Working Hand-in-Hand with Nature

Country Study (2010)
&
Proposed National Biodiversity Strategy and Action Plan for Malta (2012-2020)

2012

DRAFT

Executive Summary

> All Maltese citizens will value the importance of Malta's biodiversity and work hand-in-hand with nature in their daily lives. Efforts aimed at sustainable and more resource-efficient choices and actions by local communities and relevant sectors have contributed to a significant improvement in the status of Malta's biodiversity and associated ecosystem services, for the well-being of present and future generations."
>
> Long Term Vision of Malta's NBSAP

Biodiversity encompasses the variety and variability of all life on earth. The array of native and endemic species and their habitats, not only constitute Malta's biodiversity (natural capital), but also maintain important life-supporting ecosystem services.

Malta's National Biodiversity Strategy and Action Plan (NBASP) is being given the theme 'Working Hand-in-Hand with Nature'. It puts forward the long-term vision that "*All Maltese citizens will value the importance of Malta's biodiversity and work hand-in-hand with nature in their daily lives. Efforts aimed at sustainable and more resource-efficient choices and actions by local communities and relevant sectors have contributed to a significant improvement in the status of Malta's biodiversity and associated ecosystem services, for the well-being of present and future generations*." The vision hence ropes in the NBSAP theme and also reflects priorities for resources efficiency and curbing biodiversity loss in line with CBD and EU visions.

The main purpose of Malta's NBASP is to serve as a national policy driver and to integrate biodiversity concerns into relevant sectoral or cross-sectoral plans, programmes and policies, especially those that may affect Malta's biological and natural resources.

Malta's NBSAP proposes 19 targets to be achieved by 2020 and arranged according to five policy areas. These national targets reflect national priorities for biodiversity while at the same time also being complementary to the 2020 global targets established by the Convention on Biological Diversity (CBD). These national targets aim to contribute to collective global efforts to reverse global trends in biodiversity loss.

The NBASP also aims to mobilise action in order to contribute to the achievement of the EU 2020 biodiversity headline target at a national level, which is "*to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss*." The collaboration and commitment of all relevant stakeholders is required in order to achieve the following strategic goals:

- The full range of values (including economic) of biodiversity and ecosystem services, as well as the potential role of biodiversity in addressing other environmental challenges (such as climate change), should be recognised at all levels and be fully reflected in decision and policy-making, where relevant;
- A coherent biodiversity monitoring regime is required to build a stronger knowledge base on the conservation status and trends of species and habitats of European community and national importance, in particular for those currently assigned an "unknown" status;
- Enhanced national implementation of relevant programmes of work (PoW) under the framework of the Convention on Biological Diversity necessitates collaborative projects and enabling activities;

- Strengthening the relationship between policy making and scientific research would ensure that research addresses the needs of policy makers and that in turn, policy development responds to research findings;
- Resource mobilisation is needed to improve national capacity in the fields of enforcement, site management, monitoring as well as research and development;
- Coordinated action and positive incentives, which promote local participation and private-public partnerships, and which drive forth successful conservation and sustainable use of biological and natural resources are called for, both within and outside protected areas;
- Greater awareness of the linkages between biodiversity, economic prosperity and human welfare is needed as it can empower changes in consumer behaviour based on informed-choices and, hence contribute towards a more sustainable-oriented and resource-efficient economy and society;
- The right market signals are required to support the sustainable use of biological and natural resources, and to leverage private investment as well as reward practices that safeguard biodiversity; and,
- Further policy integration of biodiversity concerns in relevant sectors is essential; such mainstreaming should address direct and indirect drivers of biodiversity change, and should build on mutually-supportive measures, which in turn contribute to the achievement of the CBD and EU 2020 targets at a national level.

These strategic goals are translated into action-based measures which focus on outcomes and are grouped into 18 thematic areas. Through these measures, the NBASP is responding to the mandates required by the CBD and related multilateral environmental agreements, as well as European Union policies. To this end, the NBSAP aims to set Malta on the right track to meet its own biodiversity and other environmental objectives, as well as its international commitments, by 2020.

Malta's NBSAP is a living document, which will continue to evolve on the basis of feedback received through consultation with stakeholders, especially with respect to its targets, strategic directions and actions. This requires the participation of a broad set of the community, comprising all major groups as well as individuals, to build a sense of ownership and commitment. The NBSAP aims to achieve consensus on a set of practical and realistic actions that reflect national aspirations for the conservation and sustainable use of biodiversity, together with other environmental goals in Malta.

Disclaimers

This draft background document presents the findings of Malta's Country Study and primarily builds upon the information submitted by Malta in its Fourth National Report to the Convention on Biological Diversity, which was drawn up in 2010 in consultation with relevant Ministries and stakeholders. The latter report provided an opportunity to assess Malta's progress towards the 2010 global biodiversity target, drawing upon an analysis of the current status and trends in biodiversity and actions taken to implement the Convention at the national level, as well as to consider what further efforts are needed.

This Country Study is intended to provide the necessary background information in support of the draft Consultation Document on Malta's National Biodiversity Strategy and Action Plan.

Table of Contents

1 Biodiversity of the Maltese Islands
1.1 Overview of the Physical Environment of the Maltese Archipelago
1.2 What is Biodiversity?
1.3 Components of Malta's Biodiversity – Habitat, Species and Genetic Diversity
1.4 Why does Biodiversity matter?
1.5 Malta's Biodiversity - Status and Trends
1.6 Other Environmental Trends
1.7 Threats to Biodiversity
2 Vision, Objectives and Targets of Malta's NBSAP
2.1 What is a NBSAP and what is the mandate for developing it?
2.2 2010 and 2020 – Global and EU Biodiversity Targets
2.3 Vision, Objectives and Targets on Malta's NBSAP
3 Conservation Action to Halt Biodiversity Loss – Current State of Play
3.1 Nature Protection – The Legal Framework
3.2 Malta's National Ecological Network of Protected Areas
3.2.1 Malta's Contribution to Global and Regional Networks of Protected Areas
3.2.2 Management of Protected Areas
3.2.3 Ecological Connectivity and the Concept of a Green Infrastructure
3.3 Species Recovery and Habitat Restoration
3.3.1 Sustainable Use of Biological Resources
3.3.2 Access to Genetic Resources and Benefit Sharing (ABS)
3.4 Wildlife Trade
3.5 Biosafety & GMOs
3.6 Invasive Alien Species
3.7 Biodiversity and Climate Change
3.8 Biodiversity Surveillance, Monitoring and Research
3.9 Financing Biodiversity and Natura 2000
3.9.1 The CBD Strategy for Resource Mobilisation
3.10 Biodiversity Communication, Education and Public Awareness
3.10.1 Level of Awareness of Biodiversity Issues by the Maltese
3.11 Community-Based Nature Conservation
3.11.1 Biodiversity Partnerships
4 Integrating Biodiversity Concerns Across Sectors and Cross-Sectors
4.1 Agriculture and Rural Development
4.1.1 Pillar I of the CAP: Cross-compliance
4.1.2 Pillar II of the CAP: Agri-Environment Measures
4.1.3 Biodiversity Considerations in the Post-2013 CAP Reform
4.1.4 Organic Farming
4.2 Aquaculture
4.3 Land Development
4.3.1 Development Control and Scheduling
4.3.2 Planning Enforcement and Direct Action
4.3.3 Environment Assessments
4.4 Energy and Transport
4.4.1 Reducing Air Emissions
4.4.2 Reducing Greenhouse Gas Emissions
4.4.3 Promoting Energy Efficiency in Malta
4.5 Capture Fisheries
4.6 Health

4.7 Tourism
4.8 Waste
4.9 Water
4.9.1 Freshwater Quality with a Focus on Groundwaters
4.9.2 Coastal and Marine Water Quality
4.9.3 Bathing Water Quality
4.9.4 Integrated Water Management – The Water Framework Directive & Marine Strategy Framework Directive
5 Conserving and Mainstreaming Biodiversity – Current Gaps and Proposed Strategic Goals and Actions
5.1 State of the Environment Recommendations
5.2 Strategic Action Plan for the Conservation of Maltese Coastal and Marine Biodiversity
5.3 National Strategy for Sustainable Development
5.4 Programmes of Work, Initiatives and Strategies under the CBD Framework
5.4.1 CBD Programme of Work on Island Biodiversity
5.4.2 CBD Programme of Work on Inland Waters Biodiversity
5.4.3 CBD Programme of Work on Marine & Coastal Biodiversity
5.4.4 CBD Programme of Work on Agricultural Biological Diversity
5.4.5 CBD Programme of Work on Dry & Sub-humid Land
5.4.6 CBD Programme of Work on Protected Areas
5.4.7 Global Strategy on Plant Conservation (GSPC)
5.4.8 Global Taxonomy Initiative (GTI)
5.4.9 Plan of Action on Sub-national Governments, Cities and Other Local Authorities for Biodiversity
5.5 Way Forward
5.5.1 Strategic Goals of the NBSAP
5.5.2 National Actions
5.6 Concluding Remarks
6 References
7 Annexes

List of Figures

1 - Location of the Maltese Archipelago
2 - Population Density Change
3 - CORINE Land Use Cover
4 - Hydrogeology of the Maltese Islands
5 - Geological Map of the Maltese Islands
6 - Stratigraphic Succession in Malta
7 - Soil Types in Malta
8 - Levels of Biological Organisation
9 - Estimate Numbers of Species for Certain Groups of Taxa
10 - Types of Ecosystems and Habitats Found in the Maltese Islands
11 - Types of Ecosystem Services
12 - Conservation Status of Habitats and Species of European Community Importance
13 - Relation of Biodiversity with ecosystem functioning, ecosystem services, and drivers of change
14 - Objectives of the Convention on Biological Diversity
15 - Thematic Programmes and Cross-cutting Issues of the CBD
16 - Structure of the Flora, Fauna and Nature Habitats Protection Regulations
17 - Species of international importance covered by national legal protection
18 - Maltese Transposition of the EU GMO Directives
19 - Procedural steps for the experimental release of GMOs in Malta
20- Climate Change Driving Forces and Impacts and Environmental Responses
21 - EU Financial Instruments
22 - The Role of CEPA in Biodiversity
23 - Inter-linkages between Agriculture and Biodiversity
24 - Effects of Unsustainable Intensification of Agriculture on the Environment & Land Productivity
25 - Possible Impacts of Marine Cage Aquaculture
26 - Interaction between Aquaculture and other coastal and marine-based activities
27 - Potential Impacts of Fishing on Marine Biodiversity
28 - Human health consequences of ecosystem changes
29 - Waste generation in the EU -27
30 - Waste Generation Impacts
31 - The different steps in dealing with waste
32 - Water Production by Sector
33 - Bodies of Groundwater and their distribution within the Maltese Water Catchment District

List of Tables

1 - Malta Land Size
2 - Number of Endemic and Sub-Endemic Species
3 - Trends of Selected Groups of Species
4 - Trends reported by the State of the Environment Indicators
5 - General Threat Categories and Examples of Associated Impacts
6 - Direct Drivers of Biodiversity Change
7 - Extent of Progress in meeting the 2010 sub-targets under the CBD
8 - EU 2020 Targets and Actions
9 - CBD and Complementary National 2020 Targets
10 - National designations of protected areas in Malta
11 - Global and Regional designations of protected areas in Malta
12 - Purpose of surveillance/monitoring programme and examples of possible goals
13 - Funded Projects
14 - Comparing Eurobarometer Surveys 2007 and 2010 – Attitudes of Maltese people towards the issues of biodiversity
15 - Biodiversity Tours
16 - Summary of the main Strengths, Weaknesses and Needs of the Rural Areas
17 - Overview of measures in the new EU RD Regulation and how they have been applied in Malta's RDP (2007-2013)
18 - Extent of Uptake of Agri-Environment Measures - Indicators and Results
19 - Synopsis of environmental impacts of organic farming
20 - Extent of Progress in meeting SOER recommendations (1998, 2002 and 2005)
21 - Extent of Progress in meeting SAPBIO Priority Actions
22 - Extent of Progress in meeting NSSD Strategic Directions for Biodiversity
23 - Extent of Progress in meeting Targets of the CBD PoW on Island Biodiversity
24 - Extent of Progress in meeting the Goals of the CBD PoW on Inland Waters Biodiversity
25 - Extent of Progress in meeting the Operational objectives of the CBD PoW on Marine and Coastal Biodiversity
26 - Extent of Progress in meeting the Operational objectives of the CBD PoW on Agricultural Biodiversity
27 - Extent of Progress in meeting the Operational objectives of the CBD PoW on Dry and Sub-Humid Land
28 - Extent of Progress in meeting Targets of the CBD PoW on Protected Areas
29 - Extent of Progress in meeting Targets of the GSPC
30 - Extent of Progress in meeting the Operational Objectives of the GTI
31 - Overall Summary of Progress
32 - Sectoral Policies, Plans and Programmes

Abbreviations

AA	Appropriate Assessment
ABS	Access and Benefit Sharing
BAP	Biodiversity Action Plan
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CEPA	Communication Education and Public Awareness
CFP	Common Fisheries Policy
CHM	Clearing House Mechanism
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoE	Council of Europe
COGAP	Code of Good Agricultural Practice
COP	Conference of the Parties
DAISIE	Delivering Alien Invasive Species In Europe
DPA	Development Planning Act
DPSIR	Driving Forces-Pressures-State-Impacts-Responses
EAFRD	European Agricultural Fund for Rural Development
ECBS	European Community Biodiversity Strategy
EDPA	Environment and Development Planning Act
EE	Environmental Education
EEA	European Environmental Agency
EIA	Environmental Impact Assessment
EPA	Environment Protection Act
ERDF	European Regional Development Fund
GAEC	Good Agricultural and Environmental Conditions
GI	Green Infrastructure
GL	Globigerina Limestone
GMO	Genetically Modified Organism
GN	Government Notice
GTI	Global Taxonomy Initiative
IAS	Invasive Alien Species
IUCN	International Union for Conservation of Nature
LCL	Lower Coralline Limestone
LMO	Living Modified Organism
LN	Legal Notice
MA	Millennium Ecosystem Assessment
MAP	Mediterranean Action Plan
MEPA	Malta Environment and Planning Authority
MNRN	Malta National Rural Network
MPA	Marine Protected Area
NBSAP	National Biodiversity Strategy and Action Plan
NCSD	National Commission for Sustainable Development
NSSD	National Strategy for Sustainable Development
PA	Protected Area
PBB	Pro-biodiversity business
PoW	Programme of Work
SAC	Special Area of Conservation
SAPBIO	Strategic Action Programme for the Conservation of Biological Diversity in the Mediterranean Region
SMR	Statutory Management Requirement
SOEI	State of the Environment Indicator

SOER	State of the Environment Report
sp	Species (singular)
spp	Species (plural)
TPA	Tree Protection Area
UAA	Utilised Agricultural Areas
UCL	Upper Coralline Limestone
UNEP	United Nations Environment Programme

1. Biodiversity of the Maltese Islands

> Biodiversity underpins ecosystem functioning. The services provided by healthy ecosystems, in turn, are the foundation for human well-being. ... By disrupting ecosystem functions, biodiversity loss makes ecosystems more vulnerable to shocks and disturbances, less resilient, and less able to supply humans with needed services.
>
> Secretariat of the Convention on Biological Diversity (2006)
> *Global Biodiversity Outlook 2*

This chapter provides a short overview of the physical environment of the Maltese Islands. The substance of this chapter explores the meaning, complexity and importance of biodiversity and also looks at the status of Maltese biodiversity and causes/drivers of its loss. Environmental trends are also illustrated based on information conferred by State of the Environment Reports for Malta.

1.1 Overview of the Physical Environment of the Maltese Archipelago

The Maltese archipelago is located in the Central Mediterranean and geographically, lies approximately at a distance of 93 km south of Sicily and 290 km north of the African Continent. The archipelago (Table 1; Figure 1) consists of a group of three islands: Malta and the two smaller islands of Gozo (Maltese: *Għawdex*) and Comino (Maltese: *Kemmuna*). These three islands are aligned in a north west to south east direction. A series of smaller uninhabited islets are found scattered around the shoreline of the islands. The fact that the Maltese islands are sloping towards the north east, has created two types of Maltese shorelines; the sheer cliffs bordering the south west and west which contrast the gently sloping shores that characterise the north eastern part of the islands.

	Area (km^2)	Max Length (km)	Max Width (km)	Shoreline (km)
Malta	245.728	27.359	14.48	196.8
Gozo	67.078	14.484	7.242	56.01
Comino	2.784			
Total	315.59			

Table 1 - Malta Land Size
(Based on NSO 2009a - **Malta in Figures 2009**)

Figure 1 – Location of the Maltese Archipelago (Republic of Malta)

The topography of the islands is pretty much low-lying and is essentially characterised by low hills and terraced slopes. Mountains, rivers and lakes are entirely absent. Considering the very high population density (1,309 persons per km^2) [1] (Figure 2) and the small land size (316 km^2), substantial pressure is placed on the limited natural resources that are present, including on infrastructure and amenities[2]. The coast is indeed the hub of land development and land use by various sectors, and an increase in population density has been detected between 1995 and 2005 in coastal settlements due to internal migration trends (SOEI 2008 - Population Density).

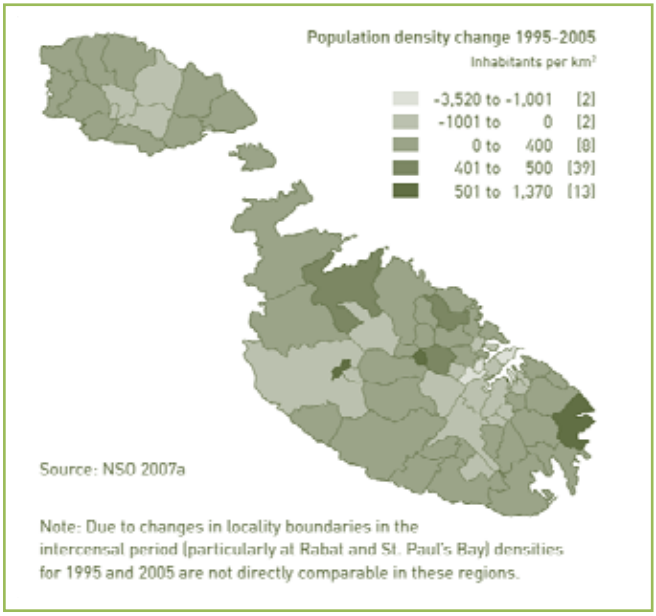

Figure 2 - Population Density Change
(Source: Extracted from SOEI 2008 – DF 1 Population Density)

The land use pattern of the Maltese Islands is illustrated by mapped CORINE land cover data for 2006 (Figure 3). Agriculture is Malta's predominant land cover (51%), followed by urban areas (22%) and natural vegetation (18%). The land use pattern of the archipelago has remained largely constant between 2000 and 2006, with development in the island of Malta being mainly concentrated in the north eastern part of the mainland, while Gozo is in turn characterised by pockets of development, mainly located in the southern and central part of the island (SOEI 2007 – Land Cover by Type).

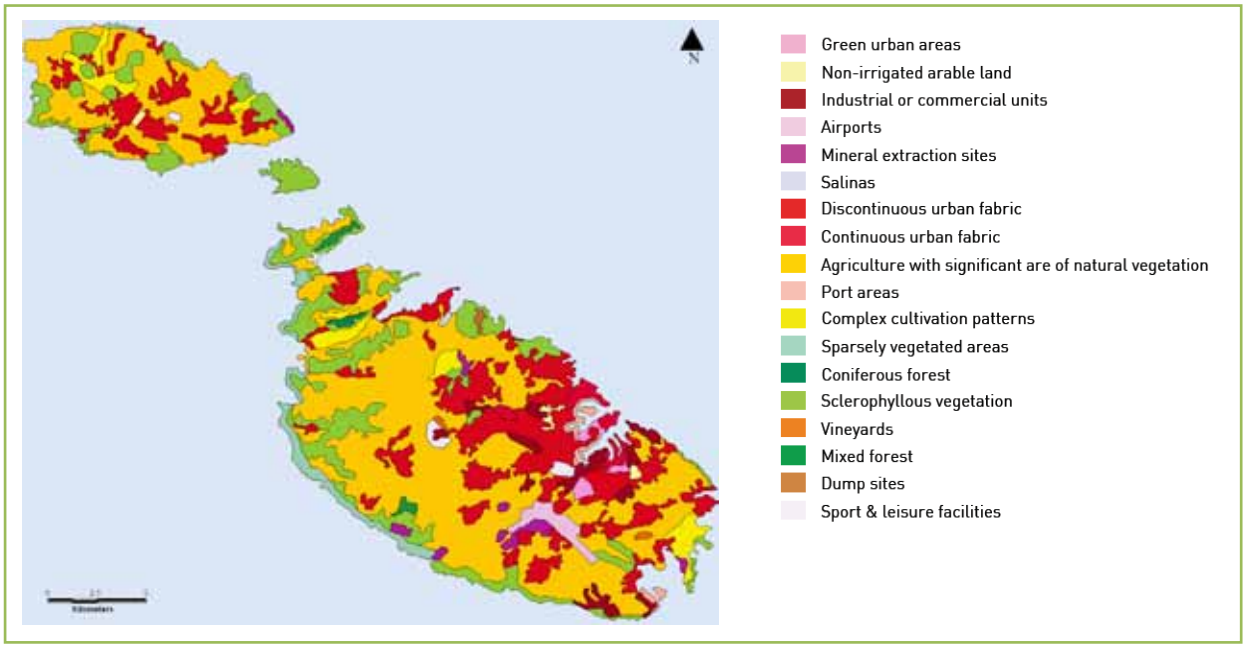

Figure 3 - CORINE Land Use Cover (Source: 2006 Data)

[1] The population size was of 413,609 persons in 2008 (NSO 2009a - Malta in Figures 2009)
[2] The SOER 2008 highlights the growing pressures Malta is facing in areas such as waste management, biodiversity protection, water management, and control of traffic emissions, as well as the ongoing pressures on land.

In Malta, freshwater essentially occurs either as surface water (flowing out from small springs or stored as temporary or permanent freshwater pools) or groundwater (stored as soil and subsurface moisture or in aquifers) (Figure 4). When compared to other Mediterranean countries, Malta has the lowest natural water resource per capita (less than 100 m^3 per year per inhabitant) and is hence considered below the extreme poverty threshold of 500 m^3 per year per inhabitant (MED-EUWI WG on Groundwater, 2007).

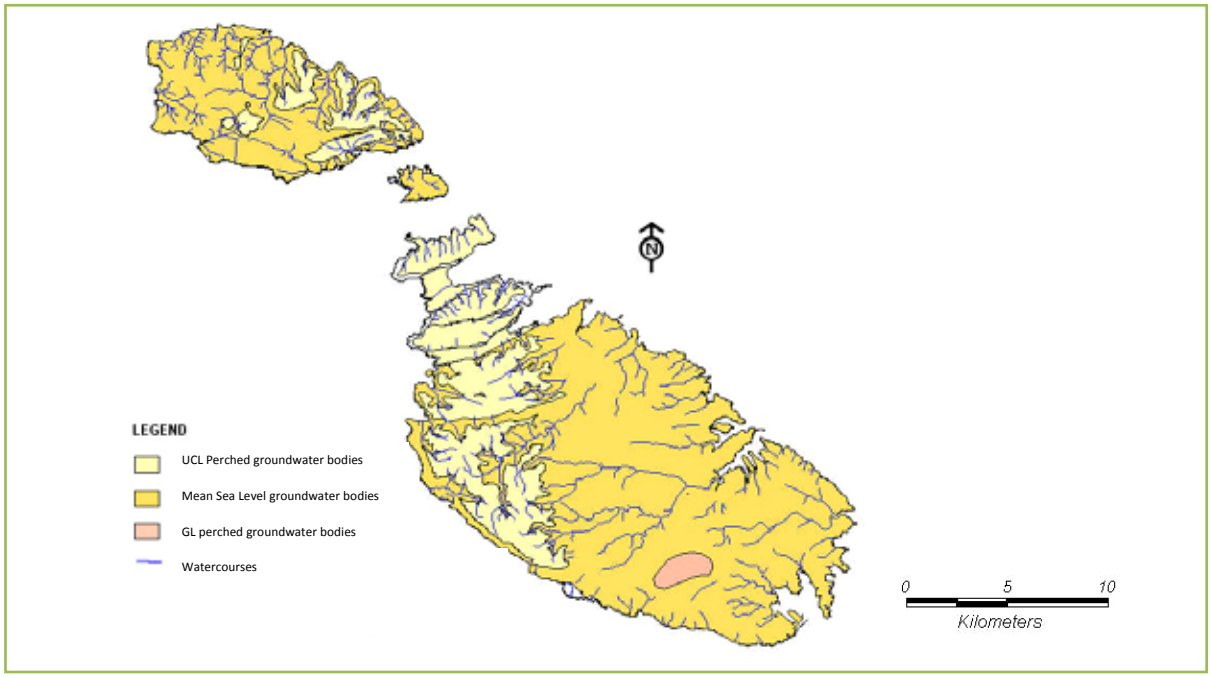

Figure 4 - Hydrogeology of the Maltese Islands (Source - EMWIS (MALTA) National Focal Point, 2001)

The geology of the Maltese Islands (Figure 5) is constituted mainly by different types of limestone deposited during the Oligo-Miocene era, with some marls and clays.

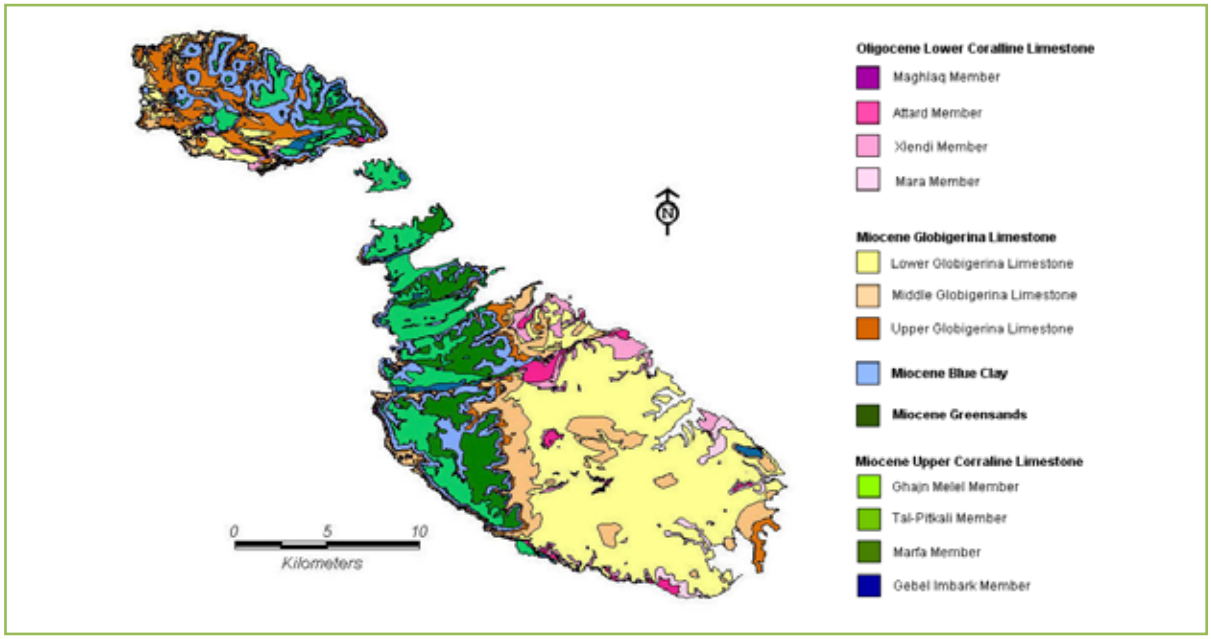

Figure 5 - Geological Map of the Maltese Islands (Source: EMWIS (MALTA) National Focal Point, 2001)

The main five types of marine sedimentary rocks (Figure 6) are layered one over another to form distinct strata, which are of varying composition and hardness. This arrangement of sedimentary rocks is known as a "stratigraphic succession". In certain areas of the sea cliffs (*e.g.* at the Rabat-Dingli Plateau) this arrangement is clearly distinct. Each stratum can vary in thickness from one location to another. Each limestone layer is also rich in fossilised organisms, the calcareous nature of which imparts Maltese soils with a pH of 7.0-8.5; soils are therefore naturally alkaline. Limestone is Malta's principal non-renewable mineral resource, whereby Globigerina Limestone (GL - softstone), is used for the manufacture of limestone blocks and other products for use in the construction industry, while Lower Coralline Limestone (LCL) and Upper Coralline Limestone (UCL) are mainly used for road construction and in the production of concrete.

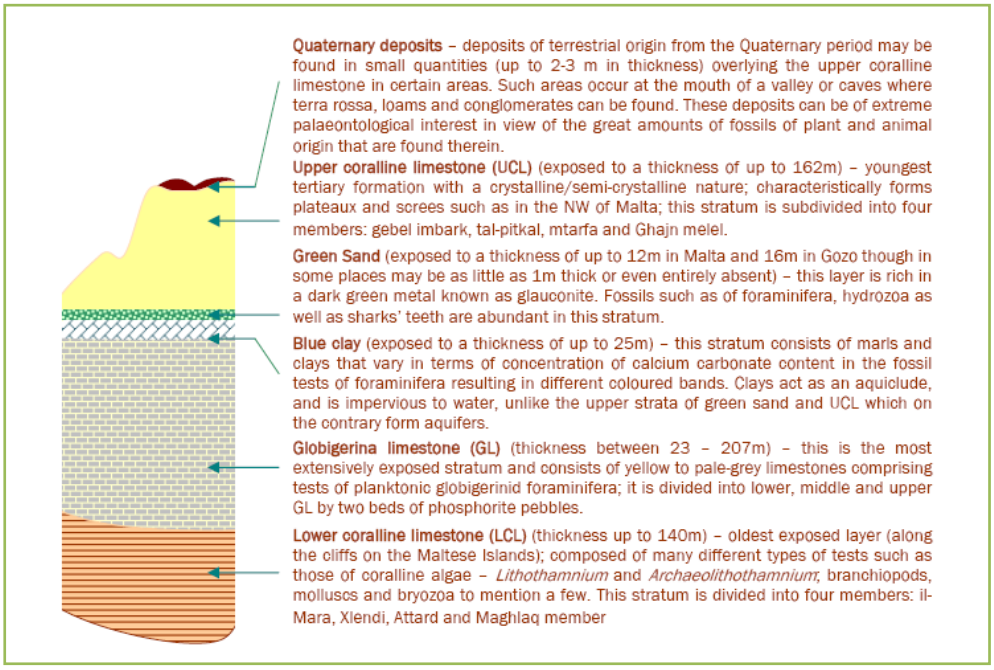

Figure 6 - Stratigraphic Succession in Malta
(Information based on EMWIS (MALTA) National Focal Point, 2001 and Schembri 1993)

The geomorphology of the islands (based on EMWIS (MALTA) National Focal Point, 2001) is characterised by a number of distinctive features, amongst which one can mention the sheer cliffs at the south west and west of the Maltese Islands (formed from UCL and LCL); coastal screes in the north west of Malta (formed where UCL overlays formations of blue clay); valley systems (characterised by steep sided valleys which serve as drainage channels and form along zones of weakness formed by fault lines); creeks and bays (formed from inundated river valleys); sloped taluses (formed by blue clay); and circular subsidence structures (solution of limestone by percolating acidified groundwater forming either dolines on land or submarine caves).

The classification of the different types of soils in the Maltese Islands (Figure 7, overleaf), following reference soil groups of the World Reference Base for Soil Resources (WRB), has been achieved via the two year LIFE III (Third countries) project which set up Malta's soil information system (MALSIS). The MALSIS grid survey has identified 19 soil units, from 7 soil reference groups (Leptosols, Arenosols, Vertisols, Calcisols, Luvisols, Regosols and Cambisols). A detailed account of Maltese soils is provided by Sammut 2005.

