marine environment from land-based sources; seabed activities; dumping and through the atmosphere. In doing so, States shall act so as **not to transfer, directly or indirectly, damage or hazards from one area to another or transform one type of pollution into another.**

2.4.2 The Convention also binds States with **the duty to protect objects of an archaeological and historical nature found at sea**. Provisions for semi-enclosed seas, such as the Mediterranean, call for the **co-ordination** between bordering States on **management**, **conservation and exploitation** of living resources; **implementation of rights and duties** with respect to protection and preservation of the marine environment; **scientific research** and related policies.

2.5 Related legislation

2.5.1 Other international agreements apply to specific issues. The Convention on Wetlands of International Importance especially to Waterfowl (the RAMSAR Convention), for example, is mainly aimed for the protection of **areas important for birds**. Marine pollution from vessels is one issue that has been covered extensively by international law and has been the instigator for further development of international legislation directed towards the marine and coastal environment. Two important agreements dealing with the shipping industry are the International Convention for the Prevention of Pollution from Ships and the 1978 Protocol (MARPOL 73/78) and the

Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (London 1972). MARPOL 73/78 aims to protect the marine environment by **eliminating intentional discharges of oil and other harmful substances** and minimising accidental discharges of such substances by vessels sailing under Flags of State Parties. The London Convention is designed to control the **dumping of waste in the sea** from vessels flying flags of State Parties beyond national jurisdiction.

2.5.2 The general trend on the international level is towards the adoption of Integrated Coastal Zone Management as a national strategy to address human impacts and needs within the coastal environment. Through such an approach, each document identifies specific tools that may assist in the implementation process of this strategy by each Contracting Party.

2.6 Regional Measures: The Mediterranean

2.6.1 In 1975 Mediterranean countries and the EEC adopted the Mediterranean Action Plan (MAP) under the auspices of the United Nations Environment Program (UNEP). Its main objectives were to assist the Mediterranean Governments assess and control marine pollution, formulate their national environmental policies, improve the ability of governments to identify better options for alternative patterns of development and make more rational choices for allocation of resources. Gradually MAP's focus shifted from a sectoral approach of pollution control to integrated coastal zone planning and management.

2.6.2 Following the Rio Earth Summit, the approach for the Regional Program focused towards a more comprehensive approach leading to measures for ensuring sustainable development. The objectives set for MAP Phase II, covering the period between 1996 and 2005 are the following:

- to ensure sustainable management of natural marine and land resources and to **integrate the environment in social and economic development, and land-use policies**;
- to protect the marine environment and coastal zones through **prevention of pollution, and by reduction and, as far as possible, elimination of pollutant inputs**, whether chronic or accidental;
- to protect nature, and to **protect and enhance sites and landscapes of ecological or cultural value**;
- to strengthen solidarity among Mediterranean coastal States in **managing their common heritage and resources** for the benefit of present and future generations; and
- to contribute to **improvement of the quality of life**.

2.6.2 The obligations to implement MAP objectives are embodied in the 1976 Convention for the Protection of the Mediterranean Sea against Pollution which was amended in 1995 to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean. This Convention calls on Contracting Parties to commit them to promote the integrated management of coastal zones whilst taking into account the protection of areas of ecological and landscape interest and the rational use of natural resources. The Barcelona Convention is the framework legislation through which specific Protocols have been adopted.

2.6.3 The six Protocols adopted to date are listed in Appendix A. Reflecting the trends in the international scene of environmental legislation, five deal with specific issues relating to pollution prevention and one aims to safeguard biodiversity. Some of the obligations that need to be implemented by Malta as a Contracting Party include:

- **Regulation of dumping through a special permit system** based on adequate scientific basis for assessing the consequences of such dumping in the area concerned taking into account seasonal variations, amenities, and other sea uses. The practical availability of alternative land-based methods of treatment, disposal or elimination or of treatment to render the matter less harmful for sea dumping should also be considered. **Incineration at sea is prohibited**.

- Maintenance and promotion of **contingency plans** and means for combating marine pollution as well as develop monitoring activities.

- **Phasing out inputs of the substances** that are toxic, persistent and liable to bioaccumulate arising from the production of energy, fertiliser and cement; tourism; agriculture, waste management, transport and works which cause physical alteration of the natural state of the coastline.

- **Prevention, abatement and elimination of the generation of hazardous wastes** which include clinical waste, waste generated from the production and formulation and use of wood preserving chemicals, household wastes such as sewage sludge and residues arising form the incineration of household wastes.

- **Protection, preservation and management in a sustainable and environmentally sound way of areas of particular natural or cultural value**, through the establishment of specially protected areas. Strategies, plans and programmes for the conservation of biological

diversity and the sustainable use of marine and coastal biological resources are to be adopted and integrated into the relevant sectoral and intersectoral policies.

- **Compilation of a comprehensive inventory** of areas that contain rare or fragile ecosystems, are reservoirs of biological diversity and are important for threatened of endangered species; species of flora and fauna that are endangered or threatened.

- **Drawing up of a list and a network of specially protected areas** of Mediterranean Importance (SPAMI) to be selected on a scientific basis and be representative of the Mediterranean region and its biodiversity.

- **Regulation of exploration and exploitation activities** whereby applications must include a survey concerning the effects of the proposed activities on the environment and the competent authority may require an EIA; safety measures; contingency plan; monitoring procedures; plans for removal of installations; precautions for SPAs and insurance or other financial security to cover liability.

2.6.4 These obligations direct Contracting Parties in managing specific uses and activities arising from their sovereign territories or vessels registered under their flag. They deal mainly with pollution prevention from marine activities, land based activities and with biodiversity protection. As a Contracting Party Malta is to introduce these and other obligations of the Barcelona Convention and its Protocols within its national legal framework. To date no legislation currently in force actually makes specific reference them.

CAMP Malta

2.6.5 In 1993, the contracting parties to the Barcelona Convention approved funds for the implementation of a Coastal Area Management Program (CAMP) in Malta, under the MAP. CAMP-Malta was initiated in February 2000 and its aim is to introduce and apply the principles, methodologies and practices of sustainable coastal management in Malta, particularly in the North West area. The Programme entails a number of thematic activities ranging from Integrated Coastal Management, Marine Conservation, Water Resources Management, Soil Erosion and Tourism and Health. It involves a number of public agencies (Agriculture Department, Environment Protection Department, Health Department, Ministry for Economic Services, Planning Authority, Water Services Corporation) as well as NGOs (Nature Trust) and institutions (University of Malta) with the purpose of ensuring integration. The

project is to be finalised by 2002 with the formulation of **an integrated resource plan** on the NW of mainland Malta.

2.7 The European Union and Coastal Zone Management

2.7.1 Currently there is no specific legislation directed towards coastal zone management on a regional level within the EU, however the Union recognises that coastal problems are of a European dimension and cannot be solved by Member States separately. To this effect the European Commission set up a Demonstration Programme in 1996 to identify appropriate measures needed to address European coastal zones and their management on a regional level. The Programme recognises that an efficient EU policy can only be implemented in close collaboration between the European institutions and with full participation of national, regional and local administrations. This reiterates the principle of policy integration required to tackle coastal issues arising from a variety of uses.

2.7.2 Following the conclusions reached from the Demonstration Program, (at the end of September 2000), the European Commission adopted a document which announces a European Strategy for ICZM. The Strategy defines the EU's role as one of leadership and guidance to support the implementation of ICZM by the Member States, at local, regional and national levels. Where possible the Strategy builds on existing instruments and programmes, even though many were not conceived exclusively for the coastal zone. These cover sectors such as agriculture, transport, telecommunications, energy, industry, fisheries, aquaculture and environment protection. Other sectors that have a significant impact on the coast and are not covered by any specific EU policy, such as tourism, would require additional focus.

2.7.3 The Strategy also includes a proposal for a European Parliament and Council Recommendation to Member States in order to encourage ICZM action at the relevant administrative levels.

2.7.4 The importance of the Land Use Planning System for Integrated Coastal Management is recognised by the Demonstration Programme which calls for the establishment of close co-ordination between land-use planning and sectoral administrations. The conclusions reached by the Programme suggest that the Planning Ministries of the Member States may be the logical place to promote ICZM. In effect the aim of the European Strategy is to promote a collaborative approach to planning and management of the coastal zone within a philosophy of governance by partnership with civil society.

The Euro-Mediterranean (Euro-Med) Partnership

2.7.5 The Euro-Med Conference of Ministers of Foreign affairs held in Barcelona in 1995 marked the starting point of the Euro-Mediterranean Partnership (Barcelona Process). This is a wide framework of political, economic and social relations between the EU member states and the 12 Partners of the southern Mediterranean, which include Malta. The objectives of the partnership within the Euro-Med process are embodied in the Barcelona Declaration, which also provides for a financial package to implement them:

- The definition of a common area of peace and stability through the reinforcement of political and security dialogue;
- The construction of a zone of shared prosperity through an economic and financial partnership and the gradual establishment if a free trade zone;
- The rapprochement between people through a social, cultural and human partnership aimed at encouraging understanding between cultures and exchanges between civil societies.

2.7.6 The Euro-Med process has identified 6 priority areas for regional co-operation, namely **industrial**, **environment**, **water**, **information society**, **energy** and **transport**. The Short- and Medium- term Priority Actions Program (SMAP) is one of the main regional funding mechanisms targeted to provide the funds for implementation of this objective.

2.7.7 Malta is currently negotiating EU Membership and therefore relations with the EU concerning trade and political dialogue are based on first-generation association agreements concluded in 1960s and 1970s, rather than within the Euro-Med process. However Malta is still eligible for the regional funds such as SMAP.

2.7.8 Whether Malta achieves EU Membership or not, it is evident that the approach adopted for a national strategy towards coastal management has to look into policy integration and be in line with the EU objectives if it is to benefit from the available funds.

2.8 National Law and Practice

Implications on coastal planning

2.8.1 The most common element that needs to be tackled in coastal management is the sectoral approach within the administrative agencies having jurisdiction over specific coastal areas and/or uses. The Maltese Islands are no exception. A list of the main government agencies having a legal obligation to control and regulate specific areas and/or activities along the coast is provided in Appendix B.

2.8.2 The agency which controls and regulate development on land and at sea is the Planning Authority whereas the strategic development of each sector is the responsibility of other agencies. Overlapping responsibilities, in the absence of a clear obligation for policy co-ordination between all concerned makes effective management more difficult to achieve. To date consultation between agencies during a strategic plan formulation process is only a specific legal requirement for the Planning Authority. In the absence of a comprehensive coastal strategy, efforts towards integration are left to the good will of the agencies involved.

Implications to the Coastal Strategy

A national strategy for the coastal zone within the land-use planning system is the general approach adopted and called for, globally. The Structure Plan is a spatial planning tool and any coastal strategy it adopts is but one tool towards the goal of Integrated Coastal Zone Management. This strategy should be comprehensive, aiming to protect resources and coastal uses, whilst respecting the legal jurisdiction of the present administrative framework. It should be the basis for guiding policy co-ordination with the coastal zone.

3 Natural Coastal Resources

3.0.1 This section provides a general overview of the natural resources found within the coastal zone. It also gives a brief description of the type, status and threats affecting the major coastal and marine habitats, based on the information available to date. Efforts were made to include the most recent and updated information. The most updated information includes the natural resources surveys commissioned by the Planning Authority and The State of the Environment Report published in 1999 by the Environment Protection Department. This description is also based on the approach adopted by local researchers.

3.1 Geology and Geomorphology

3.1.1 The Maltese Islands are almost entirely made up of sedimentary rock deposited in a marine environment during the Oligo-Miocene period. These limestones and clays form a series of stratigraphic layers of varying composition and hardness. In a few localised places, these are uncomformably overlain by sparse Quaternary terrestrial and raised beach deposits, most of which are of high palaeontological importance. Igneous, intrusive, extrusive or metamorphic rocks do not exist.

3.1.2 The inter-relationship between geological features and natural processes, such as erosion, influence the characteristics of living natural resources. The topography and natural undeveloped landscape are determined primarily in this way. These features will influence the type of habitats that eventually develop. The geological composition is also important for hydrological purposes. The structural composition of rock influences its permeability and thus the development of underground aquifers. The type of geological material itself may provide a useful resource for the construction industry, as is the case with the local limestone.

TABLE 2 : MAIN GEOLOGICAL FORMATION OF THE MALTESE ISLANDS

Geological formation	Features
Upper Coralline Limestone (UCL)	This is the youngest of the rock layers and it characteristically forms the mesa-type plateaux and boulder screes. It is predominantly found in the North West part of Malta and on the higher plateaux of Gozo. Due to extensive faulting, the islands of Filfla, Cominotto and Comino are entirely made up of UCL.
Greensand	This is a very thin layer found underneath the UCL. Its exposures are often buried under the talus deposits of the UCL. It is often found as large detached boulders on the clay slopes beneath it.
Blue Clay	This formation forms an impermeable base (aquiclude) to the water-bearing Greensand and Upper Coralline Limestone (aquifers) above. They hold rainwater that manages to percolate through the rock layers thereby forming so-called "perched aquifers". Where the interface between the Blue Clay formation and the Greensand/ UCL formation is exposed, high level springs can form. These springs pour their contents into watercourses and are widely exploited for irrigation purposes.
Globigerina Limestone	The formation is characterised by a predominantly massive, soft, yellow, cream or white, intensely burrowed limestone with few interbeds of phosphate pebbles mainly at the interface between the sub-component members of the formation. This formation outcrops widely in the southeastern part of Malta extending over two-thirds of the island's surface area. Exploitation of the Lower member is carried out for construction purposes.
Lower Coralline Limestone (LCL)	It is especially exposed along the North West, West and South West coasts of the islands where it forms massive cliffs in view of the northeasterly tilt of the archipelago. This member is generally semi-crystalline or crystalline in nature.
Quaternary Deposits	These are of terrestrial origin dating from the Pleistocene period and are present in isolated patches, often lying near the present-day coast at the mouth of a valley (e.g. Benghajsa, Armier, Marsaxlokk) or in deep caves or other cavities (e.g. Ghar Dalam, Ghar Hasan). These deposits are generally the product of erosion of valleys during fluvial Quaternary climates. Deposits found along Sliema terraces and at Dwejra are the remains of cave material. Others are aeolian in nature. These deposits, of an average thickness between 2-3m, lie on older strata of Oligo-Miocene age. Quaternary deposits are important for their vast number of fossilised remains, which include fauna and flora now extinct from the Islands.

3.1.3 Tectonism, drainage features, drowned valleys and drowned doline structures determine the local geomorphology. The Maltese Islands have an undulating tilt towards the northeast thus producing two types of coastline, a gently sloping rocky coast on the north eastern side and a steep cliff-dominated coastline on the southwest and west side of the Islands. Superimposed on this general dip are the effects of faulting and differential erosion. Faulting, especially that brought about by the Great Fault system, resulted in the formation of broad valleys (as at Pwales, Simar, Burmarrad) which slope gradually to sea level forming relatively broad sandy bays like Mellieha Bay, Xemxija Bay or saline marshlands as at Salina. Other valleys

developed along the zones of weakness formed by the fault lines and result in steep sided gorge-like valleys known as widien (as at Mgarr ix-Xini, Wied Anglu, Wied il-Ghasel and Wied iz-Zurrieq).

Coastal Erosion: Risks and Climate Change

3.1.4 Wind and particularly wave erosion influence the geomorphological patterns and the overall effect depends upon the structural properties of the various rock layers. As a result the Maltese coastline is characterised by the following formations:

- wave cut notches or wave cut platforms at the base of the Lower Coralline Limestone cliffs (often extending below sea level);
- smooth gently sloping platforms on Globigerina limestone shores;
- bays where clays and marls have been eroded away at a fast rate (as at Xrobb l-Ghagin and Peter's Pool);
- boulder screes (both on land and in the sea) where erosion of the blue clay undermines the upper coralline limestone cap above it forming the typical rdum coastline (as at Ghajn Tuffieha, Qammieh and, San Blas,);
- karstland.

3.1.5 The coastal geomorphology has resulted in a coastline that is low-lying on the NE side, thus more accessible to the marine environment and cliffs exposed on the southern shores. This type of formation has influenced the general location and distribution of the various uses on the coastline, with most uses opting for the more accessible low-lying shores, whereas agriculture dominates the cliff areas on the southern shores.

3.1.6 Coastal erosion locally can be associated with beach loss and cliff failure. To date there are no published studies addressing the rates and risks of coastal erosion around the Maltese Islands. The main factor that accelerates erosion is human intervention through development. Road construction and hard engineering structures such as sea walls within sandy beaches and their adjacent coastline alter the sediment supply process and affect the wave energy impacting on the beach, respectively. The coast road along Bahar ic-Caghaq is a typical example.

3.1.7 Development on coastal cliffs may accelerate the rate of erosion through destablisation from engineering works during construction as well as increased load over the underlying rock. Such a situation is evident with the hotels constructed at Ghajn Tuffieha and Golden Bay. Abandonment of agricultural activities leads to breaching of rubble walls and extensive soil

erosion particularly during flooding after heavy rainfall. The impact of such run-off may lead to a further destabilisation along rdum areas.

Climate change

3.1.8 There is extensive literature on the issues of climate change and associated sea level changes. The various models proposed so far predict different scenarios on a global level. The one consistent factor with all the models is that a rise in sea level due to a global temperature rise will have considerable implications on low lying coastal regions around the world. It is important to note that regional and global variations will result from this global change and each individual coastal State will be affected differently, due to its particular natural and socio-economic characteristics. In 1996 the United Nations Environment Program commissioned a study to look into the implications of climate change on the Maltese Islands. The study seems to suggest that locally the implications will be relatively low. Although this may be the case, as most commercial and industrial activity in the Maltese Islands is located along the low-lying coastal areas, consideration of this issue is essential.

3.1.9 Due to the time frames associated with the implications of sea level change, it seems that current measures are difficult to adopt. The recommended procedure in recognising the role of land use planning policies suggests that planners should begin from now to consider options for averting adverse consequences of sea level rise and the best available management option for today is the precautionary one.

3.2 Hydrology

3.2.1 The geological formation and topographical features of the islands influences the hydrological patterns. The NW of Malta is the region supporting perched aquifers that are replenished from fresh watercourses, whereas the mean sea level aquifer covers almost one third of the island of Malta. Although most of the identified drainage routes are now dry river valleys, knowledge on their location helps to evaluate impacts of pollutants that are transported with the watercourses.

3.2.2 Apart from replenishing aquifers, surface water from rainfall has a significant influence on coastal habitats. Deviation or loss of freshwater courses, primarily through over exploitation and urbanisation, may lead to changes in habitat, if left unchecked. Increased development may also lead to contamination: hydrocarbons from adjacent roads, toxins from land fills, increased sediment from quarries and nutrient loading from agriculture. All these may lead to impacts on habitats. Additionally the increase in road surfacing has reduced the surface area through which rainwater can percolate in to the ground. Subsequently, this has led to accumulated

volumes of storm water discharged at sea, particularly at valley mouths. This is a major source of coastal erosion leading to loss of sandy beaches and decreased stability of rdum and clay slopes, if left unchecked. It may also increase risks to human safety from falling debris.

3.3 Coastal Habitats

3.3.1 As mentioned in the Introduction the coast is the interface between marine and terrestrial environments. Coastal ecosystems are present in a very delicate balance and are very susceptible to changes arising from disturbances induced both by natural processes and human activity.

Terrestrial Habitats

3.3.2 A brief description of the terrestrial and marine habitats within the coastal zone under review is given below. The five different types of terrestrial coastal habitats present are:

- saline marshlands
- sand dunes
- rupestral communities
- low-lying maritime rock communities
- transitional coastal wetlands

Photo 1: Coastal cliffs at Dwejra

3.3.3 Saline Marshlands are very scarce locally and are maintained by seasonal fluctuations in precipitation, run-off, evaporation and seepage rather than by coastal tidal fluctuation, which is very limited in the Mediterranean. Locally

these marshes are characterised by a muddy substratum on which a pool of brackish water collects in the wet season. During the dry season this water becomes progressively more brackish until it becomes hyper saline and finally disappears completely, leaving the marsh dry until the following wet season.

3.3.4 Such habitats support highly specialised species and although several of them are common to all local salt-marshes, each site has its own particular characteristics and suite of species. In addition to supporting endemic species these areas have an ornithological value since they are utilised by waders, on their migratory route across the Mediterranean, as well as by wintering species: Ghadira and Simar have been modified to facilitate the development of a managed habitat for attracting migratory species of birds. From an ornithological perspective they are a success in that they now provide a breeding habitat for certain species such as the Moorhen *Gallinula chloropus* and the Little Bittern *Ixobrychus minutus*.

3.3.5 The 1989 coastal zone survey identified 25 localities in the Maltese islands which at the time supported this type of habitat (19 in Malta, 5 in Gozo and 1 in Comino). Six of these had already been obliterated by 1989, 13 were heavily degraded and only 6 sites were considered to be in good condition. The remaining marshland areas today are at Ghadira (Mellieha Bay), is-Simar (Xemxija), il-Maghluq (Marsascala), il-Ballut (Marsaxlokk Bay) and Salina (Salina Bay). They are considered to be under constant threat from human pressure associated with construction and unmanaged recreation activities. Il-Maghluq at Marsascala has undergone clean up operations that have unfortunately transformed it illegally into a brackish pool for domesticated waterfowl.

3.3.6 ***Sand dunes*** are associated with sandy beaches that make up only two percent of the entire coastline in the Maltese Islands, thus making them a rare and vulnerable habitat type. Dune stabilisation is aided by specially adapted plants, which allow sand dune formation. Local research has mainly focused on sand dune vegetation however preliminary studies have indicated that local dunes support a characteristic fauna found in no other habitat in the Maltese Islands, some members of which are of regional biogeographical interest. Sand dunes are important geomorphologically as well since they provide a sediment bank that may replenish the beach following its erosion after a catastrophic event such as a severe storm.

3.3.7 Fourteen localities supporting such habitats were identified in the 1989 survey, two of which had become extinct by then. The only site that supports a relatively complete dune ecosystem is Ramla l-Hamra (NE Gozo). Other sites with dune systems include Ghadira (Mellieha Bay), Ramla tat-Torri (Marfa), Ramla l-Mixquqa (Golden Bay) and Santa Marija Bay (Comino).

3.3.8 ***Rupestral Communities (Coastal Cliffs)***. The South, south west and western coast of Malta and the S and SW of Gozo consist of cliffs rising from the sea to heights of c.70-130m. On mainland Malta, this chain of cliffs is supported by second tier of cliffs further inland. Important cliff communities identified in the 1989 survey extended from il-Mara to Qammieh in Malta and from Mgarr ix-Xini to Wied il-Ghasri in Gozo.

3.3.9 Due to their relative inaccessibility and available shelter, the cliff and rdum coastlines with their boulder screes provide refuge for many species of flora and fauna, a large number of which are endemic to the Maltese Islands. Two plant species present belong to monotypic genera, which are palaeoendemics: the Maltese Cliff-orache *Cremnophyton lanfrancoi* and the Maltese Rock Centaury *Palaeocyanus crassifolius*. These habitats also support several species of plants with a restricted distribution in the Mediterranean.

3.3.10 Inaccessibility attributes an ornithological importance to the coastal cliffs with respect to the rest of the coastline. Development has altered habitats elsewhere in the Maltese Islands, which were utilised for breeding, feeding and wintering purposes. Breeding areas are now restricted mainly to the coastal cliffs, and the islands of Comino, Filfla and Fungus Rock. The main bird species which breed on the coastal areas include the Cory's Shearwater (*Calonectris diomedea*), the Levantine Shearwater (*Puffinus yelkouan*), the Storm Petrel (*Hydrobates pelagicus*), the Blue Rock Trush (*Monticola solitarius*) the Yellow-Legged Gull (*Larus cachinnans*), the Short-toed Lark (*Calandrella brachydactyla*), the Spectacled Warbler (*Sylvia conspicillata*) and the Corn Bunting (*Milaria calandra*).

3.3.11 The seabird colonies at the cliffs at ***Ahrax*** (Marfa) and ***Ta' Cenc*** (Gozo) together with ***Filfla*** are considered of ***global importance*** whilst those present on ***Comino*** and along the cliffs at ***Hal Far*** and ***Gharb*** (Gozo) are considered important for the Mediterranean region.

3.3.12 Observations in behavioural patterns of shearwaters and storm petrels show that these birds are susceptible to light, which deters them from reaching the colony. Coastal developments, which introduce light from the cliffs or on the sea surface in proximity of the colony and rafting zones create disturbances, which may lead to abandonment of the site. Although several coastal sites still provide adequate breeding habitat these have been deserted over the last 25 years due to human interference, through the taking of adults and young, killing by ferrets (used by rabbit hunters) and entanglements with fishing lines located on cliff tops. On a positive note new breeding species have been recorded in recent years. These include the Kestrel (*Falco*

tinnunculus), Rock Dove (*Columba livia*) and the Starling (*Sturnus vulgaris*).

3.3.13 ***Low-lying maritime rock communities*** of gently sloping coralline and globigerina shores are found along NE Malta and NE Gozo. Due to their geological composition, the coraline limestone shores erode to form a karstic landscape whereas a smoother topography with only small irregularities is associated with globigerina shores. On both types of shores halophytic (salt tolerant) vegetation grows in isolated patches in the shallow saline soil, which accumulates in pockets in the rock. The Crithmo-Limonietum association of vegetation typical of Mediterranean coastal areas is common in these areas, which also provide the only habitat for two endemic species: Zerafa's Sea Lavender (*Limonium zeraphae*) and the Maltese Sea Camomile (*Anthemis urvilleana*). The rocks inland are colonised by garigue vegetation whereas closer to the sea the vegetation becomes more halophilic, forming a habitat type classified as maritime garigue. Such areas include Il-Ponta l-Irqieqa (Comino) and it-Torri tal-Madliena, White Rocks and Pembroke, Exiles, Tigne and Manoel Island.

Photo 2: Low-lying rocky coast at Pembroke

3.3.14 Particularly valuable shore communities are the vermetid platforms occurring towards the lower boundary of the mediolittoral zone described below. These consist of cemented and intertwined loosely coiled shells of vermetid gastropods (snails) embedded in a matrix of coralline algae. Subsequent generations of snails and algae enlarge this structure. Such structures occur all along the shore from St George's tower northwards: ix-Xwieghi is a good example. This habitat type was also identified along the east coast of Delimara peninsula in the 1989 survey.

3.3.15 ***Transitional Coastal Wetlands*** are characterised by the presence of a brackish water environment that is mainly seasonal. During the dry period, only seawater replenishes these rock pools, through wind and wave action; species that thrive in brackish conditions are therefore predominant. In the

wet season, the pools become colonised by freshwater species that have some degree of tolerance to maritime influence. Only a few examples of such communities are locally present and thus are considered to be rare. The three sites identified within the Maltese Islands are l-Ghadira s-Safra, on the north east coast of Malta, Qammieh Pools and il-Qattara in Gozo.

3.3.16 Erosion has led to the formation of caves along certain stretches of the shoreline and these offer conditions for another habitat type to develop. Very little data exists regarding caves locally, primarily because there are only a few known deep caves and these are not easily accessible. Permanent cave dwellers include species that are adapted to living in such dark and damp conditions. Consequently they have a very restricted distribution, making them vulnerable to environmental stresses. Other cave dwelling species that are not restricted to the cave environment include bats and there is also a possibility that caves within coastal areas support small colonies of sea birds. Additionally, caves may have deposits of Quaternary age (e.g. Ghar Dalam), which can provide information on the islands' palaeoenvironment and biogeography.

Marine Habitats

3.3.17 Most of the information of the marine habitats around the Maltese Islands has been gathered over the last decade as part of assessments of the environmental impact of existing and proposed projects, or in order to produce an inventory of coastal resources. These baseline studies on the submarine littoral habitats and macrobenthic assemblages were carried out in 14 different localities around the Maltese Islands and covered a total of c. 4.71km^2 of seabed area and a coastal length of c. 20km. This data represents the largest set of infralittoral biological surveys carried out to date in the Maltese Islands.

3.3.18 The Technical Report on Marine Parks and Reserves Potential (Role 1990) produced a general overview of the infralittoral habitats around our coastline. A description of the main habitat types is given below, following the classification system adopted locally and within the Mediterranean region, as developed by Peres and Picard (1968). The major zones are classified as follows:

- the supralittoral zone
- the mediolittoral zone
- the infralittoral zone
- the circalittoral zone

3.3.19 The **supralittoral zone** occurs on the upper reaches of the shore and is exposed only to sea spray and splashing waves. Since the coastline is mostly rocky, supralittoral communities of rocky substrata are the commonest in the Maltese islands. This type of habitat is equivalent to the low-lying rocky shoreline habitat described above. Soft substrata are associated with beaches.

3.3.20 A specialised community of Mediterranean coasts is the banquette system which develops on masses of drying and decaying plant debris (normally shed leaves of sea grasses), deposited on the shore by wave action during the autumn and winter storms. If left undisturbed the leaves may accumulate to form banks of up to two metres in height. These banquettes also act as a protective buffer against erosion of sand induced by strong wind and wave action in the winter months.

3.3.21 The **mediolittoral zone** experiences continuous alternate submergence and exposure due to wave action. A typical mediolittoral community is the vermetid platform as described for low-lying rocky shorelines above.

3.3.22 The **infralittoral zone** incorporates the zone which is completely submerged and reaches down to the depth where there is sufficient light for normal photosynthesis. The type of substratum present influences the type of communities that flourish in these areas. Rocky substrata are mainly dominated by attached macro-algae whereas sandy substrata are mainly dominated by sea-grasses.

3.3.23 When well-developed, these take the form of algal 'forests' which, like terrestrial forests, are stratified with tall-growing arboreal species forming a canopy, and a number of sub-strata of lower growing species, including a basal layer of encrusting, shade-tolerant species growing on the rock. Many subtypes are known, depending on a number of factors such as shelter, light penetration, nature of the substratum, and water movement.

3.3.24 The most widespread are those dominated by species of Cystoseira which grow on exposed rocky shores starting from very shallow water. Another type of Cystoseira community grows in deep water and is based on the species *Cystoseira spinosa*, *Cystoseira dubia*, and *Cystoseira zosteroides*. Most of the Mediterranean species of Cystoseira are endemic to the region.

3.3.25 Sea-grass meadows are perhaps the most important sublittoral biotic communities in the Mediterranean. These are highly productive ecosystems on which a large number of other ecosystems, and individual species, depend. A number of fish species and cephalopods (e.g. octopus, squid,

cuttlefish) use these meadows as breeding and nursery grounds. Sea-grass meadows are very sensitive to pollution and habitat alteration which, in many parts of the Mediterranean has led to their regression, leaving in their place communities based on dead or dying organisms (thanatocoenoses). Meadows in enclosed or semi-enclosed coastal areas receiving a variety of effluent or subject to certain activities (dredging, aquaculture, dumping) in the Maltese Islands seem to be experiencing the same effects.

3.3.26 The substrate and water depth influence which dominant type of sea-grass is present. Deeper waters are mainly dominated by *Posidonia oceanica*, (Neptune Grass), a species endemic to the Mediterranean. In more sheltered and shallower areas, the meadows are predominantly based on the Lesser Neptune Grass *Cymodocea nodosa*. The Red Sea Grass *Halophila stipulacea* (which is a migrant species from the Indo-Pacific region) is also occasionally present. Mixed seagrass communities of the types mentioned above are also found in certain areas and water depths.

3.3.27 The **circalittoral** region is characterised by very dim light and fewer organisms than the upper layers of the water column. Rocky substrata are populated by sessile organisms such as encrusting algae, tube-worms, bryozoans, sponges and corals. This assemblage of species is present in shallower waters where conditions are similar to this zone, such as in submarine caves. Soft substrata have a diversity of bottom-dwelling organisms which either burrow into the sediments, such as heart urchins, live on the bottom (brittle stars and sea-cucumbers) or are partly embedded in the sediment, such as sea-pens and soft-corals (alcyonarians).

3.3.28 Off the northern and north western coasts of the Maltese islands, a characteristic maerl assemblage forms in the transition between the lower infralittoral and the upper circalittoral. Maerl consists of mixed coarse sand and shell gravel which becomes colonised by species of coraline algae, the most important species of which are *Phymatolithon calcareum*, *Lithothamnion minervae* and *Lithothamnion coralloides*, free living on the bottom and a constituent of the sediment. In the Mediterranean, maerl communities have a limited geographical distribution, and are considered a threatened habitat.

3.3.29 In terms of spatial extent, the most important macrobenthic assemblages are the communities of photophilic algae on hard substrata, meadows of the sea-grass *Posidonia oceanica*, communities of bare, well-sorted sand, and maerl communities. For all these, many subtypes and facies exist, depending on the light intensity, hydrodynamic conditions, microtopography, sediment granulometry and other edaphic factors as well as anthropogenic influences, including pollution.

3.3.30 Other important assemblages with a limited distribution include meadows of the sea-grass *Cymodocea nodosa* and of the Lessepsian immigrant *Halophila stipulacea* on sandy bottoms, the assemblages of boulder fields which are complexes of photophilic and sciaphilic communities, those associated with accumulations of pebbles and cobbles and those of marine caves.

3.4 Protection status

Current Framework

3.4.1 The current process whereby protection is afforded to the natural and cultural heritage is through the legal mechanisms provided by the Environment Protection Act, 1991 (EPA) and the Development Planning Act, 1992 (DPA). These measures have proved effective in restraining the impacts from certain activities, particularly related with development. A list of the protected areas is provided in Appendix B. Map 2 illustrates these areas as well as those areas in Gozo and Comino that are considered to be of high ecological importance and worthy of protection.

3.4.2 The EPA enables the designation of nature reserves and protection of particular species of flora and fauna. A list of protected areas and species under the EPA is given in Appendix A. The Development Planning Act affords protection through the Scheduling Process whereby the Planning Authority can designate areas, buildings, structures and remains of geological, palaeontological, archaeological, architectural, historical, antiquarian or artistic importance, as well as areas of natural beauty, ecological or scientific value as scheduled property and make conservation orders to regulate their conservation. A list of the coastal areas that have been scheduled to date is given in Appendix A and includes most the identified coastal habitats on mainland Malta. Protection measures in Gozo and the south of Malta have been waiting for natural resources surveys to be undertaken, to provide the necessary information.

3.4.3 No Conservation Orders have been issued for the natural environment, primarily due to the lack of financial and human resources required for implementation. No Marine Conservation Areas have been designated as yet either, mainly due to lack of financial resources to undertake infralittoral surveys.

Protection afforded according to international obligations

3.4.4 To date only the Ghadira Nature Reserve has been given protection under such obligations and is designated as a wetland of international importance for wildfowl, within the provisions of the RAMSAR Convention.

3.5 Threats

3.5.1 The status of these habitats depends very much on the type and level of activities and uses occurring within them or in their vicinity. Cliffs and rdum areas have developed and still sustain richer communities due to their relative inaccessibility. However over the last ten years or so, new types of development together with the ongoing mineral exploitation and a variety of other activities have increased pressure on them. Low-lying areas and beaches are under continuous pressure from tourism and recreational activities, which led to the obliteration of certain areas. Table 3 below enlists the main direct threats and their causes, for each identified habitat type within the Maltese coastal environment.

Implications to the Coastal Strategy

The natural processes occurring within the coastal zone are interlinked and affect each other. Geologic, geomorphologic and hydrologic features interact to influence the type and distribution of habitats present as well as landscape. Any threat affecting a particular process would potentially threaten the natural resources present. Uncontrolled access and use of natural resources is a major threat, normally occurring under different types of development.

The natural resources within the Maltese coastal zone are diverse but their occurrence is not abundant due to the limited size of the Maltese Islands. The impacts resulting from years of unmanaged development limit this abundance further. Legal protection has been effective in controlling the types and level of activities permissible in ecologically and scientifically important areas at a strategic level. Similar protection of the remaining areas, particularly on Gozo and within the marine environment is necessary. Areas that are not of Ecological or Scientific Importance but play a role in coastal processes, such as low-lying rocky shorelines, should also be safeguarded from inappropriate development.

TABLE 3 : THE MAIN THREATENING ACTIVITIES TO COASTAL HABITATS.

Habitat	**Threat**	**Causes**
Rupestral cliffs and plateaux boulder screes; clay slopes	Damage to cliff face erosion	Quarrying off-road vehicles
saline marshlands	degradation and loss of habitat	informal recreational activity; illegal dumping of building waste; parking.
Transitional coastal wetlands	degradation of habitat; introduction of alien species.	picnics, hunting, parking, rubbish dumping,
low-lying rocky shorelines	loss of habitat	quarrying, development especially associated with water-related activities e.g. concreting surface; encroachments for parking.
Sand-dunes	trampling, loss of habitat and species	clearing of vegetation, informal recreation BBQs, camping, off-road vehicles, kiosks on beaches, exploitation of sand for construction
supralittoral sand	trampling, loss of sand	recreational activities, beach cleaning, removal of sand for construction purposes
Banquette communities	community not allowed to grow	beach cleaning activities; material used as natural fertiliser
supralittoral and mediolittoral rock	loss and /or degradation of habitat	urbanisation, modification for amenities related to water activities; dumping of building waste
mediolittoral bioconstructions vermetid	loss of habitat	Development
sea grass meadows	degradation and loss of habitat	terrestrial runoff; dredging, coolant water from power stations, hypersaline discharge from desaliantion plants, nutrient-rich effluent from sewage, fish-farm waste, trawling, unmanaged anchorage, explosives for fishing, coastal engineering works which altered hydrodynamics and sediment transport processes.
Posidonia barrier reefs	Same as for meadows	same as above, particularly susceptible to mechanical damage from unmanaged anchorage
Cystoseira communities	degradation and loss of habitat	upper communities are highly susceptible to organic pollution; altered hydrodynamics and sediment transport processes from coastal development; dumping and use of explosives for fishing.
Cladocera cespitosa (coral) banks	mechanical damage and loss of habitat	collection, unmanaged anchorage, fishing with explosives
maerl communities	degradation and loss of habitat	bottom trawling, altered hydrodynamics and sediment transport processes from coastal development;
Coralligene communities	degradation of habitat	bottom trawling, altered hydrodynamics and sediment transport processes from coastal development;
Submarine caves	degradation	uncontrolled diving activity leading to mechanical damage and death to biota on ceiling from trapped air bubbles.

Source: The State of the Environment Report, 1999 (EPD); Natural Resources Reports of Survey (PA)

4 Historical and Cultural Resources

Background

4.0.1 With respect to the coastal environment cultural resources are important on two levels. First and foremost they provide invaluable information about the history of the Maltese Islands and coastal land use in the past, and may also hold keys to changes within the natural processes, such as sea level changes. They also prove to be a valuable educational asset for public enjoyment by locals and tourists alike.

Photo 3: Mnajdra Temples on the foreground, the Congreve Memorial and one of the Coastal Towers.

4.1 Coastal Heritage

4.1.1 The Maltese Islands are enriched with historical and archaeological remains covering several epochs. A considerable number of these are located within the coast, reflecting the fact that our history is intertwined with our natural configuration as a small archipelago. Apart from archaeological remains ranging from the Neolithic period to the Early Modern period, most of the cultural heritage on the coast is associated with port related activities (e.g. the dockyard), industry (e.g. salt pans and quarries) and defence, as is testified by the fortifications in the Grand Harbour, the coastal towers established under the Knights of St. John, and the forts and military outposts constructed under the British period.

4.1.2 The layout of the land has been used to guide the location of such infrastructure. The natural creeks and embayments resulting from natural geomorphologic processes have been developed for maritime transport and defence. The development of the coastal towns at Grand Harbour has been a result of such maritime activity that gives these urban areas their distinct character. The architecture and design of traditional coastal settlements, particularly those aligning the waterfront such as M'Xlokk are also part of our heritage.

4.1.3 A number of remains have also been discovered at sea. These were either purposely placed there, or became submerged either due to shore erosion, or sea level changes. A typical example of these features is Ramla Bay in Gozo where an underwater stop wall had been placed during the Knights' period to hinder vessel from gaining access to shore and the remains of the Roman baths, which are now covered by the sandy beach. The Bronze-Age silos at St. Georges Bay, Birzebbugia are another example having exposed and partially submerged rock-cut archaeological features. Artefacts purposely or accidentally thrown overboard, offshore or particularly at their moorings, have been found and include shot, pipes, ceramics, glass amongst others.

4.1.4 Additionally there are remains of wrecks and deposits scattered within the territorial waters. These vary from sea-fearing vessels of all types and periods to aircraft, ordnance, artillery, anchors, amphorae and even military vehicles. The number of sporadic surveys carried out since the 1960s have brought to light a diversity of findings as listed in Table 4 below.

TABLE 4: EXCAVATIONS/SALVAGES RESULTING FROM SURVEYS

Survey Year	**Artefact**	**Area**
1960	Roman vessel 6th c B.C. vessel	Mellieha Bay M'Scala
Since 1960's	Three Punico- Roman wrecks	Xlendi
1965	Two old-four pronged anchors	Off St. Paul's Islands
1970's	Almost intact Messerschmitt 109E; Two 17th century Swivel guns	Near Manoel Island
1970s	German JU-88 Stuka	Dockyard creek
1980's	British Submarine (HMS Talbot)	Msida Creek
1988	Leather and wood artefacts	Grand Harbour: central channel
1993	Punic Amphorae	At 150m depth off Gozo
1994	Parts of two Roman lead anchors Early modern pottery Late antique pottery Spitfire engine	Off Gozo Birgu Waterfront M'Scala Bay

4.2 Protection Status

4.2.1 The national framework safeguarding cultural heritage is embedded in the Antiquities Protection Act (1925), the Environment Protection Act (1990) and the Development Protection Act (1992). The Antiquities Act protects affords automatic protection to archaeological and historical artefacts present in the Maltese Islands for at least 50 years, and it includes the marine environment as well. Protection measures implemented under the EPA is limited to the Legal Notice L.N 160 of 1997 directed towards the Conservation and Maintenance of Rubble Walls and Rural Structures. Through the period covering 1994-1999, a number of Sites of Archaeological Importance or Areas of Archaeological Importance on the coast have been scheduled under the DPA. These include the Hagar Qim and Mnajdra Temples, which are designated as a World Heritage Site under the Convention Concerning the Protection of World Cultural and Natural Heritage (1972). With regards to the archaeological sites within marine environment, only three localities have been scheduled to date. These are Ramla Bay in Gozo, Salina Bay and St. George's Bay, Birzebbugia. The areas of cultural heritage afforded protection are shown in Map 3, which also indicates the location of salt pans along the coast.

4.2.2 A provision is made in Structure Plan policy MCO 2 to include marine archaeological sites within the boundaries of Marine Conservation Areas. As mentioned above however no Marine Conservation Areas have been designated to date.

4.2.3 As a Party to a number of international Conventions that aim to safeguard cultural heritage, Malta has an obligation to implement the agreed protective measures. World Heritage Sites have already been designated under the 1972 Convention mentioned in Section 4.2.1. Under the European Convention on the Protection of the Archaeological Heritage (1992), each party has to institute a legal system for the protection of archaeological heritage through the provision of an **inventory** and **physical protection preferably *in situ***. The Convention also calls for the creation of **archaeological reserves even where there are no visible remains on the ground or underwater, for the preservation of material evidence to be studied by later generations.** The United Nations Convention on the Law of the Sea (1982) also calls for the protection of archaeological and historical features found at sea (refer to Section 2.4.2).

4.3 Threats

4.3.1 The measures under the current legislation have proved effective in protecting historical artefacts to a certain degree. Threats are still present and arise from a variety of coastal activities. A lack of awareness of our historical heritage coupled by a lack of policy co-ordination between the different government entities controlling these activities is a major factor influencing the current situation. Furthermore, a lack of financial resources directed towards enforcement undermines any protection measures already carried out.

4.3.2 Construction works and recreational activities are the main sources threatening the cultural heritage along the coast. The introduction of new building material and design as well as increased building heights along coastal settlements has replaced traditional facades along the waterfront (e.g. Sliema). The strategic location of some coastal towers has been obliterated with the large-scale development (e.g. M'Scala). Structures vary from hotels (St. Geroge's Bay, St. Julians) to boat houses (e.g. along Armier entrenchment wall) and kiosks (as was the case in Ramla Bay, Gozo before they were placed outside the beach itself).

4.3.3. The quaint fishing villages marketed for their picturesque Mediterranean characteristics have been almost completely transformed by the increase in holiday accommodation facilities. Additional activities such as market stalls and development of promenades are taking up the remaining available space used for boat maintenance, thus replacing the main use of the area which gave it the original attraction. Industrialised and urban waterfronts are also threatened from incompatible development types or design.

4.3.4 The main threats for underwater relics and structures of cultural significance are associated with coastal engineering works especially in ports and harbours and pilferage by a number of SCUBA divers. Coastal engineering works range from the construction of quays and jetties to dredging. Artefacts on the seabed or embedded in silt within the seabed may be completely smothered or damaged by development on the surface of the seabed. The placement of concrete blocks for anchorage is also a potential threat. Dredging normally takes place at the construction phase for harbour development and is usually an ongoing maintenance procedure to ensure adequate depths for vessels to navigate through.

4.3.5 The main issue in the Maltese islands is that the harbour areas as well as most of the larger bays are known to have archaeological remains and the potential for future finds is high. At the same time harbour and port operations cannot be halted or suspended for long periods.

4.3.6 The underwater wrecks and remains are a diving attraction to SCUBA enthusiasts. Problems arise mainly due to pilferage where artefacts are removed, particularly if there are no documented records, leaving a gap in our national heritage. Such actions may also damage the remaining structures from which artefacts are removed. The Museums Department had tried to launch an awareness campaign and distributed leaflets to Dive Clubs aiming to encourage reports on sitings. However, mainly due to lack of resources supporting a nation wide campaign with follow-up educational activities as well as an established enforcement set-up, the response was not successful.

Implications to the Coastal Strategy

Legal protection has been effective in controlling the types and level of activities permissible within Scheduled areas. Similar protection of the remaining areas, particularly within the marine environment is necessary following the compilation of a detailed inventory. The cultural heritage along the coastal zone, including that found underwater, has to be safeguarded within a framework that acknowledges the presence of other legitimate coastal activities and uses. Any coastal uses present in the vicinity of such remains have to be regulated so as to preserve such structures as well as their contextual landscape. This would have to apply also for rehabilitation projects of derelict waterfronts where the maritime activities that characterised the area need to be incorporated within the new projects in order to retain the vitality of our heritage.

5 Coastal Uses

5.0.1 Uses and activities within the coast vary and each have particular resource needs. When coastal resources are limited, particularly due to area and demands for use are high, there is great competition for their use. Consequently the resources themselves tend to be affected by this pressure and if uses are left unmanaged, conflicts may also arise between users.

5.0.2 The major coastal uses identified include:

- Tourism and recreation
- Agriculture
- Aquaculture
- Fisheries
- Shipping
- Mineral Extraction
- Infrastructure
- Oil Exploration

Other types of uses present within the coastal zone include dwellings and industrial estates. This section looks at all these coastal activities and uses within the Maltese coast, as represented in Maps 4-7, with the aim to identify sources of conflicts and compatibilities between them.

5.1 Tourism and Recreation

Background

5.1.1 Tourism in the Maltese islands has grown from 12,583 tourists in 1959 to over 1.2 million in 1999. This sector accounts for more than 25% of total exports of goods and services where gross earnings have reached Lm347 million in 1999 (Malta Tourism Authority Strategic Plan 2000-2002).

5.1.2 The Maltese Islands have promoted the coastal environment as a main tourist attraction and subsequently the measures taken over the years to build up a strong tourism industry have been directed towards coastal development. Tourism infrastructure related to the coast is mainly associated with the availability of accommodation in terms of hotels and holiday

apartments. The associated products were mainly related to beaches. In the mid 1980s a considerable stretch of the coast has been given up by government as an incentive to promote tourism development. Part of the coast along Sliema is under private management with the establishment of beach lidos, concessions and restaurants. This trend to maximise and exploit coastal areas continues to date where most of the tourist projects undertaken over the last decade have been located on the coast. The main tourist localities on the coast are St.Paul's Bay, Sliema, St. Julians, Valletta, M'Xlokk, M'Scala and Mellieha (in Malta), with Xlendi and M'Forn in Gozo. The distribution of accommodation stock is concentrated in St. Paul's Bay with Mellieha, Sliema and St.Julians having a moderate share, as indicated in Map 6.