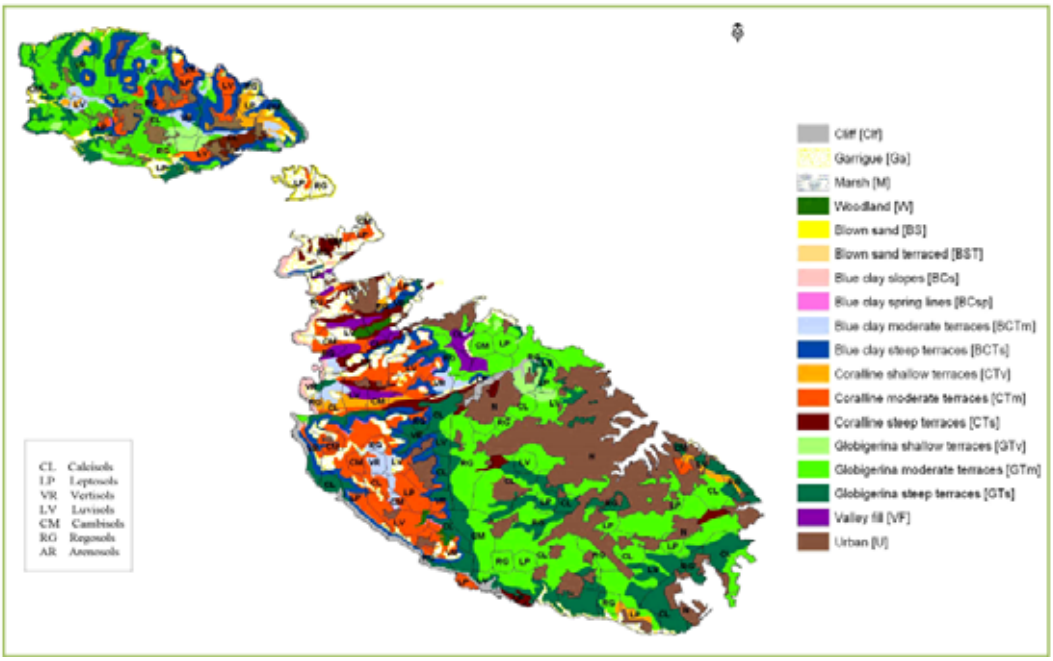

Figure 7 - Soil Types in Malta (National Soil Unit © 2005)

The interaction of the natural environment with this physical environment influences biophysical processes such as water and carbon cycles, soil fertility and climatic patterns. Before proceeding with describing Malta's natural environment, an understanding of what the term "biodiversity" means and what it encompasses is required.

1.2 What is Biodiversity?

"Biodiversity" or "biological diversity" is defined by the global treaty known as the Convention on Biological Diversity (CBD) as '*the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.*' [CBD, Article 2]. As reflected in this definition, biodiversity constitutes diversity at three levels of biological organisation (Figure 8). Biodiversity, in other words, encompasses the immense number, variety and variability of species and habitats on earth. The complex interplay between

Figure 8 - Levels of Biological Organisation

different species and their physical environment drives the functioning of the natural environment and other life supporting processes upon which human welfare and, in the end, all life on earth, depends.

The three levels of biological organisation are inter-related and inter-dependent. For instance, diversity at the genetic level within a species contributes to the resilience of that species to adapt to changes in its environment while, diversity of species contributes to the complexity, stability, functionality and health of ecosystems. Hence, it becomes apparent that an impact on/change at one level will also affect the other levels. Biodiversity should be viewed as an interconnected system, where each element in the system provides a key function or role, which also depends on, and interacts with, other elements. All elements work together to create the "web of life". Man is also part of this biodiversity.

Biodiversity also covers the intricate suite of structural, compositional and functional relationships within and between the different levels of biological organisation, including human action, and their origins and evolution in space. The abundance and composition of biodiversity in a given area (spatially) and at a certain time (temporally) is determined by a suite of factors, including:

- Mean climate and its variability;
- Intensity and interdependence of biotic interactions;
- Overall productivity;
- Resource availability and cycling;
- Species breeding modes;
- Disturbance regime plus occurrence, frequency and extent of perturbations;
- Level of heterogeneity; and
- Native stock of biodiversity and dispersal opportunities.

1.3 Components of Malta's Biodiversity

Despite its small land area, the Maltese islands and surrounding territorial waters are fairly rich in native plant and animal diversity, mostly plants and invertebrates (Figure 9), as well as habitat diversity. Malta's isolated yet central position in the Mediterranean has led to some species exhibiting elements of Western Mediterranean, Eastern Mediterranean, North African and Sicilian affinity (including circum-Sicilian islands), particularly when considering the past events of sea level changes and tectonic processes and whereby in certain instances the emergence of the Pelagian block above sea level allowed the interchange of species between Europe and Africa. This interchange of species has particularly influenced the composition of plants and animals that currently inhabit the Maltese Islands. The occurrence, geographic distribution and affinity of such species have in fact been of major interest to local ecologists in their study of the biogeography of the Maltese Islands. Isolation and long-term evolution have led to some species being strictly endemic to the Maltese Islands.

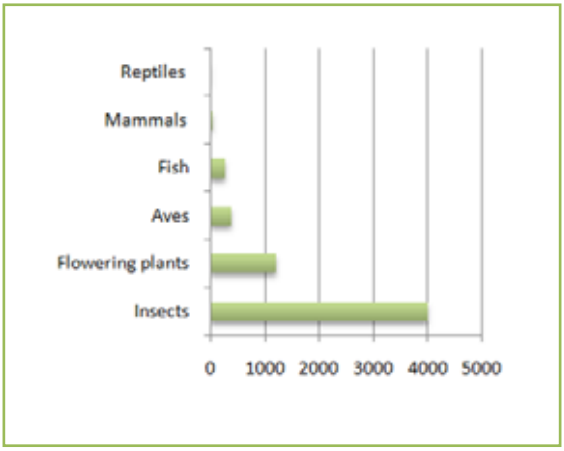

Figure 9 - Estimate Numbers of Species for Certain Groups of Taxa

Sub-endemic species also occur, and include Siculo-Maltese, Hybleo-Maltese and Pelago-Maltese endemics. An estimate of the number of endemics and sub-endemics for major taxonomic groups is given in Table 2. It must however be noted that various species are still being studied or warrant further study.

FAUNA	
Invertebrates (excluding insects)	ca. 27 endemic ca. 14 sub-endemic
Insects	ca. 51 endemic ca. 36 sub-endemic
Vertebrates	1 endemic subspecies of shrew 5 endemic subspecies of Maltese Wall Lizard
FLORA	
Fungi	ca. 134 possibly endemic
Lichens and Bryophytes	ca. 14 endemic
Flowering Plants	ca. 25 endemic

Table 2 - Number of Endemic and Sub-Endemic Species
(Many species are still under study)

Various in-depth accounts of Maltese biodiversity have been undertaken over the years and can be traced way back to the 1800s. Such research, both published and unpublished, has advanced the local knowledge of Malta's natural heritage. Considering the flora, vascular plants are the most taxonomically diverse and are also the most studied group. Malta's indigenous flora amounts to some 1,200 species of flowering plants with around 25 strict endemics (2%). The Maltese plant endemics: Maltese Rock Centaury (*Palaeocyanus crassifolius; Widnet il-Baħar*), Maltese Cliff-Orache (*Cremnophyton lanfrancoi; Bjanka ta' l-Irdum*) and Maltese Everlasting (*Helichrysum melitense; Sempreviva ta' Għawdex*) are included amongst the top 50 Mediterranean Island Plants at the brink of extinction, since they are critically endangered. They are in fact strictly protected in Malta, and are also included as "Species of European Community Importance" under legislation adopted by the European Community (*i.e.* the EC Habitats Directive). The least diverse group of flora is that of the gymnosperms and includes the national tree, the Sandarac Gum Tree (*Tetraclinis articulata*; *Siġra ta' l-Għargħar*) which belongs to the Cypress Family. Considering marine plant diversity, this is mainly represented by micro- and macro-algae (seaweeds), including a variety of taxonomic groups, such as blue-green, brown, red and green algae. Five species of seagrasses are recorded – with two species possibly extinct (Lanfranco, 1989 in the Red Data Book). When considering the diversity of fungi, thus far only the macrofungi have received most attention (Lanfranco, 1989 in the Red Data Book) with the study of microfungi still lagging behind. When considering bryophytes, some 130 species are known from the Maltese Islands.

Looking at the native fauna of the Maltese Islands, one can mention the immense diversity of insects, this being the most taxonomically represented group, with Coleoptera and Lepidoptera amounting to some 600 species for each group. New records are continually being discovered. Considering the vertebrates, while a significant number of birds and marine bony fish are present (with over 200 species for each group), the number of mammals is very limited, with less than 30 species, and mostly represented by bats and cetaceans, with large land mammals being practically inexistent nowadays. One of the reptilian species that has received most attention nationally is the Maltese Wall Lizard (*Podarcis filfolensis; Gremxula ta' Malta*), with one endemic subspecies found on the main islands of Malta, Gozo and Comino, while other endemic subspecies are confined to islets: one to Filfla, one to *Selmunett* and one to Fungus Rock; it is also possible that a further subspecies is present on the islet of Cominotto. In view of the scarcity of freshwater ecosystems in Maltese, freshwater organisms are very limited in number, with for instance only one native amphibian, the Painted Frog (*Discoglossus pictus*; *Żriġ*), and the Killifish (*Aphanius fasciatus*; *Bużaqq*). Marine fauna are then particularly diverse, with a considerable variety of annelids and molluscs. Amongst the marine fauna of the open sea of particularly

interest, one can mention the various cetaceans and marine turtles, together with a variety of sharks and rays that are encountered. Endemic marine organisms are also present, such as the Maltese Topshell (*Gibbula nivosa; Gibbula ta' Malta*)[3].

The various soil types in Malta provide a habitat and food source for many soil organisms. Important habitat types in terms of soil biodiversity include woodlands of various types. Notwithstanding the fact that soil biodiversity requires further taxonomic research, a number of soil-inhabiting species have been found in soil at 10-30cm depth, often under trees, many of which have been recently described as new species to science, and endemic to the Maltese Islands. Argillaceous soils (clay slopes) and karst soil pockets in garigue, rocky steppes and *rdum* are also important for a wide array of fauna, including threatened and endemic species such as the very rare Filfla Door Snail (*Lampedusa imitatrix; Dussies ta' l-Irdum*), the Maltese Door Snail (*Lampedusa melitensis; Dussies ta' Malta*) - a critically endangered endemic species, and the *Għar Lapsi* Top Snail (*Trochoidea gharlapsi; Żugraga ta' l-Irdum*) - a vulnerable endemic snail. Wooded areas and garigue are also important for various fungi. Many fungi live in soil and are mostly inconspicuous to the naked eye. An exception is provided during the fruiting period of the so-called macrofungi, which produce various fruiting bodies, of different forms and shapes. The soil of kamenitzae, a specialised habitat type, is also important for its biodiversity. Since this habitat is of an ephemeral nature, because of the percolating nature of coralline limestone, these pools house a transient flora and fauna which grows rapidly and is capable of reproducing in the limited time available. Such flora and fauna persist, from one cycle to another, as seeds, eggs or cysts in the shallow soil layer in the karstic structure that eventually fills with water. Important species thriving in such resting stages in the soil include: the rare Maltese Horned Pondweed (*Zannichellia melitensis; Ħarira ta' l-Ilma*), the rare Maltese Waterwort (*Elatine gussonei; Elatine*), the very rare Mediterranean Star-Fruit (*Damasonium bourgaei: Damażonju*), and the very rare Tadpole Shrimp (*Triops cancriformis; Gamblu ta' l-Elmu*), the latter being one of the oldest species inhabiting this planet. Specialised habitats, including saline marshlands, freshwater wetlands and other humid areas, and sand dunes also house important species, including many rare and endangered beetles, which depend on the soil (or its equivalent, sand, in sand dunes). A more detailed account of soil biodiversity is provided by Stevens 2005.

Information on the genetic diversity of native and endemic biological resources is limited, although it may be inferred when considering certain habitat types. For instance, looking at woodlands, native tree stands are important since they are the last remaining native genetic stocks, with certain trees being very old and hence listed as "trees of antiquarian importance" by Government Notice 269 of 1933 published under the provisions of the Antiquities (Preservation) Act (Act XI of 1925 as amended), which protects all trees older than 200 years. These include Holm Oaks estimated to be between 500 – 900 years old, with some of the oldest being the olive trees, estimated to be 2,000 years old and found in an area in *Bidnija*. The work of Borg (1922)[4] provides an extensive account of plant varieties in Malta, particularly with respect to trees.

As indicated earlier, freshwater habitats are very restricted in Malta. Hence, most of the native species reliant on water during some part of their life cycle are confined to valley watercourses, emphasising the importance of these habitats in terms of both species and genetic diversity. Added to this, is the significance of rock pools when noting the distinctive flora and highly

[3] The works of Schembri, Borg, Deidun, Knittweis & Mellado Lopez, 2007 - Is the endemic Maltese top-shell *Gibbula nivosa* extinct? – is the latest research carried out on this topshell

[4] *Cultivation and Diseases of fruit trees in the Maltese Islands* - Borg, 1922

specialised fauna that they support (see for instance Lanfranco, 1995)[5]. The genetic diversity of saline marshlands is noteworthy since each such marshland is typified by its own characteristic habitat features and species assemblages, with a number of invertebrates known only from this habitat type.

Maltese ecosystems and habitats may be simply classified as shown in Figure 10. Further details are provided in the following paragraphs. Malta's most characteristic vegetation communities are those that pertain to the "sclerophyll series". The four communities - woodland remnants, maquis, garigue and steppe - undergo a succession process in response to both natural and man-made disturbance/stress. These habitats however generally occur in a mosaic fashion, with habitat types overlapping with one another and not being clearly distinct. Moreover, various sub-types of these communities exist – for instance with regards to garigue one can mention phrygana, labiate garigues and pre-desert scrub.

Figure 10 - Types of Ecosystems and Habitats Found in the Maltese Islands

The highest expression of the series is the "evergreen wood", which has practically disappeared from Malta since the first settlers colonised the islands 7000 years ago, due to the fact that they felled trees for procuring wood (building material and to make tools), and for clearing land for agriculture, apart from having introduced grazing animals that prevented plant regeneration and re-growth. Moreover, trees were destroyed in great numbers during the Turkish invasion in the 16th century, namely, to make wood scarce for the defenders. Trees were also felled as a source of wood during both World Wars (see Lanfranco, 2000)[6]. What remains nowadays are pockets of evergreen wood remnants, generally composed of large evergreen trees such as Holm Oak (*Quercus ilex; Siġra tal-Ballut*) and Aleppo Pine (*Pinus halepensis; Siġra taż-Żnuber*). The various microclimates and shelter available to species inhabiting this habitat type, means that such species are unique to this habitat. *Buskett* qualifies as the only locality which can be said to represent "mature woodland" in the Maltese Islands.

[5] Lanfranco S. - Temporary rainwater rockpools as repositories of biological diversity in the Maltese Islands - Presented at BIO'MES 95 scientific symposium; 7eme Rencontres de L'A.R.P.E.; Digne-les-Bains, France (in press). October 1995.
[6] *Is-Siġar f'Malta: l-użu, l-impatt u l-pajsaġġ* – Lanfranco, 2000.

The second stage is the "maquis", dominated by a variety of small trees and large shrubs, including trees introduced in antiquity in view of their usefulness. A particularly interesting maquis community is that dominated by Sandarac Gum Tree (*Tetraclinis articulata; Siġra ta' l-Għargħar*), once a widespread species but now being rare in the natural environment. Maquis also comprises a rich undergrowth of large herbs and lianas. The structural complexity of this habitat supports a diverse biota and hence various niches are formed. The third stage is the "garigue", a community of aromatic woody shrubs that typically forms on karstic substrate particularly on large expanses of limestone with shallow pockets of soil and rock fissures, in exposed areas. Garigue also harbours a rich diversity of herbaceous plants, while serving as a home to around 500 species of flowering plants. This habitat also supports many rare plants including orchids and irises. The fourth stage is the "steppe", which supports a high diversity of herbaceous plants but lacks woody species. It is in fact represented by grasses, thistles, umbellifers and geophytes and is characterised by a uniform layer of soil which is low in nutrients. Steppe is the pioneering stage, but can also derive from maquis and garigue as a result of some form of degradation or disturbance, such as due to fire or livestock grazing. Grasslands are important for many invertebrates and also serve as nesting sites for certain bird species.

Apart from the sclerophyll series, other significant terrestrial ecosystems include freshwater and coastal ones, mostly being represented by minor, yet more specialised habitat types, some of which have suffered extensive range contraction over the years. Such ecosystems are considered to be crucial from a conservation and ecological point of view, when considering the important native communities they support, while also playing important functions.

Freshwater wetlands are particularly vulnerable ecosystems in Malta as in other parts of the world. They include valley watercourses, permanent ponds and springs, and temporary rainwater rockpools. Watercourses are the commonest type of freshwater habitat on the islands, albeit restricted in range. While being one of the most species-rich habitats, watercourses are also intensively exploited. Some of the plants that colonise this habitat are rare on a national scale. In general, the greater part of local flora and fauna reliant on water during some part of their lifecycle are found in valley watercourses, where water flow is normally limited to the wet season. Certain valleys however drain springs originating from the perched aquifers and hence retain some surface water even during the dry season. The few remaining permanent springs support unique and rare species, such as the endemic subspecies of the Mediterranean Freshwater Crab (*Potamon fluviatile lanfrancoi; Qabru*). These springs are of great local interest since they represent the only natural standing water bodies in the islands. Rockpools, which are pools in karstic limestone depressions that originate as a result of flowing water, and, which collect freshwater in the wet season, support a number of rare species specialised to this habitat.

In view of the relatively small size of the Maltese archipelago, the entire land area is considered to be essentially "coastal". Indeed, all habitat types are under some degree of maritime influence. Coastal ecosystems *per se*, include transitional coastal wetlands, saline marshlands, sand dunes, rupestral/cliff habitats and rocky shores, amongst others. Saline marshlands are very scarce in Malta, with only a few extant noteworthy marshes in terms of conservation value, the largest being *L-Għadira* (Malta), and few other sites which are highly degraded. Biota that inhabit marshlands have become specialised to withstanding harsh environmental conditions that predominate. They have done this through changes in behaviour and physiology and hence are considered as "habitat specialists" confined to this type of habitat. For instance, a number of invertebrates are only known from this habitat type. Species found in local marshlands include for instance Sharp Rush (*Juncus acutus; Simar Niġġież*), Sea Rush (*Juncus maritimus; Simar tal-Baħar*), Sea Clubrush (*Bolboschoenus maritimus; Simar tal-Baħar*) and Common Reed (*Phragmites australis;*

Qasbet ir-Riħ), amongst others. Different species assemblages colonise transitional coastal wetlands during different periods of the year. For instance, during the dry period, conditions favour brackish water species since water reaching these depressions is seawater carried by wind and wave action. Coastal wetlands in Malta are important as stop-over sites for migratory avifauna. Transitional coastal wetlands are then represented by only a few, minor examples.

Over the years, many sand dunes have been lost and, nowadays, this habitat type is extremely restricted in the Maltese Islands. Presently there are only few that still persist and are amongst the rarest and most threatened of local ecosystems. The dune system at *Ir-Ramla* (Gozo) is the largest and most representative in the Maltese Islands and has suffered the least alteration by man. The dune system is characterised by the embryo dune (the most seaward zone of the dune where perennial plants are first encountered), followed by the mobile dune. The latter is characterised by the following sequence of sub-zones: a low dune (sparsely vegetated by plants such as Sand Couch [*Elytrigia juncea; Sikrana tar-Ramel*] and Sea Holly [*Eryngium maritimum; Xewk tar-Ramel*]); a semi-consolidated dune (characterised by Carnation Spurge [*Euphorbia terracina; Tengħud tax-Xtut*], Sea Daffodil [*Pancratium maritimum; Pankrazju*] and Spiny Echinophore [*Echinophora spinosa; Busbies Xewwieki tar-Ramel*]), and a fixed dune (vegetated with a dense thicket of salt tolerant shrubs such as Sand Restharrow [*Ononis natrix* subsp. *ramosissima; Broxka ta' Għawdex*). Maltese sand dunes also have characteristic invertebrate fauna namely nematodes, annelids, several insects, amphipods, and isopods.

Rupestral communities are both of national and international importance. Maltese sheer seaside cliffs and screes can reach up to 250 metres in altitude and are composed of coralline limestone, with calcareous soils. They extend along the south-west coast of the main islands and are an important natural habitat since they harbour a variety of interesting species, including endemic plants, with Maltese Everlasting (*Helichrysum melitense; Sempreviva ta' Għawdex*) being solely restricted to the western cliffs of Gozo, and found nowhere else in the world. Cliffs also support interesting fauna, including one of the rarest animals found in Malta – the endemic Maltese Door-Snail (*Lampedusa melitensis; Dussies ta' Malta*), which is restricted to crevices and cavities in boulders that have detached from cliff edges. Coastal cliffs are also noteworthy since they provide shelter and a breeding habitat for many bird species, including seabirds, such as Cory's Shearwater (*Calonectris diomedea; Ċiefa*); Yelkouan Shearwater (*Puffinus yelkouan; Garnija*) and European Storm-Petrel (*Hydrobates pelagicus melitensis; Kanġu ta' Filfla*). When compared to other terrestrial habitats, cliff communities have suffered moderate anthropogenic effects, and various areas have been relatively untouched by man and these serve as particularly important refugia for endangered and rare species, including endemic ones. Indeed, coastal cliffs immensely contribute to the natural heritage of the Maltese Islands, and are deemed of high priority for protection and conservation. In contrast to the cliffs, the low-lying rocky coasts, most typical of eastern past of Malta, are colonised by halophytic vegetation, which grows in isolated patches in shallow saline soil which accumulates in rock pockets, with the species mainly forming the vegetational community referred to as *Crithmo-Limonietea,* which also include a number of endemic species.

The coastal-marine area is divided into a zonation system[7] where each zone is characterised by more or less homogenous environment conditions and which are separated from adjacent zones by environmental discontinuities. These four zones are the Supralittoral, the Mediolittoral, the Infralittoral and the Circalittoral zone. The Supralittoral zone (*i.e.* the upper 4 to 5 metres) is never submerged but is rather influenced by wave splash and sea spray. It is subdivided into hard and

[7] Noveau manuel de bionomie benthique de la Mediterranee, Pérès, J.M. & Picard, J., 1964

soft substrata. The soft substratum is either of the slow-drying form (with the most common type being *Posidonia* banquettes), or, the rapidly drying form (consists of sand and burrowing animals. On the other hand, the hard substratum is mainly composed of rocky shores mainly resulting from the erosion of bedrock brought about by the pounding of sea waves. This zone is characterised by species such as the Small Periwinkle (*Melarhaphe neritoides; Żibġet il-Blat*) on rocky shores and the Sandhopper (*Talitarus saltator; Bergħud tar-Ramel*) in sandy shore habitats.

The mediolittoral may extend from 10 to 150 cm (very rarely 200 cm - depending on the degree of exposure) and undergoes periodic emergence and submergence by wave action. Organisms colonising this zone are characterised by vertical zonation that can tolerate regular immersion in seawater but not continuous submersions, allowing the distinction between the upper, middle and lower zones. The most evident organisms colonising the upper mediolittoral, which is exposed for far longer periods than the lower mediolittoral, are species of barnacles and limpets. The medium and lower mediolittoral, typically support vermetid and coralline algal "*Trottoirs*" also known as "Rims". A "*Trottoir*" may either be an encrustation of shells of the vermetid snail (*Dendropoma petraeum; Bebbuxu tal-Blat*), which are embedded in encrustations of the calcareous coralline red alga, or, a formation of Stone Weed (*Lithophyllum lichenoides; Litofillum*) which it typical of the Western Mediterranean. The fringe between the lower mediolittoral and upper Infralittoral is marked in exposed shores, by a belt of *Cystoseira* species, particularly Rainbow Bladder-weed (*Cystoseira amentacea; Ċistosejra Kaħla*) and Flat Bladder-weed (*Cystoseira compressa; Ċistosejra tal-Friegħi Ċatti*). The lower Mediolittoral is mainly dominated by sea grasses particularly the Neptune Grass (*Posidonia oceanica; Posidonja or Alka*), which is endemic to the Mediterranean and the Lesser Neptune Grass (*Cymodocea nodosa; Ċimodoċja* or *Alka Rqiqa*). Seagrass meadows, and communities based on *Cystoseira* species, are possibly the most important natural habitat in Maltese waters in terms of productivity since they provide shelter as well as breeding and feeding grounds for numerous marine species.

Extending from the lower limit of the Mediolittoral, one will find the Infralittoral zone, which is never or seldom exposed down to the lowest limit, where seagrasses and photophilic (light-loving) algae can live. The lower limit of this zone, on average, lies at circa 50m depth in clear seas. This zone is characterised by various hard and soft substrata, hosting a variety of habitats ranging from brown algae such *Cystoseira* species and Common Sargasso-weed (*Sargassum vulgare*; *Sargassu Komuni*) in the upper Infralittoral. A multitude of microhabitats occurs within these algal beds, supporting rich species diversity. Algal beds provide habitats for a large number of invertebrates and fish.

The Circalittoral zone extends from the lower limit of the Infralittoral down to the maximum depth where multicellular photosynthetic forms can survive; in practice this is about 200 m with light intensity being very low at such depths. On hard substrata, the Circalittoral is dominated by attached forms, such as encrusting algae, tubeworms, bryozoans, sponges and corals. The most characteristic communities in the Circalittoral are those consisting of coralline algae formations. These may either form massive reefs composed of accretions of encrusting calcareous algae or mäerl composed of nodules of free-living calcareous algae. Mäerl communities (beds) consist of loose lying, living or dead coralline red algae (*Lithothamnion corallinoides*, *L. minervae* and *Phymatholithon calcaraem*). When considering the marine environment, one can mention the different macrobenthic assemblages that are found around the Maltese Islands and include communities of photophilic algae on hard substrata; meadows of Neptune Grass (*Posidonia oceanica; Alka*); meadows of Lesser Neptune Grass (*Cymodocea nodosa; Alka Rqiqa*), photophilic and sciaphilic communities; communities of bare, well-sorted sand, and mäerl communities.

Man-made habitats, shaped by various actions and activities brought about by man since the time the first settlers set foot on the islands, also characterise the Maltese landscape, with agricultural land predominating in cover and accounting for just over half (51%) of total land area. Agroecosystems are shaped by the different farming practices employed: dry farmed land (Maltese: *Raba' bagħli*) or irrigated land (Maltese: *Raba' saqwi*). Agroecosystems are supported by organisms that are important in nutrient cycling, pest and disease regulation, pollination, soil and water conservation, and maintenance of soil fertility. In turn, agriculture has played an important role in moulding the rural environment via a patchwork of terraced cultivated and fallow fields. The traditionally built stone rubble walls which delineate land parcels, serve as important ecological corridors for organisms such as the Moorish Gecko (*Tarentola mauritanica; Wiżgħa tal-Kampanja*), Ocellated Skink (*Chalcides ocellatus; Xaħmet l-Art*) and Western Whip Snake (*Heirophis viridiflavus; Serp Iswed*), together with species such as shrews. They also serve as a refuge for insects and terrestrial molluscs, amongst others. Rubble walls, as stabilising structures, are in turn also important for soil conservation. Agricultural land provides a food supply for insectivorous birds that breed in the Maltese Islands, like the Sardinian Warbler (*Sylvia melanocephala; Buffula Sewda*), Spectacled Warbler (*Sylvia conspicillata; Bufula Ħamra*), Corn Bunting (*Emberiza calandra; Durrajsa*), and Short-Toed Lark (*Calandrella brachydactyla; Bilbla*). Very rare plant species are also encountered in fallow fields such as Wild Tulip (*Tulipa sylvestris; Tulipan Selvaġġ*).

The urban fabric, which covers approximately 22.3% of land area, is also important for certain species that have managed to adapt to living alongside man and make use of man-made structures as refuges. These include various species of birds such as the Spanish Sparrow (*Passer hispaniolensis; Għasfur tal-Bejt*), various invertebrates such as the House Centipede (*Scutigera coleoptrata; Xini ta' l-Indewwa*) and various reptiles, amongst which are the Turkish Gecko (*Hemidactylus turcicus*; Wiżgħa tad-Djar), Leopard Snake (*Elaphe situla; Lifgħa*) and the Maltese Wall Lizard (*Podarcis filfolensis; Gremxula ta' Malta*). Other species that are encountered within urban environments include the House Mouse (*Mus musculus; Ġurdien ta' l-Imramma*), shrews, and bats, with the latter roosting in old and abandoned dwellings and bastions. Biodiversity is hence not only confined to natural areas but is also found in areas managed by man.

1.4 Why does Biodiversity matter?

> Currently, we lose biodiversity each year that would have produced Ecosystem Services worth around 50 billion Euros per year, in every subsequent year. ... By 2010, the loss 'grows to' 545 billion EUR in that year compared to 2000, for the land based ecosystems alone. This is just under 1% of world GDP in 2010.
>
> The Cost of Policy Inaction - The case of not meeting the 2010 biodiversity target
> COPI Study - Executive Summary
> Braat & ten Brink, (eds.) 2008

Biodiversity forms the basis of the multiple benefits provided to people for their day-to-day comfort, well-being, health and security. These benefits are known as "ecosystems services" and are described according to four categories (Figure 11, overleaf). Biodiversity maintains conditions that are essential for the existence of human life on Earth. Indeed the myriad species of flora and fauna that inhabit the Maltese Islands interact with biotic (living) and abiotic (non-living) factors to form inexorably complex communities that play an important role in ecosystem functioning and in the associated ecological services that are indispensable for supporting the Maltese community and for national economic growth.

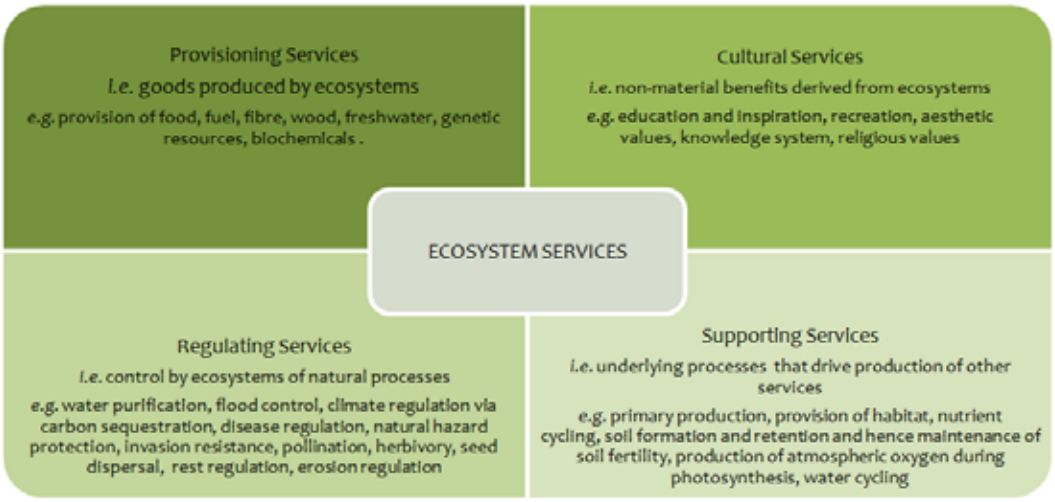

Figure 11 – Types of Ecosystem Services
(Adapted from Millennium Ecosystem Assessment, 2005 - Ecosystems and Human Well-being: Biodiversity Synthesis)

For instance, the following communities are associated with particular services:

- Woodland remnants are important for air quality in terms of carbon sequestration and oxygen production; soil stabilisation; in the water cycle (evapotranspiration); shelter provided by the canopy; amenity and recreational value;
- Maquis includes trees which were introduced in antiquity in view of their usefulness; carob and olive trees are still exploited for the making of carob julep/syrup and olive oil;
- Garigue is an important habitat for many aromatic shrubs that are used as herbs such as rosemary (*Rosmarinus offinalis; Klin*) while other species have even been associated with medicinal properties such as the Maltese savory (*Satureja microphylla; Sgħatarija*); the thyme component (*Thymus capitatus; Sagħtar*) of this habitat is important in honey production as it is a foraging species for the honey bee;
- Steppic grasslands are important for grazing although this is not that much practised anymore in Malta;
- Valley watercourses are a very important ecosystem in view of the availability of water; important also for drying higher ground during the rainy season and hence in preventing floods;
- Saline marshlands act as a water catchment area and are important for coastal protection. Reed beds that colonise this habitat are also important in filtering pollutants apart from creating a refuge for certain rare species, such as the freshwater crab (*Potamon fluviatile lanfrancoi; Qabru*);
- Sand dunes are important in the prevention of beach erosion;
- Soil biota are essential in nutrient cycling (by decomposers) and in the maintenance of soil fertility, which in itself is important for agriculture productivity;
- Certain species play a particularly important role (and hence are termed "keystone species") such as insect pollinators of plants, including crops, and hence are crucial for food security;
- As a natural resource, soil provides a number of important functions in the context of ecosystem processes such as providing a growth and support medium for plants; storing carbon and water; buffering of ions and water purification, as well as the breakdown and cycling of organic matter and the nutrient supply to soil biota. Such functions contribute to soil quality and the health of ecosystems and form a basis for land and agricultural productivity and viability.

These services are also important for national development in terms of seeking ways to improve human well-being such as through safeguarding health, protecting against natural hazards, providing freshwater, adapting to climate change and maintaining agricultural productivity and food security. It must however be noted that ecosystem services are strongly determined by land use, soil properties and specific environmental conditions, which can all be altered by man.

The importance of Maltese biodiversity has been echoed in various works, with authors expressing the need to safeguard our natural heritage. Ecosystem services, such as provision of food and raw materials, freshwater and clean air, are all indispensable life-support services, even though this might not be immediately apparent to members of society. The maintenance of biodiversity is of utmost importance, and it is the responsibility of the Maltese population to ensure the conservation and sustainable use of biodiversity components. It is deemed imperative to ensure this for both present and future generations. Moreover the importance of Maltese biodiversity is not only confined to our national boundaries. For instance, certain native species that are found in the Maltese Islands are also important at a regional and international. The reason is that while certain species may be locally relatively common, they may on the other hand, be endangered on a European scale or have a restricted Mediterranean distribution. For instance, Filfla supports one of the largest breeding colonies of the European Storm-petrel (*Hydrobates pelagicus melitensis; Kanġu ta' Filfla*) in the Mediterranean. Some taxa with a restricted distribution were also first described from Maltese material, and for these the Maltese Islands are the "type locality". Without a doubt, apart from the intrinsic importance of endemic species, such species contribute a great deal to the uniqueness of Malta's natural heritage.

Apart from this inherent value, other forms of value include: aesthetic/scenic (*e.g.* observing wildlife and bird watching), recreational (*e.g.* natural areas are sought by families during weekends following a hectic week), educational, scientific (*e.g.* noting that various species are of particular evolutionary and biogeographical interest in a small island State), ecological (*e.g.* biodiversity plays a vital ecological role that is translated in various ecosystem services), cultural (*e.g.* Maltese endemics contribute a degree of uniqueness to the Maltese natural environment and its identity), and socio-economic (sectors like agriculture, fisheries and tourism, are ultimately dependent on biodiversity). The use of local biological resources also brings various other benefits to the Maltese community and also the local economy (recreation and tourism). Use of local biological resources (for food, medicinal products) provides the country with a degree of self-sufficiency and minimises the reliance on the importation of foreign produce and resources thereby minimising the risk of introduction of alien species and harmful pests, which can lead to devastating effects on agriculture, horticulture, and not to mention natural ecosystems. Local produce can also have an important place in niche markets.

Malta's State of the Environment Report for 2008, mentions as one of its key messages that: '*The environment is a crucial contributor to the Maltese economy: it is directly used to produce around one-fifth of employment and one-sixth of value added, while also providing amenities for recreation, residence and location of economic activity and absorbing the by-products of production and consumption*' (Relationships between the natural environment and economic activity Sub-report). On a national level however the value of biodiversity and ecosystem services has not yet been fully explored. Apart from noting the intrinsic value of biodiversity and other values, it is fundamental to acknowledge the economic value of biodiversity. The total economic value (TEV) of biodiversity has been widely used as a framework for describing the value of natural resources in terms of use values, non-use values including option values. Various valuation methods[8] in fact have been designed to attempt to elucidate and ascribe such economic value to components of biodiversity that are seen as "public goods" (*i.e.* those which are freely available with no markets or prices) and also ecosystem services. Efforts to find ways of how to internalise environmental costs and remove market distortions, as well as create appropriate incentive measures and informed policy initiatives to drive forth biodiversity conservation and sustainable use are also

[8] It is beyond the scope of this document to describe valuation tools however the reader is referred to the following publication for further information: An Exploration of tools and Methodologies for Valuation of Biodiversity and Biodiversity Resources and Functions - Secretariat of the Convention on Biological Diversity, 2007;

indispensable. Proper valuation of ecosystem services can help in for instance giving arguments for conservation when alternative land uses are planned, showing that certain ecosystems can provide services in a more cost-effective way than man-made infrastructure (cost-benefit analysis) and hence enable to get financial sources for ecosystem rehabilitation or conservation.

The strong economic rationale for conserving biodiversity is demonstrated by The Economics of Ecosystems and Biodiversity (TEEB), a major international study, which has reviewed the current state of the science and economics of ecosystems and biodiversity, with the aim of mainstreaming the economics of ecosystems and biodiversity. According to the TEEB study, the annual loss of ecosystem services under a business-as-usual scenario is estimated to be equivalent to around €50 billion, while by 2050 the accumulated welfare losses could be equivalent to 7% of annual consumption – hence, inaction represents an unbearable financial cost. The role of biodiversity in addressing the current economic crisis has also been acknowledged for instance by the "Message from Athens" and by the "Carta di Siracusa" on Biodiversity. Investments in biodiversity should be promoted as part of efforts to "green the economy" and to fully exploit the potential that biodiversity restoration and conservation offers in terms of job creation. Market mechanisms that take biodiversity concerns into account should also be encouraged (*e.g.* Green Procurement). Humans play an important role in maintaining the web of life because the action of each and every individual in society can influence, whether negatively or positively, the fate of biodiversity. Consumer choices and national policies can also mould the future of biodiversity.

1.5 Malta's Biodiversity - Status and Trends

Knowledge of the conservation status of a species, and its habitat(s), is required in order to identify and assess which species are threatened with extinction and hence which species warrant legal protection and conservation. Appraisals of the conservation status of species of the Maltese Islands have been carried out intermittently since the 1970s, but the first official detailed assessment was made in 1989 with the publication of the 'Red Data Book for the Maltese Islands'. This included a red list of native and endemic flora and fauna, and identified at the time those species considered to be rare, endangered, vulnerable, and/or having a restricted distribution. Scientific research by Maltese and foreign biologists and ecologists has been invaluable in the study of Maltese biodiversity with the result of numerous published and unpublished works throughout the years. These all in all, do contribute towards a working list (rather than a definitive list), albeit fragmentary, of the flora and fauna of the Maltese Islands. A widely accessible and complete list of the Maltese flora and fauna is yet to be compiled and published. Work is ongoing on the setting up of a National Database on Biodiversity, which will incorporate updated red lists for selected species. The State of the Environment Reporting Process has also adopted as one of its indicators, the indicator "Status of Selected Groups of Species" for the years 2005 (Table 3, overleaf) and 2006. The findings of such qualitative reviews highlight that many rare and indigenous species, including endemic species, remain threatened. Native species that are considered critically endangered include the Sicilian shrew (*Crocidura sicula calypso; Bugeddum ta' Għawdex*), Fungus Rock wall lizard (*Podarcis filfolensis generalensis*), and St. Paul's Island wall lizard (*Podarcis filfolensis kieselbachi*). Those species assigned an endangered status are the Grey Long Eared Bat (*Plecotus austriacus; Farfett il-Lejl Widnejh Kbar*), Filfola wall lizard (*Podarcis filfolensis filfolensis*), and the Painted Frog (*Discoglossus pictus pictus; Żrinġ*). For a majority of species data still remains deficient as in the case of the weasel (*Mustela nivalis; Ballotra*), snakes, and marine turtles. Certain species of plants and animals have become locally extirpated such as the Mediterranean Fan Palm (*Chamaerops humulis; Ġummar*). Other species may possibly face a similar fate unless action is taken to counteract such loss.

PLANTS Significant reduction in species diversity since early 1980s, particularly in sand dunes, freshwater wetlands and saline marshlands. Some species possibly extinct while others vulnerable or endangered, mainly through habitat loss or modification. The endemic Maltese Everlasting is now found only in Gozo. Increased species diversity is observed in disturbed habitats, possibly due to invasions by alien species that threaten native flora, including endemics.	MAMMALS Variable trends and information available. Bats are generally declining. The Algerian hedgehog seems stable, although the impact of vehicles needs more detailed assessment. Rats are increasing, particularly in urban areas, disturbed habitats and smaller islands, to the detriment of flora and fauna. Wild rabbit populations increasing in some areas, particularly Comino, which may negatively affect the regeneration of native plants and animals. Status of marine mammals is unknown.
FUNGI Many species are confined to few areas, particularly forest remnants and selected garigue sites, of which a good number are protected. Increased human disturbance in key areas leading to possible decline.	FISHERIES Mediterranean dolphin fish stocks appear unaffected by fishing pressure so far. Stocks of tuna and swordfish apparently diminishing. Large pelagic species account for over 60% of annual value of landings – these are heavily dependent on international management efforts. Fishing activities or effort distribution in the 25 mile Fisheries Management Zone should not be increased to ensure their sustainability and safeguard fish "refugia".
INVERTEBRATES Studies of a few well-known groups such as insects (*e.g.* butterflies) indicate general decline. Molluscs also declining in particular habitats, especially water-associated species, and some endemics threatened by human-associated disturbance and development.	BIRDS 33 bird species breed in Malta, of which some 20 retain constant numbers. Recent increases in breeding pairs for the Tree Sparrow are noted, while Corn Bunting numbers continue to decrease drastically. Spectacled Warbler still breeding in very low numbers but seems to be spreading slowly in Gozo. Most breeding in protected areas (*Buskett* and *Simar* sanctuary), where Moorhens, Little Ringed Plovers and Reed Warblers increased recently. Reed Warbler breeding records increased from 1 (at *Salina*) in 1995 to 8 (at *Simar*) in 2004.
AMPHIBIANS & REPTILES Populations overall appear stable, although many species still vulnerable and/or subject to illegal exploitation. Despite lack of detailed assessment, endemic wall lizard populations appear stable, with the possible exception of those at *Selmunett*. Some snake populations appear to be increasing. Although marine turtles accidentally captured or injured are now being rehabilitated, their status needs assessment.	
Sources: MEPA, Malta Centre for Fisheries Science, M. Gauci/Birdlife Malta, Coleiro 2002, Coleiro 2003, Bertrand *et al* 2000, Camilleri 2002, Camilleri 2005, MaLiRa Group 2004, Mosteiro and Camilleri 2005, MEPA Nature Protection Unit 2005	

Table 3 - Trends of Selected Groups of Species (Source: 2005 SOER)

Native trees in the Maltese Islands form the following communities: Mediterranean sclerophyllous woodlands and maquis; dry valley-bed woodlands; riparian woodlands; coastal maritime woodlands; and semi-natural woodlands. Despite the small size of the islands, the diversity of Maltese trees amounts to about 60 species. An assessment carried out in 2008 by MEPA reveals that 11% of Maltese trees are already extinct from the wild, while two-thirds (66%) of Maltese trees are rare and/or threatened. The remaining 23% are frequent species.

More recent reviews of the status of breeding birds are presented by the 2007 State of the Environment Indicator "B2 – Status of Breeding Birds", by the 2008 State of the Environment Report and the Malta Breeding Bird Atlas 2008, which provides a review of 32 species. Examples of threatened bird species include *inter alia* the national bird - Blue Rock Thrush (*Monticola solitarius; Merill*) - which has declined in the last 20 years. 'The status of migratory birds may be considered as threatened due to illegal hunting' (SOER 2008). Several bird species including the

Peregrine Falcon (*Falco peregrinus; Bies*), Barn Owl (*Tyto alba; Barbaġann*) and Eurasian Jackdaw (*Corvus monedula*) have become locally extirpated. 34 bird species were recorded as either confirmed or probably breeding Malta in 2008, along with a further 3 introduced species. Recent increases in breeding success rates for Yelkouan Shearwater (*Puffinus yelkouan; Garnija*) at their main colony at *Rdum tal-Madonna* are noted. On the other hand, numbers of Corn Bunting (*Emberiza calandra; Durrajsa*) continue to decrease drastically. Spectacled Warbler (*Sylvia conspicillata; Bufula Ħamra*) still breeds in lower numbers than historically known, but appears to be increasing again in Gozo. Many of the rarer species breed in protected areas (such as *Buskett* Bird Sanctuary and *l-Għadira* and *is-Simar* Nature Reserves), where species such as Little Grebe (*Tachybaptus ruficollis*), Little Ringed Plover (*Charadrius dubius; Monakella*) and Reed Warbler (*Acrocephalus scirpaceus; Bagħal tal-Qasab*) retain their only Maltese breeding populations. Reed Warbler breeding records increased from 1 (at *Salina*) in 1995 to 8 (at *Simar*) in 2004. In 2009, the first pairs of Common Kestrel (*Falco tinnunulus; Spanjulett*) were confirmed breeding after an absence of 15 years. In that year, Pallid Swifts (*Apus pallidus*) bred for the first time, while the Grey Wagtail (*Motacilla cinerea; Zakak tad-Dell*) returned after an absence of 150 years, and two species of finch were confirmed breeding, that is, Common Chaffinch (*Fringilla coelebs; Sponsun*) and Linnet (*Carduelis cannabina*; *Ġojjin*). The status of birds also seems to be improving as recently highlighted in the 2009 Rare Breeding Bird Report issued by BirdLife Malta. This report notes that almost half of all rare breeding species are increasing their distribution and several rare species are breeding on the islands for the first time in many years.

Looking at habitat trends, although garigue is one of the most common vegetation communities in the Maltese Islands it is declining due to land conversion. Specialised habitats, such as valley watercourses and sand dunes, have suffered extensive range constriction over the years due to habitat loss, modification and deterioration.

Habitats and species of European Community Interest covered by the EC Habitats Directive[9] (Council Directive 92/43/EEC) and which are found in the Maltese territory have been assessed as part of Article 17 Reporting obligations. Malta's Report was submitted to the European Commission in 2008 and a national summary has also been published. This assessment took into consideration 55 species and also resulted in the preparation of 31 datasheets on habitats: 26 terrestrial and 5 marine. Such assessment serves as baseline for monitoring trends in the conservation status of species and habitat in future years.

Figure 12, overleaf shows the conservation status of species and habitats, respectively, of European Community interest that are found in the Maltese Islands. The status of 29% of Maltese habitats and 36% of Maltese species listed in the Habitats Directive is still unknown. In addition, 64% of habitats and 44% of species have an inadequate or bad conservation status. There is now the need to extend a similar assessment to those species and habitats that are not covered by the EC Habitats Directive, that is, to those of national importance.

[9] The Habitats Directive covers approximately 1 180 species and 231 habitats of special European concern.

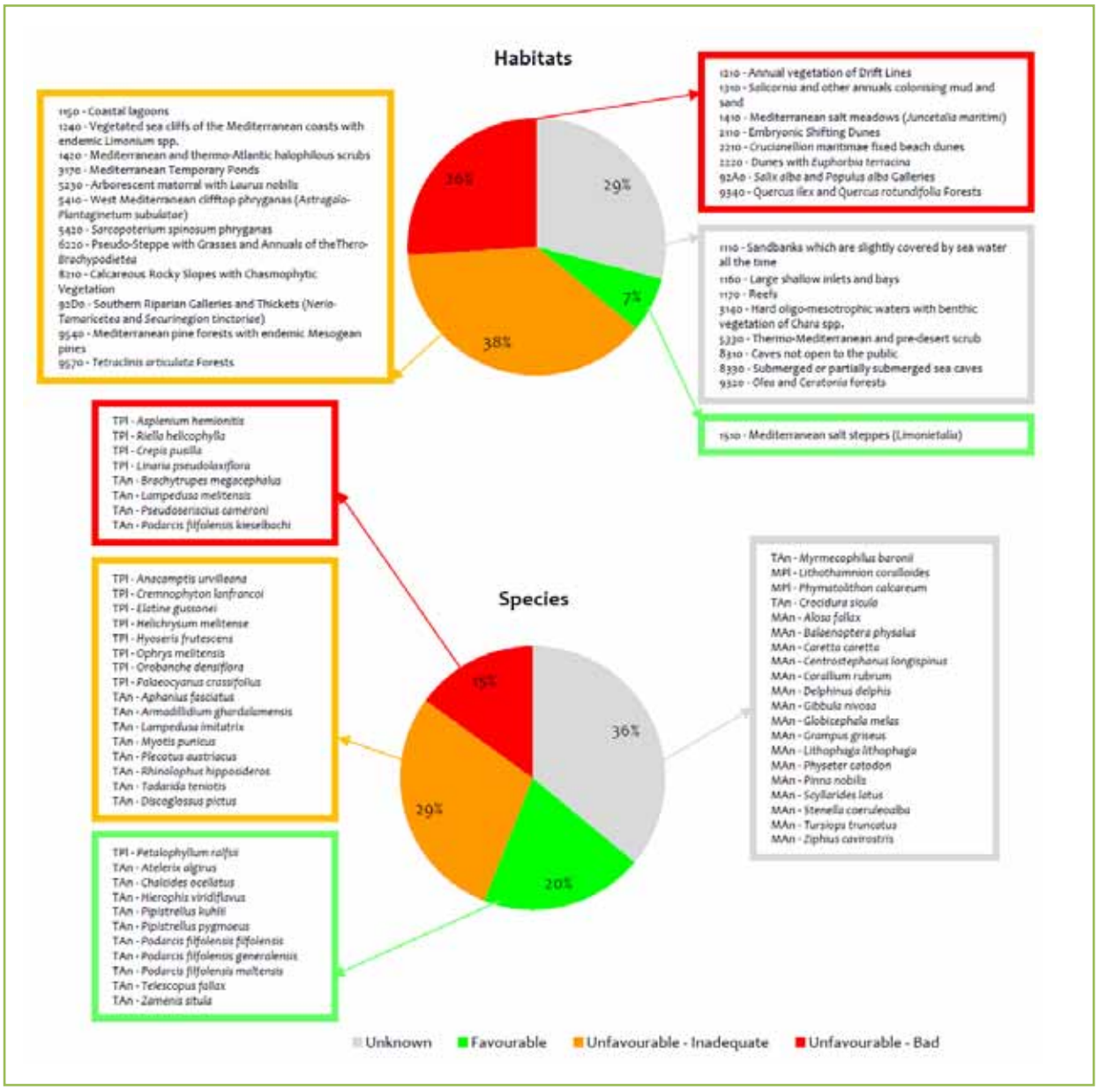

Figure 12[10] - Conservation Status of Habitats and Species of European Community Importance

(TPl = Terrestrial Plant; TAn = Terrestrial Animal; MPl = Marine Plant; MAn = Marine Animal; OCC = occasional, vagrant or marginal species; PEX = probably extinct prior to the coming into force of Habitats Directive)

[10] See also: Habitat and Species Checklist - Malta - The following species are excluded: *Balaenoptera acutorostrata* (OCC; MAn); *Nyctalus noctula* (OCC; TAn); *Orcinus orca* (OCC; MAn); *Ophrys lunulata* (PEX; TPl); *Pseudorca crassidens* (OCC; MAn); *Steno bredanensis* (OCC; MAn)

1.6 Other Environmental Trends

The starting point for environmental policy is a scientific understanding of the state of our environment. Policy makers need to understand the extent to which environmental problems are getting better or getting worse. In those areas where the situation is worsening the challenge is to develop new and ambitious policy responses.

Extract from the *Mid-term review of the Sixth Community Environment Action Programme*
COM (2007) 225 final

Indicators documenting the state of the environment for the years 2005, 2006, 2007 and 2008, have been compiled by the Malta Environment and Planning Authority in partnership with the National Statistics Office. These indicators draw upon information and data deriving from environmental monitoring programmes carried out by various government agencies including the Malta Resources Authority, the Malta Competition and Consumer Affairs Authority and the Department for Environmental Health. The indicators are grouped into 10 policy areas (Table 4, overleaf)[11]. The faces accompanying the indicators have been awarded according to two criteria, related to both to the overall dimensions of the problem and the recent trend.

1.7Threats to Biodiversity

Biodiversity loss disrupts ecosystem functions, making ecosystems more vulnerable to shocks and disturbances, less resilient, and less able to supply humans with needed services.

Global Biodiversity Outlook 2
Secretariat of the Convention on Biological Diversity (2006)

Biodiversity loss ensues from changes in ecosystem conditions and reduction, deterioration and fragmentation of natural areas as a result of changes in land use and inefficient use of natural resources. Adverse impacts include those associated with pollution and nutrient overload, overexploitation, land fragmentation, soil erosion, anthropogenic climate change and biological invasions. These all engender biodiversity loss, that is, the loss of species diversity and transformation of habitats (Table 5, overleaf). Global biodiversity is being lost at an unprecedented rate, as a consequence of increasing man-mediated pressures. Indeed, the Millennium Ecosystem Assessment, the major global scientific undertaking involving more than 1,360 experts, concluded that out of 24 assessed ecosystem services that make a direct contribution to human well-being, 15 are in decline (*e.g.* provision of fresh water, marine fishery production, the ability of the atmosphere to cleanse itself of pollutants, natural hazard regulation, pollination, and the capacity of agricultural ecosystems to provide pest control)[12]. Exploitation of biodiversity and use of biological resources in the Maltese Islands for basic subsistence can be traced all way back to when the first settlers set foot on the islands. Nowadays the Maltese community relies greatly on biodiversity and associated natural resources and ecosystem services for many reasons, as apparent throughout all major production and extractive sectors. However, the unsustainable use of natural resources over the past decades has created a heavy toll on Maltese biodiversity. Malta's 2005 State of the Environment Report stated that the "three principal threats to Malta's biodiversity are development in rural and marine areas, introduction of invasive species and exploitation of wildlife". This was also reiterated in the 2008 State of the Environment Report, which added that Malta's biodiversity is faced with similar threats as those exerted throughout the EU. Waste generation and anthropogenic climate change also impact biodiversity.

[11] The actual state of the environment reports and accompanying indicators should be referred to for additional information.
[12] Ecosystem and Human Well-Being: Biodiversity Synthesis - MA, 2005.

Draft

Positive outlook | Outlook unclear or positive but limited, insufficient to reach targets | Negative outlook

Indicator	2005	Indicator	2006	Indicator	2007	Indicator	2008	Indicator	2009
Theme: Driving Forces for Environmental Change									
Population trends and projections		Population trends and projections		Population changes		Population Density		\	\
Sectoral contributions to GDP		Sectoral contributions to GDP		Sectoral contributions to GDP		Sectoral contributions to GDP		Sectoral contributions to GDP	
Housing permissions		Housing permissions		Housing permissions		Housing permissions		Housing permissions	
Vehicle fleet per capita		Vehicle fleet per capita		Vehicle fleet per capita		Vehicle fleet per capita		Vehicle fleet per capita	
Sectoral electricity consumption		Electricity Generation		Electricity Generation		Electricity Generation		Electricity Generation	
Daily number of tourists		Daily number of tourists		Daily number of tourists		Daily number of tourists		Daily number of tourists	
\	\	Area covered by Operational Quarries		Area covered by Operational Quarries		Area covered by Operational Quarries		\	\
Theme: Air									
Particulate matter concentrations		Particulate matter concentrations		Particulate matter concentrations		Particulate matter concentrations		Particulate matter concentrations	
Ozone concentrations		Ozone concentrations		Ozone concentrations		Ozone concentrations		Ozone concentrations	
Benzene concentrations		Benzene concentrations		Benzene concentrations		Concentration of benzene and other volatile organic compounds		Concentration of benzene and other volatile organic compounds	
Nitrogen oxides concentrations		Nitrogen oxides concentrations		Nitrogen oxides concentrations		Nitrogen dioxide concentrations		Nitrogen dioxide concentrations	
Sulphur dioxide concentrations		Sulphur dioxide concentrations		Sulphur dioxide concentrations		Sulphur dioxide concentrations		Sulphur dioxide concentrations	
Theme: Climate Change									
Greenhouse gas emissions by sector		Carbon dioxide emissions from energy generation		Greenhouse gas emissions by sector		Greenhouse gas emissions by sector		Greenhouse gas emissions by sector	
Energy intensity of growth		Energy intensity of growth		Energy intensity of growth		Energy intensity of the economy		Energy intensity of the economy	
Theme: Water/Freshwaters									
Water consumption by source		Water consumption by sector		Billed water consumption		Billed water consumption by sector		Billed water consumption by sector	
Nitrate and chloride levels at abstraction boreholes		Nitrate and chloride levels at WSC pumping stations		Nitrate and chloride levels at WSC pumping stations		Nitrate and chloride levels at WSC pumping stations		Nitrate and chloride levels in groundwater bodies	

Indicator	2005	Indicator	2006	Indicator	2007	Indicator	2008	Indicator	2009
Groundwater quantitative status	☹	\	\	\	\	\	\	\	\
Theme: Water/Coastal and Marine Environment									
Bathing water quality	☺	Bathing water quality	😐	Bathing water quality	☺	Bathing water quality	☺	Bathing water quality	☺
Theme: Waste/Resources & Waste									
\	\	\	\	\	\	Domestic material consumption	☺	\	\
Waste generation by type	☹	Waste generation per unit GDP	😐	Waste Generation	😐	Waste Generation	😐	Waste Generation	😐
Municipal waste generation per capita	☹	Municipal waste generation per unit GDP	☺	Municipal waste generation per capita	☹	Municipal waste generation per capita	☹	Municipal waste generated	☹
Waste separation and recycling	😐	Waste recycled	☺	Waste recycled	☺	Waste recycled	☹	Biodegradable waste diverted from landfill	☹
Theme: Land									
Land cover by type	☹	\	\	Land cover by type	☹	\	\	\	\
% 1Km coast built up	☹	% 1Km coast built up	☹	\	\	\	\	\	\
% Organic farming	☹	% Organic farming	☹	% Organic farming	☹	% Organic farming	😐	% Organic farming	😐
\	\	\	\	Vacant dwellings	☹	\	\	\	\
Theme: Soil									
Soil organic matter	☹	Soil organic matter	😐	\	\	\	\	\	\
Concentrations of heavy metals in soil	☹	Lead concentrations in soil	☹	\	\	\	\	\	\
Risk of soil erosion	☹	\	\	\	\	\	\	\	\
\	\	Soil salinity	☹	\	\	\	\	\	\
Theme: Landscape									
Areas protected for landscape value	☹	Areas protected for landscape value	☺	\	\	\	\	\	\
Theme: Biodiversity									
Natural areas designated & managed	😐	Natural areas designated &managed	☺	Natural areas designated &managed	☺	Natural areas designated	☺	\	\
Percentage of total species of international importance per group protected by national legislation	☺	\	\	\	\	\	\	\	\

Indicator	2005	Indicator	2006	Indicator	2007	Indicator	2008	Indicator	2009
Status of selected groups of species	☹	Status of selected groups of species	☹	Status of breeding birds	😐	Status of Maltese habitats and species of European community importance	☹	\	\
\	\	Sites proposed or designated as part of the Natura 2000 Network	🙂	Sites proposed or designated as part of the Natura 2000 Network	🙂	Sites designated as part of the Natura 2000 Network	🙂	Sufficiency of terrestrial Natura 2000 Sites Designated	🙂
Theme: Policy Responses									
Public environmental expenditure	🙂	Public environmental expenditure	🙂	Public environmental expenditure	🙂	Public environmental expenditure	🙂	Public environmental expenditure	🙂
Take-up of voluntary schemes	☹	Take-up of voluntary schemes	😐	Take-up of voluntary schemes	😐	\	\	Take-up of voluntary schemes	😐
\	\	Schools covered by EkoSkola	🙂	Schools covered by EkoSkola	🙂	Schools covered by EkoSkola	🙂	Schools covered by EkoSkola	🙂
\	\	Number of trees planted in afforestation projects	🙂	Number of trees planted in afforestation projects	🙂	\	\		
\	\	\	\	\	\	Sites requiring IPPC permits	😐	Sites requiring IPPC permits	🙂
\	\	\	\	\	\	\	\	Trends in public attitudes	🙂

Table 4 - Trends reported by the State of the Environment Indicators

Table 5 - General threat Categories and Examples of associated Impacts

1.7.1 Drivers of Biodiversity Change – Current State of Knowledge

Causes of biodiversity loss (drivers of biodiversity change), biodiversity, ecosystem functioning and associated goods and services as well as human well-being (in terms of health, food security, basis for good life) are all interlinked (Figure 13).

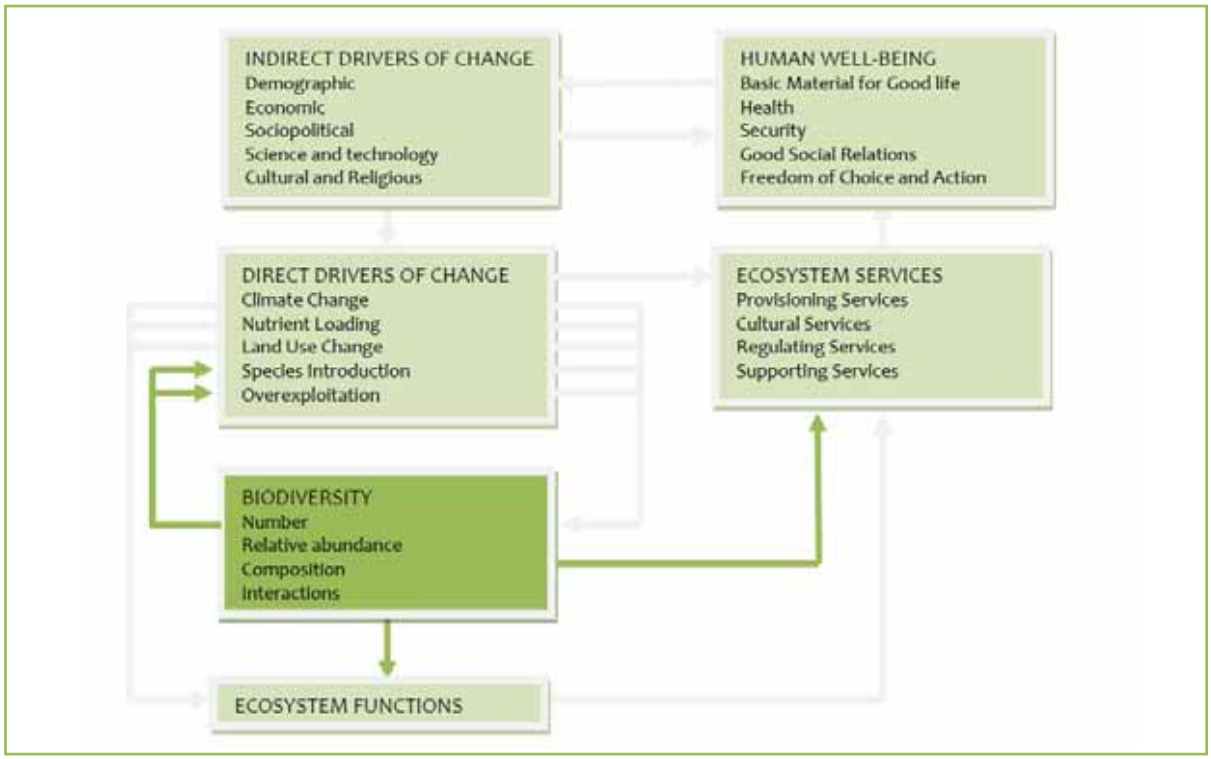

Figure 13 – Relation of Biodiversity with ecosystem functioning, ecosystem services, and drivers of change
(Adapted from Millennium Ecosystem Assessment, 2005 - Ecosystems and Human Well-being: Biodiversity Synthesis)

Drivers of biodiversity change can be direct or indirect and, act concurrently, with possible synergistic effects, causing considerable pressure to flora, fauna and their habitats. Major direct drivers of biodiversity change in the Maltese Islands are those mediated by man. Table 6, overleaf provides a qualitative assessment of the state of knowledge of the effects of direct drivers of change on biodiversity in the Maltese Islands. Quantitative data however is needed to substantiate these observations.