5.1.3 The trend for developing coastal areas for tourist accommodation has taken up extensive areas that were previously utilised or could have been promoted for walking, bathing and other recreational activities. This trend has undermined the available space for informal recreation even for visiting tourists, and is an issue on an island were the only experience of open space is the coastal environment. This section addresses those issues associated with informal recreation within the coast.

Photo 4: Tourism related development along the coast of Buigbba, extends right down to the waterline

5.1.4 The Ministry of Tourism's policy, as indicated in the Strategic Plan 2000-2002 supports a strategic direction already highlighted in the Tourism Development Plan for the Maltese Islands (Horwarth and Horwarth 1989) of *diversification*, *seasonality* and *product development*. Of particular significance is the strategy aiming to *'encourage the development of new or*

improved recreational or cultural facilities, with less emphasis on accommodation and on increase in bed stock.'

5.1.5 Product development refers to the improvement, management and conservation of those resources which may form the basis of the attractiveness of the destination and which together provide the tourist with the experience expected (Tourism Topic Paper, 2000). These include both natural and cultural resources. The draft Tourism Topic paper identifies the need to upgrade and improve such resources with respect to adequate visitor facilities and management. Product planning ensures that the development of tourist products takes into account the capacities and fragility of environmental and cultural resources.

Infrastructure requirements

5.1.6 Tourism also brings a demand on the national infrastructure, namely water supply and sewage treatment. According to analysis made for the Tourism Topic Study (Planning Authority), it is envisaged that the current infrastructure should satisfy demands within the Structure Plan period. Certain tourism products would necessitate a greater demand for fresh water supply, such as golf courses. Supply of second-class water (produced from sewage treatment) is a possible alternative to additional pressure on the available desalination plants.

5.1.7 A number of hotels, most of which are in conglomerations along the coast, are opting for their own desalination facilities. Considering that hypersaline water is discharged directly at the shoreline creating a significant impact on the benthic habitat in the immediate vicinity of the discharge point, the cumulative impact of such measures requires attention.

5.1.8 The sharp increase in tourism in the early 1990s led to severe problems with sewage where most of the beaches had to be closed as the infrastructure could not cope with demand. It should be emphasised that most of the sewage is currently discharged at sea without treatment thus affecting the very same tourism product. Recent works on the sewerage system have alleviated part of the problem. The sewage outfalls at Wied il-Mielah (Gozo) and Xaghjra (Malta) are located away from popular bathing areas. The recent installation of the pipeline at Ras il-Hobz in Gozo has been targeted to reduce the impacts on bathing water quality in the area. However discharge at Anchor Bay in Malta, San Blas in Gozo together with the overflows that alleviate the discharge from the main outfalls when demand is great, are almost all located within bays that are either popular bathing areas or are close to recreational establishments, as indicated in Map 6. This creates a problem with respect to bathing water quality. Continuous monitoring of

seawater by the Health Department and Pollution Control Unit of the Environment Protection Department ensures that bathing conditions within these bays remain safe. Additionally there are illegal discharges that occur from certain catering establishments, however no action has been taken as yet to identify the sources and curb this practice. The proposed sewage treatment plants at Ras il-Hobz in Gozo and another one in Malta are expected to solve this problem. Section 5.7 deals with issues related to sewage in more detail.

Beaches

5.1.9 The recreational value of the coast provided throughout the year is sought after by both tourists and locals alike. The low-lying rocky shoreline and sandy beaches are popular with bathers in the summer months. The limited beach space is however, taken up by beach paraphernalia such as deck chairs and umbrellas, which are placed there by beach concession operators. Whilst the provision of such services is acceptable, this should not obstruct the general public from utilising any area of the public beach. It should be noted that whilst the permits issued by the Lands Department gives right to the developer to hire equipment over a stretch of beach space it does not extend that right to actually take over that same area and prevent other bathers who do not wish to hire equipment from using that stretch of beach. This has become common practice to the detriment of the general public.

5.1.10 Sandy beaches make up only 2% of the Maltese coastline and most of them have been degraded through road construction or the development of concrete platforms. Such works have led to alteration of beach dynamics and thus a loss of a valuable recreational and tourist asset. It had been common practice in the 1980s and early 1990s to shift sand from Mellieha Bay and place it in other bays to replenish them, only for this sand to be lost over the winter season.

5.1.11 As a tourism product Malta's beaches cannot meet the capacity of the tourists encouraged to visit the islands. Consequently the idea to replenish smaller, already degraded beaches emerged. Beach replenishment projects have been carried out successfully elsewhere in the Mediterranean e.g. Mallorca, in areas where beach sand is known to have eroded, following the necessary studies concerning environmental processes and impacts.

Photo 5: The limited beaches space available is taken up by development and concessions.

5.1.12 Other issues pertaining to bathing areas are related to management of activities, namely watersports, and provision of facilities and services. Both the Malta Tourism Authority and the general public are seeking to adopt a beach management system, similar to the EU Blue Flag concept. This system had been introduced in the EU originally to safeguard the environmental value of beaches whilst providing a safe environment for users, and it was directed mainly to the resort beaches. The provision of toilets, showers, telephones and access points (particularly on rocky shorelines) together with the regulation of watersports in popular bathing areas is commendable.

Diving

5.1.13 One activity that is seen as a major contribution towards tourism is diving. According to a survey carried out by the National Tourism Organisation around 35,000 divers and 20,000 accompanying persons visit the Maltese Islands annually. This constitutes 4% of the total market. The Maltese Islands offer optimal conditions to learn SCUBA diving with clear, relatively calm and clean seas. The marine life, particularly the underwater geomorphology with sheer drop-offs and caves offer interesting attractions to divers as well as the number of wrecks from the Second World War.

5.1.14 The number of divers within any one site affects the benthic habitats through mechanical dislodgement of sessile organisms as well as turbidity, caused by fins (particularly by inexperienced divers) and air bubbles (especially in caves). There are a number of SCUBA divers, even tourists, who practice harpoon fishing to the detriment of the local fish stock and SCUBA divers who want to explore the underwater environment.

5.1.15 Local practitioners have increased over the last 10 years and given the limited size of our islands, new diving experiences are being sought. Consequently the trend to scuttle vessels as a diving attraction has been introduced. The issues concerning the scuttling of vessels pertain to environmental impacts and user safety. Although the scuttled vessels have all been cleaned of oils and apertures taken off, the scuttling method leaves much to be desired in that the vessels have almost all shifted to deeper waters beyond accepted depths for recreational diving. Consequently one questions whether the scuttling of vessels is an alternative to scrapping unused vessels.

5.1.16 Arguing that these vessels serve as artificial reefs is debatable for although the vessels may serve as anchorage for sessile organisms, it s not known whether they are aiding to enrich life or whether fish are merely being displaced from natural reefs and cliff faces. Such vessels, if not properly cleaned, may also introduce certain species to localities where they were not originally present thus disrupting the local ecosystem. The main issues concerning the diving industry relate to protection of current sites for their continuous use, the availability of adequate onshore facilities, particularly relating to access to the sea and the potential of improving the diving experience.

Coastal walks

5.1.17 In winter time, the coastal areas offer a magnificent scenery. Most locals and tourists enjoy coastal walks and in fine weather may even have picnics. Efforts to promote coastal walks have been made by the Ministry of Tourism and by the Planning Authority. It is unfortunate that there are no established footpaths that direct users along routes where one can enjoy the view without damaging the countryside. An activity that affects this type of coastal use is hunting and trapping which is practised by approximately 32,000 licensed hunters and trappers. As most bird species are migratory ones, the main areas to hunt are obviously on the coast and at sea. Most of the undeveloped and agriculture dominated coast is dotted with illegally constructed huts and trapping sites. The hunting seasons are September till January and March till May. With the new regulations issued in 2001, hunters are allowed to shoot from secondary roads as well, implying that coastal walks are to be further restricted as no one would find it relaxing to walk along routes with such a concentration of shotguns, shanty structures and grazed land. The only time tourists and the public can walk safely, in legal terms, is on Sunday afternoons and public holidays.

Extension of land based activities off-shore

5.1.18 Over the last five years a trend has arisen to extend traditionally land-based activities off-shore. Proposals for floating cafeterias and homes have been put forward reflecting the current situation where land development is perceived to be restricted. None of the submitted development of this type has been accepted to date. Such alternative ideas should be reviewed in a positive light but still need to be assessed not only in terms of environmental issues but also from a socio-economic perspective.

The Domestic Market

5.1.19 During the summer months it is customary to spend time by the sea, even in the evenings, mainly to ease the effects from weather conditions. Over three decades, it has become customary to spend the summer months in coastal areas even if nowhere in Malta is far from the coast itself. Structures initially built for boat storage started to serve as summer holiday residences as well. Due to a lack of regulatory enforcement as well as adequate alternative provisions such as managed camp sites, a trend grew whereby people started building single rooms close to beaches in order to serve as summer holiday residences. Over the years, significant stretches of public land were taken illegally and large agglomerations of such structures mushroomed in Marfa Ridge, Gnejna, Marsascala and Mellieha Bay. These structures are taking up public land preventing law-abiding citizens from enjoying these coastal areas, ruining the landscape, degrading habitats and introducing unhygienic conditions.

5.1.20 Domestic tourism goes beyond the development of boathouses, shantytowns, caravans and tents. Locals are being encouraged to make use of tourist accommodation particularly in the low and shoulder seasons. In Gozo there has been an increase in second homes, particularly from the Maltese market. During summer there is a mass movement of locals to the resort areas (St. Paul's Bay, Marsascala) and Gozo, exerting a degree of pressure over a short period of time. Carnival, Easter, St.Maria and similar holidays are also associated with a mass movement of Maltese people to Gozo, exerting pressure on the island over a very short period of time.

Photo 6: The incremental and illegal development of boathouses along Marfa ridge has taken up public space and has a negative impact on both the natural resources (namely beaches) as well as the cultural heritage present.

5.1.21 The Tourism and Recreation Community Survey estimated that around 39% of the local population take a short break during the year. The same Survey confirms the pattern that people from the South and Grand Harbour areas prefer to go to M'Scala during the summer whilst those from the North Harbours, Central, South and Grand Harbour areas go to the North West and particularly to St. Paul's Bay and Mellieha. The Tourism Topic Study identifies that there is a possibility that with the decreasing use of holiday flats by tourists, such properties may be offered to locals and thus increasing the number of locals present in these localities.

Implications to the Coastal Strategy

Issues concerning tourism to be addressed by a coastal strategy are mainly focused on safeguarding popular tourist areas, including dive sites, from incompatible uses. Measures to protect existing sandy beaches and low-lying rocky shorelines within popular bathing areas from development are necessary. The provision for and protection of access within the coast is another issue which has to be provided in recreational/touristic areas with due consideration of other legitimate coastal uses to avoid unnecessary negative impacts. Additionally, areas where potential off-shore development related to tourism is possible, may be identified.

5.2 Agriculture

5.2.1 Data on agricultural activity within the Maltese Islands is scarce and therefore the coverage within this section is based on information gathered through discussions with the Department of Agriculture and the initial findings from the Rural Topic Paper that is being drafted for the Structure Plan Review process.

5.2.2 The main issues relating to coastal agriculture concern:

- landscape
- pollution from pesticides, fertilisers and farm waste
- access
- afforestation and reclamation of garigue

Agriculture and the coastal landscape

5.2.3 The main agricultural areas present along the coast today are along the North west of Malta and Gozo. This activity has moulded the natural environment and with time has given a cultural characteristic to the coastal landscape normally associated with cliffs. Agricultural use of the coast along the low-lying areas of the northern shores has been replaced by other types of development in the rapid urban growth patterns that characterised our islands over the last three decades.

5.2.4 New employment opportunities in other sectors, as well as an inheritance practice whereby land is divided into small tenements has led to land abandonment and a general shift towards part-time work in agricultural activity. Wind, salinity, water availability and soil depth conditions in coastal areas determine which products are to be cultivated. Exposed coastal areas are subject to wind erosion and saline conditions from proximity to the sea and this may have been the major cause for land abandonment. Subsequently this has led to lack of maintenance in rubble wall terracing and thus over the years, wind transport and seasonal flooding have led to loss of topsoil making the areas difficult for cultivation.

5.2.5 Moreover the increase in hunting and trapping activity has led to a practice whereby subletting of fields for such purposes has become more economically viable in the short-term. Tenants get more revenue from subletting land for trapping purposes than agricultural activities. This practice continues despite the regulations issued in 1972 that prohibit such practice. This has led to degradation of fields as well as landscape since a number of shabby structures have been constructed as hunting hides.

Photo 7: Agriculture is the main land-use along the coastal cliffs and is an inherent feature to the coastal landscape

Source of Pollution

5.2.6 Pollution arises from two main sources, namely pesticides and fertilisers from crop management, and waste from animal husbandry. The current legislation regulating pesticide use is outdated: at present pesticides are classified only in terms of potential human toxicity, with no reference being made to impacts on the natural environment. Additionally there is no reference to biological pesticides. A new Draft Act on Importation, Sale and Use of Pesticides has been drafted but has not yet passed through Parliament. Monitoring of boreholes has indicated that in certain areas, such as Fiddien, there is a problem with nitrates entering the water directly into the valley. Farmers tend to redirect this enriched water to their fields thus increasing concentrations.

5.2.7 At present waste is not separated on farms and although most of the solid animal waste is used as fertiliser, this is only a seasonal occurrence and only from bovine and chicken farms. At present this waste is left to decompose in unsheltered storage areas or disposed of directly in the sewerage system. The recent Drainage Regulations have introduced limits on Biological Oxygen Demand thus inducing farmers to invest in sedimentation tanks. There is no data available on the implementation of these regulations. Additionally waste form pig farms is put out to dry on fields and a large volume of slurry is produced. This percolates into the valley drainage systems, affecting the water table as well as agricultural land. Health Regulations ban the use of untreated sewage for irrigation purposes, however this practice is still known to take place.

5.2.8 Both types of pollutants are transported with rain water runoff to coastal areas and eventually the marine environment, particularly in the heavy storms at the beginning of the rainy season where large volumes of water contaminated with these pollutants end up in bays. No data has been obtained regarding the effects on the marine environment.

Access to cultivated areas

5.2.9 Access to fields is normally through dirt tracks but there is pressure from farmers to use concrete on dirt tracks in order to facilitate transport. This not only affects drainage patterns, through lack of percolation, it creates an aesthetic impact on the landscape. It has also been noted that some vehicles are driven across fields to access hunting and trapping sites, leading to further degradation and soil loss.

5.2.10 No regulations exist locally to allow access to the general public along the countryside, particularly in cultivated areas. As mentioned earlier, these areas are sought after by locals and tourists alike for their landscape value and in the absence of defined footpaths, conflicts arise with farmers when hikers and walkers trample on fields. To date lack of information on land ownership does not allow for official footpaths and coastal routes to be established and access for non-farmers along fields is dependent on the farmer's goodwill.

Afforestation and reclamation of garigue

5.2.11 A considerable stretch of land on the coast which was previously under the British Forces was handed over to the Agriculture Department after 1979. These areas underwent afforestation schemes with large-scale plantation of Acacia and Eucalyptus species, both alien to the Maltese Islands, thus creating an impact on the local vegetation. Afforestation projects are commendable when carried out appropriately as they consolidate the soil, preventing further erosion. Species that are planted should be native ones and suitably adapted for the localities chosen, taking into consideration the existing environmental characteristics so as not to displace existing habitats.

5.2.12 A significant impact arising from agriculture is the laying of soil on garigue habitat to open up new areas for agriculture. Besides the associated ecological impact of smothering the existing flora and fauna such a practice introduces a change in the landscape character of the area. Pesticide and fertiliser use is introduced and gradually augmented through continuous practice of such reclamation.

Implications to the Coastal Strategy

The abandonment of agriculture in coastal areas will accelerate the rate of soil erosion and consequently lead to land degradation and a change in the coastal landscape. The main issue with respect to coastal agriculture is the protection of this type of use through measures that facilitate farmers to continue to cultivate such land. The rehabilitation of abandoned fields should be favoured to the practice of soil deposition on garigue. As with other legitimate coastal uses, agriculture activity should be safeguarded from incompatible development. Compatible uses that benefit from the continued practice of coastal agricultural should be encouraged; one example is the provision of agreed coastal routes, and the development of agro-tourism.

5.3 Aquaculture

Introduction

5.3.1 Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants, in controlled conditions in order to enhance production. The process incorporates some form of intervention in the rearing stage to enhance production, such as regular stocking, feeding and protection from predators.

5.3.2 Aquaculture systems have developed in freshwater, marine and inland environments giving rise to a wide range of farming practices and options for diversification of the industry. With the decline in yields from capture fisheries world wide, there are increasing expectations from aquaculture to increase its contribution in the production of aquatic food. In effect the Food and Agriculture Organisation's conservative estimates (in 1997) predicted a production of 35 million metric tonnes for all species groups for the year 2000. By 1996, actual production was already 34 million metric tonnes.

5.3.3 The main resource required by the industry is clean water, therefore for both marine and onshore units, it is essential that the farm is not threatened from any other uses which may hamper water quality, such as sewage discharge points, harbour/port operations and heavy traffic. In most cases aquaculture production has been sectoral in its approach and very little consideration has been taken to the impacts created from the industry. Certain forms and locations of aquaculture have created a climate of negative perceptions in the industry. It is acknowledged that the industry has to respond to these perceptions by putting its own house in order and promote aquaculture as a responsible activity and an essential component of food security (New, 2000).

Aquaculture in Malta

5.3.4 Aquaculture as an industry was introduced in Malta in 1989. Over a period of 5 years a number of farms were established, in accordance to guidance provided by the National Aquaculture Centre (NAC), now officially renamed as the Malta Centre for Fisheries Science (MCFS). This centre was established in 1988 within the Ministry of Agriculture and Fisheries to promote the industry in the Maltese Islands through the provision of expert advice, research, monitoring services and to forge a link to foreign investments. Such guidance was mainly directed towards the location of marine-based farms, which was mainly chosen on the basis of shelter availability for the cages.

5.3.5 Fish farming developed rapidly in Malta from a production of 300 tonnes in 1992 to a production of 2000 tonnes in 1998. The total licensed production potential of existing farms is estimated at 3000 metric tons per year, which was expected to be achieved by the year 2000. Until recently six private enterprises operated commercial sea based and land based units locally for the production of two finfish species, seabass (*Dicentrarchus labrax*) and seabream (*Sparus aurata*). These are cultured mainly for the export market. A planning permit was issued for a tuna penning farm off Qawra Point in May 2000 and the seabass farm in Marfa has gained a development permit in July 2001, for the rearing of tuna as well.

5.3.6 The Malta Development Corporation regulated the economic activity initially through the issue of leases for use of the sea surface utilised by the cages and moorings. The first attempt to regulate this type of development was introduced with the Policy and Design Guidance issued by the Planning Authority in 1994 to regulate the size, location and impacts of the industry on land and marine resources. An Environmental Impact Assessment is required for aquaculture development applications. All operating units, except one that was established prior to 1992, have a valid development planning permission covering either all or part of the development. Maps 5 and 6 illustrate the location of the production units.

Marine cage farms

5.3.7 With the exception of the tuna-pens, all other marine cage units for fish farming are located within 500 metres from the shoreline in semi-exposed areas, with water depth between 7-45 meters. They consist of five ongrowing units located in semi-exposed coastal areas and two nursery units in sheltered bays. Each ongrowing site has an average annual production of

about 400 - 600 tonnes of fish. Such farms have spatial demands on land for a number of facilities including:

- storage of feed and farm equipment;
- management and staff centre, including recreational facilities;
- packing unit, with ice making machine and cold stores;
- net washing
- fish ensilage unit
- storage for boats and facilities for emergency repair.

5.3.8 These activities require a substantial area of land. Only one farm is deemed to have proper constructed facilities, whereas the other farms operate from historic buildings or shabby mobile structures. Initially, there was an investigation for the possibility to house all package facilities within one structure, however none of the operators were willing to take this on board, leaving the issue still pending. A potential site was identified in Marsaxlokk for two farms, however the Yachting Subject Study had identified this same site for use as a yacht hard standing facility.

Land based farms

5.3.9 Land-based aquaculture consists of a small-scale on-growing fish farm and a hatchery unit for seabream. Such land-based (freshwater and marine) farms are not considered feasible for Malta mainly because of the costs of running the farm, lack of land and freshwater resources.

Hatcheries

5.3.10 A hatchery unit is run by the Malta Centre for Fisheries Science on a commercial scale and produces about 1 million fry annually for local farms. Another hatchery, located on Gozo, was given development permission but has never materialised. Thus the local farms are highly dependent on foreign supplies where 8 million fingerlings are annually imported. It is the local operators' view that the local supply of fingerlings would guarantee more control over the product.

Species Diversification

5.3.11 Rearing species other than sea bass and sea bream is seen as an opportunity to compete in both the Mediterranean market as well as outside

the region. Investigations regarding shrimp culture indicated that demand for land and sea area required for crustacean culture cannot be met on the Maltese Islands. Similarly, it was not seen viable to cultivate molluscs, as local waters are not sufficiently enriched with nutrients. Recently, however, there has been a growing interest in the culture of the Mediterranean blue fin tuna, with interest shown from foreign investors.

5.3.12 Following the experience of the tuna farm established in May 2000, together with a continuous decline in exports the majority of the existing farms are opting for diversification into tuna penning. The Bluefin tuna to stock the cages are caught in international waters by purse seining during their migration period within the Mediterranean and purchased by the farm operators. The fish are reared on the farm for a period of nine months before harvest.

5.3.13 The main issues concerning diversification and expansion relates to limited space. The bathymetry around the islands is a factor which influences decisions on farm location. Due to the NW tilt of the island, the southern coast is bound by deep waters very close to the shoreline. The location of farms there would entail an element of cost in terms of adequate equipment and its subsequent maintenance. Other uses and environmental concerns have to be taken into consideration when assessing possible farm location. Maps 6 and 7 give an indication of the types and level of coastal activities that are located close to the shoreline.

Environmental Considerations

5.3.14 The local experience over the last ten years has been associated with the following environmental issues arising from the local farms. The location of some of the cages placed before 1992 is in sheltered waters merely exceeding 12m in depth. There has been concern about the amount of waste generated from feed and the fish, which affects the benthic habitats as well as water quality. The use of pharmaceuticals in such shallow areas may also lead to substance accumulation that would affect the local biodiversity.

5.3.15 The development control process has attempted to reduce this impact by controlling the location of subsequent farm cages in waters beyond 35m, following a positive EIA. However the fish farm search areas as identified within the Fish Farming Policy Guidance 1994, are not satisfactory from an environmental as well as socio-economic perspective. For safety of navigation, operators are obliged to put lights around the cages. This obligatory requirement poses a problem when locating cages in the proximity of seabird breeding areas. This limits the available coastal areas suitable for

aquaculture since most of the seabird colonies are located along the cliffs of both Malta and Gozo.

5.3.16 Conditions given in the development permit require a monitoring programme for water quality and benthic communities at the cage sites. It should be noted that although the MCFS carried out water quality monitoring regularly, results have only been forwarded to the Planning Authority in mid-2000. Furthermore, monitoring surveys of the benthic communities at all the cage sites have not been carried out as required and it is therefore not possible to assess the environmental impact of the cages on the marine environment at this stage.

5.3.17 Some of the fish farms are located within candidate sites for marine conservation areas. The development permit was given on condition that an agreement that these farms would contribute towards the management of MCAs. There has been no progress to date on the legal agreement with the PA for the contribution towards the establishment of a marine conservation area. This situation coupled with the lack of monitoring data has created concern about the status of the marine habitat.

5.3.18 Aquaculture is perceived to conflict with quite a number of other legitimate coastal uses, in terms of demands for coastal resources including water quality, visual/scenic value and space. Bunkering and tourism are two sectors that conflict with aquaculture, for safety of navigation reasons and amenity value, respectively. Two aquaculture projects have utilised historical sites and buildings for their operations with consequent damage to the structures and their environs. Although attempts have been made to search for alternative locations, the operators have not moved, on the basis that the location offers security over the farm.

Economic viability

5.3.19 The product from the local sea bass and seabream farms is in competition with other Mediterranean farms such as those in Greece. These countries have a large coastline and can afford to locate more farms. Consequently the production rate is higher and this has led to a reduction in prices for sea bream. Additionally, as Malta is a non-EU country and exports fish to Italy, the produce has been subject to 15% tariff. It is the belief of the Malta Aquaculture Producers' Association (MAPA) and the MCFS that the existing sea bass and sea bream farms are operating at a loss. Originally the solution was perceived to be an increase in production capacity to 1000 tonnes annually for each marine production unit, however the current trend is to opt for diversification into tuna pens, where the market would be in Asia, namely Japan. Discussions held this year with the EU have been successful towards

the removal of the 15% tariff in the near future, which may influence the direction of the industry.

Implications to the Coastal Strategy

Whilst it is not the remit of the Planning Authority to decide the future of the industry, it is the role of the PA to direct where aquaculture production units and associated facilities are to be undertaken. It should be noted that the ecological and geomorphologic characteristics and the presence of other users within such a limited coastline make it practically difficult for this industry to expand unless the cage units are taken further offshore within sites primarily zoned for this type of activity.

5.4 Fisheries

5.4.1 The fisheries industry in Malta is considered mainly to be artisanal, since only a small number of fishing vessels operate on the high seas. The total number of registered fishermen is 1864 (August, 1998). The number of full-time fishermen (that is, fishermen whose main income comes from fisheries) is 374 and the number of vessels they own is 302; they are considered the sole contributors to the industry. The fishing fleet is made up of 1792 vessels. Only 47 vessels are considered to be industrial (more than 15 meters in length), the rest of the vessels are considered multi-purpose since they undertake all types of fishing on a small scale and in the territorial waters only.

5.4.2 The main fishing ports are Marsaxlokk Malta and Mgarr in Gozo, while a number of vessels are moored within the main bays around the Maltese Islands. The fish market is currently located in Valletta and discussions are underway for possible relocation and inclusion of fish processing and storage units. The fish market should be located in an area that is approachable by most fishermen and possibly within an area that is already catering for such vessels, such that there is minimum conflict with other coastal uses.

5.4.3 No major changes in the industry are expected in the next ten years as the Fisheries Department do not envisage any significant changes in fishermen number, and fishing fleet. Regulations to control the industry are to be introduced with the approval of the draft Fisheries Act, which aims to regulate fishing as well as aquaculture.

5.4.4 Consultation with the Fisheries Department has identified the following major planning concerns:

- Protection of fishing harbours including protection of shoreline structures such as slipways and quays for use by the fishermen, and protection of mooring points;
- Consideration to fisheries requirements in any proposed developments in St. Paul's Bay (the most important fishing port in the North of Malta);
- Provision for facilities for hard standing and maintenance for boats exceeding 10 meters in length in Marsaxlokk
- Upgrading of the fish market in Valletta;
- a need for cold stores and ice making machine in Gozo and Marsaxlokk.

Implications to the Coastal Strategy

The main strategic issues relating to fisheries are the relocation of the fish market to a suitable site and the protection of coastal areas used by the registered fishing fleet from other types of development.

5.5 Shipping

5.5.1 The shipping industry in the Maltese Islands revolved around the Grand Harbour for several centuries. However the technological revolution in maritime transport between the 1950s and 1960s led to the development of large industrial ports having extensive hinterland areas required for storage of petroleum products and the newly introduced standard cargo containers. The bastions within Grand Harbour limit port expansion for cargo storage thus preventing it from competing with the new emergent industrial ports such as Genoa and Barcelona. Although Grand Harbour continued to offer its shipbuilding and repair services together with its grain storage facilities, these industries also began to decline. Consequently the waterfront grew into a state of dereliction over the years as no economic investment was being channelled there.

5.5.2 The Grand Harbour has a number of wharves that were developed to cater for a variety of services. The main activities are associated with cruise vessels, general cargo handling, ship repair and the provision of storage. Other services include the grain silo terminal, tank cleaning facilities, mooring facilities for super yachts and ferry services. Efforts to regenerate the Grand Harbour include a set of projects that have been recently put forward to enhance already existing services and introduce new ones. These projects include the expansion of the present Car Transhipment Stacking Area at Korradino Heights, the Cottonera Waterfront project aiming to develop an international marina and the development of the Cruise Liner Terminal, targeted to capture another tourism sector.

The Malta Freeport

5.5.3 In an attempt to reap the benefits from the cargo-handling industry and to exploit Malta's geographical position within the Mediterranean a new port with sufficient storage area to allow for extensive cargo handling was developed at Marsaxlokk Bay. An extensive area of land was developed to provide storage space and a considerable sea area was reclaimed for the construction of quays. The port is now fully functional with the finalisation of Terminal Two and no projects are planned for the next 10 years.

5.5.4 The facilities offered to the international market by the ***Malta Freeport*** are for cargo handling and oil storage as indicated in Box 3 below. In addition land supplied with basic infrastructure services will be leased to the Freeport's clients for development in accordance with their own requirements.

5.5.5 The development of the Malta Freeport proved to be a success in shipping terms however the damage created from its development is considerable. The enormous quantities of dredged material dumped in Marsaxlokk Bay and subsequent construction operations have led to a severe deterioration of the benthic habitat as well as alteration of the hydrodynamics within the bay. Additionally, the presence of such a conglomeration of industrial activities is in conflict with other traditional uses. Marsaxlokk Bay, particularly Birzebbuga, was a popular summer resort for residents from the south of Malta. The intensification of port related activities have now undermined the traditional aesthetic value of the area.

TABLE 5: FACILITIES AT THE MALTA FREEPORT

Container terminal	Terminal one: annual handling capacity of 650,000 Tonne Equivalent Units (TEUs) with 5,574 container slots. Terminal two: is expected to have a capacity to over one million TEUs over an area of 20 hectares.
Oil Terminal Oiltanking Malta Ltd.	This terminal provides storage and facilities for blending of oil products. Other services associated with petroleum products include butanising, leading and injection of additives. These facilities are in accordance with the latest safety and operational standards. The terminal has a total capacity of 360,000m^3 and is expected to grow due to increased global demand for free zone transhipment of oil-based products.
Industrial Storage Facilities - Freeport Industrial Storage Malta Ltd.	The storage capacity consists of 10 warehousing units of 2,400m^2 each, with 1,000m^2 covered space. Additional 150,000 m^2 adjacent to the port were planned for this purpose as well.

Inter-island Traffic

5.5.6 Inter-island traffic is focused at Cirkewwa Harbour in Malta and Mgarr Harbour in Gozo. Facilities within Marsamexett Harbour at Pieta' have been utilised in severe weather conditions when the Cirkewwa Terminal was not operational. This Terminal is currently being enlarged to cater as a passenger terminal and provide additional berthing space, whilst Pieta is mainly being developed to cater for inter-island cargo handling. Continuous monitoring of construction works at Cirkewwa Terminal is currently being undertaken jointly between the PA and MMA.

5.5.7 Over the years there have been indications to expand the port facilities at Mgarr in Gozo. Unlike Malta, there are no natural harbours in Gozo and any potential hinterland extensions (required for storage facilities) to Mgarr would probably incur extensive engineering works. The current proposals to upgrade the Mgarr terminal aims to re-organise and re-route traffic and passengers whilst increasing berthing facilities for additional ferry services.

Bunkering

5.5.8 The increased shipping activity generated also by the presence of the Malta Freeport has increased the need for associated facilities such as bunkering. Licensed operators perform bunkering operations either within harbours to vessels secured alongside a berth or outside harbours in the allocated areas listed below. The volume of fuel oil re-exported through bunkering operations has increased from 83,661 tonnes in 1995 to 444,649 tonnes in 2001. These re-exports amounted to a total of more than Lm28.7 million in 2001, a ten-fold increase from 1995 (National Statistics Office, 2001). The privatisation of the sector is envisaged to maintain this performance.

5.5.9 Bunkering areas take up a considerable amount of sea surface, prohibiting any other type of use from utilising that space. This creates conflicts between uses, as is currently the case with the aquaculture industry. In addition the bunkering sites were primarily selected for the safety they offer to vessels during operations. This suggests that very little consideration was given to environmental implications as well as impacts on other uses and activities at sea. In fact all the Bunkering Areas outside Ports, with the exception of Hurd Bank, are close to the shore as identified in Map 7. They are within or adjacent to candidate Marine Conservation Areas as identified within the current Structure Plan. This suggests that there is a higher potential threat of damage from pollution. A National Contingency Plan to control pollution has been set up identifying the responsible agencies and level of action required, however it is still awaiting endorsement within National Legislation.

Bunkering operators are currently required to have a contingency plan as well to safeguard against any accidental spillage during operations.

TABLE 6: OFFICIAL BUNKERING SITES IN THE MALTESE ISLANDS

Bunkering Sites outside Ports	**Bunkering Sites within Ports**
North of Qawra Point	*Grand Harbour*:
Off Zonqor Point	Laboratory Wharf
Hurd Bank	Deep Water Quay
Off Delimara Point	Flagstone Wharf
Off Anchor Bay	*Marsaxlokk*
	Delimara Power Station (Loading/Discharging Fuel EneMalta)
	31st March Installation (Loading/Discharging Fuel EneMalta)
	San Lucian Oil Terminal
	Oil Tanking (Freeport Terminal) whilst vessels are berthed

Source: Malta Maritime Authority

Environmental Measures

5.5.10 Port activities generate environmental impacts if not adequately regulated. Considering the numerous activities taking place within the Grand Harbour, ranging from tank cleaning to moorings of cruise liners, super yachts and ferries, to dredging, there are risks associated with the heavy traffic. With the revival of Malta's EU membership application, the Malta Maritime Authority (MMA) has become an observer member of the European Sea Ports Organisation (ESPO) the monitoring and lobbying group for the Union member ports with the Commission. ESPO's Environmental Code of Practice, prepared in consultation with the Commission's Transport Directorate recommends each port to:

- Comply with the letter and spirit of environmental legislation and abide by internationally agreed conventions, directives and resolutions intended to protect the environment;
- Initiate steps to consider the potential for the improvement of environmental standards beyond those currently legislatively required;

- Nominate representatives from senior management positions to take responsibility for co-ordination policy and action on the environment within the ports sphere of competence;
- Establish a management system, which encourages environmental protection as an integral part of business and management practice.

5.5.11 In an attempt to comply with the provisions of the ESPO Code of Practice the MMA has adopted a Program for a Marine Environment Risk Management System (MERMS) with assistance from the EU's LIFE funding scheme. The objective of MERMS is the provision of a tool with which the MMA could continually monitor and audit the progress of industries falling within its areas of responsibility. It includes a number of measures:

- a MERMS manual providing operational measures, procedures and updating methodology for the system;
- a Register of effects which provides information on the various marine environmental hazards potential to the multifarious activities conducted within the areas under the MMA's legislative remit, advising upon prevention and amelioration measures provided by both site operators and the MMA;
- the Monitoring and Auditing personnel and systems which must be in place to ensure the system is effective;
- the Legislation pertinent to the system.
- A GIS that provides accurate and timely information and location of all emergency fire-fighting, marine pollution control and safety equipment and personnel resources available on the islands.

5.5.12 Risks of collision and pollution generated from increased traffic cargo vessels are a reality. It is therefore essential that port activities within Marsaxlokk Bay have a similar management program as that operating within the Grand Harbour.

Dumping at Sea

5.5.13 Other environmental concerns associated with ports and harbours are associated with maintenance works related to dredging. Dredging maintains adequate depths within harbours. Concerns are created with respect to the fate of the dredged material, which is often anoxic and usually contaminated with metals and persistent oils. If dumped material remains in piles on the seabed, it may remain anoxic and contaminants would be biologically unavailable, however if the spoil is dispersed by currents and oxygenated,

metals may change their chemical species, cease to be absorbed on to silt particles, and then enter food chains (Clark 1997)[1].

5.5.14 The official spoil ground area currently used for the dumping of waste material is located 2.5nm NE of Valletta Breakwater and is regulated by the Malta Maritime Authority. This site has also been used for the disposal of inert waste from major projects. The criteria used for identifying the spoil ground was mainly related to safety of navigation not environmental reasons.

5.5.15 Locating a spoil ground close to the shore without any consideration of the physical properties of the spoil site may lead to inshore transportation of material. The impact emanating from disposal of waste at sea depends on the quantity of material and the frequency of dumping operations. Any strategic decisions taken on the subject has to acknowledge that a number of economic and recreational activities in Malta depend on the natural and socio-cultural value of the coastal environment. The highest income earning sector, tourism, is also dependent on the natural resources of the coast, for a number of tourism products as mentioned in section 5.1 above.

Coastal Engineering

5.5.16 Other environmental considerations related to port development which need to be addressed are associated with engineering works. Construction works associated with changing the configuration of the coastline (such as the development of quays, sea walls and breakwaters) have an effect on the hydrodynamics of that stretch of coast and potential impacts on the adjacent areas as well. These impacts are not limited to direct environmental ones but indirectly would affect coastal uses and activities as well. For example the introduction of seawalls along sandy beaches leads to sand erosion and alteration of wave climate that may make the bay less safe for bathers. Adjacent works to desalination plants would have impacts on the quality of the water that is being pumped, leading to potential damage to the plant itself, thus affecting potable water supply.

[1] Clark, B et al (1997) Marine Pollution. Clarendon Press, Oxford

Photo 8: Coastal engineering works have implications on coastal processes such as wave action and sediment transport, as well as other coastal uses.

Marinas

5.5.17 The Planning Authority and Malta Maritime Authority published a Yachting Subject Study in 1997, which looked into the demands of the industry and investigated the yachting development potential of the Islands. The Study recognises that the Malta is in a strategic location to reap the benefits from the stop over traffic cruising the Mediterranean. Language, the social environment and the availability of good quality chandlery and yard services in Malta are perceived as advantageous qualities to promote Malta on the international yachting scene. However capacity constraints and the relatively short coastline are seen as weakening points. Domestic yacht owners took up the available capacity within a few months of the opening of Msida marina and the local demand is not decreasing.

5.5.18 The push in favour of marina development is linked with the economic contribution such an industry provides. A marina typically accommodates around 400 boats at any one time and the more competitive marinas offer visitor berths, refuelling points, facilities for temporary repairs, shopping and restaurant facilities, a club house and various other amenities for both the visiting and the locally based yachtsmen. With the development of the large scale marina recently developed at Msida Creek, together with the additional berthing spaces currently available in the Maltese Islands, it was estimated that in 1995 the yachting industry generated Lm4.3 million in the Maltese economy. About 40% of the total contribution is estimated to be from international yachtsmen. The Subject Study predicted that the industry would generate a total of more than Lm10 million by the year 2007.

5.5.19 Marinas require considerable land areas for ancillary facilities especially with the recent concept of the marina village where residential units and offices are being created to make the marina itself viable. The number of yachts cruising around the Maltese Islands will have significant impacts not only in terms of traffic but also on the marine environment. Anchors from yachts are destroying *Posidonia oceanica* beds within bays. A system of organised moorings located at strategic localities around the Maltese islands, regulated and managed by the MMA, could be a possible solution to minimise such impacts.

5.5.20 The Subject Study concluded that a further 900 marina berths are required to meet a sustainable level of yachting demand based on a likely range of demand levels over a 10 year period. In view of the announced Marina developments (Hilton, Excelsior and Manoel Island) this figure was adjusted to 600 marina berths over and above these developments. The objectives of the Manoel Island/Tigne Point Development Project include the development of Manoel Island as part of Marsamxett Harbour for an international yachting centre and related tourist centre. The project also proposes that berthing facilities for local crafts particularly small fishing and pleasure craft should be provided.

5.5.21 The site selection exercise for possible marina development conducted in the Subject Study was based on a number of criteria that included technical, social, economic as well environmental considerations. The highest ranking site was *Dockyard Creek* where it was estimated that 600 berths could be accommodated comfortably and hard standing could be provided for approximately 75 boats. *Xemxija*, on the northern side of the island is seen as more appropriate to develop into a smaller facility of around 300 berths primarily for domestic demand since the site offers no specific relative strengths. The Subject Study identifies this site as a safety valve to spread the yachting activity and enable the focus of international yachting activity to remain around Valletta and the main harbours of Malta.

5.5.22 The Cottonera Waterfront Development envisaged to put Malta in the international yachting map by providing adequate berthing space for boat the international and local yachtsmen is based on the findings of the Subject Study. It is not clear however whether all the local demand will be met, particularly for Gozitan boat owners. A revised approach should be adopted to consider berthing provisions for local demand within existing and planned marinas since the Maltese coastline is limited.

TABLE 7: MARINA BERTHS IN THE MALTESE ISLANDS (1994)

Lazaretto Quay	57
Ta' Xbiex	53 (superyachts berths)
Msida/Whitehall Marina	640
Whitehall Quay	21 (10 used in summer only)
Pieta	60
Sliema	60 (all used in Summer only)
Vittoriosa	8 (superyachts)
Mgarr Marina, Gozo	157
Maximum berth capacity	***1,056***

Source: Yachting Subject Study 1997

Yachting Development in Gozo

5.5.23 The extent of the sheltered sea area and the hard standing area that can be attained by breakwater extension at Mgarr Harbour are considered to be very small compared to the huge investment required for such a major project. According to the MMA Mgarr Harbour should be primarily considered as a ferry port since there are approximately 20,000 yearly ferry operations. The addition of yachts would create problems for navigation.

5.5.24 Another potential site is Marsalforn Bay, which is the only deep port in Gozo and is being proposed as a yacht marina for 400 berths. This bay is a very popular bathing area and harbours fishing vessels along its eastern shoreline and displacement of such uses is an issue.

Hard Standing Facilities

5.5.25 To complement and support these additional marina berths there is an estimated target requirement for approximately 450 hard standing spaces, which may be revised to over 500 spaces subject to displacement of existing facilities during the early stages of the Manoel Island development. The short-listed sites for hard-standing facilities are *French Creek* (Grand Harbour) with a potential site at the mouth of the Creek offering space for about 130 yachts for hard storage, and *Malta Hydrofoil,* Marsaxlokk Bay (refer to section 5.3) with a potential for a comprehensive yacht servicing and storage centre, having a capacity for 250 spaces, which would meet local and international demand.

5.5.26 The Subject Study recognises that the development of any of these sites is likely to be financially viable because of low capital investment. The other sites investigated by the Subject Study were ranked as shown in Box 5. The possible sites already cater for limited berths and are within developed harbours with the exception of Marfa Bay, which is on the northernmost shore of mainland Malta. This bay is used by the Comino ferry service in bad weather conditions and provides a permanent berth for the feeding vessel operating for the fish farm at Comino. With the exception of Cirkewwa Harbour, which as mentioned above is currently being extended to cater for more inter-island traffic, the sites with low potential for such development are all popular bathing areas having a few recreational boating mooring points. The development of such sites would greatly reduce the availability of much needed bathing space within the islands. Additionally, Mistra Bay and Mellieha Bay have aquaculture operations that would not benefit from the location of a marina, as water quality would be affected. Sites looked into for Hard Standing facilities would entail the displacement of other uses or else require significant investment to develop.

Implications to the Coastal Strategy

Maritime activities are still expected to continue within both the Grand Harbour and Malta Freeport. Therefore the spatial requirements for these activities need to be safeguarded but not at the expense of the coastal characteristics both from a natural as well as cultural perspective. Other legitimate uses that take place within both harbour areas need to be safeguarded as well. Similar considerations need to be taken with respect to the yachting industry and the development/maintenance of Cirkewwa and Mgarr harbours, so as not to displace activities such as diving and fishing. The selection of bunkering sites as well as disposal sites offshore need to be considered within a much broader context than solely safety to navigation, in order to safeguard the natural resources as well as existing and potential coastal and marine uses.

TABLE 8 POTENTIAL FOR DEVELOPMENT OF MARINA AND HARD STANDING FACILITIES

Highest Ranking: potential for development	***Possible sites: fall short of requirements for international standard; if viable may be developed as secondary facilities***	***Unlikely sites: locations where the cost of development would probably be unacceptable due to technical, environmental or social problems.***
Kalkara and Dockyard Creek: international standard Xemxija: domestic market	Outer Mgarr Harbour, Gozo Marfa Bay Sliema Creek, Pieta Creek St George's Bay, Marsaxlokk	Cirkewwa Harbour Marsascala Bay Ramla Bay, Malta St. George's Bay, St Julians White Rocks Mistra Bay Mellieha Bay St. Thomas Bay Outer Salini Bay
Hard-standing French Creek	***Hard-standing*** Rinella Creek	***Hard-standing*** Wied il-Buni Qala Quarry, Gozo

Source: Yachting Subject Study 1997

5.6 Mineral Extraction

Location of Existing Quarries

5.6.1 Mineral extraction in the Maltese Islands concentrates on the exploitation of coralline limestone (hardstone) for aggregate material and globigerina limestone (softstone) for building blocks. To date, quarry location in the Maltese Islands has been determined by geological composition and exploitation influenced by the quality of material present. Consideration for ecological and hydrological resources as well as landscape, have only recently been taken into account when determining mineral extraction operations. Impacts of quarrying on other uses were similarly ignored and development continued to expand in areas that are rich in mineral resources thus giving rise to conflicts.

5.6.2 According to information available up to 1999, there is a total of nineteen (19) quarries operating within the coastal zone boundary as indicated in Map 6. There are ten (10) hardstone quarries, seven (7) of which operating on mainland Malta exploiting the Coralline outcrops along the south and Upper Coralline along the north of the Island. Nine (9) softstone quarries operate on Gozo concentrated around Dwejra. Hardstone quarries exploit the Lower Coralline Limestone along the eastern coast and upper coralline limestone at Nadur and Xaghra.

5.6.3 Hardstone quarries have taken up a land area of 334,412m^2 whereas nine softstone quarries have taken up an area of 188,802m^2 along the coast. Extraction of hardstone aggregate consumes almost twice the amount of land taken up by sofstone operations. The total surface area taken up by quarries is no less than 523,214m^2, taking up approximately 0.9% of the coastline

Impacts of quarry operations on natural resources

5.6.4 Impacts generated by quarry operations affect both the resources as well as their uses. The main operations associated with extraction operations depend on the nature of the mineral.

For Hardstone, these include:

- site preparation including soil stripping the removal of overburden and establishing the site access and infrastructure.
- blasting to remove rock from the quarry face (typical blast would remove 200m3)
- secondary breaking as required using hydraulic hammers
- loading material onto dump trucks with wheeled shovels (gafef)
- transporting material to crushing plant via hoppers
- crushing of material through primary and secondary crushers
- stockpiling
- where there are concrete batching or asphalt coating plants transporting the material to those plants
- transporting the aggregate off-site lorries with a typical load of 20 tonnes

Whereas for Softstone, the main operations include:

- site preparation including removal of soil and overburden
- cutting the stone using vertical and horizontal saws
- the stone is cut according to end-use which may be building blocks, steps, slabs or lintels
- curing or facing the stone
- loading the stone by hand into conveyors which in turn transport the stone onto lorries
- transporting the stone off the site

5.6.5 The permanent damage to the existing ecological characteristics and landscape value is unavoidable. Site preparation causes the most drastic ecological impact with the immediate removal of surface cover. This issue is not adequately being tackled, particularly in Gozo where only limited parts of the coastline have been protected. The quarries present along Malta's coastline are bordering Areas of Ecological Importance scheduled as Level 2 and 3 where illegal extensions of these quarries are threatening the coastal cliff habitat.

Photo 9: Coastal quarries have major impacts on natural resources and other coastal uses. Their rehabilitation has the potential to regenerate the coastal landscape and improve areas for informal recreation.

5.6.6 Most of the material extracted from hardstone quarries is used. Inadequate management of soft stone operations however leads to significant quantities of waste material. This unwanted product together with the material removed in the site preparation stages is often tipped in nearby areas attracting more people, other than quarry operators, to dump material at these sites. Such activity is illegal but through lack of adequate enforcement has led to several illegal waste tips to develop in the vicinity of quarry operations, to the detriment of the natural environment, landscape and the amenity value of the area. Moreover, since the only landfills on the Maltese islands have a coastal location and as inert waste constitutes around 80% of all waste generated, it can be safely argued that the mineral production industry has a cumulative negative effect on the coast

5.6.7 Blasting operations create fissures and other geological instability to sensitive features in the proximity of the site. Hard stone quarries have

breached the cliff faces in most cases, destroying even geological features such as caves.