Unsustainable activities can threaten our natural heritage and undermine efforts to safeguard it. Protecting our natural heritage is a very challenging task more so when considering that Malta has the highest population density in Europe, coupled with the limited assimilative and carrying capacity, and, small overall size of the islands apart from other environmental concerns that are inherent of small island states.

Direct Driver of Biodiversity Change	State of Knowledge	Description and Source of Information
Land Conversion	***	Urban encroachment on the countryside still one of the most significant threats to biodiversity in Malta. Coastal development has increased. 'Between 1990 and 2006, approximately 2.7km (0.85%) of total land area, consisting of sclerophyllous vegetation, agricultural land and non-irrigated arable land, was converted to discontinuous urban fabric, industrial or commercial units, mineral extraction sites and dumping sites'. (Source of Data: SOER 2008 – Biodiversity Sub-Report). This issue is dealt with further in Chapter 4 – Section 4.3.
Climate Change	*	Malta's greenhouse gas emissions rose by 49% between 1990 and 2007, while emissions per unit GDP fell by 18% over the same period. The energy sector was the principal contributor to Malta's GHG emissions in 2007, at 88.7% of total (2008 SOER). Malta's First National Communication to the UNFCCC outlined current and future concerns in relation to climatic vulnerability, arising from current and projected climate change impacts. Studies are required on the effects of climate change on vulnerable species and habitats. Studies on the effect on climate change on biodiversity are needed, although expert observations are noting the increase in drought-tolerant species in wetlands, and the arrival of new species to the Maltese Islands from northern Africa, possibly as natural extension (*e.g. Persicaria lanigera*; *Persicaria senegalensis*). However, the link of this with climate change has not been scientifically ascertained, as yet. This issue is dealt with further in Chapter 3 – Section 3.6 and Chapter 4 – Section 4.4.
Invasive Alien Species	**	Commissioned studies on alien flora and fauna have provided the necessary baseline with regards to which alien species are found in the Maltese islands and which are invasive. Research is need in particular with respect to marine alien species. Monitoring needs to focus on important vectors and pathways so as to timely intercept new invasions but also in order to elucidate trends of invasions and degree of impacts, and hence point to where remedial action is warranted. An early warning system and national strategy on IAS are essential to strengthen national policy on preventing and addressing IAS. This issue is dealt with further in Chapter 3 – Section 3.5.
Wildlife Exploitation	*	Exploitation levels of commercial species targeted by fisheries are available through landing data; data is lacking with regard to non-commercial species taken from the wild and certain non-target marine species (excluding marine turtles). An indication of the scale of exploitation of wild migratory birds can be given using the catches registered in the Carnet de Chasse declarations, which are mandatory for persons wishing to obtain a licence for hunting and trapping. Between 2002 and 2006, an annual average of 188,126 birds was declared hunted or trapped in the Maltese Islands.' (Source: SOER 2008 – Biodiversity Sub-report)
Water Pollution	**	Nitrate pollution is a concern in Malta. Water pollution through the over-use of nitrogenous fertilizers is namely the cause; nitrogenous waste from inappropriately managed animal husbandry units is another cause. This affects soil quality, inland surface water quality and groundwater quality. Monitoring is carried out in compliance with a number of EU Directives such as the Nitrates Directives and Bathing Water Quality Directive. Monitoring will also be strengthened based on requirements of the WFD (via the Water Management Catchment Plan) and the MSFD. A comprehensive coastal and marine environmental monitoring programme is currently being put in place within the context of a structural funds project, which aims to be operational in 2010 (2008 SOER) Seawater intrusion in groundwaters as a result of over-abstraction is also a concern. Land-based pollutant sources and run off can also affect marine water quality. These issues are addressed in Chapter 4 of the NBSAP - Section 4.10.
LEGEND * excellent ** good * poor**		

Table 6 - Direct Drivers of Change on Maltese Biodiversity

2. Malta's NBSAP – Mandate, Vision and Objectives

This chapter explains the mandate for developing and adopting a national biodiversity strategy and action plan. This section also presents a short account of progress made by Malta to address the 2010 biodiversity target and also looks at plans for EU 2020 biodiversity. The vision and aims of Malta's NBSAP for the period 2011-2020 are also defined.

2.1 What is a NBSAP and what is the Mandate for developing it?

The Convention on Biological Diversity (CBD) is a global legally-binding treaty initiated formally in 1992 at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. It covers all components of biological diversity: genetic resources, species and ecosystems. Malta became a Party to the CBD in 29 December 2000 through ratification. Malta is also a Party to other UN Conventions, a member of the Council of Europe and a Member State of the European Union, amongst others[13]. As one of the 193 Parties to the CBD, Malta is required to contribute to the achievement of the Convention's three objectives (Article 1 of Convention text) at a national level (Figure 14). These three objectives, which are complementary, also reflect the principles of sustainable development.

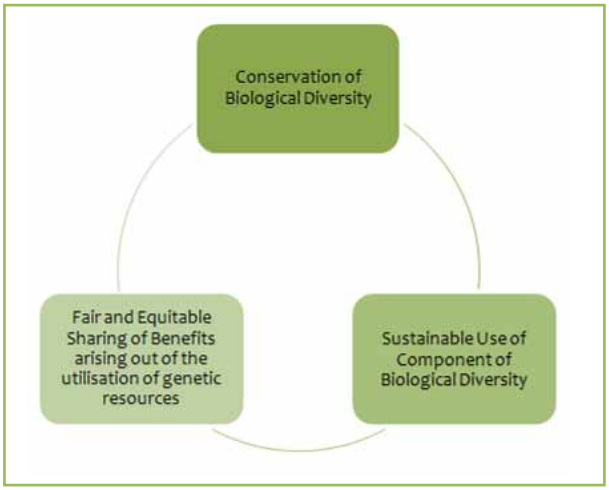

Figure 14 – Objectives of the Convention on Biological Diversity

Parties are given strategic guidance in their implementation of the CBD via a Strategic Plan. The tenth conference of the parties to this Convention (CBD COP10, Nagoya, 18-29 October 2010) adopted a revised and updated Strategic Plan for the period 2011 to 2020 as an overarching international framework for biodiversity for the next decade. The text of the Convention, and in particular its three objectives, provide the fundamental basis for this Strategic Plan. The Convention is also accompanied by supplementary agreements dealing separately with biosafety issues with respect to the governance of the movement of living modified organisms (the Cartagena Protocol and its Supplementary Protocol) and, with access to genetic resources and benefit sharing issues (the Nagoya Protocol).

Under Article 6 of the Convention text, Malta is required to establish a biodiversity strategy and action plan with the aim of mainstreaming biodiversity concerns into relevant sectoral or cross-sectoral plans, programmes and policies. Through such mainstreaming, the pivotal role biodiversity plays for social welfare and human well-being, in terms of ecosystem goods and services provided, is acknowledged.

[13] A Joint Liaison Group (JLG) between the three Rio Conventions (*i.e.* the CBD, the UNFCCC and the UNCCD) was established as an informal forum for exchanging information, exploring opportunities for synergistic activities and increasing coordination. The JLG is currently developing cooperative activities between these three conventions. One such activity is the Promotion of complementarity among the national biodiversity strategies and action plans (NBSAPs) under the CBD, the national action programmes (NAPs) of the UNCCD, and the national adaptation programmes of action (NAPAs) of the UNFCCC.

The national biodiversity strategy and action plan (NBSAP) is viewed as the main tool for implementing the CBD at a national level and for bringing forth the achievement of the Convention's three objectives. The NBSAP outlines and establishes a national strategy for action to conserve, sustainably use and manage national biodiversity by identifying defined strategic directions that shall be achieved through motivated and coordinated support and action by society. The mandate for developing the NBSAP for Malta also stems from Council Decision of 25 October 1993 concerning the conclusion of the Convention on Biological Diversity (93/626/EEC), the European Community Biodiversity Strategy (ECBS – COM/1998/42 and its four biodiversity action plans on the protection of natural resources, agriculture, fisheries, development and economic cooperation), the EC Biodiversity Action Plan to 2010 and beyond, and more recently the Communication by the Commission on Our life insurance, our natural capital: an EU biodiversity strategy to 2020 (COM(2011) 244). The need to develop the NBSAP has also been recognised at a national level. Its development and adoption is in fact called for by the 'Convention on Biological Diversity (Incorporation) Regulations, 2002' (Legal Notice 160 of 2002), the 'Flora, Fauna and Natural Habitats Protection Regulations, 2006' (LN 311 of 2006, as amended), Malta's National Reform Programme (2005-2008) as well as Malta's National Strategy on Sustainable Development.

In furthering the implementation of the Convention, a number of thematic areas and cross-cutting themes have been adopted under the CBD's framework (Figure 15). The cross-cutting issues essentially correspond to issues addressed by Articles 6 to 20 of the CBD.

Figure 15 - Thematic Programmes and Cross-cutting Issues of the CBD

Some of these thematic areas and cross-cutting issues have detailed Programmes of Work (PoWs), which put forward conservation actions which can be implemented at a national level[14]. Parties to the CBD are urged to integrate elements of all the CBD thematic PoWs into their NBSAPs and to set measurable targets in order to achieve biological diversity conservation and sustainable use objectives.

The Potsdam Recommendations on the Convention on Biological Diversity[15] underline the importance of:

- turning NBSAPs into "living documents";
- preparing and updating NBSAPs with the participation of a broad set of people from all major groups to build ownership and commitment;
- consulting those responsible for policies in other areas so as to promote policy integration and cross-sectoral and horizontal co-operation to ensure coherence;
- incorporating NBSAPs into national strategies for sustainable development and poverty reduction; and
- taking NBSAPs into full account in planning and decision making.

The Global Biodiversity Outlook 3[16] mentions that NBSAP's should catalyse strategic action in terms of biodiversity mainstreaming, communication and involvement, tools for implementation, knowledge, monitoring, and, financing and capacity.

2.2 2010 and 2020 Biodiversity – Global and EU Targets

> A key lesson from the failure to meet the 2010 biodiversity target is that the urgency of a change of direction must be conveyed to decision-makers beyond the constituency so far involved in the biodiversity convention.
>
> Secretariat of the Convention on Biological Diversity (2010)
> *Global Biodiversity Outlook 3*

The NBSAP is view as a principal strategic tool to coordinate and mobilise action to reverse negative biodiversity trends and to fulfil global, EU and national targets that are set for biodiversity. In 2002, the sixth Conference of the Parties to the CBD (COP 6 Decision VI/26) agreed "*to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth*". This 2010 biodiversity target was later endorsed by Heads of State and Governments at the World Summit on Sustainable Development. The EU Heads of State in turn, had adopted in 2001 a more ambitious target: to halt the decline of biodiversity in the EU by 2010. The 2010 target was included in the Millennium Development Goals (MDG) under Goal 7 – Ensure Environmental Sustainability. In 2004, the European Environment Agency (EEA Briefing No. 1/2004 on Halting the Loss of Biodiversity in Europe) documented: "*Achieving these targets will require monitoring, information, assessments and understanding of: the causal relationships between human activities, the pressures they produce and the impacts of these pressures on the environment in general and biodiversity in particular; the options for actions to reduce and prevent biodiversity loss; and the effects and effectiveness of agreed actions on biodiversity*".

[14] An assessment of progress by Malta in implementing these is detailed in Chapter 5.
[15] Adopted during the Expert Workshop on Implementation of the Convention on Biological Diversity (13-15 December 2006, Potsdam)
[16] *Global Biodiversity Outlook 3*, Secretariat of the Convention on Biological Diversity (2010).

The year 2010 was proclaimed as "International Year of Biodiversity" (IYB) during which countries were not only urged to raise awareness on biodiversity but were also expected to carry out a stocktaking phase to assess to what degree their conservation efforts contributed toward the 2010 target. The results of Malta's stocktaking of progress made in achieving the sub-targets[17] that complement the 2010 biodiversity target under the CBD framework are shown in Table 7. Looking at this table, 30% of the CBD 2010 sub-targets have been attained, 55% are being attained whereas 15% are not being attained. Although, there is significant ongoing work as further detailed in the next chapters of the NBSAP in order to curb biodiversity loss in the Maltese Islands (Chapters 3 and 4), in the majority of cases, goals/targets have not yet been attained, as further measures are deemed necessary or need to be strengthened (Chapter 5). A set of headline indicators[18] grouped into 7 focal areas, were also established under the CBD framework to measure progress towards the 2010. Trends in these headline indicators were assessed and published in the CBD Global Biodiversity Outlook 2 and more recently by the EEA (Technical Report No 5/2009).

Target being successfully attained

Ongoing work but target not yet attained as further measures are necessary

Target not being attained

2010 Sub-target	Malta's Progress
Focal Area: Protect the components of biodiversity	
1.1: At least 10% of each of the world's ecological regions effectively conserved	
1.2: Areas of particular importance to biodiversity protected	
2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups	
2.2: Status of threatened species improved	
3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained	
Focal Area: Promote sustainable use	
4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.	
4.2: Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced	
4.3: No species of wild flora or fauna endangered by international trade	
Focal Area: Address threats to biodiversity	
5.1: Rate of loss and degradation of natural habitats decreased	
6.1: Pathways for major potential alien invasive species controlled	
6.2: Management plans in place for major alien species that threaten ecosystems, habitats or species	
7.1: Maintain and enhance resilience of the components of biodiversity to adapt to climate change	
7.2: Reduce pollution and its impacts on biodiversity	
Focal Area: Maintain goods and services from biodiversity to support human-well-being	
8.1: Capacity of ecosystems to deliver goods and services maintained	
8.2: Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained	

[17] The 2010 goals and targets have been adopted by Decision VIII/15

[18] A set of 26 pan-European biodiversity indicators have also been devised under the SEBI (Streamlining European 2010 Biodiversity Indicators) 2010 project to assess progress towards the 2010 biodiversity target. Malta's representativity of the SEBI 2010 set (2009) is some 11%. (Refer to EEA Technical Report No 5/2009)

2010 Sub-target	Malta's Progress
Focal Area: Protect traditional knowledge, innovations and practices	
9.1 Protect traditional knowledge, innovations and practices	☺
9.2: Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit sharing	N/A
Focal Area: Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources	
10.1: All transfers of genetic resources are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements	☹
10.2: Benefits arising from the commercial and other utilization of genetic resources shared with the countries providing such resources	☹
Focal Area: Ensure provision of adequate resources	
11.1: New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20	☺
11.2: Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4	☺

Table 7 – Extent of Progress in meeting the 2010 sub-targets under the CBD

In recognition of the urgency to step up the pace and extent of policy implementation to address the 2010 target, the EU Commission adopted in 2006 a 'Communication on Halting the Loss of Biodiversity by 2010 - and beyond (Sustaining ecosystem services for human well-being)'. This communication set out a policy approach to deliver the 2010 target and to put biodiversity on course of recovery via an EU Biodiversity Action Plan (BAP), which for the first time, provided a single inter-sectoral and horizontal plan of action for both the European Community and Member States. The BAP focused on four main policy areas: biodiversity in the EU, the EU and global biodiversity, biodiversity and climate change, and the knowledge base, and identified 10 key objectives translated into over 150 priority actions and supporting measures. However, in 2008, the EU's "Mid-term Assessment of Implementing the EC Biodiversity Action Plan" (COM/2008/864) concluded that it is unlikely - on the basis of current efforts - that the overall goal of halting biodiversity loss in the EU by 2010 will be achieved. This failure to meet the 2010 global and EU targets was confirmed last year during global and EU high level meetings attended by heads of states. The main reasons for not achieving the EU target have been noted by Conclusions on Biodiversity Post-2010 adopted by the Council (Environment) on 15 March 2010, and include the following:

- incomplete implementation of certain legal instruments,
- incomplete and poor integration into sectoral policies;
- insufficient scientific knowledge and data gaps;
- insufficient funding;
- lack of additional efficiently-targeted instruments to tackle specific problems (such as on invasive alien species), and
- shortcomings in communication and education to enhance awareness.

Essentially it has been underlined that the means have not matched the targets set. The urgency for effective action at all levels in order to avoid going beyond the limits of nature and causing serious additional pressure on European welfare was also noted. The Global Biodiversity Outlook 3 also concludes that the 2010 biodiversity target has not been met at a global level, and indeed

components of biodiversity continue to decline, and pressures continue, with some even intensifying. The fact that this target has stimulated action in support of biodiversity is however also recognised. The GBO3 also underscores the need to address the underlying causes of biodiversity loss. Nevertheless it is noteworthy that the 2010 global and EU biodiversity targets have been essential in generating useful actions in favour of biodiversity even at global and regional levels, including at a national level.

The CBD Strategic Plan 2011-2020 sets out the global vision of a world of "living in harmony with nature" where '*by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.*" The mission sets out to take effective and urgent action to halt biodiversity loss so as to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human wellbeing, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits shared in a fair and equitable manner, adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach. This vision is accompanied by 20 Aichi Biodiversity Targets (listed in Chapter 5 to the NBSAP), including Target 17, which states that countries should have developed adopted and commenced implementation of revised NBSAPs by 2015. Achieving the 2020 targets, and monitoring progress towards them, will require improved coordination, synergy and partnership among various actors at all levels.

At the March Council Meeting, EU Member States agreed on a 2050 EU vision and 2020 EU headline target – "*to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss*". In May 2011, the European Commission presented a Communication proposing the EU Biodiversity Strategy for 2020, which is said to replace the current EU BAP (COM/2011/244). The strategy is in line with two commitments made by EU leaders in March 2010, and details six main targets and 20 accompanying actions (Table 8, overleaf). The first two targets focus directly on biodiversity problems, while the third, fourth and fifth targets focus on the causes of biodiversity loss. Taken together, the targets address the three dimensions of the EU 2020 biodiversity headline target, whereas the sixth target reflects the third dimension of the headline target: the global contribution. These targets were endorsed by Environment Ministers at the Council (Environment) meeting held on 21 June 2011, during which the Conclusions on the EU Biodiversity Strategy to 2020 were adopted.

Each Member State is required to incorporate these targets, complemented with corresponding national targets as deemed necessary, into its own NBSAP and taking into account the global Aichi targets set out in the CBD Strategic Plan 2011-2020, the majority of which are reflected in varying degrees in the proposed EU targets. The shared EU and CBD targets need to be pursued through a combination of measures at national and EU level. Close coordination will therefore be needed to track progress in reaching the targets using the EU 2010 Biodiversity Baseline[19] published by the European Environmental Agency as a benchmark for measuring progress to improve the state of biodiversity in the EU. For this purpose, the Commission will work with Member States to develop a common framework for implementation. Moreover, the EU 2020 Biodiversity Strategy will contribute to at least three of the targets in the Europe 2020 Strategy,

[19] A Biodiversity information System for Europe (BISE) has been set up and serves as a European information portal designed to facilitate access to existing information about nature and biodiversity.

namely climate change, innovation and employment, in particular through the flagship initiative for a resource-efficient Europe, supporting the shift towards a resource-efficient, low-carbon economy to achieve sustainable growth.

TARGET 1: FULLY IMPLEMENT THE BIRDS AND HABITATS DIRECTIVES *To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status[20] so that, by 2020, compared to current assessments: (i) 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50% more species assessments under the Birds Directive show a secure or improved status.*
Action 1: Complete the establishment of the Natura 2000 network and ensure good management 1a) Member States and the Commission will ensure that the phase to establish Natura 2000, including in the marine environment, is largely complete by 2012. 1b) Member States and the Commission will further integrate species and habitats protection and management requirements into key land and water use policies, both within and beyond Natura 2000 areas. 1c) Member States will ensure that management plans or equivalent instruments which set out conservation and restoration measures are developed and implemented in a timely manner for all Natura 2000 sites. 1d) The Commission, together with Member States, will establish by 2012 a process to promote the sharing of experience, good practice and cross-border collaboration on the management of Natura 2000, within the biogeographical frameworks set out in the Habitats Directive.
Action 2: Ensure adequate financing of Natura 2000 sites 2) The Commission and Member States will provide the necessary funds and incentives for Natura 2000, including through EU funding instruments, under the next multiannual financial framework. The Commission will set out its views in 2011 on how Natura 2000 will be financed under the next multi-annual financial framework.
Action 3: Increase stakeholder awareness and involvement and improve enforcement 3a) The Commission, together with Member States, will develop and launch a major communication campaign on Natura 2000 by 2013. 3b) The Commission and Member states will improve cooperation with key sectors and continue to develop guidance documents to improve their understanding of the requirements of EU nature legislation and its value in promoting economic development. 3c) The Commission and Member States will facilitate enforcement of the nature directives by providing specific training programmers on Natura 2000 for judges and public prosecutors, and by developing better compliance promotion capacities.
Action 4: Improve and streamline monitoring and reporting 4a) The Commission, together with Member States, will develop by 2012 a new EU bird reporting system, further develop the reporting system under Article 17 of the Habitats Directive and improve the flow, accessibility and relevance of Natura 2000 data. 4b) The Commission will create a dedicated ICT tool as part of the Biodiversity Information System for Europe to improve the availability and use of data by 2012.
TARGET 2: MAINTAIN AND RESTORE ECOSYSTEMS AND THEIR SERVICES *By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15%[21] of degraded ecosystems.*
Action 5: Improve knowledge of ecosystems and their services in the EU 5) Member States, with the assistance of the Commission, will map and assess the state of ecosystems and their services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020.

[20] This target is indicative, and may be reviewed in 2014, when the outcome of the next 'Article 17' report will provide an update on trends in conservation status of habitats and species. (Source: Impact Assessment)

[21] This figure was chosen in that restoration of at least 15% of degraded ecosystems is considered the minimum level of ambition as any less would put the EU in non compliance with the CBD obligations. This target is indicative, and the level of ambition should be reviewed in 2014, when it should be clearer how much restoration is likely to take place under the WFD and the MSFD, and progress has been made on the costs and benefits of further action. (Source: Impact Assessment)

Action 6: Set priorities to restore and promote the use of green infrastructure

6a) By 2014, Member States, with the assistance of the Commission, will develop a strategic framework to set priorities for ecosystem restoration at sub-national, national and EU level.

6b) The Commission will develop a Green Infrastructure Strategy by 2012 to promote the deployment of green infrastructure in the EU in urban and rural areas, including through incentives to encourage up-front investments in green infrastructure projects and the maintenance of ecosystem services, for example through better targeted use of EU funding streams and Public Private Partnerships.

Action 7: Ensure no net loss of biodiversity and ecosystem services

7a) In collaboration with the Member States, the Commission will develop a methodology for assessing the impact of EU funded projects, plans and programmers on biodiversity by 2014.

7b) The Commission will carry out further work with a view to proposing by 2015 an initiative to ensure there is no net loss of ecosystems and their services (*e.g.* through compensation or offsetting schemes).

Target 3: INCREASE THE CONTRIBUTION OF AGRICULTURE AND FORESTRY TO MAINTAINING AND ENHANCING BIODIVERSITY

3A) Agriculture[22]: By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement([23]) in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU2010 Baseline, thus contributing to enhance sustainable management.

Action 8: Enhance direct payments for environmental public goods in the EU Common Agricultural Policy

8a) The Commission will propose that CAP direct payments will reward the delivery of environmental public goods that go beyond cross-compliance (*e.g.* permanent pasture, green cover, crop rotation, ecological set-aside, Natura 2000).

8b) The Commission will propose to improve and simplify the GAEC (Good Agricultural and Environmental Conditions) cross-compliance standards and consider including the Water Framework Directive within the scope of cross-compliance once the Directive has been implemented and the operational obligations for farmers have been identified in order to improve the state of aquatic ecosystems in rural areas.

Action 9: Better target Rural Development to biodiversity conservation

9a) The Commission and Member States will integrate quantified biodiversity targets into Rural Development strategies and programmes, tailoring action to regional and local needs.

9b) The Commission and Member States will establish mechanisms to facilitate collaboration among farmers and foresters to achieve continuity of landscape features, protection of genetic resources and other cooperation mechanisms to protect biodiversity.

B) Forests: By 2020, Forest Management Plans or equivalent instruments, in line with Sustainable Forest Management (SFM) 30 , are in place for all forests that are publicly owned and for forest holdings above a certain size[24] (to be defined by the Member States or regions and communicated in their Rural Development Programmes) that receive funding under the EU Rural Development Policy so as to bring about a measurable improvement([1]) in the conservation status of species and habitats that depend on or are affected by forestry and in the provision of related ecosystem services as compared to the EU 2010 Baseline.

Action 10: Conserve Europe's agricultural genetic diversity

10) The Commission and Member States will encourage the uptake of agri-environmental measures to support genetic diversity in agriculture and explore the scope for developing a strategy for the conservation of genetic diversity.

[22] The target for agriculture is based on the rationale that biodiversity-related measures are needed on all types of agricultural land and that the area under such measures is to be maximised to ensure a measurable improvement in the status of species and habitats. This approach offers the best guarantee to deliver on biodiversity objectives without requiring a disproportionate financial effort. This target is indicative, but would need to be translated in concrete terms in the design of the CAP reform, to deliver on the 2020 biodiversity target. The situation should be reviewed in 2014, once the CAP reform package has been adopted, and also in light of the take up of the proposed measures by farmers, and any updated data on areas covered by the different types of ecosystems (Source: Impact Assessment).

[23] For both targets, improvement is to be measured against the quantified enhancement targets for the conservation status of species and habitats of EU interest in Target 1 and the restoration of degraded ecosystems under target 2.

[24] For smaller forest holdings, Member States may provide additional incentives to encourage the adoption of Management Plans or equivalent instruments that are in line with SFM.

Action 11: Encourage forest holders to protect and enhance forest biodiversity

11a) Member States and the Commission will encourage the adoption of Management Plans, *inter alia* through use of rural development measures and the LIFE+ programme.

11b) Member States and the Commission will foster innovative mechanisms (*e.g.* Payments for Ecosystem Services) to finance the maintenance and restoration of ecosystem services provided by multifunctional forests.

Action 12: Integrate biodiversity measures in forest management plans

12) Member States will ensure that forest management plans or equivalent instruments include as many of the following measures as possible:

– maintain optimal levels of deadwood, taking into account regional variations such as fire risk or potential insect outbreaks;

– preserve wilderness areas;

– ecosystem-based measures to increase the resilience of forests against fires as part of forest fire prevention schemes, in line with activities carried out in the European Forest Fire Information System (EFFIS);

– specific measures developed for Natura 2000 forest sites;

– ensuring that afforestation is carried out in accordance with the Pan-European Operational Level Guidelines for SFM, in particular as regards the diversity of species, and climate change adaptation needs.

TARGET 4: ENSURE THE SUSTAINABLE USE OF FISHERIES RESOURCES

Achieve Maximum Sustainable Yield (MSY) by 2015[25]*. Achieve a population age and size distribution indicative of a healthy stock, through fisheries management with no significant adverse impacts on other stocks, species and ecosystems, in support of achieving Good Environmental Status by 2020, as required under the Marine Strategy Framework Directive*[26]*.*

Action 13: Improve the management of fished stocks

13a) The Commission and Member States will maintain and restore fish stocks to levels that can produce MSY in all areas in which EU fish fleets operate, including areas regulated by Regional Fisheries Management Organisations, and the waters of third countries with which the EU has concluded Fisheries Partnership Agreements.

13b) The Commission and Member States will develop and implement under the CFP long-term management plans with harvest control rules based on the MSY approach. These plans should be designed to respond to specific time-related targets and be based on scientific advice and sustainability principles.

13c) The Commission and Member States will significantly step up their work to collect data to support implementation of MSY. Once this objective is attained, scientific advice will be sought to incorporate ecological considerations in the definition of MSY by 2020.

Action 14: Eliminate adverse impacts on fish stocks, species, habitats and ecosystems

14a) The EU will design measures to gradually eliminate discards, to avoid the by-catch of unwanted species and to preserve vulnerable marine ecosystems in accordance with EU legislation and international obligations.

14b) The Commission and Member States will support the implementation of the Marine Strategy Framework Directive, including through providing financial incentives through the future financial instruments for fisheries and maritime policy for marine protected areas (including Natura 2000 areas and those established by international or regional agreements). This could include restoring marine ecosystems, adapting fishing activities and promoting the involvement of the sector in alternative activities, such as eco-tourism, monitoring and managing marine biodiversity, and combating marine litter.

TARGET 5: COMBAT INVASIVE ALIEN SPECIES

By 2020, Invasive Alien Species (IAS) and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS[27]*.*

Action 15: Strengthen the EU Plant and Animal Health Regimes

15) The Commission will integrate additional biodiversity concerns into the Plant and Animal Health regimes by 2012.

Action 16: Establish a dedicated instrument on Invasive Alien Species

16) The Commission will fill policy gaps in combating IAS by developing a dedicated legislative instrument by 2012.

[25] Although indicative at this stage, this target would need to be translated in the legal framework of the CFP reform to ensure that the objectives are reached. The situation would need to be reviewed in 2014, once the package of the CFP reform has been adopted. (Source: Impact Assessment)

[26] Activities carried out under the fisheries target, and targets 1, 2 and 5 would contribute to achieving the objective of good environmental status of marine waters in the EU by 2020 as required under the Marine Strategy Framework Directive.

[27] This target is indicative, although it should be underlined that the EU has committed to it as a CBD party. It will need to be reviewed after the Strategy on invasive alien species has been adopted, which is foreseen in 2012, and may be translated into a regulatory framework, if this is the option retained at that time.

TARGET 6: HELP AVERT GLOBAL BIODIVERSITY LOSS *By 2020, the EU has stepped up its contribution to averting global biodiversity loss*[28]*.*
Action 17: Reduce indirect drivers of biodiversity loss 17a) Under the EU flagship initiative on resource efficiency, the EU will take measures (which may include demand and/or supply side measures) to reduce the biodiversity impacts of EU consumption patterns, particularly for resources that have significant negative effects on biodiversity. 17b) The Commission will enhance the contribution of trade policy to conserving biodiversity and address potential negative impacts by systematically including it as part of trade negotiations and dialogues with third countries, by identifying and evaluating potential impacts on biodiversity resulting from the liberalisation of trade and investment through *ex ante* Trade Sustainability Impact Assessments and *ex post* evaluations, and seek to include in all new trade agreements a chapter on sustainable development providing for substantial environmental provisions of importance in the trade context including on biodiversity goals. 17c) The Commission will work with Member States and key stakeholders to provide the right market signals for biodiversity conservation, including work to reform, phase out and eliminate harmful subsidies at both EU and Member State level, and to provide positive incentives for biodiversity conservation and sustainable use.
Action 18: Mobilise additional resources for global biodiversity conservation 18a) The Commission and Member States will contribute their fair share to international efforts to significantly increase resources for global biodiversity as part of the international process aimed at estimating biodiversity funding needs and adopting resource mobilisation targets for biodiversity at CBD CoP11 in 2012. 18b) The Commission will improve the effectiveness of EU funding for global biodiversity *inter alia* by supporting natural capital assessments in recipient countries and the development and/or updating of National Biodiversity Strategies and Action Plans, and by improving coordination within the EU and with key non-EU donors in implementing biodiversity assistance/projects.
Action 19: 'Biodiversity proof' EU development cooperation 19) The Commission will continue to systematically screen its development cooperation action to minimise any negative impact on biodiversity, and undertake Strategic Environmental Assessments and/or Environmental Impact Assessments for actions likely to have significant effects on biodiversity.
Action 20: Regulate access to genetic resources and the fair and equitable sharing of benefits arising from their use 20) The Commission will propose legislation to implement the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation in the European Union so that the EU can ratify the Protocol as soon as possible and by 2015 at the latest, as required by the global target.

Table 8 – EU 2020 Targets and Actions

2.3 Vision, Objectives and Targets of Malta's NBSAP

"All Maltese citizens will value the importance of Malta's biodiversity and work hand-in-hand with nature in their daily lives. Efforts aimed at sustainable and more resource-efficient choices and actions by local communities and relevant sectors have contributed to a significant improvement in the status of Malta's biodiversity and associated ecosystem services, for the well-being of present and future generations."