Impacts of quarry operations on other uses

5.6.8 The compatibility of mineral extraction with other uses is negligible. Conflicts with other uses emerge significantly along the coastline. The Maltese coastline, limited in its spatial extent, is under pressure from a widespread variety of uses each demanding land area; the presence of a quarry excludes most of these uses thus increasing more pressure on the remaining coastal stretch. Blasting operations for aggregate extraction may create problems to structures located within the vicinity of the site, particularly those having a cultural value and being free standing. Operations at the quarries at il-Maghlaq and Qasam il-Kbir were halted because of their potential threat to the Neolithic temples at Mnajdra, a designated World Heritage Site. In addition these operations generate noise, dust and traffic throughout the entire extraction process. Once in operation there is generation of dust from stockpiles associated with hard stone quarries and this affects the major land use in the vicinity of the present coastal quarries, namely agriculture. Dust, together with the associated traffic generated by quarry operations, also affect the amenity value of adjacent areas thus influencing any recreational or touristic activities. Accessibility to areas adjacent to operational quarries is currently not restricted.

Restoration

5.6.9 Current quarry operations, due to the surface extraction methodology applied, create scars on the surrounding landscape and degrade potential or designated Areas of High Landscape Value. The lack of restoration plans thus leaves scars within the landscape. Within the coastal zone, this impact is even more significant considering that coastal walks are being promoted by the tourism industry and are similarly enjoyed by locals. The amenity value arising from the coastal landscape is threatened by quarry operations. To a certain extent, adequate restoration sensitive to the landscape characteristics around the quarry site could mitigate impacts.

5.6.10 Site restoration is not a common practice locally even though there exists a great potential to gain new land area from restoration. Although most of the older soft stone quarries have been reclaimed for agricultural purpose, proper site restoration schemes have never been operated. Such schemes are only included in the recently approved projects, such as in Qala, Gozo. Landfilling is perceived as the main option for restoration schemes, however other uses may be possible. Within the context of the coastal zone, possible

alternative uses can be identified depending on the present use and characteristics of adjacent areas.

Mineral Reserves

5.6.11 The Mineral Resources Assessment survey carried out by the Planning Authority looked at mineral resources outside areas already under operation. According to the Mineral Resource Assessment, potential sites have been classified on two levels. For **Level I** sites there is a good degree of geological confidence and an apparent lack of conflict with other land uses. These are considered priority areas for protection from other types of development and may be regarded as having strategic importance. **Level II** sites have a lesser degree of confidence but further investigations are required. Land over such areas should also be protected from development.

5.6.12 Sites identified within the identified coastal zone include 6 sites in Malta and 7 sites in Gozo totalling to an approximate in-situ mass of 447million tonnes of hardstone and 30 million tonnes of softstone. These are approximate values, however one needs to clarify that all target areas for hardstone are located within the coastal zone and extend beyond into the hinterland. The sites in Malta are within or in the immediate proximity of scheduled sites. In Gozo, none of the sites are within scheduled areas due to the absence of a similar scheduling exercise as carried out in Malta.

5.6.13 The Minerals Subject Plan Consultation Draft (2000) states that the demand from the main resource users will determine the level of exploitation. The main sectors within the construction industry to influence resource use significantly are housing and roads. From demographic data, the projected population increase will be coupled by an increasing demand for a steady supply of additional housing. Similarly it is envisaged that most of the roads in Malta will be subject to repair during the plan period. The same Draft Document estimates a demand for 36million tonnes of hardstone and 16million tonnes of softstone for the plan period 2000 - 2010. It also identifies that a large number of hard stone quarry sites are reaching exhaustion.

5.6.14 On the other hand the Structure Plan Monitoring Reports state that marketing of softstone products was facing strong competition from concrete and steel substitutes in the construction industry thus leading to a decline in the use of soft stone in the building industry since 1991. Concrete products are replacing the use of soft stone to such an extent that the continued operation of existing soft stone quarries is in question. The importation of concrete products is not deemed feasible since it would entail a production cost from imported material which is twice or three times higher than that produced with local hard stone material. Within the context of falling demands the

Minerals Board was not considering applications for new softstone works favourable.

5.6.15 The Draft Minerals Subject Plan identifies a strategy for the next ten years whereby no new quarries are to be granted until the first review of the Subject Plan. Extensions are favourable if all criteria are satisfied, namely,

- Protection to scheduled sites;
- Previous operational conduct;
- No significant environmental impact;
- Groundwater protection;
- A comprehensive and progressive restoration scheme is in place.

5.6.16 The strategy places an emphasis on extensions. With the present trend towards an increased demand in hard stone production, any extensions have to be reviewed on a national scale and depend on the findings of the Draft Minerals Subject Plan. A priority list including both coastal and hinterland quarries should be established on the basis of established criteria.

5.6.17 The Draft Minerals Subject Plan already identifies that operations with direct or indirect impact on Level 1 AEI SSI, Class A/B AAI, Grade 1 and 2 Historic buildings and UCA **will not be permitted unless** the need for the mineral outweighs these impacts. Furthermore, the Draft Subject Plan calls for a prohibition of mineral development in areas prone to coastal erosion.

Salt pans

5.6.18 Mineral extraction includes salt production. A number of saltpans were sculptured on most of the low-lying rocky shoreline with complex systems found along the northern coastline in Gozo and M'Scala/Delimara areas in Malta, as shown in Map 3. Table 4 lists the saltpans identified in the 1989 coastal zone survey, the only source of available information. Data availability as to their current status in terms of physical conditions and use is very limited. The identified and plotted saltpans in the 1989 survey occupy a total area of 340,595m^2 incorporating 0.55% of the coastal zone.

5.6.19 The cultural value of saltpans has been mostly ignored since only a few of them have been afforded protection under the Development Planning Act. There are no Structure Plan policies specifically for saltpans.

TABLE 9: SALT PAN AREAS IDENTIFIED BY THE COASTAL ZONE SURVEY (1989).

Survey Sheet	Location
4480	Mgiebah (tal-Blata)
4878	Salina
5078	il-Ghoqot l/o Qalet Marku
5077	Bahar ic-Caghaq
5871	Blata l-Bajda l/o San Leonardo
6069	Zonqor point l/o M'Scala
6068	l-Abjad tal-Gzira l/o M'scala
6066	Xrobb l-Ghagin l/o Delimara
6065	il-Ponta tat-Tumbrell; Ras il-Qali
5864; 6064	Ponta tal-Gidien; il-Ponta ta' Delimara; Taqtiegha ta' Delimara
3889	Ta' Klement l/o Dahlet Qorrot
3292part of 3293	Xwieni Bay
3093	Ghar ir-Rih l/o Reqqa point
2690	Dwejra
3486	Ras il-Hobz

Implications to the Coastal Strategy

The main issues relating to mineral extraction are related to the different stages of quarry development and abandonment. The selection of sites for future quarry operation has to consider the impacts associated with the natural environment. Implementation programs for restoration schemes for both existing and future quarries need to be developed in line with the existing characteristic of the adjacent coastal areas, in terms of topography, resources and uses with the objective of rehabilitating these sites for multiple uses. Areas known to have mineral reserves should as far as possible be protected from certain types of development. With respect to salt production the main concern is related to lack of adequate protection and the identification of suitable alternative use.

5.7 Infrastructure

5.7.1 Most infrastructure needs demand a coastal location and for a small island state such as Malta, these requirements have to be met by a relatively small coastline that is under pressure from other uses. Maps 4 and 6 illustrate the location of the major infrastructure developments currently present along the coast in the Maltese Islands, which include:

- Thermal power stations
- Desalination plants
- Sewage outfalls

- Power cables
- Pipelines (oil, gas, water)
- Landfills
- Roads

Thermal Power Stations

5.7.2 Currently two power stations generate the electrical needs for the Maltese Islands, one located at Marsa (within the Grand Harbour) and the other at Delimara (within Marsaxlokk Harbour). Their location within harbours is advantageous on two fronts: fuel transportation costs are reduced and there is provision of coolant waters. The Delimara station was constructed in the late 1980s initially to meet the growing national needs and replace the existing one at Marsa. The Delimara plant is in its third phase of development and is targeted to be ready by 2004. It is envisaged that by that time only two-thirds of the Marsa Power Station will be in operation. With the current trends of increasing energy consumption in summer, there are no plans to shut down the Marsa plant. The proposed plant is to rehabilitate Marsa power station in view of the commitments related to EU accession and rising public pressure, concerning atmospheric pollution. This suggests that local energy needs would be adequately supplied by the existing plants, implying that no further spatial requirements are necessary. There are plans to build two jetties at Delimara Power Station to provide space for two tankers in order to facilitate fuel supply to the plant. This would entail further alterations to the coastal configuration of the bay and increase marine vessel traffic to Delimara peninsula, intensifying an industrial port landscape on Marsaxlokk, which is being marketed as a quaint Mediterranean fishing port.

5.7.3 Both power stations discharge untreated coolant waters directly into the marine environment. It is estimated that approximately 20 million m^3 of cooling water, 120^{o}C above the ambient sea temperature, are discharged for 1000 MW of electricity generated by oil or coal-fired power stations (Clark 1997). The area affected is limited to the plume of hot water and its immediate surroundings. The prevailing currents in the area also assist in dispersal of the plume thus allowing for the discharge to be cooled. The maximum demand for electricity in the Maltese Islands is in winter but is gradually picking up in the summer time.

5.7.4 Added heat is dissipated more slowly in warm waters, and the increased temperature may exceed the thermal threshold for many organisms. The plume itself scours the seabed to the extent that it may change the nature of a soft substratum and subsequently the benthic habitat. Additionally coolant water is usually treated with chlorine as an antifoulant for the heat exchange system and this is discharged into the sea together with metals that may

have leached form the cooling system. This puts forward another issue since Delimara is a candidate Marine Conservation Area.

Desalination Plants

5.7.5 Desalination plants are the solution to a fresh water shortage that exists on the island due to climatic factors. Such plants require electricity and are thus dependent on the efficient running of the power stations. Their location on the coast is related to the fact that such plants take up sea water, which has to be of a very good quality, and purify it to produce freshwater. Thus proximity to the sea, particularly on low-lying rocky shores is ideal in terms of costs (for pumping water).

5.7.6 There are four plants on Malta supplying water for public consumption. Significant maintenance work carried out by the Water Services Corporation has eliminated a substantial amount of water losses thus making the current plants sufficient to meet local demands. Additionally, there are a number of hotels that have a desalination plant, which provides water for the running of the establishment. There exists a potential for a cumulative impact on the benthic habitats and water quality in bays should all hotels opt for such infrastructure. There are also very small desalination plants run by Enemalta to produce water for the boiler plant in power stations. These plants discharge hypersaline water, which scours the benthic environment within the vicinity of the discharge point.

5.7.7 Concern exists as to whether the current infrastructure is sufficient should large-scale projects requiring huge volumes of water, such as golf courses are established. This could be avoided with the construction of the projected sewage treatment plants, which are envisaging the production of large volumes of second-class water from sewage treatment plant.

Sewage and liquid waste management

5.7.8 There is only one sewage treatment plant in the Maltese Islands and it caters for the southern part of Malta. The rest of the sewage is discharged raw at sea via a number of outfalls, two in Gozo, two on Comino and three in Malta. The discharge points are directly on the shoreline with the exception of the pipeline at Xaghjra on the SE of Malta and the new pipeline at Ras il-Hobz, Gozo. This pipe is subject to continuous damage from explosives thrown in by amateur fishermen, as the effluent attracts fish to the area. The other pipeline on Gozo has been recently placed as part of a larger project in preparation for the planned sewage treatment plant. This plant together with the other one proposed in Malta is expected to cater for all the demand in the

Maltese Islands by 2005. Their location has to be on low-lying coastal areas for operational purposes and pumping costs. The nature of such development also requires them to be distant from urban/residential areas, calling for appropriate attention to the design of these areas that should be sensitive to the surrounding topography and other coastal features. As these plants are expected to produce second-class water for irrigation it would be ideal to locate them in areas where distribution of second class water would be facilitated, e.g. to adjacent cultivated lands.

5.7.9 The majority of the sewage overflows are located within popular bathing areas. It has already been mentioned that the increase in tourist arrivals had created an overwhelming demand on the existing infrastructure, which could not provide the required capacity, in the early 1990s. Subsequently most of these bays were contaminated through the resulting discharge from the overflows.

5.7.10 The development of the new plants would eliminate pollution problems arising from sewage disposal, which are not solely related to water quality: as there will also be a reduction of sediment accumulation on the benthic environment. Sedimentation of particulate matter rich in nutrients and bacteria smothers the surface of the seabed. It also reduces the oxygen concentration levels due to increased bacterial activity to decompose the nutrients, thus affecting water quality. Some concern still remains with respect to the disposal of sludge produced from the treatment process. Disposal at sea should not even be considered as it defeats the purpose of sewage treatment since sludge is the concentrate sewage residue. Alternative disposal methods that are environmentally acceptable should be sought.

Underwater Pipelines and Cables

5.7.11 Water and electricity supply to Gozo and Comino is provided via underwater pipelines and cables crossing the channels between the islands. The presence of such structures restricts certain activities, particularly on the seabed or close to the shore interface point, for security reasons. The only other areas where cables and pipelines have been laid on the seabed are the Grand Harbour and Marsaxlokk. The submarine cables are located along the busiest traffic route for pleasure boats utilising the Msida Marina, the Hilton Marina and in future the proposed marina at Manoel Island and the Excelsior Hotel along Valletta waterfront. The main underwater infrastructure facilities in Marsaxlokk Bay are those at il-Qajjenza where the LPG plant is currently located, to allow transfer of fuel from ships.

5.7.12 The only threats arise from trawling and laying of moorings, however, they are minimal as these activities are regularised by legislation and the structures are marked on the bathymetric charts. Impacts associated with placement of new pipelines and their continuous presence need to be assessed.

Solid waste management

5.7.13 All the infrastructural uses discussed so far necessitate a coastal location for their operation. However the coastal area had been earmarked in the past as the prime location for landfills, primarily to prevent ground water contamination within the aquifers located inland. When such a decision was made, cars were not common, development was not as intense as today and most of the population was concentrated in towns within the urban conurbation, away from such facilities. As there is a Subject Study that is dealing with all aspects of solid waste management it is not the objective of this Topic Paper to discuss the issue in detail. The main concern related to the coastal strategy is with the location of waste dumps or engineered land fills on the coast and any impacts that may result on the coastal as well as marine environment from inappropriate waste management strategies.

5.7.14 A waste dump for Pulverised Fuel Ash was located at il-Mara in Benghisa and although no further dumping takes place since coal is no longer used as an energy fuel in the power stations, no efforts have been made to restoration or mitigation of impacts on the natural resources and landscape of the area.

5.7.15 The official municipal waste dump at Wied Fulija has been officially closed for some years and the only official waste tip present on Malta is at Maghtab. There are two waste tips on Gozo. None of these sites are engineered and waste is not separated limiting options for recycling and re-use of materials such as inert waste, which constitutes 80% of the waste generated in the Maltese Islands. Consequently these sites are being transformed into huge mounds taking up land, creating noxious smells and aesthetic impacts which are affecting other coastal uses, namely tourism and recreation.

Photo 10: Maghtab - Landfills were placed on coastal locations to safeguard the underground water resources inland.

5.7.16 The urge to maintain the construction industry working at the same pace as it has done for the last 10-15 years has now created a situation whereby the one likely solution for waste management perceived today, is to dispose of it at sea. Although this issue is also being addressed in the Waste Management Subject Plan it should be reiterated that dumping of waste at sea should not be considered unless all other options for reduction, reuse, recycling and landfills are exhausted. This is in line with international obligations under the United Nations Law of the Sea and the London Dumping Convention, to which Malta is party. These obligations are highlighted in section 2. The physical and biochemical impacts of dumping waste at sea are briefly addressed in section 5.5.13. As an arbitrary measure, the 50m bathymetric contour may be considered as the most ecologically productive area in the marine environment. It should also be noted that deeper waters are also ecologically important: the benthic environment especially where maerl assemblages form (see section 3.3 28) and the water column itself with respect to migratory species This suggests that disposal of any material within these coastal waters is likely to create significant impacts to the health of the marine environment, including water quality.

5.7.17 The socio-economic implications of such impacts need to be addressed as well, considering the number and variety of uses present, as indicated in Maps 6 and 7. It is evident that the disposal of waste material (even inert construction material) close to the coast will generate conflicts. The uses that would be affected include fisheries (degradation of fishing grounds and impacts on migratory species), tourism, desalination plants and aquaculture (through degradation of water quality) and navigation (through changes in bathymetry and changes in navigational routes), to mention but a few. In conclusion, the common perception that waste can be easily disposed of at sea should be reviewed critically through a comprehensive understanding of all the potential implications that may arise. The small size of the Maltese Islands and the intensity of coastal uses put an immediate limitation on the possibility of such option within the vicinity of the coastal waters.

Land Reclamation

5.7.18 Tied with the issue of inert waste management is that of land reclamation. Contrary to current perception, land reclamation is not a means to deal with inert waste management, but a form of marine related development. Such coastal engineering works have taken place in Marsamxett Harbour for other purposes in the post war era. As with other coastal engineering works, mentioned in Section 5.5.16, these projects have to be justified as they result in a substantial impact on the natural processes within coastal areas.

5.7.19 The engineering works and financial resources required to fulfil such projects are high. Structural stability is essential as the reclaimed areas are continuously exposed to wave action and therefore require appropriate

construction materials and operations to ensure the long-term existence of the reclaimed areas. The majority of reclamation projects require relative shallow waters to facilitate construction works. As mentioned in Section 5.7.16 above the coastal waters within the 50m bathymetric contour are considered to be ecologically important, characterised in the Maltese Islands by the presence of *Posidonia oceanica* meadows, a species meriting protection under international law. As these areas are also under intense use from the tourism and recreation sector as well as maritime activities, the impacts of such projects would therefore be substantial on both social and economic grounds.

Roads

5.7.20 The remaining infrastructure development to be addressed in this section is road construction. Past decisions to construct roads along the coast were taken without any consideration for the environmental implications, particularly associated with beach dynamics. The road linking Mellieha to Cirkewwa cuts right through the dune system that forms part of the beach itself, damaging the process of natural beach replenishment. Additionally, the roads were constructed so close to the water's edge that nowadays, with a population having easier vehicular access and more spare time, these areas do not cater for parking facilities and areas such as the main coast road from Pembroke to Qawra become congested by traffic, particularly in summer time. Consequently one finds carpark spillage along adjacent areas to the detriment of the existing resources or uses, such as low-lying rocky shorelines and in certain instances even fields.

Implications to the Coastal Strategy

The main strategic issues from a spatial planning point of view with respect to infrastructure development on the coast relate to the following:

Thermal power stations: as there are no plans for new spatial requirement the main issues relate to the engineering works associated with jetties and quays as well as the impacts related to the marine environment with respect to the proposed Marine Conservation Area in Delimara.

Desalination plants: since the current infrastructure is envisaged to satisfy future demands the main issues are related to safeguarding the coastal waters from degradation by other uses.

Sewage: the main issue is the provision of a suitable location for the proposed sewage treatment plants and ensuring that impacts on other uses as well as the coastal resources are minimised. From a strategic point of view this is translated into the

prevention of incompatible development from taking place in the vicinity of the proposed locations.

Waste: the main concern related to the coastal strategy is related with the location of waste dumps or engineered land fills on the coast and any impacts that may result on the coastal as well as marine environment from inappropriate waste management strategies, particularly if disposed of at sea.

Land reclamation: the small size of the Maltese Islands and the intensity of existing coastal uses put an immediate limitation on the extent of development projects necessitating land reclamation from the marine environment.

Roads: although access to the coastline, particularly in urban areas is essential, land take up from undeveloped low-lying shorelines is not to be used for this purpose. Small carpark facilities need to be identified along certain coastlines, following consideration of the environmental and amenity characteristics of each particular area.

Pipelines and cables: from a spatial planning perspective, the main issue is related with safeguarding these areas from incompatible development that requires works such as dredging and placement of moorings.

5.8 Oil Exploration

5.8.1 The continental shelf under Maltese sovereignty has been divided into separate blocks within which exploration is possible. Map 5 indicates their distribution. Oil exploration in Malta has been ongoing sporadically over the past four decades. The first two attempts made on land occurred when Malta was still a British colony. One site was located in the vicinity of Zabbar whilst the second one was located at Naxxar; drilling at Naxxar 2 was extended to 3000m. The most recent exploration attempt was that undertaken between 1997-1999 at Kercem in Gozo. The well, 'Madonna taz-Zejt' is the only exploratory site where extensive work had been in progress over that period. The original objective to drill up to 5km was exceeded and a new target of 7km established. The investigations concluded that the commercial potential of the well is not viable. Offshore explorations undertaken in the aforementioned ‘blocks’ also proved to be unsuccessful at locating exploitable quantities. Ten sites were drilled in total by foreign companies between 1971 and 1992.

Practices associated with land and/or marine use

Exploration

5.8.2 According to the Oil Exploration Division (OED) within the Office of the Prime Minister, activities within the Oil Industry in Malta have been limited to the exploration phase. These phases are governed by contracts issued by the OED, which usually extend over a period of 6 years. The contracted party responsible for the exploration phase is bound by several conditions. The standard requirements of such contracts call for contractors to follow operations in accordance with international petroleum industry practice, which conform to Malta's obligations under international law.

5.8.3 The only international agreement specifically addressing this industry, to which Malta may eventually be bound to implement is the *Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil.* Although Malta became a signatory State to the Protocol on the 14th October 1994 ratification has not yet been affected.

5.8.4 The general undertakings of this Protocol invoke Party States to “take all appropriate measures to prevent, abate, combat and control pollution...ensure the best available techniques, are environmentally effective and economically appropriate”.

5.8.5 As a Party State to the United Nations Convention to the Law of the Sea *(Part XII, Art. 208),* Malta is bound to “adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with sea-bed activities subject to their jurisdiction and from artificial islands, installations and structures under their jurisdiction.”

5.8.6 Contractors are requested to carry out an Environmental Impact Study for onshore drilling, which establishes the effect on the environment and human beings. Such a Study should also contain mitigation measures such as proper monitoring of operations. Before operations begin the contractor is to submit a *fire contingency plan* for rapid response, for Government Approval. The only submitted Environmental Assessment was the EPS for the drilling of the well at Kercem. Although it covered most of the operational stages, no mention was made regarding the fate of waste generated particularly from drilling muds.

5.8.7 From the data made available, it appears that no risk assessments were carried out to identify potential hazards arising from operational procedures (e.g. leakage, drilling, transportation), which could affect the natural environment and adjacent uses. The absence of such assessments impedes the adoption of appropriate mitigation measures.

Abandonment of Site

5.8.8 If the exploration results indicate that the area is not a commercial field then the area shall be relinquished to Government. All wells, unless otherwise agreed, are to be plugged by contractor before abandonment. The method is to be in accordance with international petroleum industry practice. If not plugged the wells are to be left in good order and fit for re-entry and further working together with all casing and well head fixtures.

Impacts of Oil Industry

5.8.9 Environmental Impacts arise not only form the catastrophic oil spills from grounded tankers but also from smaller accidental spills and continual operational discharges of oils and chemicals associated with oil and gas exploration and production. Most of the operations taking place on land - based exploration sites are similar to offshore drilling activities. The impacts are somewhat different since for offshore activities, spills and discharged wastes have no boundaries. Impacts may be more difficult to contain, affecting not only the seabed and water quality but also marine life and potentially even coastal areas.

5.8.10 Onshore activities must take into consideration the existing land-uses of the Contract Area and its vicinities. Environmental characteristics to be considered in such cases include presence of good agricultural land, underground aquifers and water sources as well as residential and popular recreational areas. Discharges resulting from offshore oil and gas exploration and production include a wide variety of liquid, solid and gaseous wastes produced on the platform, some of which are discharged into the sea: These include coolant water from machinery, deck drainage, domestic sewage, drill cuttings, drilling fluids (muds) and 'produced waters'.