Long Term Vision of Malta's NBSAP

By 2050 European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided.

2050 EU Vision for Biodiversity

[28] The target is again indicative, although representing an international EU commitment, and will need to be reviewed in 2014 or earlier, in particular following COP-11 negotiations on financing targets and the adoption of a legislative proposal on ABS (Source: Impact Assessment)

Malta's NBSAP aims to yield results in terms of increased awareness on biodiversity, and to mobilise action across sectors in support of biodiversity protection and conservation. The participation of all stakeholders at all levels is deemed of essence in order to achieve this. The overall objective is that the decline/loss of biodiversity in the Maltese Islands is reversed through effective *in situ* conservation (substantiated by *ex situ* measures where required) coupled by timely threat mitigation, sustainable use of biological resources and strengthened enforcement of environmental legislation applied in the wider countryside (and not limited to protected areas), while the health, functioning and resilience of ecosystems in the Maltese Islands, is maintained and safeguarded. The conservation measures identified for bringing forth the NBSAP's objective should also strive for improved action and cooperation to encourage the involvement of the private sector, namely through the development of partnerships at the national level; and to strengthen the contribution of the scientific community in order to improve the science/policy interface to support research-based advice on biodiversity.

Malta's NBSAP also directly addresses all three pillars for conserving biodiversity and ecosystem services as defined in the draft National Environmental Policy. Indeed the NBSAP provides a comprehensive policy framework for protecting biodiversity in the Maltese Islands. It also aims at improving the status of biodiversity by safeguarding ecosystems, species and genetic diversity; and, reducing direct pressures on biodiversity as well as promoting sustainable use.

Malta's NBSAP also needs to mobilise action at a national level in order contribute to the achievement of the CBD Aichi Targets and the EU 2020 targets. The NBSAP hence responds to mandates under the CBD, related MEAs and EU policy thereby aiming to set Malta on the right track to meet its own biodiversity and environmental objectives as well as its global and EU commitments. Malta is required to develop national targets, using the CBD Strategic Plan for 2011-2020 as a flexible framework, in accordance with national priorities and capacities and taking into account both the global targets and the status and trends of biological diversity in the country, and the resources provided through the resource mobilization strategy, with a view to contributing to collective global efforts to reach the global targets. Table 9 lists the CBD targets included in the Strategic Plan and proposed complementary national targets to be achieved by 2020[29].

CBD Target	Proposed National Target
Policy Area: Addressing the underlying causes of biodiversity loss	
Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	***Target 1:*** More than 35% of Maltese citizens are aware of the term "biodiversity", know what it means and also know what steps they can take to conserve and use biodiversity in a sustainable manner[30].
Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems	***Target 2:*** The values of biodiversity and ecosystem services, and the opportunities derived from their conservation and sustainable use, are recognised and integrated in national policies (including national accounting, as appropriate), as well as decision-making and planning processes.

[29]These targets are indicative, and may be reviewed in 2014, when the outcome of Malta's assessment of progress towards implementation will be provided in its fifth national report to the Convention on Biological Diversity.

[30] The results of the Eurobarometer Surveys on Attitudes of Europeans towards Biodiversity in 2007 and 2010 indicate that 14.4% and 18% respectively of Maltese respondents had heard of the term "biodiversity" and knew what it meant.

CBD Target	Proposed National Target
Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions	***Target 3:*** Incentives, including subsidies, harmful to biodiversity are reformed, reoriented or eliminated, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied.
Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits	***Target 4:*** Main sectors that are beneficiaries of ecosystem services have incorporated biodiversity concerns into their sectoral and cross-sectoral plans, policies and programmes, as appropriate.
Policy Area: Reducing the direct pressures of biodiversity	
Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced	***Target 5:*** The rate of loss of natural and semi-natural habitats of conservation value is at least halved, and degradation and fragmentation is significantly reduced. CORINE land cover data shows that "forests and semi-natural areas" have not decreased below the current level[31].
Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits	***Target 6:*** Pressure on vulnerable ecosystems through overexploitation of biological resources is reduced by adopting sustainable practices.
Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity	**Target 7:** Areas under agriculture and aquaculture are managed sustainably, ensuring conservation of biodiversity**.**
Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity	***Target 8:*** Pollution, including from excess nutrients, has been brought within limits set by established legislation, as far as feasible.
Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment	***Target 9:*** Measures are in place to prevent, in so far as practical, the introduction and establishment of new invasive non-native species, while those that are established are identified and prioritised for eradication or control, where feasible.
Policy Area: Improving the status of biodiversity	
Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning	N/A
Target 11: By 2020, at least 17 % of terrestrial and inland water, and 10 % of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes	***Target 10:*** Malta's 13% land area covered by terrestrial Natura 2000 sites is maintained, and Malta's sufficiency in designation of key marine biodiversity areas is improved through a representative network of marine protected areas.

[31] The current level as at 2006 is 19.1%.

CBD Target	Proposed National Target
Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained	***Target 11:*** The risk of local extirpation of known threatened species has been reduced, with 30% of the species of European Community Importance in the Maltese territory having a favourable or improved conservation status[32].
Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity	***Target 12:*** The status of crop and livestock genetic diversity in agricultural ecosystems and of wild relatives has improved, where feasible.
Policy Area: Enhancing the benefits from biodiversity	
Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable	***Target 13:*** Vulnerable ecosystems that provide essential services are safeguarded, with at least 15% of degraded ecosystems restored, while 20% of the habitats of European Community Importance in the Maltese territory have a favourable or improved conservation status[33].
Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 % of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification	***Target 14:*** The impacts of climate change on ecosystems have been reduced, in so far as feasible and, mitigation and adaptation responses to climate change that support and conserve biodiversity have been agreed and are being implemented
Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation	***Target 15:*** Access to genetic resources is regulated through a National Regime on Access and Benefit Sharing (ABS).
Policy Area: Enhancing implementation	
Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan	***Target 16:*** Malta has commenced implementing an effective and participatory national biodiversity strategy and action plan
Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels	***Target 17:*** The contribution of local communities to the sustainable management of biodiversity is recognised and enhanced
Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied	***Target 18:*** Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved and applied

[32] This percentage is composed of the 20% of species in a favourable conservation status as documented in Malta's last assessment as per requirements of the EC Habitats Directive Article 17 reporting + 10% of species with an improved conservation status.
[33] The 20% in this target is composed of the 7% of habitats in a favourable conservation status as documented in Malta's last assessment as per requirements of the EC Habitats Directive Article 17 reporting + 13% of habitats with an improved conservation status.

CBD Target	Proposed National Target
***Target 20*:** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels[34]	***Target 19:*** Capacity for national implementation of the Convention on Biological Diversity, other related Multilateral Environmental Agreements (MEAs) and EU obligations, has increased from current levels.

Table 9 – CBD and complementary national targets

[34] This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties

3. Conservation Action to Halt Biodiversity Loss – Current State of Play

In situ conservation, sustainable use of biological diversity and the fair and equitable sharing of benefits arising from the use of genetic resources are dependent upon properly maintaining sufficient natural habitat. Protected areas, together with conservation, sustainable use and restoration initiatives in the wider land- and seascape are essential components in national and global biodiversity conservation strategies.

CBD Programme of Work on Protected Areas
[COP 7 Decision VII/28]

Biodiversity loss is irreplaceable and irreversible, unless collective, integrated and cost-effective conservation action is taken to curb its loss. The term "conservation" essentially refers to a set of measures for maintaining or restoring components of biological diversity. Generally those components that are targeted for conservation action include for instance, important natural areas in danger of disappearance in their natural range or that represent outstanding examples of typical characteristics of a biogeographical region, as well as endangered, vulnerable, rare or endemic species. Biodiversity conservation is crucial to maintain the resilience, resistance and integrity of ecosystems, and, to maintain the capacity of species to respond and adapt to environmental changes, including those brought about by man. In situ conservation is one of the primary ways in which a country conserves its biological diversity. It involves measures that aim at conserving components of biological diversity (genes, species and ecosystems) in their natural surroundings such as by enacting legislation to protect species through regulation of activities, designating protected areas, and by undertaking remedial action on the ground to for instance rehabilitate degraded ecosystems and species therein. Requirements of in situ conservation under the CBD are outlined in Article 8 of the Convention Text. This Chapter looks at direct conservation action in the Maltese Islands in the fields of inter alia protected area designation and management; biodiversity inventorying, assessment and monitoring; awareness raising activities; and threat prevention and mitigation. As noted in this Chapter, Malta has made significant leaps, especially over the last decade, in adopting measures aimed at safeguarding the natural heritage that it is bestowed with, while other measures are ongoing or are foreseen, and are intended to advance past and current conservations efforts.

3.1 Nature Protection – The Legal Framework

An enhanced national legal framework has been set up to safeguard endangered species and ecologically important sites in the Maltese Islands. Primary nature protection legislation has been set up since 1991, although some minor law was already in place as far back as 1932. The Environment Protection Act (EPA, Act V of 1991) was first enacted in 1991 and was subsequently repealed and replaced in 2001 by Act XX of 2001 (which in turn was amended by Act II of 2006) and partly repealed and replaced by the "Environment and Development Planning Act, 2010" (EDPA, Act X of 2010). This Act is an environmental framework law with general mandatory provisions regarding various environmental issues. The EDPA, places on every person together with the government, a duty to protect the environment and to assist in the taking of preventing and remedial measures to protect the environment and manage natural resources in a sustainable manner (Article 3). Under this Act and previous EPA, the government is granted the power to issue subsidiary legislation specific to environmental issues related to, amongst others, the protection of biological diversity. Thenceforth, several pieces of subsidiary law have been

published (either as legal notices [LN] or government notices [GN]) in conformance with relevant global and regional treaties to which Malta is a Party.

Legal notices include regulations on protected species (covering flora and fauna, and in certain cases being specific to groups of taxa *e.g.* the protection of marine mammals [LN 203 of 2003, as amended], reptiles [LN 76 of 1992, as amended], birds [LN 79 of 2006, as amended] and trees [LN 200 of 2011]). The "Flora, Fauna and Natural Habitats Protection Regulations, 2006" (LN 311 of 2006, as amended) (Figure 16) include both species-oriented provisions as well as provisions on the designation of protected areas and their management. These regulations aim to contribute towards ensuring biodiversity in the territory of the Member States of the European Community through the conservation of natural habitats and of wild fauna and flora in the Maltese Islands. They transpose the Articles of the Convention on Biological Diversity, other multilateral environmental agreements (MEAs)[35], and also the EU Nature Directives into national law.

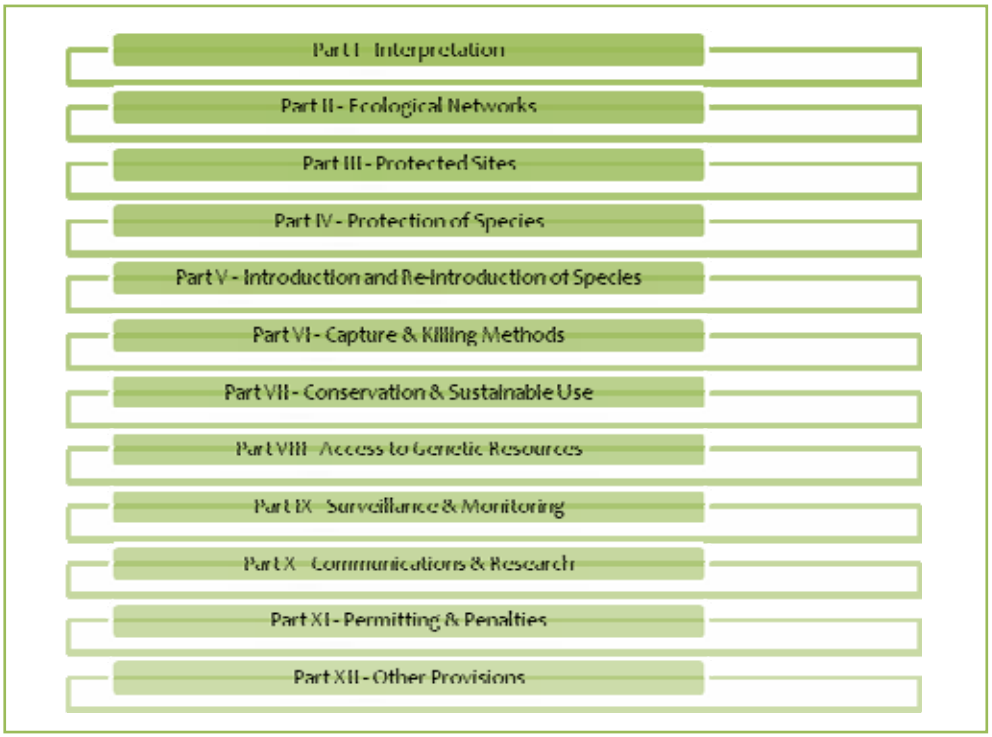

Figure 16 – Structure of the Flora, Fauna and Nature Habitats Protection Regulations

In general, legal notices such as the afore-mentioned incorporate lists of species to which the provisions apply, including those aimed at the strict protection of endangered species, endemic species and migratory species such as prohibitions of capture, killing and trade. Habitats important for the survival of such species are also protected. The enforcement of legislation is backed by systems of permitting to regulate certain activities, and by systems of penalties to address illegalities. In actual fact, subsidiary legislation pertaining to the protection of species includes the requirement for the issuance of a permit prior to the handling, possession, capture, trade, exchange and release of specimens of those species that are nationally protected. Two systems of permitting are distinguished: nature permitting under the legal instruments on nature

[35] These include the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention),the Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention), and the Protocol for Specially Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention (SPA & Biodiversity Protocol).

protection and, CITES-related permitting specific to regulating trade under the "Trade in Species of Fauna and Flora Regulations, 2004" (LN 236 of 2004)[36].

Malta has made considerable progress in affording legal protection to threatened species. An assessment carried out in 2005 revealed that out of the 189 species of international importance which are found in Malta, 183 (97%) are given a legal status (Figure 17). This is noteworthy when considering that in 2002, 39% of the species of international importance were unprotected, with the most marked improvement being with respect to higher plants, fish and crustaceans. Of the six species that remained unprotected, one is reported as threatened in Malta, while three species are non-native. The assessment was repeated in 2009 revealing that 100% of crustacean and insect species of international importance were subsequently also protected. Two of the six unprotected taxa have since then, become legally protected by LN 311 of 2006, as amended, such that 2.1% remain unprotected. Nonetheless, it should be noted that these 4 remaining species are included in IUCN Red lists of threatened species (of 1996 and/or of 2000); they are however not protected by any treaty/legislation. Several other species are being considered for inclusion in national legislation on nature protected under the ongoing Better Regulation Initiative to reflect developments in the amendments of lists annexes to relevant MEAs.

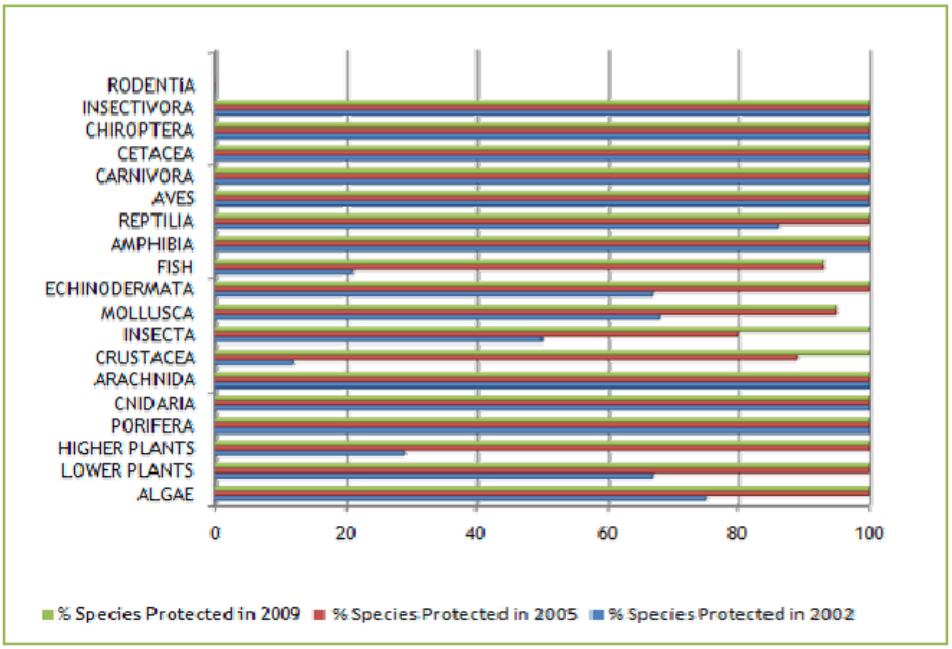

Figure 17 - Species of international importance covered by national legal protection (Source: MEPA 2009)

In 2008, an environmental liability framework based on the polluter-pays principle, was established via the enactment of the "Prevention and Remedying of Environmental Damage Regulations, 2008" (LN 126 of 2008) with the purpose to prevent and remedy environmental damage and to implement the provisions of Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004. Environment damage as construed under these regulations also covers damage to protected species and natural habitats caused by any occupational activities other than those specified (schedule III to the regulations), and any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or

36 Permit application forms and issuance of permits is detailed in the public register available on the nature permitting portal of the MEPA website. An up-to-date list of published legislation under the EPA is also available on MEPA's Legislation and Policy portal.

negligent (Regulation 4.1). The significance of any damage, which causes adverse effects on reaching or maintaining the favourable conservation status of habitats or species, has to be assessed by reference to the conservation status at the time of the damage, the services provided by the amenities they produce and their capacity for natural regeneration.

3.2 Malta's National Ecological Network of Protected Areas

Establishing a coherent and representative network of protected areas is another strategy for conserving components of biodiversity *in situ* such as by providing refugia to species and protecting nursery grounds; and also in safeguarding and maintaining the structure and function of natural and semi-natural ecosystems and their associated ecological goods and services. Protected areas also serve as a platform for sustainable development and are viewed as "a cornerstone of efforts to preserve biodiversity"[37]. The conservation of natural resources via the designation of protected areas provides a number of benefits essential for human well-being such as the provision of amenity value, recreation, carbon sequestration and hence air quality. Sectors, such as tourism, fisheries and agriculture that rely on the existence and flow of ecological goods and services, also benefit from the establishment of protected areas such as through the creation of nature-based tourism, watershed protection, pollination, soil erosion prevention and control, nutrient cycling, maintenance of wild relatives of crops that can supply genes for plant improvement as well as serving as tools for fisheries resources management. Last but not least protected areas also provide opportunities for research.

In contrast to species protection, habitat protection aimed directly at species conservation has been adopted in Malta much later, and indeed culminated in 2003 with the enactment of domestic legislation to transpose the EC Habitats Directive and hence safeguard habitats of European community interest that are present in the Maltese territory. The legal basis for designating protected areas is provided by national subsidiary legislation enacted under the EPA and/or the DPA and more recently the EDPA. Designation is done in compliance with various MEAs, including the CBD. The "National Ecological Network" is afforded legal status via LN 311 of 2006, as amended, which also provides for land use management in protected areas, and management of the protected area itself. Interim measures to protect highly threatened areas are addressed through the issuance of a conservation order under Article 81 of the EDPA. The first site to be given a legal status in Malta is Filfla, when it was declared a nature reserve by Act XV (Cap. 323) way back in 1988. Since then additional sites have been protected. Several designations of protected areas apply on a national level and essentially comprise nature reserves, areas designated due their importance for avifauna, areas scheduled under the DPA (and the EDPA), and more recently, special areas of conservation (SAC) of national importance and tree protection areas (TPAs) (Table 10, overleaf). Designation of marine SACs formally begun in 2005, with the first protected area being *Rdum Majjiesa to Ras ir-Raheb* (Malta) and designated in 2005. In 2010, 4 additional marine SACs of international importance have been designated covering over 18,000 hectares of the Maltese marine environment. These include the marine areas in the limits of *Għar Lapsi* and *Filfla, Dwejra* (Gozo) and *Mġarr ix-Xini* (Gozo) as well as the marine area in the Northeast of Malta. They provide protection to over 80% of *Posidonia* beds and other important habitats in the Maltese Islands.

[37] Further reading: EEA 10 Messages for 2010 – Protected Areas.

Type of National Designation	Relevant Legal Instrument	Number of Sites
Bird Sanctuary	LN 79 of 2006 as amended	26
Strict Nature Reserves (Islets)	Act XV of 1988 LN 22 of 1992	2
Nature Reserve (Islet)	LN 25 of 1993	1
Site designated for trees having an antiquarian importance	GN 269 of 1933	6
Special Areas of Conservation (SAC) of National Importance (terrestrial and marine) and SACs of International Importance	LN 311 of 2006 as amended	39 in total 32 of these are of international importance 7 of national importance
Special Protection Areas (SPA)	LN 311 of 2006 as amended	13
Areas of Ecological Importance and/or sites of Scientific Importance	Scheduling under DPA and EDPA and published under relevant G.N.	73
No Berthing Zone/No Entry Zone except for Fisheries	GN 173 of 1990	1
Protected Beaches	LN 39 of 2007	11
Nature and History Park	LN 251 of 2007	1
Tree Protection Areas	LN 200 of 2011 and GN 473 of 2011	30

Table 10 - National designations of protected areas in Malta (MEPA, 2011)[38]

3.2.1 Malta's Contribution to Global and Regional Networks of Protected Areas

Malta's responsibility for designating protected areas further extends to the international context as a result of ratification by Malta of various treaties (Table 11, overleaf). To this end, an area may fall under more than one national designation and/or global and regional designations. Hence management aspects considered for each protected area would vary accordingly. The list of designated sites, including site boundaries, is compiled for the Common Database on Protected Areas (which is submitted through EIONET on a generally annual basis). MEPA internally maintains and updates the relevant list of designated sites, and relevant map/shape files.

Type of Global/Regional Designation	Relevant Legal Instrument	Number of Sites
Wetlands of International Importance	Ramsar Convention	2
Natura 2000 - Special Area of Conservation of International Importance	Habitats Directive	27 terrestrial 1 marine
Natura 2000 - Special Protection Area	Birds Directive	13 terrestrial
Special Protected Area & SPAMIs	SPA and Biodiversity Protocol	4

Table 11 – Global and Regional designations of protected areas in Malta

Natura 2000 is a stronghold of EU policy directed at the conservation of biodiversity. Indeed under the EU Biodiversity Strategy for 2000, the completion of this network and its management by Member States is considered pivotal to reaching the EU 2020 headline target. It consists of an EU wide network of areas designated as Special Areas of Conservation (SAC) under the EU

[38] Maps of terrestrial PAs are available online.

Habitats Directive (Directive 92/43/EEC) and/or Special Protection Areas (SPA) under the EU Birds Directive (Directive 79/409/EEC). Designation of terrestrial and marine areas is done at Member State level on the grounds of scientific criteria. The aim of the EU Natura 2000 Network is to ensure the continued survival of threatened species and habitats of Community importance by maintaining them, or where required, restoring them to a favourable conservation status in their natural range. Management of Natura 2000 sites also falls under the responsibility of Member States and essentially involves developing management plans built on defined conservation objectives. The network does not exclude all human activities from occurring within the protected areas but instead encourages sustainable management. New activities and developments within Natura 2000 sites need to be assessed on a case-by-case basis following a procedure known as an "Appropriate Assessment" (AA) in accordance with Article 6(3) of the Habitats Directive in order to determine whether the proposed activity would have significant effects on the site concerned. A series of sectoral-specific guidance documents on Natura 2000 are also being published by the Commission. Those available include on Wind Energy Developments and Natura 2000; Non-energy Mineral extraction and Natura 2000; Sustainable Tourism and Natura 2000; while a number of others are in the pipeline. Moreover, the Commission is introducing an extended biogeographical process for Natura 2000 in order to improve the overall coherence of implementation measures at a biogeographical level. It is expected that this process will also facilitate priority-setting and catalyse trans-boundary co-operation and information sharing across the Natura 2000 network. This process will entail the organisation of regular seminars chaired by the European Commission and involving representatives from the Member States, scientific experts and stakeholder observers from Member States covered by the respective biogeographical region. Regular meetings will also be held in each biogeographical region. Malta has achieved 93% sufficient in affording protection to the Maltese terrestrial habitats and species of community interest (sufficiency of sites forming part of the Natura 2000 network). A third updated list of sites of Community importance for the Mediterranean biogeographical region was published by the Commission on 2 February 2010 via Commission Decision 201/46/EU.

The 2008 EU BAP mid-term assessment report, documents that at EU level "Plans are on target to complete the terrestrial part of Natura 2000 by 2010. Additional efforts are needed, in particular, to finalise the marine network by 2012." Indeed, national efforts are now directed towards completing the marine protected area (MPA) system. A management framework and an action plan for two MPAs have been approved. These address measures on how to protect the areas from threat, on measures to enhance the marine environment, on promoting stakeholder involvement and also to propose different zones in which different regulations would apply and range from a "no-entry & no-take" status to "entry-take" status. The involvement of stakeholders in the management of MPAs is also being currently discussed. A 'National Marine Protected Area Steering Committee' (MPASC) was established in 2008. The aim of this committee is to standardise and coordinate management and enforcement measures in proposed MPAs, and is composed of key governmental stakeholders in this area. A draft "National Marine Protected Area Strategy" (NMPAS), with its associated Action Plans, has been approved by MEPA in October 2008 for inter-departmental and external consultation. The strategy aims to identify the background work required to complete this task, in line with national and international requirements. The NMPAS also includes an action plan to locate areas important for particular migratory species.

Malta's National Ecological Network also contributes to the Council of Europe's Emerald Network under the Bern Convention. The 28 Natura 2000 sites were also submitted to the Council of Europe as candidate Areas of Special Conservation Interest. The Emerald Network is based on the

same principles and criteria as the Natura 2000, although it differs in that it applies to the whole of Europe and part of Africa. The network comprises "areas of special conservation interest", for the conservation of the habitats of the wild flora and fauna species, especially those specified in Appendices I and II of the Bern Convention, and the conservation of endangered natural habitats in accordance with Article 4 of the Convention. The Emerald network forms part of pan-European ecological network under the Pan-European Biological and Landscape Diversity Strategy (PEBLDS).

3.2.2 Management of Protected Areas

Management of protected areas is either carried out through the implementation of a management plan, which is drawn up specifically for a particular site or area in question, or, via other statutory, administrative or contractual measures (*e.g.* legislation). For the purposes of implementing such plans, MEPA, as the Competent Authority, may enter into a management agreement with owners, lessees or occupiers of land forming part of a protected area. Such agreements are commonly tri-partite, as the Ministry responsible for the environment would also form part of this agreement. The development and implementation of management plans (and other conservation measures) targeting protected areas (PAs) is an ongoing practice which, where possible, is supported by stakeholder involvement.

To date, site managers of protected areas primarily include non-governmental organisations (NGOs). However, there is the scope to explore other forms of governance and other types of site managers. In some protected areas, farmers constitute the great majority of land-owners or land-users of the area, thereby being extremely relevant potential site managers in these areas. Furthermore, private owners are also envisaged to potentially play a key role in the management of protected areas. PA/site managers are required to submit an annual report of progress made in implementing conservation measures aimed at the maintenance or recovery of biodiversity within the designated site in question.

MEPA is the central authority on the designation and management of SACs and SPAs, but more coordination is required between different entities involved in site management. MEPA has been granted financial assistance under the European Agricultural Fund for Rural Development (EAFRD) to establish a framework for the management of all terrestrial Natura 2000 sites in the Maltese Islands and to increase awareness of Natura 2000 amongst the general public and stakeholders.

3.2.3 Ecological Connectivity and the Concept of a Green Infrastructure

> Protected areas are essential – but they do not exist in isolation from the rest of the landscape. The state of biodiversity in urban gardens, parks and green spaces, as well as rural areas, is extremely important.
>
> Extract from the Message from Athens, 2009

The designation of areas of high conservation value as protected areas is only the first step to curtail the loss of biodiversity and to conserve the integrity of ecosystems and their capacity to deliver ecological services under a wide range of environmental conditions. Protected areas form part of a larger environment where numerous threats and pressures directly or indirectly impinge on a daily basis.

Biophysical (*e.g.* climate change, land use conversion, invasive alien species), socio-economic (*e.g.* population growth, consumption and production patterns), and institutional factors (*e.g.* forms of governance, access to information) and how these translate into impacts on PAs is also a growing concern, more so in view of the insular nature of ecosystems in the Maltese Islands. Such factors need to be addressed in the planning, design and management of PAs. It is also important to safeguard heterogeneous habitats that are of sufficient quality to support healthy and diverse biological communities.

Ecological coherence and connectivity, via the establishment and maintenance of buffer zones, corridors, and stepping stones, to interlink landscape matrices, habitats and protected areas, are required for both biodiversity conservation and sustainable development. Such landscape tools or structures are crucial for the survival of species that are vulnerable to habitat fragmentation and are used by species for shelter, feeding and resting. These landscape structures are also important as an adaptation strategy to climate change. In order to address increase trends in habitat fragmentation, the Commission has integrated the concept of a "Green infrastructure" (GI) as a key element in the EU Biodiversity Strategy to 2020. However the concept of a GI goes beyond the boundaries of protected areas in that while still building on existing instruments such as the Natura 2000 Network, it promotes a broader and stronger integration of biodiversity and ecosystem services in sectors affecting land use by providing a smart and holistic framework for resource planning, conservation and development. A European green infrastructure would essentially comprise a green space network comprising elements such as:

- the existing Natura 2000 network and other protected areas and designations covered by national legislation;
- healthy ecosystems and areas of high nature value outside protected areas;
- natural landscape features such as watercourses;
- restored habitat patches, created to ensure the provision of specific functions;
- artificial features and technical solutions assisting species movement across artificial landscape barriers, and thus enhancing connectivity within or between spatial elements of green infrastructure such as rubble walls and other innovative solutions not yet explored in Malta such as eco-ducts and safe flyways;
- multifunctional zones where land uses that help maintain or restore healthy ecosystems are favoured; and
- specific urban elements such as green walls and green roofs.

A GI would in principle serve as a spatial tool at a landscape level to curb increasing trends in habitat fragmentation, to mitigate and adapt to climate change and to contribute to the sustainability of biodiversity by way of:

- maintaining a wide range of ecological functions at the landscape scale in combination with multi-functional land uses through functional and ecological connectivity;
- increasing the resilience of ecosystems to climate change by maintaining healthy functioning ecosystems as an effective means of tackling and adapting to climate change;
- enabling shifts in range of wild species and natural habitats, in a climate change context (although the unwanted potential role of the GI in the spread of invasive species would also need to be considered);
- integrating the Natura 2000 Network into the wider landscape thereby ensuring ecological coherence for natural habitats; and
- mainstreaming biodiversity into sectoral policies especially those policies pertaining to different land uses and to spatial planning.

Strategic and integrated planning and action at the landscape level and by following the ecosystems approach as part of implementing a green infrastructure would also assist in:

- addressing infrastructure, nature conservation and water management under one holistic project or plan thereby minimising duplication of efforts and resources;
- ensuring more efficient use and management of natural resources;
- identifying mutually-supportive and cost-efficient solutions to common problems;
- increasing coherence between different spatial plans, and
- leading to more cost-effective implementation of related EU environmental policies and their objectives including Article 10 of the Habitats Directive and also Target 2 of the EU Biodiversity Strategy to 2020.

Certain principles of connectivity through a green infrastructure are already adopted in Malta. For instance, rubble walls in Malta serve as an important ecological corridor and a refuge for a number of endangered terrestrial fauna. With a view of conserving and maintaining these structures, noting their architectural and environmental importance, the "Rubble Walls and Rural Structures (Conservation and Maintenance) Regulations, 1997" (LN 160 of 1997, as amended) were enacted. Moreover, the Local Plan for Gozo and Comino, an enabling plan containing policies, principles and standards aiming sustainable development and the protection of environmentally sensitive areas, also encourages the protection and restoration of rubble walls. The Government has also started investing in the trade of rubble wall builders in order to conserve this trade, as well as restoring and conserving such traditional dry walls. Under the current Rural Development Programme 2007-2013, support for the conservation of rural structures providing a natural habitat for fauna and flora - is adopted as an Agri-Environment measure under Axis II – Improving the Environment and the Countryside. Important valley watercourses are being addressed via the implementation of the EU Habitats Directive and the Water Framework Directive. Connectivity is also achieved in relation to the fact that the boundaries of certain protected areas overlap and protected areas are also accompanied by buffer zones. Concepts related to green infrastructure are also found in the national planning framework. These include networks of countryside walkways identified in the Structure Plan for the Maltese Islands and the scheduling of environmentally sensitive areas and the designation of 'green gaps' between urban areas located in close proximity found in Local Plans.

The integration of terrestrial PAs into the wider countryside is hence currently partially achieved via the implementation of land use policies such agri-environment measures under the Rural Development Plan and cross-compliance obligations[39] (see Chapter 4 of NBSAP – Section 4.1.1), Structure Plan Policies and Integrated Coastal Zone Management (ICZM) (see Chapter 4 of NBSAP – Section 4.3). The Structure Plan aims to influence the quality and distribution of land uses through a set of sectoral and area-based policies, which take into account the socio-economic and environmental conditions of the Maltese Islands, and also promotes integrated land and water planning.

Marine protected areas (MPA) established to date, are to a certain extent, safeguarded from land-based activities when considering that their location falls adjacent to land protected areas. Malta has also signed and ratified the revised Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities, and in this respect, has formulated the 'National Action Plan for the Protection of the Marine Environment from Land-Based Activities'. One key objective for the NAP is to eliminate by the year 2025, discharges of

39 Under cross-compliance, there are four main standards of Good Agricultural and Environmental Conditions (GAEC), as well as the Statutory Management Requirements related to the nature Directives, which can provide significant biodiversity benefits.

contaminants from point sources, in conformity with this Protocol. This NAP should serve to bring about a better collaborative approach in the shared responsibilities of those entities having jurisdiction on aspects affecting the protection of the coastal areas and the marine environment.

Another important point that merits attention is the need to undertake an effectiveness evaluation of protected area management. This '*… measures the degree to which a protected area is protecting its values and achieving its goals and objectives. The main objective of evaluation is to enable managers to improve conservation and management of protected areas*' (Hockings, 2004)[40]. Nationally such evaluation is required to shed light on whether protected areas are:

- effectively buffered from external pressures;
- effectively connected to one another thereby forming a coherent network;
- effectively managed based on best practice and by trained and equipped staff;
- achieving their intended aims and conservation objectives;

Findings of such an evaluation can be then applied to a more adaptive approach towards better management of protected areas, as well as guide in priority setting, resource allocation and project planning.

3.3 Species Recovery and Habitat Restoration

> … Everyone is entitled to enjoy a healthy and sustainable environment, which requires the conservation and sustainable use of biodiversity
>
> Extract from Preamble of Council Conclusions on Biodiversity Post-2010, 15 March 2010

Species recovery and habitat restoration are at the core of post-2010 biodiversity policy under both the CBD and EU frameworks. As part of *in situ* conservation obligations under domestic legislation, degraded ecosystems, should, as far as possible and as appropriate, be rehabilitated based on a national strategic framework for setting priorities for restoration, whereas the recovery of threatened species should be promoted through the development and implementation of action plans or other management strategies.

Efforts aimed at the rehabilitation of certain degraded habitats in order to reinforce natural processes are ongoing in those protected areas that are covered by a management plan. A number of site managers that are responsible for the management of protected areas propagate stocks of plants within their own nurseries. Propagated specimens are then planted on site as part of restoration efforts of the protected area. Positive recovery of certain habitats and increase in populations of rare species are being noted by site managers. For instance, afforestation at the *Wied Għollieqa* Nature Reserve is leading to the regeneration of a Mediterranean woodland as well as riparian species. This has also successfully contributed towards a marked increase in wildlife present on site. Habitat restoration activities targeting the maquis systems at *Wied il-Miżied* have also been undertaken. A*d hoc* interventions in areas not covered by a management plan are also undertaken (*e.g. Selmunett* Islands).

[40] Section 19 on Maintaining Protected Areas for Now and future: Evaluating Management Effectiveness of Protected Areas, In: Secretariat of the Convention on Biological Diversity (2004). Biodiversity issues for consideration in the planning, establishment and management of protected area sites and networks. Montreal, SCBD, 164 pages and I to IV (CBD Technical Series no. 15).

Conservation measures aimed at the recovery of threatened/endangered species are also being implemented. For instance, MEPA is also actively involved in turtle release programmes as well as in aiding the local network for stranding of cetaceans and turtles, through the provision of expertise and direct help (by transporting the animals for the rescue centres) in such stranding events. Species-specific projects have also been undertaken or are in progress. Two projects are presented as examples:

- The ecological restoration of *Selmunett* Islands, which is a Nature Reserve and a Specially Protected Area since 1986, has been carried out by MEPA, with the help of funds provided by the HSBC Cares for the Environment Fund (HCEF). The aim of this project was to restore the habitat for the endemic lizard, *Podarcis filfolensis kieselbachi*, to allow the population to recover. This involved the eradication of rats and alien vegetation from the site.
- The LIFE funded project "Monitoring and Conservation of Shearwaters and Petrels in the Maltese Islands (GARNIJA-MALTIJA)" aimed to address the declining trend observed in the *Puffinus yelkouan* population at *Rdum tal-Madonna*. This protected area hosts the largest colony of *Puffinus yelkouan* on the islands. BirdLife Malta took a leading role in this project in partnership with two other conservation NGOs and four Government Authorities. A multiple device tagging project was also carried out by the EU LIFE Yelkouan Shearwater Project at *Rdum tal-Madonna*, where Yelkouan Shearwaters were fitted with satellite tags, data loggers and geolocators. This tracking work enabled the assessment of different tagging techniques and methodologies as groundwork for any future and larger scale work. The results also provided data on important rafting sites, feeding areas, post-fledging migratory routes and adult wintering quarters for this species. The satellite tracking techniques were also tested on several specimens of the Cory's Shearwater.

Where needed, *in situ* conservation efforts are supported by *ex situ* measures, especially when dealing with endangered plant species.

3.3.1 Sustainable Use of Biological and Natural Resources

Sustainable use is one of the three objectives of the (CBD). Requirements for sustainable use albeit inherent throughout the Convention text, are specified in Article 10. With regards to those species that can be taken from the wild and exploited (i.e. capture and killed), national legislation requires that the use of biological resources and biological systems is done in a sustainable manner. In the event that such taking or exploitation is undermining the conservation status of the species in question (as revealed through monitoring), then management measures are required to mitigate the impacts and assist in the natural the recovery of that species.

Management measures identified by LN 311 of 2006 (as amended; Regulation 27) include:

- temporary or local prohibition of the taking of specimens in the wild and exploitation of certain populations;
- regulation of the periods and, or methods of taking specimens;
- application, when specimens are taken, of hunting and fishing rules which take account of the conservation of such populations;
- establishment of a system of licences for taking specimens or, of quotas;
- regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens;
- breeding in captivity of animal species as well as artificial propagation of plant species, under strictly controlled conditions, with a view to reducing the taking of specimens from the wild;
- any other measures deemed necessary by the Competent Authority, and
- an assessment of the effect of the measures adopted.

Similar measures are called for by the 'Trade in Species of Fauna and Flora Regulations, 2004' (LN 236 of 2004). Sustainable management should be flexible and tailored to suite, not only the species involved but also the socio-economic conditions which prevail where such management is exercised. The type and extent of information required to sustainably manage wild harvest regimes essentially depends on the biological characteristics and conservation status of the species as well as the type and level of use being practiced.

The practice of capture and killing of wild birds is also regulated by national legislation enacted under the Environment and Development Planning Act. Legislation is in place which regulates this practice for wild birds that can be capture and killed (i.e. hunted). Although certain practices are legal during specified seasons and for certain birds as specified by national legislation (see for instance the "Conservation of Wild Birds Regulations, 2006" [Legal Notice 79 of 2006, as amended] and legislation that declares periods for hunting and taking), illegal practices of capture and killing of wild birds have posed threats to various species along the years.

Sustainable use is also advocated by other policies including fishery regulations (see Chapter 4 of NBSAP – Section 4.5). However, national protocols for applying best practice for sustainable use of biological resources, based on the results of existing and new research and practical experience of management, are also called for, where required and deemed of added value.

Socio-cultural factors such as lifestyle and consumer choices, which are examples of indirect drivers of biodiversity loss, can also drive ecosystem disruptions and adversely affect quality of life beyond national borders. Shifts in production and consumption patterns to ensure sustainable use of natural resources (fuels, minerals, metals, food, soil, water, air, biomass and ecosystems) can hence alleviate pressure on the environment, and when coupled with sustainable supply of resources and optimal production systems, will bring about other benefits such as minimising waste, stimulate technological innovation and competitiveness and create new opportunities for a green economy and smart investment. Measures to reduce the biodiversity impacts of EU consumption patterns are included in the EU flagship initiative on resource efficiency (COM/2011/21).

3.3.2 Access to Genetic Resources and Benefit Sharing (ABS)

In order to strengthen the implementation of the third objective of the CBD, COP 10 adopted on 29 October 2010 the "Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their Utilisation". This protocol applies to the genetic resources (GR) that fall within the scope of Article 15 of the Convention. It proposes an international framework to ensure that the benefits arising from the utilisation[41] of GR are shared with the countries of origin, based on prior informed consent (PIC) and mutually agreed terms (MATs) with the Party providing such resources[42]. The Protocol is hence relevant for those commercial and non-commercial sectors, which are involved in the use and exchange of GR (*e.g.* research institutes, universities and private companies operating in various sectors such as pharmaceuticals, cosmetics, agriculture, horticulture and biotechnology; these will be required to share the benefits derived from GR with the providers).

[41] Utilization of genetic resources" means to conduct research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology as defined in Article 2 of the Convention.
[42] Prior informed consent (PIC) is the permission given by the competent national authority (CNA) of a provider country to a user prior to accessing GR, in line with an appropriate national legal and institutional framework. Mutually agreed terms (MAT) is an agreement reached between the providers of GR and users, on the conditions of access and use of the resources, and the benefits to be shared between both parties.

Benefits derived from GR may include the sharing of the results of research and development carried out on GR, the transfer of technologies that make use of those resources, participation in biotechnological research activities, or monetary benefits arising from the commercialisation of products based on GR, such as pharmaceuticals.

In accordance with its Article 32, the Protocol will be opened for signature by Parties to the Convention at the United Nations Headquarters in New York from 2 February 2011 until 1 February 2012 and will enter into force 90 days after its 50th ratification. As at 21 July 2011, 40 countries signed the Protocol. Following signature and ratification by a Country, the Protocol becomes legally binding thereby requiring that Country to implement it through national legislation. The EU became a signatory on 23 June 2011. The EU Commission has contracted a study to evaluate potential legal and economic consequences of implementing the Nagoya Protocol in the EU.

3.4 Trade

> The trade in wild plants and animals and their derivatives is poorly documented but is estimated at nearly $160 billion annually. It ranges from live animals for the food and pet trade to ornamental plants and timber. Because the trade in wild animals and plants crosses national borders, the effort to regulate it requires international cooperation to safeguard certain species from overexploitation
>
> Millennium Ecosystem Assessment (2005)
> Ecosystems and Human Well-being: Biodiversity Synthesis

The trade of biodiversity and biodiversity-based goods is a multi-billion euro industry. Considerable numbers of specimens of plants and animals are removed each year from the wild (excluding specimens that are farmed in controlled environments for eventual harvesting and trading) around different parts of the world for trading. Species of animals (*e.g.* species of birds, fish, insects such as moths, butterflies and beetles, and, reptiles) and plants (*e.g.* species of cacti and succulents, orchids) are captured and collected respectively to supply the worldwide demand within consumer and provider countries. Commercial trade is not limited to trading live specimens such as to supply the pet, aquarium and horticultural trade and for exhibition purposes (such as in zoos); dead specimens including their parts (such as leather, timber, skins or animal fur) and derivatives (such as chemicals), are also sold to supply for instance the curio trade, fashion and cosmetic industry, pharmaceutical industry and not to mention the natural resources that supply the food industry. Species are also traded for non-commercial purposes, such as the import/export of species for scientific research and *ex situ* conservation. '*The precise impacts of trade depend on the type of good being traded [e.g. primary commodities] and the manner in which it is moved and exchanged*'[43]. Trade in biodiversity becomes a concern when it is unsustainable, that is when the species targeted are overexploited and when species are illegally capture and killing and illegal traded, thereby undermining conservation efforts. This may lead to the targeted species becoming threatened and possibly also facing extinction. Trade activities will negatively impact biodiversity whether directly or indirectly, unless trade policies are based on the principles of sustainability coupled with internalisation of costs, consumer-behavioural changes based on informed choices, appropriate incentives for advancing conservation and sustainable use of biodiversity, and equitable sharing of benefits accrued from the trade of biodiversity.

[43] *Integrating Implementation of the Convention on Biological Diversity and the Rules of the World Trade Organization* - Downes, 1999

Malta became a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on 17 April 1989. This Convention, in force since 1975, is the major legal instrument for regulating and monitoring international trade (export, re-export, import and introduction from the sea) of endangered species, subspecies, or geographically separate population thereof, as well as other species that could become endangered in the future as a result of such trade. CITES-listed species are entered in three appendices based on the degree of threat the species is faced with, and hence different provisions of the Convention apply accordingly. Through such regulation and monitoring, the Convention endeavours to ensure that no wild animal or plant species undergoes unsustainable exploitation due to international trade bearing in mind that '*international co-operation is essential for the protection of certain species of wild fauna and flora against over-exploitation through international trade*' (Convention preamble).

CITES urges its Contracting Parties to ensure that they adequately regulate domestic trade within their respective countries as a means of assisting the regulation of international trade. Trade of CITES listed species must therefore conform to the provisions of the Convention. A system of permits and certificates is in place for controlling importation as well as export/re-export of specimens of CITES-listed species. Such permits/certificates are issued only if certain conditions are met and, these official documents have to be presented before the specimens are allowed to enter or leave the country. CITES-related violations, such as trade without the permit or certificate, are punishable by law. CITES has a memorandum of cooperation with the Convention on Biological Diversity (CBD). At COP 13, CITES adopted Resolution Conf 13.2 urging its parties to make use of the CBD's Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity while also taking into account scientific, trade and enforcement considerations determined by national circumstances when adopting non-detriment-making processes and making CITES non-detriment findings.

The CITES Management Authority designated for Malta is the Environment Protection Directorate within MEPA. It is involved in the re-export of confiscated live animals to appropriate centres, the control of the import and export of fauna and flora, issuing conditions on import licences and inspections at points of entry, as well as informing the public and trade community of the obligations arising from the regulations. The CITES management authority seeks advice from the CITES Scientific Authority, which is composed of individuals with appropriate qualifications and expertise to provide advice, before an import licence is granted for any live specimen. The CITES Management Authority liaises with several entities and assists both Customs and Police in the implementation and enforcement of CITES nationally. Compliance monitoring is undertaken by way of reviewing reports and other information provided by traders and producers, by carrying out inspections of traders, producers and markets, as well as through border control.

The EU wildlife trade regulations comprise the framework regulation, Council Regulation 338/97/EC on the protection of species of wild fauna and flora by regulating trade therein, and its amendments, as well as the implementing regulation, Commission Regulation (EC) No. 865/2006. Both framework and implementing legislations regulate trade within and between EU Member States ("domestic trade") as well as international trade with non-EU Member States, via the application of a system of permits, certificates or notifications. The 'Trade in Species of Fauna and Flora Regulations, 2004' (LN 236 of 2004, as amended) transposes EU regulation 338/97 thereby enforcing CITES at a national level. These regulations provide that the national CITES Scientific Authority and the CITES Management Authority shall provide advice on prohibitions of trade (import, export and re-export) and the possession of any species, if in their opinion, such trade or possession would endanger the biological identity or any ecosystem or any species of flora and fauna. It also provides that it is the responsibility of the person who is seeking to import or is in

possession of any live specimen to obtain the necessary information from the CITES Management Authority. Furthermore, any person who would like to import any specimen of fauna from outside the European Community requires the prior grant of an import licence. The European Commission addresses the potential impact of trade on biodiversity also through Sustainability Impact Assessments (SIAs) of major trade negotiations (Source: Mid-term Assessment of EU BAP). Malta along with other Member States is required submit annual and biennial reports in accordance with Article 15(4) of Council Regulation (EC) No 338/97. The annual reports include data on all trade in specimens of species covered by the EC Wildlife Trade Regulation, whereas biennial reports cover the information on legislative, regulatory and administrative measures that has been adopted at Member State level.

The EU Nature Directives also contain prohibitions on trade of various species unless derogations are made for specific reasons, such as research and education. Trade of non-CITES listed species which are still protected, is regulated via the following legal instruments:

- "Reptiles (Protection) Regulations, 1992" (LN 76 of 1992, as amended);
- "Conservation of Wild Bird Regulations, 2006" (LN 79 of 2006, as amended)
- "Marine Mammals (Protection) Regulations, 2003" (LN 203 of 2003, as amended); and
- "Flora, Fauna and Natural Habitats Protection Regulations, 2006" (LN 311 of 2006, as amended).

The Competent Authority responsible for the implementation of these regulations is MEPA. All the above regulations require the issuance of a permit prior to handling, possession, capture, trade, exchange and release of specimens of species that are nationally protected and are in line with various multilateral agreements to which Malta is a Party including the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), the Convention on the Conservation of Migratory Species of wild Animals (CMS or Bonn Convention) including some of its daughter agreements (ACCOBAMS and EUROBATS), and the Protocol for Specially Protected Areas and Biological Diversity in the Mediterranean (SPA & Biodiversity Protocol) of the Barcelona Convention, not to mention the EU Nature Directive, as applicable.

3.5 Biosafety & GMOs

The concept of biosafety encompasses a range of measures, policies and procedures for minimising potential risks that biotechnology may pose to the environment and human health. Establishing credible and effective safeguards for GMOs is critical for maximising the benefits of biotechnology while minimising its risks.

Biosafety and the environment: An introduction to the Cartagena Protocol on Biosafety.
Secretariat of the CBD and UNEP (2003)

The development and commercialisation of genetically modified organisms (GMOs), particularly GM foods and other produce (maize, soybean, oil-seed rape and cotton varieties), has stirred a global debate driven by proponents of GMOs on one side and opponents of GMOs on the other. Opposition to the production and marketing of GMOs mainly stems from the potential environmental and health risks that are associated with GMOs. Public concern over the use, release and marketing of GM foods has led to a number of initiatives undertaken on various levels. It also led to the enactment of extensive regulatory provisions including on a national level as well as the setting up of defined procedures.

Malta ratified the Cartagena Protocol on Biosafety (CPB), which seeks to protect biodiversity from the potential risks posed by living modified organisms (LMOs)[44] resulting from modern biotechnology[45]. The CPB establishes international legally-binding provisions for the transboundary movement of LMOs resulting from modern biotechnology apart from also dealing with aspects of safe transfer, handling and use of LMOs. The Protocol establishes an Advance Informed Agreement (AIA) procedure. The Protocol addresses all LMOs which may have adverse effects on the conservation and sustainable use of biodiversity, taking also into account risks to human health (Article 4). However, not all LMOs are subject to the AIA procedure. As specified by Article 7(1), the AIA procedure is applied to LMOs intended for intentional introduction into the environment. The CPB also requires Parties under Article 20 to contribute towards to establishment of a Biosafety Clearing-House by registering any information that is relevant under the Protocol thereby facilitating the exchange of information on LMOs and assist countries in the implementation of the Protocol. Malta has contributed the CBD Biosafety Clearing House through the development of its national counterpart. Regulating the use, release and marketing of GMOs in Malta is done following adopted EU and national policy. Transposition of the EU Directives on contained use and deliberate release of GMMs/GMOs into domestic law has been done through the enactment of subsidiary legislation under the EPA (Figure 18, overleaf).

More recently, the Nagoya – Kuala Lumpur Supplementary Protocol was adopted on 15 October 2010 by the fifth meeting of the Parties (MOP 5) to the Cartagena Protocol. Under this Supplementary Protocol, Parties have an obligation to provide, in new or existing domestic law, for rules and procedures that address damage resulting from LMOs, including response measures to prevent or mitigate damage or to restore biological diversity. The Nagoya - Kuala Lumpur Supplementary Protocol will enter into force when 40 Parties to the Biosafety Protocol ratify it.

As a member of the EU, Malta has built its biosafety policy based on the principles of EU legislation and therefore assesses the use of GMOs and GM products on a case-by-case basis. Malta also follows the precautionary principle when required to ensure the highest possible level of safety for the environment and human health. The procedure adopted for processing applications for experimental release of GMOs into the environment (Part B applications) in Malta is explained in Figure 19, overleaf.

[44] This term is defined by the Protocol as 'any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology'.

[45] Modern biotechnology" means the application of: a. *In vitro* nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles, or b. Fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombination barriers and that are not techniques used in traditional breeding and selection (Protocol definition – Article 3 on Use of Terms).

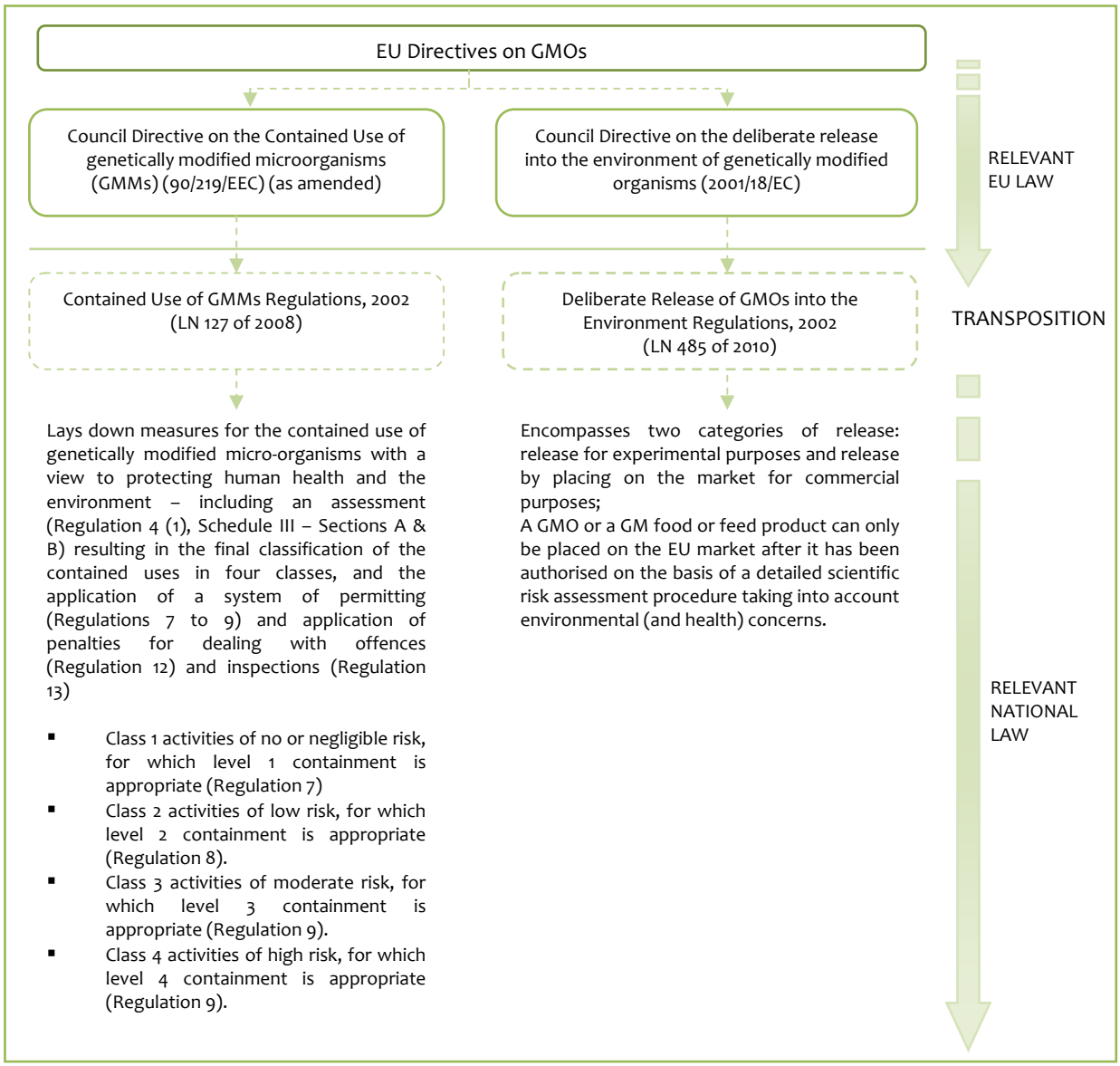

Figure 18 – Maltese Transposition of the EU GMO Directives[46]

An administrative structure has been nationally set up to process GMO applications in conformity to EU requirements. This structure consists of MEPA as the Competent Authority of the respective legislation on GMOs, and is aided by an advisory committee known as the Biosafety Co-ordination Committee (BCC) in the review of GMO applications by formulating opinions on applications for marketing of GMOs according to Directive 2001/18/EC, on safeguard clauses made by various member states and on applications of GM food and feed through Regulation 1829/2003. This committee was set up by the Biosafety Co-ordinating Committee Regulations, 2002 (LN 290 of 2002). Administering the implementation and enforcement of GMO legislation in Malta falls under the responsibility of a number of national entities having separate and defined

[46] LN 485 of 2010 repeals and replaces LN 170 of 2002. The new LN now features clearer step-by-step procedures for applicants, places an onus on applicants to inform the public of their application by publishing an advert on a prominent local newspaper and sets a new fee system and heftier fines.

roles depending on the subject area and the intended use of the particular GMO. A number of systems to handle GMO notifications are already in place in the relevant competent authorities.

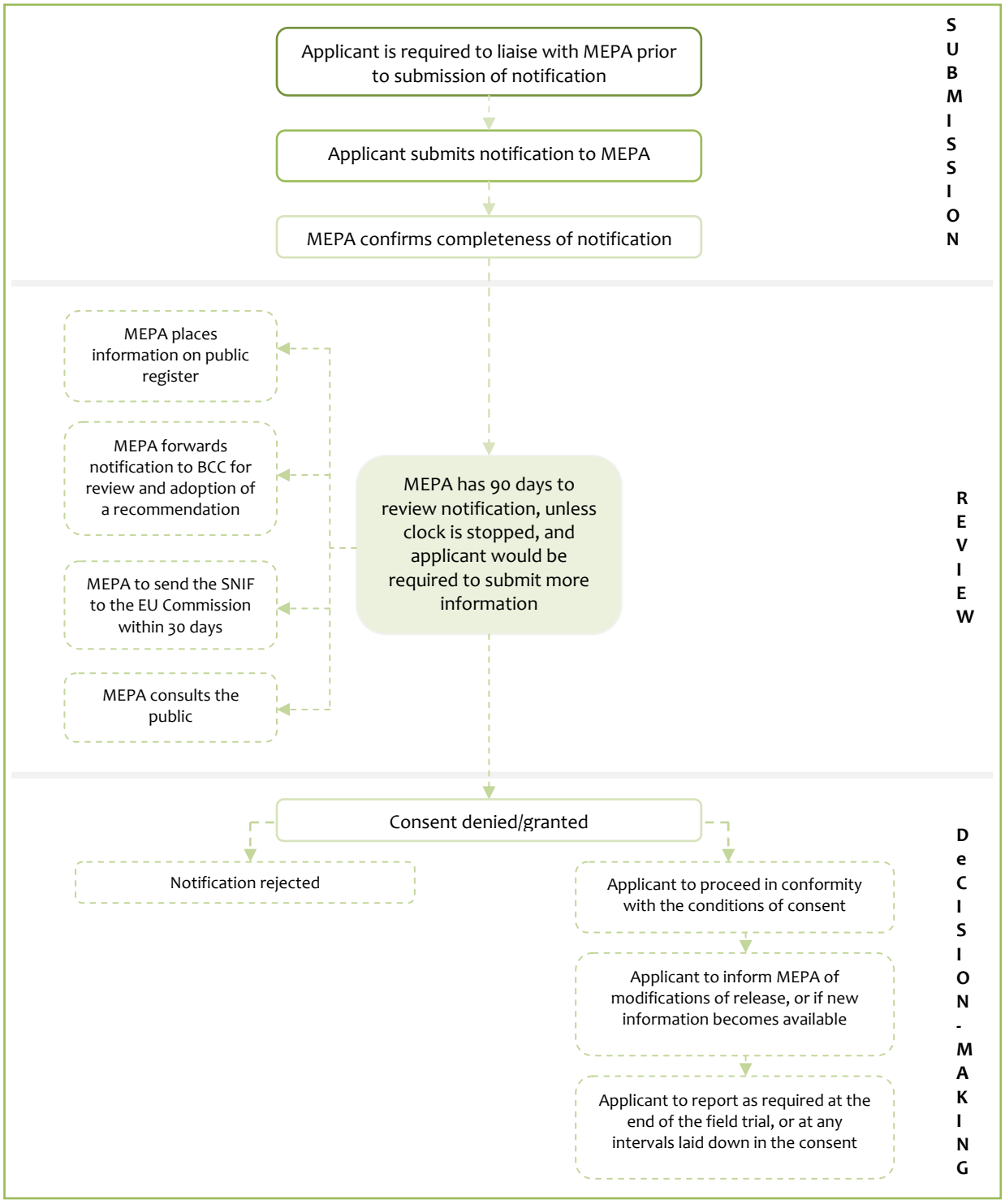

Figure 19 - Procedural steps for the experimental release of GMOs in Malta (Source: MEPA, 2006)

In May 2004, Malta was able to initiate the process of developing a framework for the management of GMOs at national level – National Biosafety Framework (NBF) – as a project under UNEP-GEF funding. The development of the NBF is one of the requirements of the CBP. This framework is essentially '*a combination of policy, legal, administrative and technical instruments that are developed to ensure an adequate level of protection in the field of the safe transfer, handling and use of GMOs*' (MEPA, 2006). This project was completed in November 2006. The NBF was issued by MEPA in December 2006. This publication delves into the biosafety issues in Malta in terms of achievements thus far made (enactment of the relevant legislation, and the setting up the administrative structure) and further highlights what issues remain to be addressed in the future. It is important that such issues are translated into action. The need for strategic direction in the field on GMOs is also one of the issues raised in the National Strategy for Sustainable Development (NSSD).

3.6 Invasive Alien Species

To summarise, for an alien species to become invasive, it must arrive, survive and thrive.

Convention on Biological Diversity
Portal on "What are Invasive Alien Species?"

For millennia, man has deliberately introduced or facilitated the accidental introduction of a wide range of species, including parts thereof, into new locations both within terrestrial and aquatic ecosystems. Intentional introductions occur through importation of the species as a commodity for economic, scientific and commercial reasons. On the other hand, several species have been, and can be, unintentionally introduced as "hitchhikers" or "stowaways". Introductions of non-native species have occurred (and still occur) all over the world, including in the Maltese Islands. The rate of new introductions of alien species, and potentially invasive species, has increased considerably over the years, along with similar trends in trade, transport and tourism across borders and, overall globalisation. Such introduced species would not naturally occur in the new receiving environment. Being outside of their natural (past or present) range, such species are termed "non-native" or "alien" to the country or region in which they have been introduced. If conditions are favourable, the non-native species will successfully colonise the receiving environment. Depending on its reproductive characteristics and ecology, the species may eventually become naturalised by forming sustainable populations (without direct human help) but does not necessarily spread to other areas beyond the area where it was originally introduced. An overview of species introductions into the Maltese Islands is provided by Schembri and Lanfranco (1996) and also by Schembri *et al.* (1999) in the 1998 SOER.