5.8.11 In addition, submerged parts of the platform may be protected against bio fouling and corrosion with antifouling paints and sacrificial electrodes. These may release small amounts of toxic heavy metals, such as Aluminium, Copper, Mercury, Indium, Tin and Zinc to the water column.

Risk Assessments, Consequence Analysis & Contingency Planning

5.8.12 No contingency plans were available for review. There is a need to identify the event of a potential risk arising from any phase during exploration and exploitation, which together with information on the ecological sensitivity of the contract area the potential area to be affected would be identified and mitigation measures established.

5.8.13 Published literature indicates the potential extent of negative impacts arising from oil exploration and exploitation. It is doubtful whether strict measures have been adopted in the drilling operations, which took place over the last 40 years in Malta.

Implications to the Coastal Strategy

The major issue relating the coastal strategy relates to the potential impacts arising from the industry with respect to coastal and marine resources as well as uses. These can be safeguarded primarily through the Environmental Impact Assessment mechanism.

5.9 Other uses within the coastal zone

5.9.1 Other types of uses that exist within the identified coastal zone boundary include settlements and industrial estates. These uses do not depend on a coastal location for their function but have been located there either because the coast offers an asset, as is the case for residential units, or the coast offers remoteness from urban areas, in the case of industrial estates. The Temporary Provisions Schemes as indicated in Map 10, have consolidated these existing areas and have limited such types of development on the coast to these areas only.

Settlements

5.9.2 As indicated in Section 1.4.9 the coastal zone boundary excludes coastal settlements and is limited to the first road aligning within urban areas, since adequate planning policies exist for them. However the residential areas discussed here are located within a predominantly undeveloped coastal stretch and have been included within the coastal zone as isolated settlement units. Xaghjra, Mellieha, Xlendi and Marsalforn are the areas zoned for Dwelling. Bugibba, Qawra and Xemxija together with Spinola and St.

George's Bay have been zoned for similar development as well, but these are located within urban areas. The introduction of the urban fabric in such otherwise undeveloped coasts threatens to change the heterogeneous features of the coastline and with the introduction of promenades and related structures, these coastal areas end up to be no different from the urban waterfronts of Sliema and Bugibba.

Industrial Estates

5.9.3 The areas zoned for Industrial development are along Hal Far and within the limits of Ricasoli. Both these estates have been developed in the 1970s. The Employment Topic Paper will be addressing these uses and their issues in detail, however impacts on the coastal resources and uses need to be considered here.

5.9.4 Following its development there have been no recent buildings developed in the Ricasoli estate. The estate is considered to be well planned, in terms of efficient land use. It is located near the village of Xaghjra along a gently sloping rocky coastline that stretches to Zonqor point. The Industrial Estate in Hal Far has been earmarked by the Marsaxlokk Bay Local Plan as the principal site for future industrial development in Malta. This site has large vacant land lying between individual premises and there is potential for more efficient use of land. The site is located along the cliff tops of the southern coast of Malta within the proximity of the seabird colonies (refer to section 3.3).

Implications to the Coastal Strategy

Development of residential units as well as industrial estates along the relatively undeveloped coastline should be restricted within the existing boundaries zoned for such development. Additional measures to mitigate against the impact of such development on the coastal landscape need to be introduced to safeguard the variety of coastal features.

6 Coastal Development

6.0.1 An analysis of trends in coastal development may give an indication on the extent and type of development pressure affecting the coastal zone. The analysis carried out for this review is based on an examination of the development applications submitted to the Planning Authority between 1990 and 1998.

Data Limitation

6.0.2 Information has been collected from the database within the PA using the codes applied within the development control process. Systematic digitisation of development applications was not introduced immediately within the Planning Authority thus data on applications submitted prior to 1994 is considered unreliable. Consequently only applications dating from 1994 onwards are considered for the detailed analysis.

6.0.3 Additionally the current classification system distinguishing between uses is not standardised. For example, the development category of 'Other' includes a range of uses such as mixed structural changes to dwellings (construction of extra levels, boundary walls), port related activities and new types of development such as scuttling of wrecks. Development classified as 'Undefined' is also mixed development. These last two types of categories are somehow used interchangeably thus making data analysis difficult.

6.0.4 The data reviewed is restricted to the terrestrial part of the coastal zone boundary. Development applications that may have contiguous areas either further inland, e.g. coastal quarries, or at sea, e.g. the Hilton project are also included. Applications that are completely marine in nature have not all been included since they have not all been plotted.

6.0.5 Data collection for this particular review was completed in 1999. It incorporates a snapshot of the development applications submitted over a period of 5 years, between 1994 and 1998. The data provides information on the decisions that were taken with regards to these applications, until the end of 1999. It therefore does not capture the decisions taken for those applications that were still pending. This explains the relatively lower figures for 1998, as a substantial amount of applications submitted in that year would still have been pending in 1999.

6.0.6 To this effect the analysis provided here should be reviewed in terms of **relativity** rather than absolutes. The value of the review is still plausible for it

still provides guidance with respect to trends. The analysis looks at the coastal area in general to identify the source of development pressures and also evaluates the development trends at Local Plan level to identify where this pressure is directed.

6.1 Demand for Development

National Demand

6.1.1 Table 10 shows the total number of development applications submitted within the Maltese Islands between 1994 and 1998. It indicates that roughly 8% of all planning applications submitted were development proposals within the coastal zone.

6.1.2 Whilst the number of development application has decreased for the Maltese Islands, requests for development on the coastal zone within the same period remained roughly constant. This suggests that as a geographical space the coastal zone within the Maltese Islands is perceived to have high development potential for a variety of uses.

TABLE 10 : PLANNING APPLICATIONS SUBMITTED PER YEAR

Year	**1994**	**1995**	**1996**	**1997**	**1998**
Total # of App.	7762	7360	7273	6909	7092
Total # in CZ	583	580	541	586	597
% of total	**7.51**	**7.88**	**7.44**	**8.48**	**8.42**

Types of Demand

6.1.3 An indication of the source and degree of pressures put on the coastal zone can be derived from the number of applications submitted by development type over a period of time. Appendix C gives a complete breakdown of the analysed data, giving the quantity of development applications and their respective spatial demand, over a four-year period between 1994 and 1998. The classification system used by the Planning Authority identifies a number of uses, which for ease of analysis have been grouped into eight categories as indicated in Table 11 below.

6.1.4 Development types vary in spatial demand and identifying the relative differences gives a further indication to the degree of pressure being exerted on the coast. Whereas the main demand in terms of quantity of applications

was for new Dwellings, with 660 applications, the equivalent spatial extent was 368,800m^2. In comparison, 75 applications classified under Tourism accounted for 2,630,922 m^2.

TABLE 11 : DEVELOPMENT CATEGORIES

GENERAL CATEGORY	DEVELOPMENT CONTROL CLASSIFICATION
Domestic	New Dwellings (DWL); Householder (HSE); Private Swimming Pool (SWM); satellite dish (SAT).
Commercial and Retail	Restaurants/cafes/bars (RCB), Advertisements (ADV); mixed residential and retail (MXD 1); mixed residential office and retail (MXD 2); mixed office and retail (MXD 3) Offices (OFF); and shops/retail services (RDS)
Tourism/ Recreation	Hotel/tourist accommodation (TOU); Recreational (REC);
Services	Community and Health Services (SRV); Educational (EDU);Car parking and garages (PRK)
Industrial	Manufacture/Industrial (MAN); Warehousing (WRH), Mineral working (MIN)
Agriculture	Agriculture including fish farms and agricultural rooms (AGR)
Listed buildings	listed building alteration (LBA); LB demolition (LBD), Conservation Area Consent (CAC)
Other	Change of Use (COU); Minor new works (MNW); Mixed other (MXD 4); Other (OTH); undefined development (*****)

6.1.5 Table 12 summarises the information gathered from the data on the development applications. It lists the number of development applications submitted within the coastal zone and the total area requested for development. The table also indicates how many of these applications were granted development or refused a development permit by the end of 1999. Decisions regarding pending 1994 –1998 applications, which were taken after 1999, are not included.

Requested Coastal Development

6.1.6 From Table 12 it is evident that the largest quantity of development applications submitted is from 'Other' and 'Domestic', whereas the lowest demands came from 'Listed Bldg.', and 'Industrial'. In total the submitted applications have demanded an area equivalent to 20% of the coastal zone, as can be seen in Map 8. As will be discussed in Section 7, development has been guided by the Temporary Provision Schemes. This explains the large amount of requests for Dwellings on the coast as part of the coast had been zoned for this particular development.

6.1.7 Table 13 gives an annual breakdown of the submitted development applications. The continued increase in the category 'Other' suggests that there is an increase in new types of development associated with the marine environment. Chart 1 illustrates clearly the decline in applications submitted

under the categories of ‘Dwelling’ and ‘Commercial’. When looking at the area equivalent to these applications, it can be noted that even though the application demands have declined, the spatial demands remain high, particularly for the categories ‘Other’ and ‘Tourism’. Some development types, particularly ‘Industry’, although low in quantity of applications submitted, correspond to a relatively high spatial demand. This is to be expected since this category includes quarrying and warehousing.

6.1.8 This information is useful as it indicates the development expectations for the coastal zone in the Maltese Islands, as perceived by the public and private sector. A demand for 20% of the coast to be developed within a 5 year period is quite significant.

Chart 1 : Submitted development applications between 1994-1998 within the coastal zone

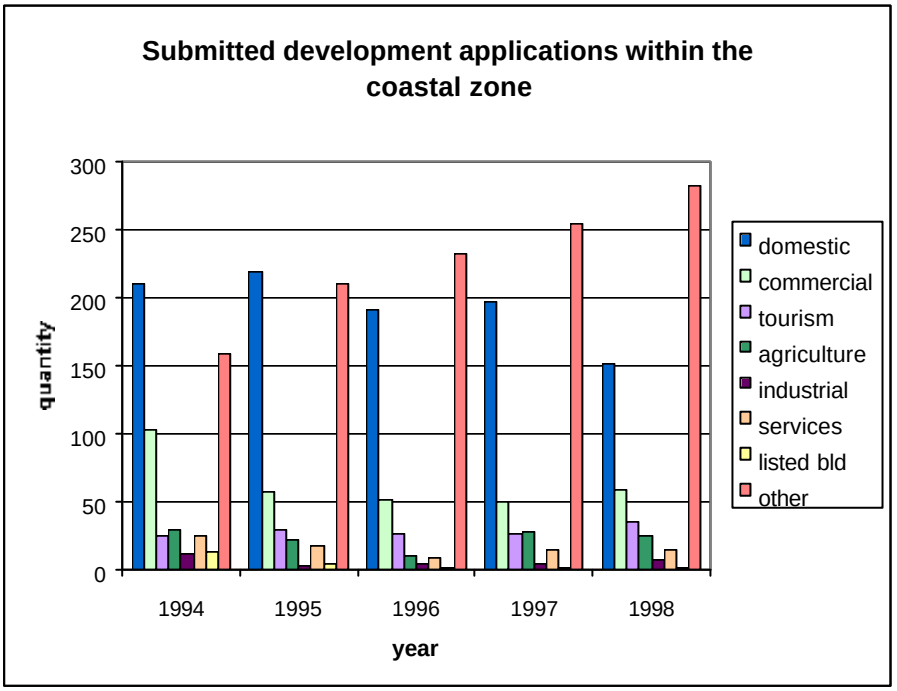


Chart 2 : Area of submitted development applications between 1994-1998 within the coastal zone

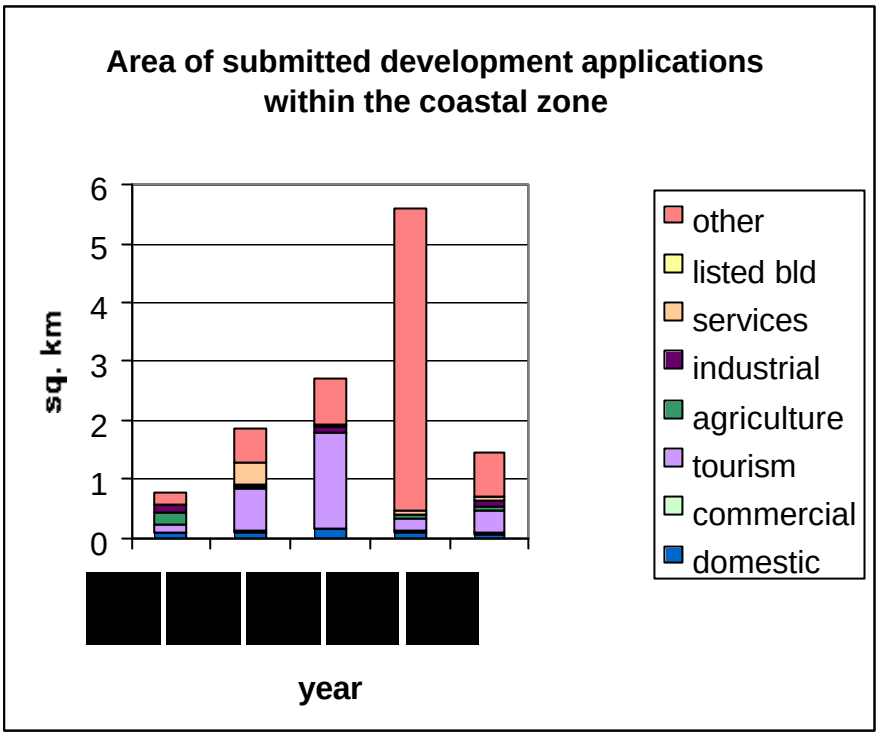


TABLE 12 : DEVELOPMENT APPLICATIONS WITHIN THE COASTAL ZONE (1994-1998)

		Submitted Applications		Granted Applications			Refused Applications	
Dev. Type	**Total #**	**Total area (m^2)**	**% area of coast**	**% of submitted**	**Total area (m^2)**	**% area of coast**	**Total #**	**% of submitted**
Domestic	971	504,620	0.82	69.27	317,832	0.51	189	19.48
Commercial and Retail	322	133,068	0.21	45.03	58,068	0.09	114	35.40
Tou/rec	144	3,009,714	4.87	41.67	518,382	0.83	3	2.08
Agriculture	114	419,268	0.67	32.46	107,164	0.17	52	45.61
Industrial	31	311,478	0.50	61.29	120,615	0.19	8	25.8
Services	82	599,157	0.97	50	111,964	0.18	1	1.22
Listed bldg	24	11,790	0.02	54.17	2,405	0.003	7	29.17
Other	1140	7,043,748	11.98	54.82	1,482,421	2.39	303	25.68
TOTAL	2924	12,032,843	20.04	-------	2,718,815	4.36	--------	

Granted Coastal Development

6.1.9 Table 14 and Charts 3-4 provide information on the amount of development applications that were granted from the total that was submitted between 1994 and 1998. In effect the total amount of granted development at the time the data capture exercise was carried out, amounts to 57% of the total submitted. In terms of total area, the granted development amounts to approximately 4.4%. Map 9 illustrates where this development has been approved.

6.1.10 Decisions are based on recommendations made by the Planning Directorate on the basis of existing planning policies. It is important to note that specific Policy Guidance and amendments to the Planning legislation were introduced at different times during the review period. These include the Policy Guidelines for Environment Impact Assessment and the Fish Farming Policy Guidelines were both issued in 1994; amendments to the Development Planning Act and the General Development Order were made in 1997. The Scheduling of coastal habitats between 1995 and 1996 has included an extensive stretch of the coastline, particularly on mainland Malta. All these instruments have certainly affected the development control process and subsequently the amount of permits issued.

6.1.11 In order to assess the extent of pressure exerted on the existing resources and uses present along coast, it is important to associate this data to specific areas. The next section looks at the development trends along the coastal zone within the local plan boundaries.

TABLE 13 : NUMBER OF APPLICATIONS SUBMITTED AND AREA (m^2) WITHIN THE COASTAL ZONE.

App.	Domestic		Commercial & retail		Tourism & rec.		Agric.		Industrial		Services		Listed Bldg		Other	
	#	M^2	#	m^2	#	M^2	#	m^2	#	m^2	#	m^2	#	m^2	#	m^2
1994	211	88,673	103	23,501	25	127,471	29	196,756	12	118,649	25		14	3,222	159	184,806
1995	219	101,516	57	20,665	29	709,727	22	54,987	3	7,809	18	403,609	5	1,516	211	575,732
1996	192	148,249	52	19,664	27	1,620,544	10	13,460	5	90,328	9	42,388	2	582	233	767,023
1997	197	103,519	51	41,185	27	183,236	28	60,253	4	20,247	15	59,647	1	41	254	5,126,492
1998	152	62,663	59	28,053	36	368,736	25	93,812	7	75,165	15	75,001	2	6,429	283	749,695
Total	**971**	**504,620**	**322**	**133,068**	**144**	**3,009,714**	**114**	**419,268**	**31**	**311,478**	**82**	**599,157**	**24**	**11,790**	**1140**	**7,043,748**

TABLE 14: NUMBER OF PERMITS GRANTED AND AREA (m^2) WITHIN THE COSTAL ZONE

App.	Domestic		Commercial & retail		Tourism & rec.		Agric.		Industrial		Services		Listed Bldg		Other	
	#	m^2	#	m^2	#	m^2	#	m^2	#	m^2	#	m^2	#	m^2	#	m^2
1994	172	70,447	47	8,956	14	100,458	12	48,888	7	85,704	15	10,478	8	1,497	110	104,510
1995	159	60,747	25	4,330	10	137,243	7	8,534	3	7,089	7	25,692	3	326	126	367,308
1996	134	98,560	27	8,187	14	77,629	6	11,845	3	17,265	2	438	2	582	143	358,022
1997	131	56,690	25	30,419	12	122,120	9	29,953	2	3,146	10	50,271	0	0	146	310,366
1998	76	31,388	21	6,176	10	80,932	3	7,944	4	7,411	7	25,085	0	0	100	342,215
Total	**672**	**317,832**	**145**	**58,068**	**60**	**518,382**	**37**	**107,164**	**19**	**120,615**	**41,**	**111,964**	**13**	**2,405**	**625**	**1,482,421**

Chart 3 : Granted development applications submitted between 1994-1998 within the coastal zone

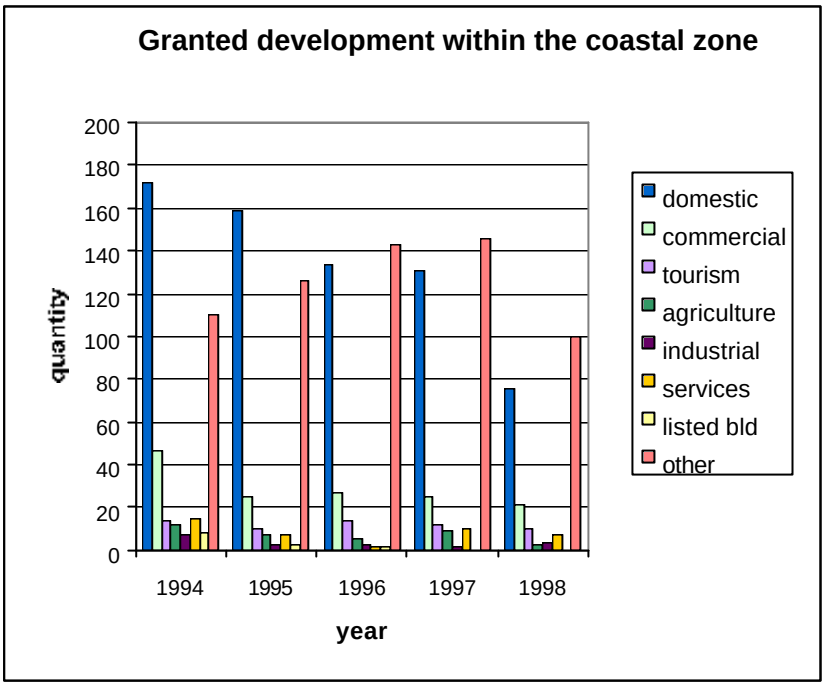
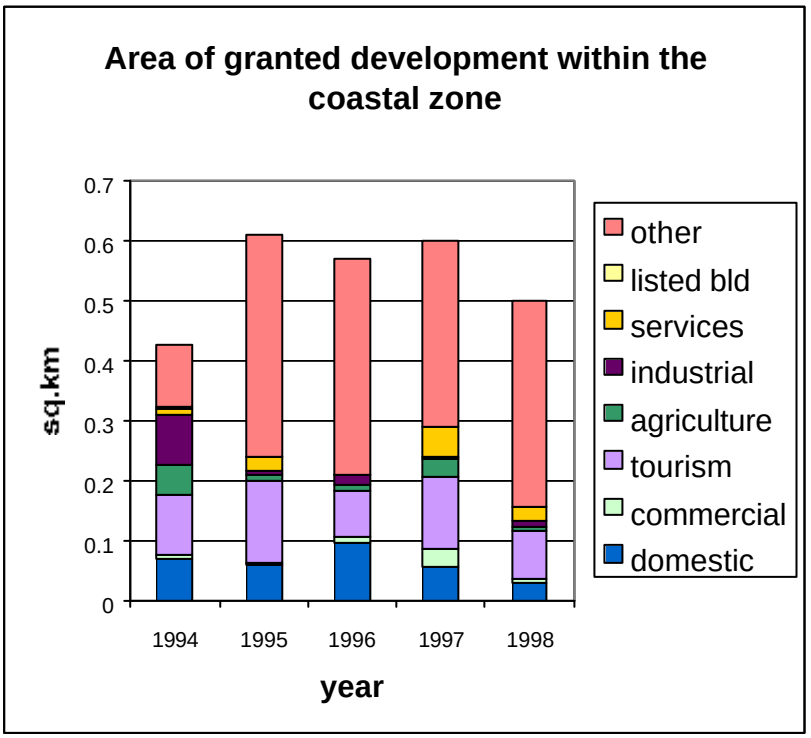


Chart 4 : Area of granted development of applications submitted between 1994-1998 within the coastal zone



6.2 Coastal Development within Local Plans

6.2.1 The coastline within each local plan area is characterised by the natural resources and uses present. In order to establish whether coastal resources are being utilised effectively and in a sustainable manner, it is useful to identify what type of pressure each of these respective coastal areas are being subjected to. This section looks at the extent of coastal area requested for and actually permitted development within each local plan. Table 15 gives the total land area of permitted development per local plan area, as a percentage of submitted applications and a more detailed breakdown for the eight categories of development types is made given in Tables 16 and 17.

TABLE 15: DEVELOPMENT PER LOCAL PLAN AREA BETWEEN 1994-1998.

Local Plan	**Total Area of Submitted development (km^2)**	**Total Area of Permitted development (km^2)**	**Area of permitted development as a % of submitted**
North West	4.85	0.84	17.31
North Harbours	1.02	0.53	51.96
Marsaxlokk Bay	2.70	0.54	20
Grand Harbour	0.39	0.22	56.41
Central Malta	0.14	0.01	7.14
South Malta	0.62	0.16	25.81
Gozo & Comino	2.66	0.41	15.41

6.2.2 Map 8 illustrates the areas where most of the development is requested, namely the low-lying areas that in general have already been developed over the years. Additionally, looking at Map 9 it is clearly evident that the areas with the narrowest coastal area, which are also the urban waterfronts that are already developed, are the ones that have had the largest percentage of applications granted. As mentioned in section 3, the Scheduling process has protected most of the undeveloped coastline and therefore explains why most of the approved development is along urban waterfronts. However this indicates a general trend of increased pressure and raises the question whether conflicts are subsequently created between uses as they are competing for such a limited space. One of the main uses affected is public use of such areas.

TABLE 16 : AREA (m^2) REQUESTED FOR DEVELOPMENT WITHIN THE COASTAL ZONE BY TYPE, PER LOCAL PLAN.