The majority of alien species provide various benefits to human society (*e.g.* crop plants, forage species, domestic animals, and other economically important species such as horticultural/ornamental species). Problems however arise when alien species turn out to be invasive. In this case, once established, invasive alien species (IAS) proceed to rapidly increase in abundance and distribution, invading areas in terrestrial and aquatic ecosystems beyond the area of primary introduction. IAS are a major environmental concern in that they cause significant social, economic and ecological impacts by for instance, harming human health (*e.g.* through allergies), adversely affecting the productivity of sectors such as agriculture (*e.g.* plant pests damaging food crops) and by competing with, and displacing native species. In the majority of cases, the impacts of IAS in the Maltese Islands are perceived to follow a continuing trend (unless specifically being addressed as in certain protected areas) nonetheless, quantitative data is needed to substantiate these observations. Moreover, further research is needed to assess the

status of marine alien species in Maltese territorial waters. By and large, most concern is over biological invasions in specialised habitats such as valley watercourses and cliffs where, in the latter case, the majority of endemic species are found. It must be borne in mind that environmental changes ensuing from climate change and pollution, which disrupt the natural disturbance regimes of habitats, can also create new opportunities for further biological invasion. Remedial action to counteract the impacts of IAS can also be costly. For instance, '*The European Union today spends at least €12 billion a year on control and on damage caused by invasive species.*'[47]

IAS have been identified by the Millennium Ecosystem Assessment (MA, 2005 - Ecosystems and Human Well-Being – Biodiversity Synthesis) as being one of the main direct drivers of biodiversity change. Indeed when considering the Mediterranean, it is documented that over the last century the impact of IAS has been high with a very rapid increase of the impact, whilst for islands the impact is very high and continuing (MA, 2005). A list of '100 of the World's Worst Invasive Alien Species' has been published by the IUCN Invasive Species Specialist Group (ISSG). A list of 100 of the Worst Invaders in Europe has also been compiled by DAISIE. Out of the 10,822 alien species listed in the DAISIE inventory[48], some 10 to 15% are deemed potentially harmful to European Biodiversity. When looking at both lists, examples of the worst invaders already present in the Maltese Islands include both terrestrial, coastal and marine species such as *Bemisia tabaci* (Tobacco or Sweet Potato Whitefly); *Rattus rattus* (Black Rat); *Ailanthus altissima* (Tree of Heaven); *Percnon gibbesi* (Sally Lightfoot Crab) and *Caulerpa racemosa* (Sea Grape).

Management of IAS crosscuts a number of fields (such as biodiversity conservation, plant[49] and animal health) and a number of sectors (for instance, trade, aquaculture and tourism). Malta has established the legislative framework, under different administrative structures and under different departmental remits, to prevent and combat IAS from several perspectives including *inter alia*, nature protection, trade, and animal and plant health. Nature protection legislation in Malta has addressed alien species since 1993. Provisions in addition to the requirements to prevent, control and monitor introductions, and adopt eradication plans, were established in the "Flora, Fauna and Habitats Protection Regulations, 2006" (LN 311 of 2006, as amended), which also prohibits possession besides importation. This piece of legislation defines an "alien species" as '*a non-indigenous organism, which has never been a native of Malta or which has been introduced therein during the past 500 years*'. Species introduced more than 500 years ago are considered "archaeophytes" that is, species that have long become established locally and are now considered to be part of the ecosystem. Guidelines on the keeping, monitoring, prevention, control, and eradication measures of established alien species may also be issued. The mandate is also in place to refuse a development application on the basis of the possible impact resulting from invasive alien species. For instance, via Regulation 18 on "Restrictions on Operations and Activities" under LN 311 of 2006, certain activities or operations can be refused or granted permission to take place.

Provisions for regulating the trade of any species of fauna or flora deemed harmful to the biological identity of any ecosystem or any species of flora or fauna in Malta are laid down by the "Trade in Species of Fauna and Flora Regulations, 2004" (LN 236 of 2004) under Regulation 6. Paragraph 2 of this regulation places the responsibility on '*… the person, who is seeking to import or is in possession of any live specimen, to obtain the necessary information from the Management*

[47] EU Factsheet on Invasive Alien Species, May 2009. [Online] Available at: http://ec.europa.eu/environment/nature/info/pubs/docs/brochures/invasive_green.pdf

[48] Delivering Alien Invasive Species Inventories for Europe – DAISIE European Invasive Alien Species Gateway [Online] Available at: http://www.europe-aliens.org

[49] Measures for combating alien pests that are in place in place in Malta and published as legislation on plant health presently exclude any invasive alien plant species.

Authority…', in order to establish whether such specimen is of any species that can harm local biodiversity. Such species would include those of an invasive nature.

A system is in place for controlling the introduction into Malta (and hence into the EU) from third countries. An import license, issued by the Trade Services Directorate in accordance with Regulation 3 of the "Importation Control regulations, 2004" (LN 242 of 2004, as amended by LN 230 of 2005) is required before animals listed in Schedule II of the said regulations, can be imported. On the other hand, importation of plant species from non-EU countries currently does not require an import license; nonetheless, importation must be done in conformity with national legislation.

Since IAS cross national borders and are an international environmental problem, cooperation, coordination and management is required at global, regional and national levels. The "Global Strategy on Invasive Alien Species" published by the IUCN and the "European Strategy on Invasive Alien Species" published by the Council of Europe, are pivotal policy tools in advancing a coherent approach to tackling IAS on global and regional levels. In 2008 the Commission adopted a "Communication towards an EU Strategy on Invasive Species"[50], which calls for a more harmonised and coherent European-wide approach to addressing IAS and which would ensure more consistency between Member States in dealing with IAS. At a national level, MEPA liaises with other relevant entities in national efforts to curb the impacts of IAS. A Plant Protection Board has been set up in accordance with the Plant Quarantine Act and addresses the phytosanitary implications of importing any plant material, plant products, pests, beneficial organisms or soil.

Although domestic legislation, incorporating provisions on preventing and regulating/controlling the introduction of unwanted invaders, has been enacted, progress in the field to eradicate extant invasive species has been limited, mainly in view of resources constraints. Various IAS are currently earmarked for removal from a number of protected areas. Targeted species include *inter alia rats* (*Rattus spp*. from *Selmunett* and *Rdum tal-Madonna*) and major invasive plants (*e.g.* the removal of *Carpobrotus* spp. [*Swaba tal-Madonna*; Hottentot Fig] from sand dunes; the removal of *Arundo donax* [*Qasba Kbira*; Giant Reed] and *Vitis vinifera* [*Dielja ta' l-Għeneb*; Grapevine] from *Ir-Ramla l-Ħamra;* the removal of *Acacia saligna* [*Akaċja*; Blue Leaved Wattle] from *Għajn Tuffieħa*, and the removal of *Agave* spp. [*Agave*; Century Plant] from *Rdum tal-Madonna*). Monitoring of progress in remedial efforts against IAS is revealing natural rehabilitation of native vegetation and fauna upon removal of the invasive species. Measures for combating alien pests are also in place and published as legislation on plant health, the implementation of which is overseen by the Plant Health Directorate. For instance, alien plant pests being targeted include *Rhynchophorus ferrugineus* [*Il-Bumunqar Aħmar tal-Palm*; Red Palm Weevil] which infests palm trees (addressed as a case study in SOER 2008).

Knowledge of the characteristics of IAS and the habitat types they invade, combined with early detection of new invasions and rapid response based on careful planning to prevent, eradicate, control or contain invasive species, are essential elements for dealing effectively with biological invasions. To this end, MEPA has commissioned two studies on setting up a list of alien flora and fauna which are already present in the Maltese Islands. The information acquired through the two studies will help in the formulation of future policy to prioritise invasive species for remedial action. These studies will also help in developing a national early warning and rapid response system to invasive species also in light of information recently published by the EEA Technical

[50] COM(2008) 789 final [Online] Available at: http://ec.europa.eu/environment/nature/invasivealien/docs/1_EN_ACT_part1_v6.pdf

Report No 5/2010 entitled "Towards an early warning and information system for invasive alien species (IAS) threatening biodiversity in Europe". Public support and participation is also vital in preventing biological invasions seeing that individual actions such as inappropriate disposal of plant cuttings, or release of unwanted exotic pets into the wild, may inadvertently lead to invasion in the Maltese countryside.

The 2008 SOER underlines the serious threat to by IAS to Malta's biodiversity and calls for the formulation of action plans to eradicate them and to prevent further introductions. Future priorities by MEPA in this field include the development of an online national database on alien species that are already present in the Maltese Islands, guidelines on the removal of invasive alien plants, a national strategy on IAS to be developed in cooperation with relevant entities, and continued monitoring to assess invasiveness as well as allow the timely detection of new alien species. The launching of an IAS campaign targeting a wide audience would also be desirable, including tailored outreach initiatives targeting a number of sectors that promote the unwanted transfer of alien species. Initial outreach material include a generic poster on IAS and examples of worst invaders as well as a booklet summarising the Code of Conduct on Horticulture and Invasive Alien Plants which was jointly developed by the CoE and the European Plant Protection Organisation (EPPO). Only by informing the public at large on invasive species and their associated risks and consequences, apart from educating on how to minimise such threats, can support be fostered by the general public, apart from instilling a sense of responsibility not to spread IAS.

On a regional and global front, attention is being recently diverted to the trade of companion animals and pets that can be potentially invasive. The CoE is working towards a series of Codes of Conduct, including one on companion animals, whereas the CBD through an Inter-Agency Liaison Group on IAS is assessing information and working towards standards on IAS introduced as pets, aquarium and terrarium species, as live bait and live food. Others areas that are increasing in importance include IAS in protected areas, corridors spreading IAS, the effect of climate change on IAS, and the potential use of IAS as biofuels.

3.7 Biodiversity and Climate Change

> The links between biodiversity and climate change run both ways: biodiversity is threatened by climate change, but proper management of biodiversity can reduce the impacts of climate change.
>
> *Biodiversity and Climate Change*
> Booklet prepared for International Biodiversity Day 2007
> CBD Secretariat, 2007

Climate change[51] currently features as one of the top priority issues on the global environmental policy agenda, in view of the disquieting consequences of related impacts. Measures are needed to adapt to the impacts and to implement measures to mitigate climate change. Adaptation involves adopting measures to deal with the unavoidable impacts of climate change, whereas mitigation focuses on reducing greenhouse gas (GHG) emissions (and includes emission avoidance activities and carbon sequestration activities).

[51] "Climate change" (CC) is defined by the UNFCCC as '…a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods'.

Malta's GHG emissions increased by 49 % between 1990 and 2007, and derive largely from the energy (including transport) and waste sectors (Source: SOER 2008). Marked changes in climate, and associated changes in the environment, in response to increasing GHGs, particularly carbon dioxide emissions, are widely documented and are summarised in Figure 20[52].

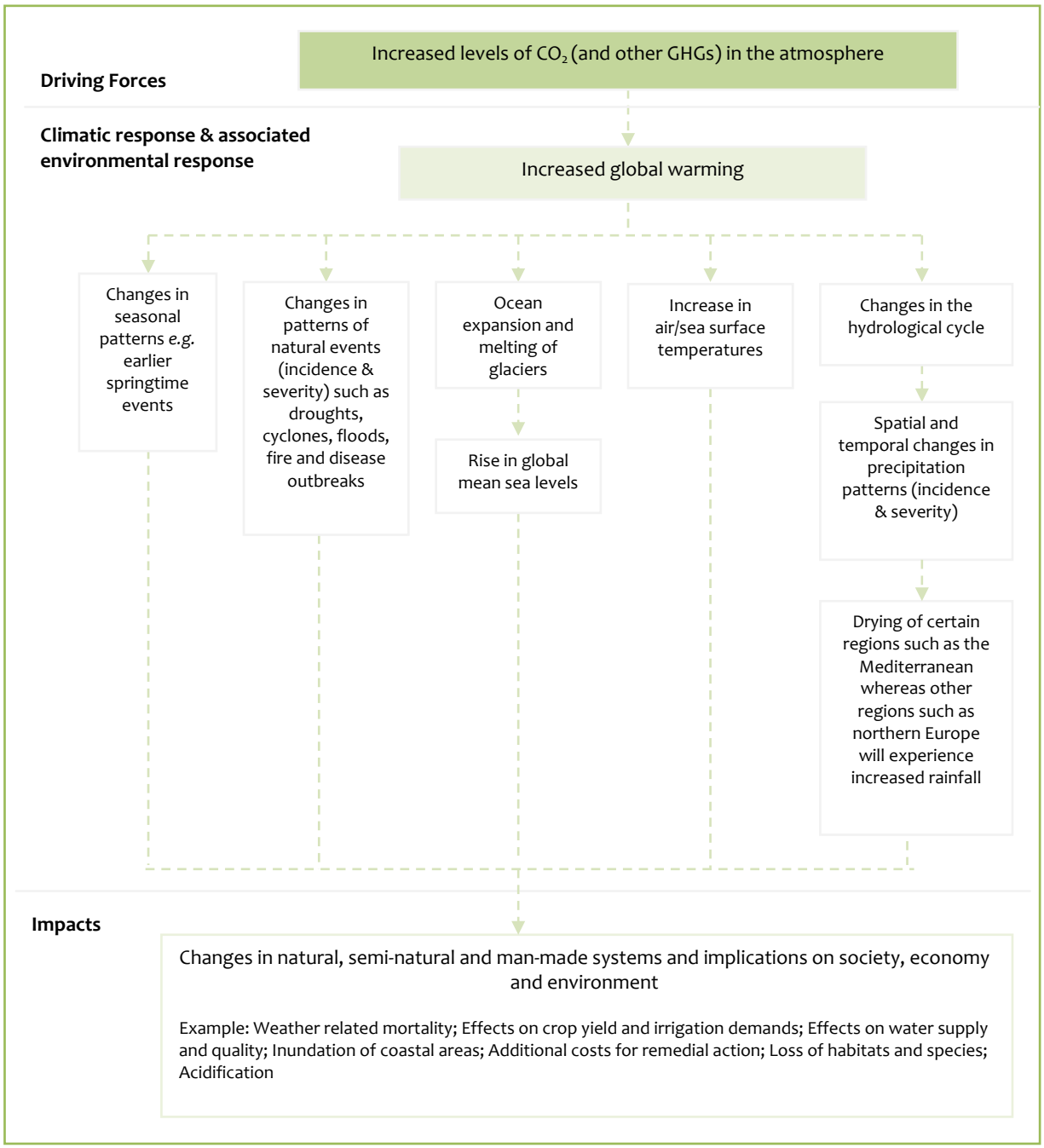

Figure 20 - Climate Change Driving Forces and Impacts and Environmental Responses
(Source: Adapted from Tompkins *et al.* (2005) - *Surviving Climate Change in Small Islands – A guidebook*)

There is growing consensus that 2°C is the maximum average global temperature rise, compared to pre-industrial levels, that can be allowed without risking catastrophic irreversible climate change. Changes in climatic events and the increase in the severity of weather-related natural

[52] Concise information can be obtained by referring to EEA's 10 Messages for 2010 – Climate Change and Biodiversity

disasters are already being detected in various regions of the world, including Malta, and exert pressure on human health, animal and plant health, human societies at large particularly vulnerable groups, businesses/industry, infrastructure (buildings, transport, energy and water supply), the economy, and also biodiversity. The Millennium Ecosystem Assessment (MA, 2005) identified climate change as one of the main direct drivers of biodiversity loss and bringing about changes in ecosystem services[53]. This is because unlike historical natural changes in climate which have served as an evolutionary force for the myriad of life forms extant on earth, the current rate of anthropogenic-driven climate change is too rapid for biodiversity to adapt to the new conditions being observed or projected to take place.

As documented by the CBD Secretariat (2003)[54], the current anthropogenic-driven climate change is '*a new perturbation, introduced in the last century, that will impact biodiversity either directly or in synergy with the other determinants of biodiversity*'. These other determinants include:

- the availability of natural resources and overall primary productivity;
- disturbance regimes and occurrence and frequency of natural and anthropogenic perturbations;
- the original stock of biodiversity and dispersal opportunities;
- the level of spatial heterogeneity;
- the intensity and interdependency of biotic interactions such as competition, predation, mutualism and symbiosis; and
- the intensity and kind of reproduction and also genetic diversity (and hence ability to adapt to change).

A detailed review of the impacts on biodiversity associated with climate change is given by IPCC (2002)[55] in their published technical report on "Climate Change and Biodiversity". It must be borne in mind that certain species are more susceptible than others to climate change; species most at risk of extinction from climate change are those with limited climatic ranges, with restricted habitat requirements; with particular physiological or phenological traits as well as those species that are already at risk due to factors such as low population numbers, restricted or patchy habitats, or occurrence on low-lying islands. The same argument may be applied to ecosystems. Implications for human welfare and biodiversity have prompted regional and global debates and action to address climate change on several fronts. The interlinkages between biodiversity and climate change are becoming ever more central to the international and EU debates. For instance, the Communication on the EU Biodiversity Strategy to 2020 mentions the inexorable interlinkages between biodiversity and climate change: '*While biodiversity makes a key contribution to climate change mitigation and adaptation, achieving the "2 degrees" target coupled with adequate adaptation measures to reduce the impacts of unavoidable effects of climate change are also essential to avert biodiversity loss*'.

The Mediterranean Basin is one of the most vulnerable regions in Europe to the severity of the impacts of climate change (see Christensen *et al*, 2007)[56]. Small island states, such as Malta, have a number of geophysical and socio-economic characteristics that make them particularly vulnerable to the effects of climate change. Such characteristics include:

[53] Ecosystems and Human Well-being: Biodiversity Synthesis - Millennium Ecosystem Assessment, 2005
[54] Interlinkages between biological diversity and climate change. Advice on the integration of biodiversity considerations into the implementation of the United Nations Framework Convention on Climate Change and its Kyoto protocol - Secretariat of the Convention on Biological Diversity, 2003
[55] Climate Change and Biodiversity - IPCC Technical Paper V – IPCC, 2002 (Gitay, Suárez, Watson, and Dokken [eds.])
[56] Regional Climate Projections - Christensen *et al*, 2007. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon *et al*., (Eds.)].

- small overall land size, high population density, and inherent land-resource constraints, which not only reduce adaptation options, but can also create land-use conflicts between adaptation and mitigation options and, also between response actions and other uses;
- limited natural resources are already exacerbated by unsustainable use, while native and endemic species and habitat types of conservation value are already under pressure by anthropogenic activities;
- land fragmentation may restrict species movement, and in the case of endemics, unavailability of alternative refuges is a major problem; and
- higher susceptibility to large-scale natural hazards such as droughts and floods, which affect a much greater share of the overall land surface area when compared to larger countries.

The United Nations Framework Convention on Climate Change (UNFCCC) calls for the stabilisation of atmospheric GHG concentrations '*… at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner*.' (Article 2, UNFCCC Convention Text)[57]. The EU's current commitment is of reducing GHG emissions to 20% below 1990 levels by 2020. Malta became a signatory to the UNFCCC in 1994 as a non-Annex I country, ratifying the Convention on 17 March 1994. In 2010 Malta changed its status to an Annex I country.

Malta also ratified the Kyoto Protocol on 11 November 2001. As part of Malta's obligations to submit national communications as required by Article 12 of the UNFCCC, Malta's Climate Change Project was initiated in March 2001 through collaboration between the Government of Malta and the Department of Physics of the University of Malta. The Project, funded by UNDP's Global Environment Facility (GEF) resulted in, *inter alia*, the compilation of Malta's First National Communication (FNC) to the UNFCCC. Malta's FNC outlines the current and future concerns in relation to climatic vulnerability, arising from current and projected climate change impacts, and including the following:

- Increase in temperatures and decrease in precipitation;
- Drought;
- Deterioration of freshwater quality and availability;
- Increased risk of floods;
- Increase in soil erosion and desertification and associated impacts on agriculture;
- Increased risk of storms and severe weather incidence;
- Accelerated coastal erosion;
- Changes in sea water mass characteristics;
- Sea level rise;
- Biodiversity loss and degradation.

Climate-change related concerns are already a reality today. Future climate change will be expected exacerbate existing pressures on natural, semi-natural and man-made systems in the Maltese Islands. The Maltese islands form part of the semi-arid region of the Mediterranean and hence exhibit a bi-seasonal climate, which is typical of the region. However over the last 50 years or so, Malta's climate has slowly become warmer and dryer, which is consistent with international climate change predictions (see 2005 SOER).

[57] The progression of climate change is periodically assessed by the Intergovernmental Panel on Climate Change (IPCC)[57]. The results of such assessments, which are based on peer reviewed and published scientific/technical literature, are published as a series of assessment reports.

The preliminary qualitative analysis of climate change impacts provided in the FNC also indicates that coastal and marine environments are at risk. Terrestrial coastal biodiversity may be particularly affected by drought, sea-level rise and coastal erosion. Coastal wetlands and other transient aquatic ecosystems present along the coast are very vulnerable to drought and associated deterioration of freshwater quality and availability, as well as inundation and salinisation of coastal aquifers through sea level rise. Such vulnerability is further aggravated by the poor conservation status of most of the coastal habitats, particularly those located on the low-lying north eastern shores, which in general are restricted to small pockets surrounded by developed areas. Malta's FNC does not indicate the extent or significance of such impacts, due to paucity of local data on climate parameters (especially long time-series data), thus also limiting projections of climate change impacts at a local scale, and also noting that local data on vulnerability is mainly qualitative rather than quantitative. Other limitations arise for the following reasons:

- the resolution of climate change projections and impact scenarios at a global/regional scale may not be applicable to the Maltese Islands;
- global/regional climate change impact scenarios do not necessarily take into consideration characteristics that are specifically associated with small island states;
- long time-series data on species and ecosystems are not available, and trends in species populations and ecosystem structure are not known;
- knowledge on the biology of species and their tolerance range to changes in environmental parameters is very limited, hence the species response to climate change impacts is uncertain;
- knowledge on the distribution of marine habitats, with the exception of **Posidonia* beds (*Posidonion oceanicae*) is limited;
- information on breeding, feeding, wintering and aggregation areas as well as migration routes of marine species is lacking; and
- the conservation status of certain species, especially migratory species, still remains unknown.

More studies are hence required to provide quantitative data based on climate projections and national impact scenarios which factor in Malta's small-island characteristics. Given the scarcity of available information, there is an urgent need for Malta to initiate or strengthen (where already in place) research on climate change, including impact and vulnerability assessments.

To date local action on climate change has primarily focused on mitigation measures; the vulnerability and adaptive capacity of the Maltese Islands are only recently being addressed. Initiatives undertaken by the Government of Malta to help mitigate the impacts of climate change include *inter alia* the Energy Policy Proposal for Malta and the National Strategy for Policy and Abatement Measures to the Reduction of Greenhouse Gas Emissions. Malta's endeavours in mitigating climate change in the energy and transport sectors are further described in Chapter 4. A White Paper on Adapting to Climate Change: Towards a European Framework for Action (COM (2009) 147 final) was presented in April 2009 by the EU Commission. This policy paper calls for a more strategic approach to adaptation and ensuring coherency across different sectors and levels of governance. To this end, the white paper is accompanied by sectoral discussion/policy papers on agriculture, human, animal and plant health and water, coasts and marine issues. The White Paper also addresses, *inter alia*, the relationship between biodiversity and climate change. More recently, the National Climate Change Adaptation Strategy has been issued for consultation.

Consideration of the role that conservation and sustainable use of biodiversity can play with respect to cost-effective mitigation and adaptation measures to climate change needs to be duly made when developing national policy both in the fields of climate change and nature protection. For instance, wetlands and wooded areas sequester carbon (act as a sink of CO_2) while ecosystems such as sand dunes and salt marshes protect against storm surges, whereas valley

watercourse systems help in flood control. Protected areas can also help in safeguarding the capacity of ecosystems to adapt and respond to the effects of climate change. Other opportunities for mitigation and adaptation by ecosystem type include:

- in the context agroecosystems, better management of agricultural soils (sequester carbon); improving the efficiency of fertilizer use and restoring degraded agricultural lands can help toward mitigation efforts, whereas opportunities for adaptation include *in situ* and *ex situ* conservation of crop and livestock genetic resources, and the conservation of components of agricultural ecosystems that provide goods and services such as natural pest control, pollination and seed dispersal;
- in the context of island biodiversity, conservation of various island ecosystems can help to build resilience to climate change in a cost-effective and practical way;
- in the context of inland water ecosystems, action to avoid degradation of wetlands (sequester carbon) are beneficial to mitigation options, whereas adaptation opportunities include wetland management and restoration, reduction of fragmentation of inland water bodies and reduction of land-based pollution;
- in the context of coastal ecosystems, such as seagrass beds and salt marshes, these provide coastal protection and contribute to the resilience of coastal systems, hence their management and restoration, or in the case of seagrasses through the alleviation of external stresses (such as destructive fishing), could serve as adaptation strategies.

It is also important to remember that adaptation may require changes to take place in ecosystems; for example some species being replaced by others that are more resilient to the new conditions or, adaptation measures taken to protect humans resulting in destruction of natural habitats. Deciding whether, and to what level, this should be allowed is a difficult process indeed. Hence, the need to integrate biodiversity concerns within climate change adaptation strategies and actions cannot be stressed enough. For instance, the sea around the Maltese archipelago could offer the necessary space for certain anthropogenic emission mitigation activities (such as offshore wind-based energy generation; modal shift from land-based transport to sea-based transport) however such measures would need to be subject to thorough environmental impact assessments (EIAs). Research is also required on the effects of climate change on endemics, on important habitats as well as on species exhibiting high habitat specificity.

Malta compiled the Second National Communication (SNC) to the UNFCCC with financial assistance provided by the United Nations Environment Programme (UNEP) – Global Environment Facility (GEF) and was submitted on 13 July 2010. This second communication focused on the theme vulnerability and adaptation in the Maltese Islands, thereby addressing climate change impacts, vulnerability and adaptation for various sectors. The project components included:

- a yearly inventory of anthropogenic GHG by sources and sinks (2001 to 2006);
- a new analysis of potential measures to abate GHG emissions in Malta, including projections of emissions to 2025;
- a new assessment of potential impacts of climate change on vulnerable areas of Malta, on cross-cutting socio-economic issues and the implications of adequate adaptation measures;
- an updated national action plan for Malta to meet its international obligations in respect of climate change issues, to decrease vulnerability and to prepare adaptation measures;
- preparation of the Second National Communication of Malta and submission to the CoP.

Locally generated regional scenarios presented in the SNC predict an increase in annual average temperature of 2.0°C and 2.8°C by 2050 and 2100 respectively. An overall decrease in the total

amount of precipitation is also predicted[58] (but with an increasing trend for heavy rainfall). The SCN states that such projected changes in precipitation should be viewed with some caution.

In the context of biodiversity, the SNC assesses the consequences of climate change on ecosystems in the Maltese Islands based on current best available knowledge on local biodiversity and professional judgement on the potential impacts from the expected climatic changes on local biota and habitats. In the case of terrestrial ecosystems the following consequences are mentioned:

- loss of biodiversity and increased risk of extinction;
- shift in the distribution of species;
- sea level rise[59] ;
- temperature increase;
- decrease in rainfall;
- effects of carbon dioxide emissions on terrestrial ecosystems;

Consequences of climate change are also assessed for marine ecosystems with respect to:

- temperature increase;
- changes in coastal hydrodynamics;
- changes in deep water circulation;
- increase in sea-level;
- increase in the intensity of rainfall events;
- increase in carbon dioxide;

The SCN draws attention to *Posidonia oceanica* meadows and the littoral and sublittoral species as some of the most vulnerable groups of marine species to such impacts. A number of adaptation measures are recommended with short term and long term goals. Measures cover managing stresses on the environment, facilitating migration, habitat restoration, natural resources management, expanding reserves and other protected areas, environmental monitoring and increasing the knowledge base.

The Climate Research Group of the Physics Department within the University of Malta is embarking on regional climate prediction modelling, which has been established as one of the Department's research areas. These initiatives shall provide scientific data and projections to support the country's efforts in tackling the challenges associated with climate change. A recently appointed the National Climate Change Committee has also been tasked with the drafting of a National Strategy on Adaptation for Climate Change tailored to address Malta's adaptation concerns.

In the knowledge of the fact that land-use planning also has a very important role in responding to climate change, MEPA has recently launched a detailed assessment of its land use planning system as part of the Interreg IV C project titled "Regions for Sustainable Change". The project has resulted in the provision of recommendations on the way forward for mainstreaming climate change into land use planning including *inter alia* the principle of green infrastructure which supports local biodiversity and healthy, living environments.

[58] Total rainy days with 0.1 mm or more of rainfall are decreasing while total yearly days with 10 mm or more of rain is increasing.
[59] The SNC documents the following areas as prone to inundation as a result of sea level rise - bays along l-Aħrax peninsula, Mellieħa, Xemxija, Salina, Ramla l-Ħamra, Marsalforn, Dwejra, Marsaskala, St Thomas Bay, Pretty Bay, Ġnejna, Golden Bay, Għajn Tuffieħa, and areas around Marsaxlokk Harbour. Tyes and extent of habitats in locations that are prone to inundation by a sea level rise of 0.5 m, and potential for migration are also identified.

A comprehensive EU Climate Change and Energy Package was adopted in 2009 comprising four pieces of complementary legislation to implement the 20-20-20 targets:

- cutting greenhouse gases by at least 20% of 1990 levels (30% if other developed countries commit to comparable cuts);
- cutting energy consumption by 20% of projected 2020 levels - by improving energy efficiency; and
- increasing the use of renewables (wind, solar, biomass, etc) to 20% of total energy production (currently ± 8.5%).

The Commission now plans to issue an EU strategy on adaptation to climate change by 2013.

3.8 Biodiversity Surveillance, Monitoring and Research

> There are substantial gaps in knowledge in relation to the conservation and sustainable use of biodiversity. These include gaps in relation to knowledge about the state of biodiversity, drivers of loss and pressures on biodiversity, their impact now and in the future, and the effectiveness or otherwise of policy responses. There are also inadequacies in the interface between policy and research, with not enough research being policy-relevant, and insufficient application of existing knowledge to policy. Addressing these gaps will require substantial financial resources for policy-relevant research, the strengthening of coordination mechanisms and capacity-building in key disciplines such as taxonomy and participatory science, the mobilisation of data, and the strengthening of institutional arrangements for the policy-research interface.
>
> Extract from the Killarney Declaration – EPBRS 2004

Biodiversity assessment involves a process of collecting and assessing data, and extracting information from such data, on the status and trends in biodiversity and responses to environmental and anthropogenic pressures, including responses to management. Assessing changes in biodiversity, whether occurring as a response to natural processes or to man's actions, is a fundamental pre-requisite for designing effective conservation strategies and/or for prioritising management action and evaluating the effectiveness of policies and practices, in order to make informed decisions and recommendations on biodiversity. Surveillance and monitoring are two important processes in carrying out biodiversity assessments and are thus fundamental requirements of global treaties on nature protection and also of regional policies. Both processes can be carried out to assess the state and response of biodiversity at different scales using a variety of tools/techniques. Surveillance and monitoring programmes may be implemented with a specific goal in mind and based on defined research objectives.

Purpose	Example of Goals/Objectives
Threat/Impact/ Pressure Assessment	To assess the risk of, or impacts of, a pollution event on components of biodiversity; To assess changes in population sizes or changes in community structure in response to anthropogenic pressure (such as fishing, farming, tourism); To assess the potential threats of a development project occurring in the vicinity of an area of conservation value;
Baseline/ Research	To obtain baseline data upon which a management plan/strategy can be devised and/or upon which sound decisions can be made in conservation management; To assess or predict how components of biodiversity will respond to climate change; To assess alteration in physical parameters and whether such alteration affects a component(s) of biodiversity; To assess why populations of a species of conservation value are in decline;

Purpose	Example of Goals/Objectives
Mitigation/ Recovery/ Policy Response	To assess the effectiveness of a mitigation/recovery/restoration programme or project; To assesses the effectiveness of conservation policy; To detect early or trace the invasion of a non-native species and its impacts on local biodiversity and assessment options for management;
Regulatory/ Compliance	To assess compliance with existing policies and regulations; To monitor the introduction of substances into the environment by industries; To assess the conservation status of a particular species or habitat type as required by law/policy;

Table 12 - Purpose of surveillance/monitoring programme and examples of possible goals

Legislation in Malta makes provision for carrying out some form of surveillance or monitoring across public sectors. Overseeing to the implementation of a monitoring programme as required by a particular legal instrument can either fall under the responsibility of a single entity, or else by more than one entity following a memorandum of understanding between the concerned parties. The 'Flora, Fauna and Natural Habitats Regulations, 2006' (LN 311 of 2006, as amended) addresses monitoring of biodiversity through the provisions laid out in Regulation 38, which *inter alia* call for the:

- surveillance and monitoring of the conservation status of natural habitats and species;
- identification of components of biodiversity and monitoring these, paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use;
- identification of processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitoring their effects; and
- assessment of the status, dynamics and seasonal movements of the populations of protected species.