Local Plan	**NWLP**	**NHLP**	**MBLP**	**GHLP**	**CMLP**	**SMLP**	**GCLP**
Agriculture Area	262,155	162	40,450	26	0	48,339	68,136
% of LP coast	0.95	0.006	0.91	0.001	0	1.88	0.31
Tour/Rec Area	428,275	441,078	46,400	52,639	66,475	208,199	1,766,648
% of LP coast	1.56	17.78	1.05	2.69	6.99	8.13	8.01
Comm/Retail Area	23,517	68,255	8,388	10,924	678	2,482	18,824
% of LP coast	0.08	2.75	0.18	0.56	0.07	0.09	0.85
Services Area	94,090	46,486	53,735	21,097	9,818	33,694	340,237
% of LP coast	0.34	1.87	1.21	1.08	1.03	1.31	1.54
Domestic Area	241,226	63,290	4,084	7,101	6,041	57,330	125,584
% of LP coast	0.87	2.55	0.09	0.36	0.63	2.23	0.56
Industrial Area	9,981	59	217,745	11,850	0	1,548	70,295
% of LP coast	0.03	0.002	4.92	0.61	0	0.06	0.31
Listed bld Area	352	7,443	602	403	101	0	2,889
% of LP coast	0.001	0.3	0.01	0.02	0.01	0	0.01
Others Area	3,794,687	392,950	2,308,704	293,909	52,828	273,282	266,835
% of LP coast	13.83	15.84	52.23	15.07	5.56	10.67	1.21
TOTAL % area of requested dev	**17.69**	**41.11**	**60.62**	**20.39**	**14.29**	**24.37**	**12.8**
Rest of LP coast(%)	**82.31**	**58.89**	**39.38**	**79.61**	**85.71**	**75.63**	**87.2**
Coastal area w/in LP (km^2)	27.43 100%	2.48 100%	4.42 100%	1.95 100%	0.95 100%	2.56 100%	22.05 100%

TABLE 17 : AREA (m^2) PERMITTED FOR DEVELOPMENT WITHIN THE COASTAL ZONE BY TYPE, PER LOCAL PLAN

Local Plan	**NWLP**	**NHLP**	**MBLP**	**GHLP**	**CMLP**	**SMLP**	**GCLP**
Agriculture Area	58,519	162	19,090	0	0	133	29,260
% of LP coast	0.21	0.006	0.43	0	0	0.005	0.13
Tou/recr Area	60,705	225,579	40,979	51,184	0	36,294	103,641
% of LP coast	0.22	9.09	0.93	2.62	0	1.42	0.47
Comm./retail Area	4,537	46,838	1,356	2,703	339	188	2,107
% of LP coast	0.01	1.89	0.03	0.13	0.03	0.007	0.009
Services Area	57,184	2,642	24,273	15,173	0	8,041	4,651
% of LP coast	0.21	0.10	0.54	0.78	0	0.31	0.02
Domestic Area	164,645	29,595	2,641	3,166	4,019	49,365	64,401
% of LP coast	0.6	1.19	0.05	0.16	0.42	1.93	0.29
Industrial Area	88	0	94,007	3,287	0	1,528	21,705
% of LP coast	0.0003	0	2.12	0.17	0	0.59	0.09
Listed bld. Area	86	852	405	339	52	0	671
% of LP coast	0.0003	0.03	0.009	0.02	0.005	0	0.003
Others Area	498,156	222,261	358,583	140,025	12,516	64,396	186,848
% of LP coastal area	1.82	8.96	8.11	7.18	1.32	2.51	0.84
TOTAL % area of permitted dev	**3.07**	**21.26**	**12.22**	**11.06**	**1.78**	**6.77**	**1.85**
Rest of LP coast(%)	**96.93**	**78.74**	**87.78**	**88.94**	**98.22**	**93.23**	**98.15**
Coastal area w/in LP ($km^{2)}$	27.43 100%	2.48 100%	4.42 100%	1.95 100%	0.95 100%	2.56 100%	22.05 100%

North West Local Plan Area

6.2.3 The North West has the largest coastal area covering approximately 27.5km^2. The area is predominantly rural in character, dominated with the coastal cliffs stretching along the western part, where the major land use is agriculture. Malta's main bathing areas, including the largest sandy beaches are located within this stretch of coastline. The Temporary provisions schemes allocate the entire coastline as ODZ with the exception of Mellieha and Xemxija, which are zoned for Dwellings and the coast of Qawra and Bugibba, which is zoned as Dwelling/White Area. On the marine side, the NW has 2 bunkering areas and 4 aquaculture production units and the northern coast in particular is very popular for boating activities. The coastal stretches along Qawra point, Cirkewwa, Golden Bay and Ghar Lapsi are all designated as candidate Marine Conservation Areas.

6.2.4 The highest demand for development has been from the 'Other' category, claiming around 13% of the coastal area of the NWLP, whilst demands for tourism and recreation projects totalled to a spatial demand of more than 428,000m^2. Tourism related development is directed around Qawra/Bugibba, Mellieha and Marfa Ridge. The coastal boundary in the first two localities is limited to a narrow strip extending from the first road parallel to the waterline. The NW coast has the highest demand for agriculture development relative to other local plan areas, requesting more than 262,000m^2. Yet this figure constitutes less than 1% of the coastal area within the Local Plan.

6.2.5 In terms of actual permitted development, the Planning Authority approved the equivalent of 17% of the total area of submitted applications, which constitutes a total of 3% of the NW coastal zone. This relatively low figure is primarily due to the extent of scheduled areas along this coastal stretch. Most of the permitted development is along the urban waterfronts and recreational focal points.

North Harbours Local Plan Area

6.2.6 Most of the 2.48km^2 of coastline has been designated as White Area or for Dwellings within the Temporary Provisions Scheme. The only ODZ area is along Pembroke. Maritime activities dominate the coast from Pieta to Sliema, where Pieta Creek is utilised for mooring the Armed Forces of Malta (AFM) patrol boats at Hay Wharf and cargo handling by the Gozo Channel. Msida Creek has been developed into a yacht marina which extends all along Ta' Xbiex and with the

upcoming Manoel Island development, the completion of the Excelsior development and the Hilton project, marinas will be a major use within the North Harbours.

6.2.7 The coastline along Gzira and Tigne is currently used for berthing of pleasure cruise craft and amateur fishing boats, as well as yachts. The land ward side all along from Pieta to Spinola Bay is a continuous promenade with the only stretches of undeveloped rocky coastline remaining along Sliema terraces, which are now utilised by bathers. Most of the low-lying shoreline has been taken up by the promenade or beach concessions issued in the 1980s as an attempt to boost tourism development. The only stretch that has remained relatively undeveloped is the area in Pembroke, part of which is utilised by the AFM as a shooting range. The area around St.George's Bay is designated as a candidate Marine Conservation Area.

6.2.8 Although the coastline is limited in area, the amount of applications submitted for development within a 4 year period amounts to more than 40% of the coastal zone within this Local Plan area. The highest demands were from 'Tourism' and 'Other' categories of development, reflecting the characteristic of this particular coastal stretch, which is dominated by recreational activities. Considering the limited amount of space it is alarming to see that there is a high demand for development; a considerable amount of the coast has been taken up in a 4 year period within a coastline that is already characterised by a high level of development.

Marsaxlokk Bay Local Plan Area

6.2.9 Marsaxlokk Bay was originally dominated by fishing related activities located within Marsaxlokk harbour and the summer resort at Birzebbugia. The Temporary Provisions Scheme zones this stretch of coastline mostly as ODZ with Marsaxlokk bay and the stretch along Qajjenza and B'Bugia as White Area. However with the development of the Power station and the Malta Freeport at Benghisa the dominant use within the coast is now related to industrial port activities. The fishing harbour at Marsaxlokk is the main fisheries port on the islands with the fort on San Lucjan promontory housing the Malta Centre for Fisheries Science. The shoreline along Marsaxlokk harbour was traditionally utilised for boat repair, hard standing, net maintenance. The Sunday fish market is now gradually being transformed to an open-air market for other products and tourism related activities are displacing these traditional activities. Dredged material from within the bay was utilised for the extension of Pretty Bay, which is now an

extensive beach encircled by development ranging from recreational to industrial uses.

6.2.10 The only undeveloped stretch is the coast on the outer part of Delimara peninsula which was previously utilised for agriculture. It is still used for salt extraction and is also popular for bathing. Two fish farms have their cages located along this coastline and the power station effluent is discharged along this coastline, which had been identified by the Structure Plan as a candidate Marine Conservation Area.

6.2.11 The coastal area is approximately 4.42 km^2 and the demand for development is significantly high, constituting more than 60% of the total coastal area within this Local Plan. The largest request for space comes from the category classified as 'Other'. Request for industrial development over the 1994-98 period covers approximately 5% of this area. On the other hand permitted development amounts to 0.54km^2, which is approximately 12% of the coastline. The largest amount of space was taken up by development classified as 'Industrial' and 'Other'.

Grand Harbour Local Plan Area

6.2.12 The Grand Harbour has the most developed coastline within the Maltese Islands with only pockets of low-lying rock extending beyond the bastions into the water around Ricasoli, Vittoriosa, Senglea and Valletta. The main activities here are related to the maritime sector and even though the role of the recreation sector is increasing with projects for the cruise liner terminal and the international marina, cargo handling and ship building still continue. The general characteristic of this coastline is that of an urban waterfront mixed with industrial development.

6.2.13 Nonetheless, submitted applications requested a total space covering more than 20% of the 1.95km^2 stretch and the main demands were from the categories classified as 'Other' and 'Tourism'. The third type of development that was granted in terms of spatial extent was 'Services'. Most of the permitted development within the review period was for these categories and in total claimed 11% of the coast within the Local Plan area. It is important to note that this area excludes the Cottonera waterfront and Cruise liner terminal projects, which were still being processed during the data collection phase.

Central Malta Local Plan Area

6.2.14 With a coastal area less than 1km^2, characterised by karstic shores and stretches of undeveloped areas that are heavily used for recreational places in summer time. The coastal zone with the exception of a small area zoned for Dwelling, has been designated as ODZ. The only developed area is along the globigerina shore platform dominated by the recreational theme park. It is noticeable that there is no or little demand for certain types of development along this coastal stretch. The only types of development requested are related to dwellings (as per scheme zoning) and recreation from the categories classified as 'Tourism', 'Other' and 'Services'. The amount of approved development was restricted to less than 2% of the coast.

South Malta Local Plan Area

6.2.15 This coastal zone is dominated by low-lying rocky shoreline stretching from Xaghjra to Munxar, separated by the narrow sandy beach at St. Thomas Bay. The temporary provisions scheme zones part of the coast for Industry, Dwellings, ODZ with the urban waterfront along Marsascala zoned as a White area and partly as Dwelling/White Area. This coastal stretch, together with that along the Central local plan and Pembroke are the only remaining representative examples of relatively undeveloped low-lying rocky shoreline in Malta. Pressure from development is significant, once again from the 'tourism' and 'other' categories, where the total demand in the four-year review period covers almost 25% of the coast within this local plan area. The type of development approved for this coastal stretch has been in accordance with the TPS zoning and in line with the trend of developing an urban waterfront dominated by recreation.

Gozo and Comino Local Plan Area

6.2.15 The coastal zone in Gozo (which includes Comino) is 22km^2 with very limited extents that have been scheduled. The Gozitan coastline can be compared with that of the North West in that it is mostly undeveloped having only focal points with concentrated development such as Mgarr Harbour, Xlendi and Marsalforn, zoned as White Areas and Dwellings respectively, within the Temporary Provisions Schemes. Demand for development covers only 12% of the coastline within this Local Plan area and most of the pressure comes from tourism and recreation. It is noticeable that while one of the major coastal use is agriculture, the area requested for this use covers only

0.31% of the coast. During 1994-1998 however, less than 2% of the coastline has been permitted for development.

Implications to the Coastal Strategy

The main issues that emerge from this review of development applications can be listed as follows:

- demand for development is concentrated in areas that have easy access to the sea and granted development is mostly restricted to those areas as directed by the Temporary Provisions Scheme, i.e. within scheme. However these two factors are intensifying development in already developed coasts. The only remaining open space provided by the coast is being taken up by structures restricting the available space for public use and sometimes even blocking views, in already congested areas as St.Julians and Bugibba.
- the major type of use requesting development and also granted are uses that do not necessarily need a coastal location to function such as commercial, retail and mixed developments. This has introduced conflicts between users, particularly in coastal areas that were predominantly used by legitimate coastal activities such as fisheries and bathing. The placing of chairs and tables along waterfronts is taking up space for hard-standing of fishing boats, such as in M'xlokk and Spinola.
- conflicts arise even between legitimate uses where these are not compatible, such as the port extension in Cirkewwa which has restricted diving and bathing.
- the zoning for dwellings along the coastal zone has not considered the relatively undeveloped character of the surrounding area, thus introducing the urban fabric in areas predominantly rural, e.g. Xlendi, Marsalforn, Mellieha, at the expense of landscape features which provide a heterogeneous element to the Maltese coastline.

7 Current Planning Policies

Background

7.0.1 The Development Planning Act of 1992 and the subsequent amendments in Act XXIII of 1997 regulate development control in Malta. The Planning Authority's jurisdiction for development control and planning extends to both land and sea (Section 30 (2)). Development in the marine environment includes land reclamation, aquaculture, beach developments and their related uses.

7.0.2 The Structure Plan policies together with the zoning given by the Temporary Provisions Schemes are the main strategic instrument through which development on the coast is controlled. A complete list is provided in Appendix C. There are over 50 policies within the current Structure Plan that address the coastal area. These policies range from specific policies promoting coastal management, restrictive policies on specific sites and activities, to policies addressing issues within particular sectors. This section looks at how the current planning policy has influenced the coastal zone within the Maltese Islands.

7.1 Temporary Provisions Schemes

7.1.1 The Temporary Provisions Schemes indicate the type of development likely to be acceptable in specific areas, subject to existing policies. Table 18 indicates how the coast is currently zoned for development. Map 10 illustrates the location of these zones.

7.1.2 All the zones identified in the TPS extend to the water's edge, creating no distinction between the undeveloped shoreline and the hinterland. Most of the coast zoned for urban development is concentrated around existing and established built-up areas.

7.1.3 Similarly land for future industrial development has been zoned within or in the proximity of industrial areas. The classification of 'White Area' promotes land as an opportunity area where some form of development may be considered however it does not define it. Most of the land classified as 'White Area' is mainly low-lying rocky shoreline.

TABLE 18 : CURRENT ZONING FOR DEVELOPMENT WITHIN THE COASTAL ZONE

ZONING	MALTA	GOZO
Dwellings	Ghajn Zejtuna (incl. Tas-Sellum) / Salina (part of) / Bahar ic-Caghaq/ Xaghjra (l/o Batterija tal Grazzja)	Marsalforn / Xlendi / Sannat (parts of)
Dwellings / White Area	St. Paul's Bay – Salina Pembroke - Spinola Bay Zonqor Pt – Marsascala	
White Area	St Julians - Marsa / Bighi (part of) / Marsascala / Marsaxlokk (promenade)/B'Bugia (promenade) / Zurrieq	Wied Mgarr / Sannat (part of)
Industrial	Kordin/ Kalkara (l/oSan Rokku)/ Hal Far	
Green Area	Wied ta' Kaki (St. Julians)	
ODZ	Rest of coastline	Rest of coastline

7.1.4 A large extent of the coastal zone has been classified as Outside Development Zone (ODZ). Development in such areas is controlled by Structure Plan policies SET 11, SET 12 and BEN 5, which generally prohibit any urban development. More specific guidance for development in such areas has been adopted with the approved **Policy and Design Guidance for Development Outside Built-up areas (1995)**. This policy guidance consolidates specific Structure Plan policies, which identify localities where development is to take place even though it is outside the development schemes. These include Manoel Island and Tigne (TOU 7); Hal Far (IND1) and M'Xlokk Bay (IND15). The Policy Guidance however does not address Policy CZM 3 leaving the issue of safeguarding coastal access for public use without any specific policy direction. Public access and use of extensive coastal areas classified as ODZ have been lost for development, leaving only narrow stretches for such purposes.

7.1.5 With respect to tourism the 1995 policy expands on paragraph 13.9 of the Structure Plan and identifies that it may not be practical to accommodate all long-term tourism accommodation demands within existing committed and planned built-up areas. The policy suggests that the Planning Authority will look at the feasibility and advisability of siting such development in the areas identified by the Tourism Development Plan as Best Use Studies. The policy goes a step further to state that 'there can be no justification for looking outside built-up areas in the short and medium term. *However it does not specify the time frame.* Additionally it acknowledges that certain development such as marinas would search for ODZ areas but the policy states that such siting can only be considered *after* a Local Plan or Subject Plan have thoroughly assessed the need and suitability of proposals. In effect the main areas for such potential

development as identified by the Yachting Subject Study are not within ODZ areas (refer to section 5.5)

Photo11: Development right down to the water's edge has decreased the limited space for public use and restricted the type of coastal activities that could make use of the same stretch of coast.

7.1.6 The ODZ designation has been a useful tool to deter pressure from development as can be seen from the number of development applications submitted in these zones compared to other zones (refer to Maps 8 and 9). Coupled with the Scheduling designation it can provide effective deterrence, however when specific development applications need to be processed, these designations are not always effective. The approved development does not consider the characteristics of the site and introduces elements that may be conflicting with them. The provision of carparking facilities in Ghar Lapsi has introduced the urban fabric into an area Scheduled for its Ecological Value.

7.1.7 Infrastructure development is a major use within the relatively undeveloped coastal areas for a number of reasons. Desalination plants as described in Section 6, require a coastal location to ensure the extraction of good quality seawater. Sewage outfalls also require a coastal location since the effluent is discharged into the marine environment; subsequently it would be economically ideal to locate Sewage Treatment Plants in their proximity. The location of such facilities within a relatively undeveloped coastline alters the characteristics of that coastline differentiating it from coastal areas that are only developed for agricultural purposes. Leaving certain areas classified ODZ may undermine the value of this tool in areas where urban development should be prohibited for environmental reasons. For example, Cirkewwa and Mgarr Harbours, as well as the Malta Freeport, although recognised for their maritime activities, are

still within coastal areas designated as ODZ. Similarly, the tourism development on Comino and Mellieha Bay, for example, are within an ODZ designated area. With the current policies where coastal policies are not comprehensive, other areas within the coast classified as ODZ are left open for development proposals of a similar scale.

Photo 12 The main attraction, Ghar Lapsi, is engulfed by incompatible development.

Illegal development and land ownership

7.1.8 The analysis on development applications and the public attitude survey both indicate that the local perception of the coast is that of a recreational resource. Most of the recreational spots along the coastal areas designated as ODZ are dotted with illegal structures like boathouses and hunting and trapping hides. The Monitoring Reports of 1990-95 and 1996-97 identified boathouses as the most common type of illegal development on the coast. The next common type of enforcement action was taken on illegal caravans, canopies, concrete platforms; placement of tables and chairs on jetties and pavements; illegal dumping; illegal kiosks; levelling of foreshore and illegal quarry extensions.

7.1.9 A number of Structure Plan policies call for the removal of such development (REC 9 and REC 12) and policies REC 10, REC11 and TOU 5 identify the need for the development of alternative facilities to replace illegal beach rooms. Action in line with policies REC 9 and REC 12 has been taken and only recently has this been consistent. This is one major hurdle that has waited almost 10 years to be implemented.

7.1.10 The unlawful appropriation of the coastline both by members of the general public and private investors has become common practice, undermining Structure Plan policy CZM 3 which states that all the shoreline is to be freely accessible to the public and should be brought under public ownership. Although this policy directs government policy to safeguard coastal areas for the general public, it does not indicate **the geographical area within which it is applicable. Consequently, this has hindered consistency in the implementation of the Policy.** In the absence of a strategy to implement Policy CZM 3, the present situation is such that most of the low-lying shoreline has now been taken up by specific development and uses, both legally and otherwise, which are providing commercial services to tourists and other members of the public who are willing to pay for access and use of such services. Thus excluding the general public from using this limited resource.

7.1.11 Information of the ownership status of the coastal zone was not available. This situation creates problems with respect to coastal planning and management. Enforcement action on structures threatening coastal resources or conflicting with coastal uses would be easier if landownership is known. Private ownership reduces the amount and quality of measures that can be easily taken by government entities for public purposes. The fact that an information gap exists hinders plans for proactive measures such as the development of management plans, particularly associated with public use and access.

7.2 Structure Plan Policies

7.2.1 Although the current Structure Plan has only three policies that specifically address Coastal Zone Management, there are more than 50 policies that directly or indirectly have an impact on the coastal zone. This section looks at the existing policies to identify their effectiveness and suitability with respect to coastal planning at a strategic level.

Coastal Zone Management (Structure Plan Policies CZM 1- 3; TOU 15)

7.2.2 As mentioned in the introduction, coastal planning incorporates a holistic approach to address all the demands and impacts arising from development on coastal resources and uses, within the identified geographical space. The three distinct policies within the Structure Plan, CZM 1-3, attempt to introduce the concept of coastal management within the planning process. Policies CZM 1 and 2

address the administrative measures to adopt coastal management rather than giving a strategic direction of how development can occur in coastal areas. As they stand, these policies do not assist the development control process at all. Policy CZM 3 calls for public coastal access all along the coast. The absence of an identified geographical space directing where this policy applies has led to loopholes in development control, whereby access has been interpreted as a pathway, thus displacing informal recreational public space by development. Furthermore the lack of information on landownership has hindered measures towards expropriation of coastal areas to bring them back into public ownership as directed in the policy. Public use of the coast is still an issue that needs to be addressed at a strategic level. Policy TOU 15 is also administrative as it calls for the formulation of a comprehensive coastal management plan.

Natural Resources

General Conservation: Structure Plan Policies RCO 10, RCO 11, RCO 19, RCO 20, RCO 21, RCO 24,

7.2.3 Policies RCO 10 and 11 have protected most of the coastal habitats and areas of scientific importance along the coast and proved effective for development control once these areas were protected. There are other areas that require protection and such policies would adequately assist this process within the formulation of the Local Plans. Once areas are scheduled and protected the next step would be to retain and if possible enhance their status. Policy RCO 20 could have been more strategic if the areas of degraded habitat and landscape were identified. Such areas are still present today and have been identified by the natural resource surveys, therefore giving a geographical location to this policy would make it more effective to implement. A similar statement can be made for policies RCO 21 and RCO 22, which deal with coastal erosion.

7.2.4 Policy RCO 19 is an administrative policy that does not affect the development control or planning process in terms of spatial use. With the existence of the Soil Preservation Act and the Sand Preservation Act, there was really no need for Policy RCO 24 since these legislative documents are still in force.

Beaches: Structure Plan Policies: RCO 16, RCO 17, RCO 18, RCO 23, RCO 22

7.2.5 Five policies addressing sandy beaches and in terms of development control have been very effective because they are very specific and allow suitable direction when processing development applications. These policies however address similar issues that are also found in other coastal areas, for example the issue of overnight camping and permanent structures are also covered in polices REC 9, REC 11, REC 12 and CZM 3. The issue of coastal engineering is partially covered by Policies RCO 16 and RCO 23 by addressing beach replenishment, creation and coastal defences, leaving a policy loophole for other types of coastal engineering works. Yet the issue of beach facilities is not addressed.

Specific Areas: Structure Plan Policies: RCO 34, RCO 36, RCO 37, RCO 38

7.2.6 These policies are site specific with Policy RCO 34 addressing minor islands and policies 36-38 directed towards the Dwejra/Qawra area in Gozo. The protection of minor islands can be linked with measures on Marine Conservation and is still applicable in terms of development control and planning purpose. The protection of Dwejra is still on the agenda as is the need to protect other important areas.

Marine Conservation Areas: Structure Plan Policies: MCO 1-13

7.2.7 No Marine Conservation Area has been designated to-date for two reasons. There were no financial resources allocated for data collection and subsequently no classification system was adopted to categorise the local habitats in a similar scheme that was adopted for terrestrial habitats. Policy MCO 1 proved to be the most useful with respect to development control, as it afforded some protection to the candidate sites from development projects through the conditions made. The strategic policies still count to date but require revisions to include additional measures for further protection particularly from land-based sources of pollution and the increasing quantities and diversity of sea-based uses.

Cultural Resources: Structure Plan Policy ARC 4, MCO 2

7.2.8 The coastal zone and the underwater environment are rich in cultural heritage. The only policy that addresses these resources is Policy ARC 4, which seeks to protect Hagar Qim and Mnajdra, which have been given legal protection. Coastal towers, the rich maritime heritage in the Grand Harbour, salt pans and numerous underwater artefacts were not addressed in a holistic manner which considers the relation of such heritage within the context of how they relate with other coastal uses and natural resources. Although it is not the objective of this Topic Paper to look at cultural heritage, the sustainable use and protection of such resources within a comprehensive strategy for the coast need to be addressed, in line with the policies and measures currently adopted and proposed by the Museums Department and the Planning Authority.

Development

General: Structure Plan Policies: REC 9, SET 11, SET 12, BEN 5,

7.2.9 Policies SET 11, SET 12 and BEN 5 apply in conjunction with the zoning of the Temporary Provisions Schemes. With respect to the coastal zone, these policies have been effective towards affording protection, however a limitation exists. There was no distinction made between legitimate coastal uses, primarily those developments that justify a coastal location because of their operational requirements. This factor distinguishes the coastal zone from other areas and highlights the policy gap that exists in traditional urban planning policies when these are adopted for the coast. On a limited shoreline as the one within the Maltese Islands, where demands arise from various sectors, it is important to safeguard coastal areas for those uses that depend on a coastal location such as infrastructure projects, ports and harbours as well as informal recreational space for public use.

7.2.10 Structure Plan policy REC 9 has been partially effective because there cannot be an overall no development policy on the coast. If it were directed to specific coastal areas, particularly identified for informal recreation, then it would have been more effective in providing a strategic direction.

Illegal Development: Structure Plan Policies: REC 12, TOU 5, CZM 3

7.2.12 Lack of information on land ownership together with a lack of a financial package targeted towards implementation of these policies has hampered their effectiveness. It is only recently that a more systematic and consistent measure is being taken on illegal development on the coast. The issue still exists and is significant, suggesting that strategic policies addressing it should be retained.

Be Camping: REC 11

7.2.13 This is a proactive policy that provides an alternative option for the illegal development related to overnight camping and boathouses. The policy is somewhat biased along one part of the coastline, when it is a known fact that similar facilities, particularly for overnight camping can be accommodated along other stretches of the coast where illegal structures are still present nowadays. These alternatives, on a reasonable scale, have the potential to provide a legal, healthier and more aesthetic option for the public to enjoy and at the same time would cause less harm to the coastal resources.

Yachting and Shipping: TOU 13, IIT 4, IND 5, IND 15,

7.2.14 Policy TOU 13 has been implemented through the formulation of the Yachting Subject Study. Alternative policies addressing yachting and in line with the Subject Study should be included in the revised Structure Plan. With the current ongoing projects along Cirkewwa, Mgarr and Sa Maison harbours, policy IIT 4 should no longer be applicable, as it calls for ferry facilities in Mellieha Bay. However, the consolidation of these harbours calls for a strategic approach that aims for their protection from other conflicting and incompatible uses.

7.2.15 The development of the Malta Freeport in Marsaxlokk, the Marsaxlokk Bay Local Plan and the draft Grand Harbour Local Plan suggest the need for a revision of policies IND 5 and IND 15. From a strategic perspective the maritime industry should be retained in both Grand Harbour and Marsaxlokk, with each port having its particular development niches. The Grand Harbour, with its limited space for hinterland development, the proposed cruise liner terminal and Cottonera Waterfront project looks at a limited scale of maritime industrial development. On the other hand The Malta Freeport has ample space for cargo handling as well as oil storage facilities.

Transport: IIT1, IIT 2, PTR 5

7.2.16 Policies IIT 1 and IIT 2 look towards improving inter-island ferry services, whereas Policy PTR 5 addresses ferry services within Marsamxett and Grand Harbour as an alternative mode of transport. This subject is being dealt with by the Transport Topic Paper, however from a coastal strategy perspective, such uses should be directed in areas where conflicts with incompatible uses are not likely to arise.

Fisheries: Structure Plan Policies: AHF1, AHF 13, AHF 14

7.2.17 Policy AHF 1 is a strategic policy that falls within the remit of the agriculture department thus making it difficult to implement within the development control and planning process. Similarly, policy AHF 3 is a broad strategic policy and does not focus on strict planning issues, with the exception of points 1 and 4. The strategic policies concerning coastal agriculture and fisheries require revision in light of the current issues highlighted in this topic paper, one of which being the protection of the sector from incompatible and competing uses.

Aquaculture: AHF 15, AHF 16

7.2.18 Following the experience gained in the industry over the last 10 years and the issues identified in this Topic Paper, it is evident that Structure Plan policies AHF 15 and 16 need revision, focusing on the location of the sea-based production units and the required ancillary facilities, with respect to other users on the coast and the marine environment.

Mineral Exploitation: MIN 5, MIN 6

7.2.19 Structure Plan policy MIN 5 proved ineffective as all quarrying activity is still carried out with the surface extraction method, creating impacts on the ecology, landscape and consequently on other uses. In the absence of adequate protective measures for ecologically sensitive areas and/or other uses, policy MIN6 is not sufficient to ensure that impacts from coastal quarries are reduced.

Oil Exploration: IND 16

7.2.20 From a planning point of view this policy is not focused enough to assist development control and planning policies. The main planning concerns relate to impacts on the marine environment and legitimate marine uses. Therefore Policy IND 16 should be revised in accordance with the new EIA regulations and call for risk assessments as well as contingency plans.

Implications to the Coastal Strategy

The main issues that emerge from this section echo those identified in the previous sections. The existing planning policies address specific coastal issues and features without taking enough consideration of the interactions that exist between coastal uses and the natural and cultural resources. Similarly, the Temporary Provisions Schemes are not specific enough to minimise the presence of incompatibilities and conflicts between coastal uses. A coastal strategy should build upon the existing planning policy framework by introducing adequate policies to protect legitimate coastal uses from incompatible development and directing where they are applicable, based on the issues that are relevant today.

With respect to illegal development, this is mostly present in areas designated as ODZ, reflecting the fact that some form of activity takes place in these areas. With no alternative and adequate solutions provided, for example for campsites and beach facilities, illegal development mushroomed. Other forms of illegal development such as illegal extensions to quarries cannot be solved through a coastal strategy but reflect the need for stronger enforcement measures.

8 Strategic Direction

8.1 Emergent Issues

8.1.1 This review has identified a number of issues pertaining to the coastal zone within the Maltese Islands. However not all of them can be addressed by a coastal strategy within the planning process. The Structure Plan is a spatial planning tool and any coastal strategy it adopts is but one tool towards the goal of Integrated Coastal Zone Management, focusing mainly on spatial demands. This section outlines the relevant issues and the proposed coastal strategy, which could be the basis for guiding policy co-ordination with the coastal zone.

8.1.2 The natural resources within the Maltese coastal zone are diverse but their occurrence is not abundant due to the limited size of the islands. The impacts resulting from years of unmanaged development limit this abundance further. Legal protection has been effective in controlling the types and level of activities permissible in ecologically and scientifically important areas at a strategic level. Similar protection of the remaining areas, particularly on Gozo, the south of Malta and within the marine environment is necessary. Areas that are not of ecological or scientific importance but play a role in coastal processes, need to be safeguarded from inappropriate development as well.

8.1.3 With respect to cultural resources legal protection has been effective in controlling the types and level activities permissible within Scheduled Areas. Similar protection of other areas, particularly within the marine environment is necessary, following the compilation of a detailed inventory. The cultural heritage along the coastal zone, including that found underwater, has to be safeguarded, within a framework that acknowledges the presence of other legitimate coastal activities and uses. Any coastal uses present in the vicinity of such remains have to be regulated so as to preserve such structures as well as their contextual landscape. This would have to apply also for rehabilitation projects of derelict waterfronts where the maritime activities that characterised the area need to be incorporated within the new projects in order to retain the vitality of our heritage.

8.1.4 Issues concerning **tourism** that need to be addressed by a coastal strategy need to primarily safeguard popular tourist areas, including dive sites, from incompatible uses. Measures to protect existing

sandy beaches and low-lying rocky shorelines within popular bathing areas from development are necessary. The provision for and protection of access within the coast is another issue which has to be provided in recreational/touristic areas with due consideration of other legitimate coastal uses to avoid unnecessary negative impacts. Additionally, areas where potential off-shore development related to tourism is possible may be identified.

8.1.5 Abandonment of **agriculture** in coastal areas will accelerate the rate of soil erosion and consequently lead to land degradation and a change in the coastal landscape. The main issue with respect to coastal agriculture is the protection of this type of use through measures that facilitate farmers to continue to cultivate such land. The rehabilitation of abandoned fields should be favoured to the practice of soil deposition on garigue. As with other legitimate coastal uses, agriculture activity should be safeguarded from incompatible development. Compatible uses that benefit from the continued practice of coastal agricultural should be encouraged.

8.1.6 With respect to **aquaculture**, the ecological and geomorphologic characteristics and the presence of other users within such a limited coastline make it practically difficult for this industry to expand unless the cage units are taken further offshore within sites primarily zoned for this type of activity.

8.1.7 The main strategic issues relating to **fisheries** are the relocation of the fish market to a suitable site and the protection of coastal areas used by the registered fishing fleet from other types of development.

8.1.8 **Maritime activities** are still expected to continue within both the Grand Harbour and Malta Freeport. Therefore the spatial requirements for these activities need to be safeguarded but not at the expense of the coastal characteristics both from a natural as well as cultural perspective. Other legitimate uses that take place within both harbour areas need to be safeguarded as well. Similar considerations need to be taken with respect to the **yachting** industry and the development/maintenance of Cirkewwa and Mgarr harbours, so as not to displace activities such as diving and fishing. The selection of **bunkering** sites as well as offshore spoil grounds need to be considered within a much broader context than solely safety to navigation, in order to safeguard the natural resources as well as existing and potential coastal and marine uses.

8.1.9 The main issues relating to **mineral extraction** are related to the different stages of quarry development and abandonment. The selection of sites for future quarry operation has to consider that impacts associated with the natural environment. Implementation programs for restoration schemes for both existing and future quarries need to be developed in line with the existing characteristic of the adjacent coastal areas, in terms of topography, resources and uses with the objective of rehabilitating these sites for multiple uses. Areas known to have mineral reserves should as far as possible be protected from certain types of development. With respect to salt production the main concern is related to lack of adequate protection and the identification of suitable alternative use

8.1.10 Issues relating to **infrastructure** development on the coast relate to the following:

Thermal power stations: with no plans for new spatial requirement the main issues relate to the engineering works associated with jetties and quays as well as the impacts related to the marine environment with respect to the proposed Marine Conservation Area in Delimara.

Desalination plants: as the current infrastructure is envisaged to satisfy future demands the main issues are related to safeguarding the coastal waters from degradation by other uses

Sewage: the provision of a suitable location for the proposed sewage treatment plants needs to ensure that impacts on other uses as well as the coastal resources are minimised. From a strategic point of view this is translated into the prevention of incompatible development from taking place in the vicinity of the proposed locations.

Waste: the main issue is the location of new waste dumps or engineered land fills on the coast and any impacts that may result on the coastal as well as marine environment from inappropriate waste management strategies, particularly disposed of at sea.

Land reclamation: the small size of the Maltese Islands and the intensity of coastal uses put an immediate limitation on the extent of development projects necessitating land reclamation from the marine environment.

Roads: although access to the coastline, particularly in urban areas is essential, land take up from undeveloped low-lying shorelines is not to be used for this purpose. Small carpark facilities need to be identified along certain coastlines, following consideration of the environmental and amenity characteristics of each particular area.

Pipelines and cables: the main issue is related with safeguarding these structures from incompatible development that requires works such as dredging and placement of moorings.

8.1.11 The major issue concerning **oil exploration** relate to the potential impacts arising from the industry with respect to coastal and marine resources as well as uses.

8.1.12 Development of **residential units** as well as **industrial estates** along the relatively **undeveloped coastline** should be restricted within the existing boundaries zoned for such development. Additional measures to mitigate against the impact of such development on the coastal landscape need to be introduced to safeguard the variety of coastal features.

8.1.13 The main issues that emerge from the review of development applications can be listed as follows:

- **demand** for development is concentrated in areas that have easy access to the sea and granted development is mostly restricted to those areas us directed by the Temporary Provisions Scheme, i.e. not within ODZ. However these two factors are intensifying development in already developed coasts. The only remaining open space provided by the coast is being taken up by structures restricting the available space for public use and sometimes even blocking views, in already congested areas as St.Julians and Bugibba.

- the **major type of use** requesting development and also granted are uses that do not necessarily need a coastal location to function such as commercial, retail and mixed developments. This has introduced conflicts between users, particularly in coastal areas that were predominantly used by legitimate coastal activities such as fisheries and bathing. The placing of chairs and tables along waterfronts is taking up space for hard-standing of fishing boats, such as in M'xlokk and Spinola.

- **conflicts** arise even between legitimate uses where these are not compatible, such as the port extension in Cirkewwa which has restricted diving and bathing.

- the **zoning for dwellings** along the coastal zone has not considered the relatively undeveloped character of the surrounding area, thus introducing the urban fabric in areas predominantly rural, e.g. Xlendi, Marsalforn, Mellieha, at the expense of landscape features which provide a heterogeneous element to the Maltese coastline.

8.1.14 The existing **planning policies** address specific coastal issues and features without taking enough consideration of the interactions that exist between coastal uses and the natural and cultural resources. Similarly, the Temporary Provisions Schemes are not specific enough to minimise the presence of incompatibilities and conflicts between coastal uses. A coastal strategy should build upon the existing planning policy framework by introducing adequate policies to protect legitimate coastal uses from incompatible development and directing where they are applicable, based on the issues that are relevant today.

8.1.15 With respect to **illegal development**, this is mostly present in areas designated as ODZ, reflecting the fact that some form of activity takes place in these areas. With no alternative and adequate solutions provided, for example for campsites and beach facilities, illegal development mushroomed. Other forms of illegal development such as illegal extensions to quarries cannot be solved through a coastal strategy but reflect the need for stronger enforcement measures.

8.2 Proposed Strategy

8.2.1 Coastal uses within the Maltese coastline vary from structural development that requires such a location for its operational purposes (e.g. thermal power station, ports) to structural development that benefits from a coastal location but does not necessitate such space for its operation (e.g. hotels, non-water related sports grounds). There are uses found on the coast simply because the nature of the exploitable resource happens to be on the coast (e.g. mineral extraction). The majority of these uses, whether they necessitate a coastal location or not, have been developed in a manner that has not considered the implications they may have on natural resources, processes and ultimately, other uses. The major infrastructure uses requiring a coastal location have all been

established to a certain extent, and no future development is envisaged within the next Structure Plan period.

8.2.2 Another major coastal use is that associated with informal recreation particularly related to water-sports and coastal walks. Some form of development is associated with such activities to provide adequate facilities namely related to access (footpaths, emergency vehicle access, telephones). There are other structural developments associated with coastal activities that by their excessive number create cumulative pressure on resources and in taking up land, limit further the space available for public use (kiosks, hunting and trapping hides, boathouses). The availability, location and design of these facilities have not been regulated and have also led to conflicts with landscape and the natural environment.

8.2.3 The main theme that emerges from the Topic Paper is that the coastal zone within the Maltese Islands is perceived as a limitless resource that can accommodate all types of uses, in particular the marine environment, which is not covered by a property management system. Consequently this has given rise to conflicts as the limited coastal space has been gradually taken up by uses that do not necessitate a coastal location, to the detriment of the legitimate coastal uses as well as the natural and cultural resources. In the case of the marine environment new developments were introduced with very little consideration to the impacts on both the natural resources and the adjacent marine and coastal activities.

8.2.4 One issue that has not been given adequate attention is the **rehabilitation** of coastal areas in terms of suitable alternative uses. Options for sustainable use of areas where the predominant use has been abandoned or will be abandoned in the time frame of the Structure Plan need to be identified. These include abandoned agricultural land and quarries.

8.2.5 The major infrastructure development that requires a coastal location has already taken place, with the exception of the proposed Sewage Treatment plants. Additional development requiring large areas of the coast is not envisaged within the next Structure Plan period.

8.2.6 The other major legitimate coastal use which requires a coastal location is recreation, and the demand for free access and use of coastal areas for such purposes is not expected to decline.

8.2.7 From the review on development trends it is clear that most development types requiring a coastal location are requesting the

same space that is being sought by both locals and tourists alike for informal recreation. The current policy is not sufficient to protect coastal areas, even along urban areas, for public use. If no policy changes are made, coastal areas available for informal recreation will continue to decrease. In addition the loss of coastal heritage, both natural and cultural, will be irreversible.

8.2.8 With the potential of marine related development still not fully exploited, it is possible that future development proposals for marine use will also increase. In the absence of a holistic policy direction, the potential for conflicts between marine uses as well as coastal activities, is high.

8.2.9 It is evident that the natural characteristics as well as the type and level of development present have created differences within the coastal zone on the Maltese Islands. As a result of the small size and high population there are no places in the Maltese Islands that can be considered to be remote and unaffected by humans. This statement also applies to the coast. A strategic approach is required to ensure that this variety is retained within a framework that safeguards both the natural and cultural heritage as well as ensures adequate use of the coast by legitimate coastal uses.

Objectives

8.2.10 The proposed coastal strategy is based on a refined zoning scheme building upon the existing Temporary Provisions Scheme which directs development in accordance with the following set of objectives:

- ***protect coastal and marine habitats and biodiversity***
- ***protect cultural heritage***
- ***protect coastal uses that necessitate a coastal location***
- ***promote and protect public access and use***
- ***minimise existing and potential user conflicts***

8.3 Zoning Scheme for the Coastal Zone

8.3.1 From the review carried out in this Topic Paper the terrestrial coast can be classified into two general categories, ***predominantly urban*** and ***predominantly rural***, depending upon the prevailing characteristics and scale of uses. A large part of the coast is

considered to be of ecological and/or scientific importance and is either already ***protected*** or is still awaiting protection. These include most of Gozo and part of the coast along the eastern shore of Malta.

8.3.2 The marine environment is dominated by different characteristics than those present on the terrestrial part of the coast. Since biological productivity is predominant in the relatively shallow coastal waters it is possible to use bathymetric data to guide a development strategy at sea. The available information on the marine environment indicates that the main benthic communities are located up to depths of 50m and therefore the coastal areas up to this depth are the most susceptible to impacts arising from development or uses. ***This does not imply that no measures are taken to regulate development and activities further offshore.***

8.3.3 Defining the coast in these categories, as illustrated in Map 11, allows for a better planning framework where strategic policies, based on the strategy objectives, correspond to identifiable geographical areas.

The Predominantly Rural Coast

Definition

This type of coast incorporates those areas that to date have very limited structural development, if any. These are the areas where **ecological and/or geomorphologic features dominate** the coastal stretch and any uses undertaken within it. The main form of development in these areas is mainly agriculture, which attributes a type of landform that characterises the local coastal landscape. Other forms of development are related to specific uses within particular geographical pockets, such as tourism along sandy beaches, quarries where mineral resources are present and accommodation units in areas zoned for Dwelling by the Temporary Provisions Scheme.

The Protected Coast

Most of this coast includes areas of ecological and/or scientific importance, as well as areas with cultural heritage. Whilst the majority of them have already been given legal protection and designation, other areas still merit such designation.

Strategy

The primary objective of the strategy for the predominantly rural coastline is to safeguard the natural and cultural heritage, including landscape. The type and level of new development acceptable within these areas should be minimal. Only development that is directed towards improving degraded areas and enhancing informal recreation, in conformity with the objective of safeguarding the coastal characteristic and heritage of such areas, will be acceptable. Existing legally approved uses and development within protected areas should be allowed to continue, provided that the value of the protected coast is not affected negatively.

Policy Direction

- For ***protected areas*** the aim is to safeguard and promote their natural and cultural value. Current measures adopted through the Scheduling Processes still apply over and above the provisions given for the predominantly rural coastline. Areas of known ecological, scientific and/or cultural importance that have not yet been given such protection are to be safeguarded until such protection is afforded to them.

- For predominantly ***agricultural areas*** the aim is to encourage the continuation of this type of use. Any activities or uses that are compatible with agriculture and may promote the continuation of this industry are also encouraged.

- For predominantly ***quarried areas***, the aim is to restrain mineral extraction from extending towards the coastline. Other types of uses should be prohibited from being developed within the vicinity of such quarries whilst these are still operating or are known to have mineral reserves.

- For ***recreational/urban pockets***, development should be limited to safeguard the predominant use of the area. This includes the improvement of beach facilities and public access, as well as port and harbour facilities, where applicable, through appropriate measures that conform to the characteristics of the surrounding coastline. The introduction of urban waterfront furniture should be prohibited.

- New development that may be considered in the predominantly rural coastal areas is to be related to the rehabilitation of abandoned agricultural fields or spent quarries. Proposals for rehabilitation that promote informal recreation would be considered favourably.

- Development related to improvement of ***public access*** for informal recreation should be encouraged.

The Predominantly Urban Coast

Definition

This type of coast is **predominantly developed for urban and/or industrial purposes**. In certain areas, the coastline itself has been modified for such purposes with the construction of wharves, jetties and seawalls. The natural element is very limited. Urban waterfronts and industrial waterfronts reflect the historical development of urban settlements and harbours and provide an element of open space in such densely developed areas.

The Protected Coast

Areas of ecological and/or scientific importance and cultural heritage are also present within this type of coastline. Whilst the majority of them have already been given legal protection and designation, other areas still merit such designation.

Strategy

The primary objective of the strategy for the developed coastline is to safeguard the existing legitimate coastal uses and to minimise existing and potential conflicts. The protection of open space for public use is to be safeguarded. Existing legally approved uses and development within protected areas should be allowed to continue, provided that it does not affect the value of the protected coast negatively.

Policy Direction

- For ***urban areas*** development of the coastal zone should promote multiple use of the coast and not displace legitimate coastal uses; visual access from promenades should be safeguarded. In bathing areas, development should be limited to enhancing public use and associated facilities provided that they are small-scale interventions preferably of a temporary and/reversible nature.

- For ***industrial areas*** development should be restricted to maritime/industrial related uses. Multiple and compatible uses that require port/harbour facilities within these areas are encouraged. Where appropriate public access should be safeguarded even if this may be limited to views of ports or harbours.

- For ***protected areas*** the aim is to safeguard and promote their natural and cultural value. Current measures adopted through the Scheduling Processes

still apply over and above the provisions given for the predominantly urban coastline. Areas of known ecological, scientific and/or cultural importance that have not yet been given such protection are to be safeguarded until such protection is afforded to them.

The Marine Environment

The lack of a property management system similar to that adopted on land has led to a perception that the marine environment is an open resource and free-for-all. The majority of marine development and uses were introduced with very little consideration to impacts on both the natural resources and adjacent marine and coastal activities. This strategy applies to the marine environment up to the 12 nautical mile limit even though most activities are located in the coastal waters.

Strategy

The primary objectives of the coastal strategy for the marine environment are to safeguard the natural and cultural heritage present; to safeguard legitimate marine uses, and to minimise existing and potential conflicts.

Policy Direction

- The candidate **Marine Conservation Areas** identified within the current Structure Plan should be afforded legal protection to allow better management of activities within and adjacent to them. Such protection should extend to other areas, including those beyond the 50m-depth contour. Until more detailed information is available on the natural characteristics, a precautionary approach towards development should be the taken.

- New development at sea should consider the resulting impacts on both the marine environment and other coastal and marine uses. As much as possible new development that does not necessitate contiguous coastal land area for operation, (such as aquaculture) should be located beyond the 50-m depth contour. New development related to ports and harbours, including marinas and sailing facilities (which do require contiguous land area for operation), are to be directed to already developed areas along the predominantly urban coastline, subject to an Environmental Impact Assessment.

8.4 Conclusion

8.4.1 In identifying a coastal zone and looking at the inter-relationship between coastal uses and resources, the proposed strategy reflects the main thrust towards which most of the issues identified within this Topic paper can be addressed in the revised Structure Plan.

8.4.2 In directing what type and scale of development can take place and where, the proposed strategy is envisaged to provide a policy direction within the revised Structure Plan that safeguard the coastal zone in the Maltese Islands from losing their varying characteristics, both natural and cultural while retaining, encouraging and safeguarding legitimate coastal uses that depend and rely upon this diversity.