This regulation also requires that data derived from the above-mentioned identification and monitoring activities, are to be maintained and organised. Scientific research to generate information necessary for the implementation of regulations 5 to 29 of LN 311 of 2006 is also required, taking into account transboundary co-operative research between countries.

Monitoring is currently limited to certain species within protected areas and other species on an *ad hoc* basis. Selected habitats are also monitored on *an ad* hoc basis. A number of studies have been commissioned by MEPA to collect essential information on Malta's biodiversity and to improve the knowledge base on groups of threatened and endemic species (invertebrates; vertebrates, excluding birds and cetaceans), as well as a study on *Posidonia* meadows in Maltese waters. Some of these studies have also created maps showing the distribution of endangered species, namely endangered insects. These studies will enable the updating of the Red Data Book through the compilation of Red Lists, and will also help in the development of conservation measures. Some of the commissioned studies comprised the development of databases in MS access format, which are foreseen to be centralised when a national biodiversity database will be established and which will be available to the public.

Apart from biodiversity monitoring, a national framework for monitoring of parameters in environmental media (air, water and soil) and monitoring of man-mediated activities is built on numerous pieces of subsidiary legislation under the auspices of the EPA and EDPA, and also in line with EU obligations such as the EU Water Framework Directive (see Chapter 4 of the NBSAP – Section 4.10). MEPA has launched a project entitled "Developing National Environmental

Monitoring Infrastructure". The project is co-financed by the European Regional Development Fund (ERDF), MEPA and the national government under the Operational Programme 1 – Investing in Competitiveness for a Better Quality of Life. The project focuses on improving the national environmental monitoring capacity in five environmental themes – air, water, radiation, noise and soil.

Knowledge is also acquired via University dissertations, projects, studies carried out by national experts in their own personal capacity as well as through findings of EIAs. EU funds that support research are also available. The Malta Council for Science and Technology (MCST) is the national advisory body to Government on science and technology policy. MCST's tasks also include *inter alia* the responsibility for the National Strategy for Research and Innovation for 2007-2010, entitled "Building and Sustaining the Research and Innovation (R&I) Enabling Framework" and the responsibility as the National Contact Organisation for creating awareness and providing support for EU's Research and Development Framework Programme (FP7). Various national research institutions also contribute towards strengthening an understanding of Maltese biodiversity and some also participate in regional research projects (apart from academic research at a national level). Amongst such entities one can mention the Department of Biology within the University of Malta (UoM) and the Institute for Environmental Studies. The UoM has established a number of Institutes (*e.g.* the International Environment Institute, the Institute for Islands & Small States and the Euro-Mediterranean Centre on Insular Coastal Dynamics), which combine research and teaching in varying degrees. Environmental NGOs also carry out research.

Notwithstanding national, regional and global obligations to carry out monitoring programmes in Malta, actual implementation is fraught with limited resources – human, financial, technical and technological. Concerted action and cooperation between various entities is indispensable for effective implementation, especially where remits overlap and considering the cross-cutting nature of certain policies including the need to adopt an ecosystem approach to monitoring. In order to overcome such hurdles, over the past few years, various projects (within the fields of sustainability impact assessment, climate change, environment protection, management and integration, spatial planning, enforcement, land use planning, waste management and pollution control) have been proposed and implemented, or are in progress, with the support of international and EU funds and national co-financing as dealt with in the next section. Selected biodiversity indicators have also been compiled in Malta and include the following:

- Number of species of international importance protected by national legislation;
- Status of selected groups of species (including selected vertebrates, insects, flora);
- Status of selected habitats;
- Sites proposed/designated as part of the Natura 2000 network;
- Natural areas designated and managed;

Although various initiatives have been or are being undertaken in developing national indicators apart from addressing monitoring requirements, a national strategy for surveillance and monitoring in the field of biodiversity conservation and management, addressing both terrestrial and marine ecosystems, is urgently required. Protocols/frameworks for monitoring priority species and habitat types and for collecting data on impacts on biodiversity should be incorporated in the strategy in order to urge the use of common standards. There is also the need for data gathering in line with the EU's 2010 Biodiversity Baseline and SEBI Indicators. Emerging research priorities at EU level are with respect to mapping and assessing ecosystem services. This will support decision making by analysing the overlap of multiple ecosystem services and support the assessment of alternative land use scenarios. The European Commission Joint Research

Centre (JRC) recently prepared the report entitled "European assessment of the provision of ecosystem services", which summarises the key data needed for mapping ecosystem services at a European scale and presents a first set of maps showing the capacity of ecosystems to provide services.

3.9 Financing Biodiversity and Natura 2000

Many EU and national funds open the possibility of providing financial support for protecting biodiversity. However, the actual level of financial resources allocated to biodiversity conservation remains small (especially when compared to the welfare benefits that ecosystem services provide).

Extract from the Message from Athens

Halting the loss of biodiversity, among others by making the Natura 2000 network fully operational, poses a real challenge especially in terms of ensuring adequate financing for the effective implementation of appropriate conservation measures and the management of protected areas. A wide variety of funding sources may be tapped to finance biodiversity-related projects. These include government funding, financial aid by bilateral and multilateral development agencies, market-based instruments, private contributions and EU funding programmes. In practice, the main sources for funding biodiversity-related investments in Malta are national government funding and various EU funding programmes. At present, a number of small scale biodiversity-related government funding schemes exist. These include the "Tree4U initiative" which focuses on afforestation and re-forestation and is administered by the Ministry for Resources and Rural Affairs (MRRA), the "Environmental Initiatives in Partnership Programme" (EIPP) administered by MEPA, as well as *ad hoc* grants to NGOs involved in the management of protected areas and in the implementation of environmental projects. Furthermore, banks and the private sector are showing increasing interest in sponsoring biodiversity-related projects.

Government and private funding for biodiversity conservation is supplemented by opportunities offered by a number of EU and international funding instruments. Since Malta became a member of the EU in 2004, the country became eligible to benefit from a number of EU funding programmes which can be tapped for financing projects with environmental objectives. The main EU funding sources for supporting biodiversity conservation, under the current financing period 2007-2013 are those shown in Figure 21.

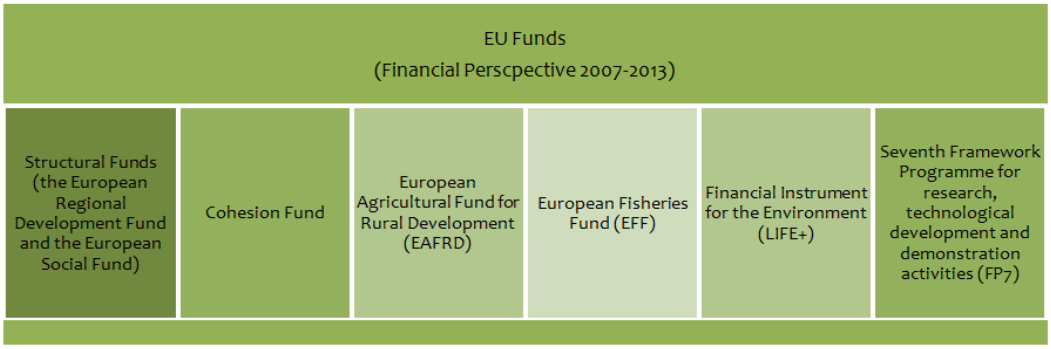

Figure 21 - EU Financial Instruments

LIFE+ is the EU's main financial instrument which supports environmental and nature conservation projects throughout the EU as well as in some candidate, acceding and neighbouring countries. LIFE + has three strands:

- LIFE + Nature and Biodiversity – co-finances best practice or demonstration projects that contribute to the implementation of the EC Nature Directives, thus providing the possibility to support initiatives related to the management and designation of Natura 2000 sites.
- LIFE + Environment Policy and Governance and – co-finances innovative or pilot projects that contribute to the implementation of European environmental policy and the development of innovative policy ideas' technologies, methods and instruments.
- LIFE + Information and Communication – co-finances projects relating to inter alia communication and awareness raising campaigns on environmental, nature protection or biodiversity conservation issues.

The European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund are the main funding instruments of the EU Cohesion Policy for 2007 – 2013. Assistance channelled under these funds aims to promote harmonious and sustainable development across the EU and to reduce socio-economic disparities between the regions. So far, Cohesion Policy Operational Programmes in Malta have played a very marginal role in the preservation of biodiversity and nature protection. Only limited interventions related to nature protection are currently possible under Axis 2 of OP 1 and such interventions must always be linked to tourism.

The European Agricultural Fund for Rural Development (EAFRD) is an instrument that supports the implementation of the EU Common Agricultural and Rural Development Policy. It finances measures to improve the competitiveness of agriculture (and forestry) as well as measures that enhance the environment and rural land management, quality of life and diversification of the rural economy. The Rural Development Programme, which specifies the priorities for EAFRD investments in Malta, offers a number of opportunities for financing of environmental projects linked to agriculture and rural development. Under Axis 3 of the programme support is provided for the preparation of Natura 2000 Management Plans. MEPA has submitted a project proposal under Axis 3 – Measure 323 for which funding was granted. This project will develop a framework for the protection, conservation, management and awareness-raising for all terrestrial Natura 2000 sites in Malta and Gozo. Envisaged activities shall contribute towards improving the quality of life in rural areas, whilst ensuring sustainable rural development through the use of methods which are compatible with environment protection and conservation.

The European Fisheries Fund (EFF) supports the implementation of the Common Fisheries Policy. It fosters the protection and the enhancement of the environment and nature resources where related to the fisheries sector and encourage sustainable development and the improvement of the quality of life in areas with activities in the fisheries sector.

The 7th Framework Programme (FP 7) is the EU's main instrument for funding research in Europe from 2007 till 2013. The broad objectives of FP 7 have been grouped into four categories: Cooperation, Ideas, People and Capacities. The Cooperation category consists of 10 different thematic research areas, on them being the Environment. For each type of objective, there is a specific programme corresponding to the main areas of EU research policy. A number of biodiversity-related projects have recently been successfully implemented with the support from some of these programmes (Table 13, overleaf).

Funding Programme & Title of Project	Description	Status of Project
ERDF: Marine Scientific Surveys around Filfla for its Conservation	Aimed to obtain accurate scientific data on the marine area around Filfla in order for the Government to decide whether the area qualifies for the designation as a marine potential Site of Community Importance (pSCI) and possible eventual designation as a Special Area of Conservation under the EC Habitats Directive. The terrestrial part is already an SAC and SPA (via GN 112 of 2007). The project involved the compilation of marine data through field surveys, using various techniques, including diving and remote surveillance by submersibles. Data collected was analysed and presented in comprehensive reports on the status of marine biodiversity and habitats in the area. Leaflets, booklets, and an educational video were also produced as part of this project with the intention of raising awareness amongst the general public and stakeholders. Furthermore, visitors to *Wied iż-Żurrieq* are now able to take a closer look to the islet of Filfla through a telescope which was also funded as part of this project.	Concluded
Interreg IIIC: MedPAN - Mediterranean Coastal and Marine Protected Areas Network	Aimed to develop a Mediterranean network of marine protected areas in the Mediterranean with the intention of improving the management of MPAs and helping partners to set up new marine protected areas. Numerous activities were concluded under this project, such as the study to establish the conservation status of the *Pinna nobilis* (noble pen shell) in the *Rdum Majjiesa to Ras ir-Raheb* MPA so as to evaluate the conservation effectives of such a protected area.	Concluded
Programme MED: MEDPAN North	Building on the Interreg III C MEDPAN project, MEDPAN North aims to utilise the already established network of managers of MPAs in order to protect and conserve the biodiversity and ecosystems. The project partners aim to come up with common approaches to meet international, European, and national commitments in terms of MPA networks. They also intend to improve the management efficiency of MPA's and to ensure the sustainable protection of the marine environment while at the same time promoting sustainable economic activities while at the same time promoting sustainable economic activities.	Ongoing
Interreg IIIC: Réseau des Parcs (Network of Parcs)	Aimed at setting up, managing and promoting a network of protected natural areas in the Mediterranean region. A good practice guidance document on the management of protected areas in the Mediterranean region was produced as part of this project, of which MEPA was part. The said document also includes the relevant experience of Malta on site and species management.	Concluded
Transition Facility: Strengthening Institutional Capacity for the implementation of the Nature Protection Acquis	Aimed at strengthening the capacity building of Malta for implementing the EU Habitats and Birds Directives. The project was jointly implemented by Austria (Austrian Federal Environment Agency) and Malta (MEPA). The project consisted of a series of training workshops targeting MEPA staff, 4 half day workshops targeting various sectors (agriculture, marine, tourism), a one national half-day seminar involving stakeholders, NGOs and the public in general; and the production of leaflets.	Concluded
LIFE Third Countries: DWEJRA – Setting up the First Coastal Nature Reserve in Malta	This project, aimed at creating the first coastal nature reserve in the Maltese Islands. Dwejra was considered to be a unique area due to its ecological, geomorphologic, paleontological and archaeological features. The project sought to protect and improve the environment in the area through consultations with all the stakeholders; compilation of data and evaluation of existing data; actual physical works to conserve the site and the production of educational and information material. The project was led by Nature Trust Malta with MEPA being one of the main partners.	Concluded

Funding Programme & Title of Project	Description	Status of Project
LIFE Nature: Monitoring and Conservation of Shearwaters and Petrels in the Maltese Islands (GARNIJA-MALTIJA)	Aims at reversing the declining trend in the *Puffinus yelkouan* population at the *Rdum tal-Madonna* special protection area. This protected area hosts the largest colony of *Puffinus yelkouan* on the islands. BirdLife Malta is leading this project in partnership with two other conservation NGOs and four Government Authorities. MEPA is a co-financier to the project. This project also includes rat eradication in its programme of activities seeing that rats are a direct threat to the chicks of this protected bird.	Concluded
Short and Medium Term Action Plan (SMAP) – Regional Project for the development of marine and coastal protected areas in the Mediterranean Region (MedMPA)	The aim of the MedMPA project was the designation of a Marine Protected Area from Rdum Majjiesa to Ras ir-Raheb. The project resulted in the elaboration of a management plan for the stretch of coast situated in the northwest of Malta. The plan provided the means for species and habitat protection; control of activities; scientific research and catered from education and public participation.	Concluded
LIFE +: Changing cultural attitudes to Trapping in order to facilitate implementation of the Birds Directive in Malta.	Aimed at raising awareness on the importance of bird migration and the impacts of trapping on Malta's wildlife. This communication project is a being led by BirdLife Malta.	Concluded

Table 13 - Internationally Funded Projects targeting nature protection and biodiversity
(Source: MEPA, 2010)

Recent studies assessing financing requirements for biodiversity and Natura 2000, both at the national and EU level however indicate that the current level of financing is clearly insufficient to attain the objectives of biodiversity conservation. Through study of the potential costs of implementing terrestrial and marine Natura 2000 in the Maltese Islands, it was estimated that a total sum of about 64.5 million EUR is required to complete and finance the management of the local Natura 2000 network. EU assessments have shown that currently the estimated annual costs of managing the Natura 2000 network are four times higher than the funds made available through different EU financing instruments, and bearing in mind current financial gaps with respect to there being no EU co-financing for ongoing management and monitoring of Natura 2000 sites[60].

The post-2013 Multi-annual Financial Framework (MFF) is currently being discussed at EU level in the context of greening the economy and reducing environmental costs through more efficient use of resources with proposals made in the Communication on a Budget for EU 2020 – Part II Policy Fiches, including for biodiversity. The Communication on the EU Biodiversity Strategy to 2020 in turn, mentions the need to:

- ensure a better uptake and distribution of existing funds for biodiversity and ensure optimum uptake of funds available;
- rationalise available resources and maximise co-benefits of various funding sources, including funding for agriculture and rural development, fisheries, regional policy and climate change; and

[60] Kettunen et al (2011). *Assessment of the Natura 2000 co-financing arrangements of the EU financing instrument. A project for the European Commission – final report*. Institute for European Environmental Policy (IEEP), Brussels, Belgium.

- diversify and scale up various sources of funding, including to promote the development and use of innovative financing mechanisms.

One must also bear in mind that the actual allocations for biodiversity and Natura 2000 are up to the decision of Member States, with the end result that financing possibilities offered by EU Community instruments might not be used to their full potential and also depending on the priority given to biodiversity and Natura 2000 when compared to other fields. One of the options being considered, apart from the integrated funding approach, which consists of making financing available by integrating the themes of nature and biodiversity in existing EU financing instruments, is that Member States develop multi-annual planning for Natura 2000, consistent with the prioritised action frameworks required under the Habitats Directive. Proceedings of the 2010 European Conference on Financing Natura 2000, as part of the EU commission project on "The Economic and Social Benefits associated with Natura 2000" delves into the evaluation of the effectiveness of the current integration approach for Natura 2000 funding, the use of different innovative financing instruments, and explores future financing options. With respect to the latter conference discussions looked at various issues including areas that could be funded via an enhance LIFE fund, innovative instruments and funding based on a programmatic approach.

3.9.1 The CBD Strategy for Resource Mobilisation

In response to the need for adequate global biodiversity financing to implement the CBD and on the recognition that the lack of financial resources is a major impediment to achieve the Convention's objectives, COP9 adopted the Strategy for Resources Mobilisation for the period 2008-2015 (Decision IX/11). The target of this Strategy is to substantially enhance international financial flows and domestic funding for biodiversity in order to achieve a substantial reduction of the current funding gaps in support of the effective implementation of the Convention's three objectives. The Strategy calls for promoting efficiency and effectiveness; building synergies; supporting innovation; strengthening capacity; raising awareness and taking into account gender and socio-economic perspectives. Parties to the CBD are invited to come forward with new and innovative financing mechanisms in support of this Strategy in accordance with Article 20 of the Convention. Various innovative financial mechanisms (IFM) have been proposed, such as those documented in the Report of the proceedings of the International Workshop on Innovative Financial Mechanisms held in Bonn (27-29 January 2010) and the report of a similar workshop held in Budapest (22-23 March 2011). Both workshops looked at proposed IFMs under six categories: payment for ecosystem services[61] (PES); biodiversity offset mechanisms[62]; environmental fiscal reforms[63]; market for green products; biodiversity in international development finance; and biodiversity climate change funding. The potential of the IFMs is largely dependent on their design, practicality, national contexts, safeguards and capacity building.

COP10 agreed on concrete activities and initiatives to achieve the strategic goals contained in the strategy for resource mobilisation and on indicators to monitor the implementation of the Strategy. The relevant COP decision notes that national implementation of the strategy for resource mobilisation should include, as appropriate, the design and dissemination of a country-specific resource mobilization strategy, with the involvement of key stakeholders.

[61] An economic instrument where a voluntary Ecosystem Service (ES) provider is paid to implement practices which guarantee ES sustainability
[62] A mechanism based on the polluter-pays principle to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure and ecosystem functioning
[63] through for instance reorienting harmful subsidies to the relevant sectors to benefit biodiversity

3.10 Biodiversity Communication, Education and Public Awareness

Without communication, education and public awareness (CEPA), biodiversity experts, policy makers and managers risk continuing conflicts over biodiversity management, ongoing degradation and loss of ecosystems, their functions and services. CEPA provides the link from science and ecology to people's social and economic reality. It supplies the oil for the implementation of the Convention on Biological Diversity.

Mainstreaming Biological Diversity - The role of communication, education and public awareness
Booklet prepared by CBD, UNESCO and the Commission on Education and Communication of the IUCN

Environmental Education (EE) formally transpired as a significant issue on the global environmental agenda in the early 1970s and has, ever since, evolved to take into account the requisite to adopt the concept of sustainable development, and also to respond to the growing concern over biodiversity loss. Nationally, EE activities are undertaken by various governmental entities and also by NGOs and are mainly in the form of production of pedagogical material and conferences/seminars or other events targeting the wider public. School visits to protected areas (such as at *is-Simar* and *l-Għadira*) and at the Argotti Botanical Gardens are also promoted and tend to be very well attended. Past EE activities in Malta traditionally targeted the younger generation seeing that children and adolescents are viewed as being the main actors to shape the future of the Maltese natural environment. More recently, EE activities have also encouraged the participation of adults (teachers and local communities) in environmental projects and in awareness raising activities such as locally carried out to mark World Environment Day. Amongst the most successful ongoing activities, one can initiatives such as *EkoSkola* – Environmental Management in Schools and *Dinja Waħda* (One World), which help to teach children on the importance of protecting nature. *EkoSkola* aims to *inter alia* raise environmental awareness through school and classroom activities and extra-curricular events, as well as encourages the school community to play a more active role in environmental decision-making. In 2007, a total of 54 schools were involved, 11 more than in 2005/2006, which amounts to approximately 25% of all schools, most of which provide primary education (and does not include other schools that may be implementing environment-friendly measures but are not participating in this programme). During the 2006/2007 scholastic year, about 24,500 students were involved in the programme through their schools, 7,500 more than in the previous scholastic year (Source: SOEI 2007 – Schools covered by *EkoSkola*). The 2008 update reports a further increase for the 2007/2008 scholastic year with the involvement of a total of 76 schools. The first edition of *Dinja Waħda* (One World) was launched by BirdLife Malta way back in 1994 targeting more than 50% of all the primary schools. During the time, 14 activities were undertaken to promote pro-environmental behaviour that varied from simple tasks (*e.g.* drawing a poster) to more demanding ones (*e.g.* organising a clean-up campaign). Nowadays 30 green activities, including school visits to the Natura 2000 sites, *l-Għadira* and *Is-Simar*, and which are included in an Action Plan, are offered to primary schools. Upon completion of each activity, a school is rewarded points. Awards (gold, silver, bronze and merit) are given to those schools that have gathered the majority of points by the end of the year. The Bank of Valletta has also been appointed as the education partner of this education programme.

The CBD calls for measures in the field of EE specifically with respect to the conservation and sustainable use of biodiversity [Article 13 of Convention Text]. Communication, Education and Public Awareness (CEPA) is addressed as a cross-cutting issue under the CBD's framework in view

of the fact that public education and awareness are viewed as central instruments to achieve the Convention's goals at a national level. Indeed, a CEPA programme of work under the CBD was adopted in 2006 (COP 7 Decision VI/19). The provisions of CBD's Article 13 are transposed into national legislation by way of the "Convention on Biological Diversity (Incorporation) Regulations, 2002" (LN 160 of 2002). CEPA-related provisions on biodiversity are also laid down by Regulation 40 of the "Flora, Fauna and Natural Habitats Protection Regulations, 2006" (LN 311 of 2006, as amended). These legal notices are administered by MEPA. LN 311 of 2006 (Regulation 40) advocates CEPA on:

- the establishment of protected sites, their boundaries, applicable regulations;
- protected species and their habitats;
- the understanding of the importance of, and the measures required for, the conservation, protection and management of biodiversity;
- the inclusion of biodiversity protection and management;
- the interest and value of protected sites and protected species; and
- the scientific knowledge which may be gained from the point of view of nature conservation.

The dissemination of information on biodiversity protection held by the Competent Authority, public participation in measures that are necessary for the protection of the areas and species concerned, and cooperation, as appropriate, with national bodies and entities, agreement states and international organisations involved in CEPA, with respect to conservation and sustainable use of biological diversity, is also advocated.

At an EU level, the preamble to the EC Habitats Directive (Council Directive 92/43/EEC) notes the importance of education and general information relating to the objectives of this Directive for ensuring its effective implementation. Moreover, Article 22(c) of this Directive calls on Member States to '*promote education and general information on the need to protect species of wild fauna and flora and to conserve their habitats and natural habitats*'. "Building Public Education, Awareness and Participation for Biodiversity" featured as one of the supporting measures for bringing forth the implementation of the EC Biodiversity Action Plan to 2010 and Beyond. The role of CEPA in biodiversity conservation can be summarised as shown in Figure 22, overleaf.

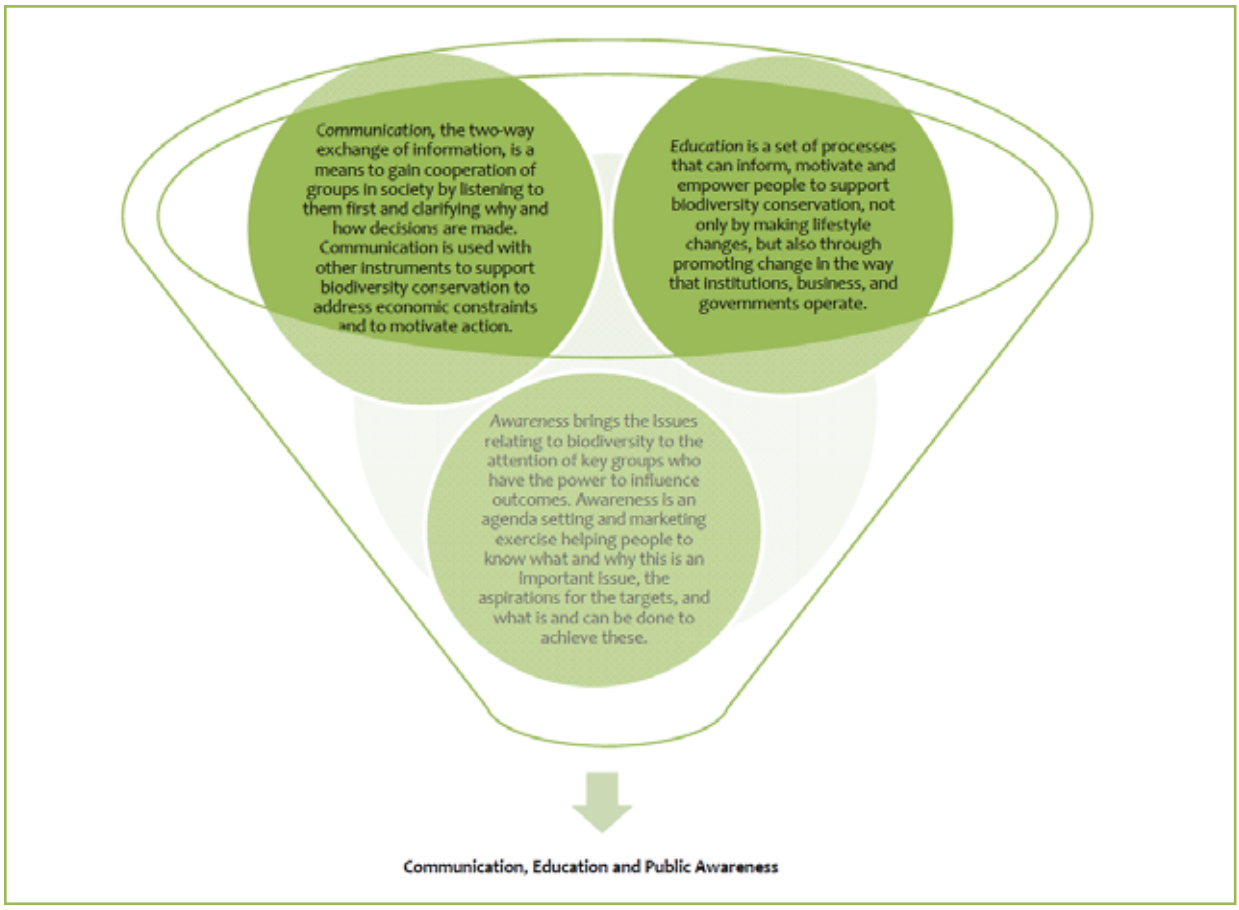

Figure 22 - The Role of CEPA in Biodiversity

(Source: Adopted from Mainstreaming Biological Diversity - The role of communication, education and public awareness - Booklet prepared by CBD, UNESCO & IUCN CEC; Hesselink *et al* (2007) Communication, Education and Public Awareness, a toolkit for the Convention on Biological Convention, Montreal – Section 1: Why do we need CEPA?)

Since MEPA formed in 2001 (through a merger between the former Environment Protection Department [EPD] and Planning Authority [PA]), several initiatives have been undertaken to increase awareness on the importance of protecting Malta's biodiversity. Recent activities have included for instance the publication of a series of posters on protected species and designated areas as part of the Interreg IIIC Network of Parks Project. The posters were funded by the budget allocated for the project from Interreg IIIC, which is a European Community initiative supported by the European Regional Development Fund (ERDF), while a calendar on biodiversity was co-funded with the National Lotteries Good Causes Fund. Various CEPA activities have been carried out, including the publication of a series of posters on protected areas and also posters on individual species and also one specific to the endemics of Malta published in 2007. Information on species has been disseminated through the publication of other forms of awareness-raising material (coasters, bookmarks and calendars) and also through presentations delivered at seminars/conferences nationally and abroad, as well as via talks broadcasted on TV and radio programmes. Apart from the publication of pedagogical information and talks delivered during workshops, seminars and conferences both locally and abroad, MEPA officials have also discussed biodiversity issues on national TV and radio stations. Nature conservation initiatives such as the release of injured turtles back to the wild and efforts to address threats in protected areas (such as the problem of rats on *Selmunett*) are also broadcasted. A documentary entitled "Journey into the Depths of the Mediterranean" has been produced. The documentary offers a visual experience of marine life found in the seas around the Maltese archipelago. MEPA has also

established a biodiversity web portal as the national clearing house mechanism (CHM) to promote and facilitate CEPA, as well as technical and scientific research and cooperation, in line with provisions of LN 311 of 2006 (as amended), LN 160 of 2002 (as amended) and the "Freedom of Access to Information on the Environment Regulations, 2005".

3.10.1 Level of Awareness of Biodiversity Issues by the Maltese

A considerable number of Maltese citizens remain unaware of the importance of protecting nature. This is evidenced by results obtained by the Eurobarometer on "Attitudes of European Citizens towards the Environment". The statistical results of the survey carried out between 9th November and 5th December 2007 reveal that when Maltese people (a sample of 500 individuals) where asked what they first thought about when hearing the word "environment" spoken of, only 1% first thought about protecting nature, whereas the majority (a 21% response) thought about the state of the environment that the generations that follow will inherit. The top three environmental issues in Malta, from the responses given, appear to be air pollution (64%), climate change (51%) and growing waste (45%), while depletion of natural resources is seen as least concern (7%). In Malta, the state of the environment seems to be considered of greater importance for people's quality of life (92%) than in the EU as a whole and is, therefore, ranked as the most influential factor, when also considering economic factors (82%) and social factors (78%). Ensuring better enforcement of existing environmental legislation (49%) is viewed as the most effective way of tackling environmental problems according to the Maltese respondents to the survey, followed by providing more information on environmental issues (36%).

A flash Eurobarometer survey on "Attitudes of Europeans towards the Issue of Biodiversity" was also carried out in 2007 and repeated in 2010. When asked, in the 2007 survey, whether aware of the term "biodiversity", 57.3% of the Maltese respondents mentioned that they had never heard of the term. A slight decrease was recorded in the 2010 survey, indicating a slight rise in awareness. Maltese respondents (as in the case of other Member State findings) understood biodiversity loss to be primarily a species-focused concept (*i.e.* certain animals and plants are disappearing/ will disappear), followed by habitat loss. The majority of Maltese people feel that they are not informed on the loss of biodiversity (drop of -1.9 between 2007 and 2010 values). Air and water pollution are considered by Maltese people to be the main threats to biodiversity. The proportion of respondents who had heard about *Natura 2000* has increased from 16% in 2007 to 29% in 2010. The majority of the Maltese respondents, 55.2%, mentioned that television news and documentaries were the primary sources where they get information about biodiversity loss from. When asked how serious the problem of the decline and possible extinction of animal species, flora and fauna, natural habitats and ecosystems was in their country, 51.8% declared it to be a very serious problem in the 2007 survey. Respondents in the 2010 were less likely to think that biodiversity was a serious problem in Malta. In the 2010 survey, when asked what measure should the European Union take as a priority to protect biodiversity, the need to raise awareness was viewed to be more important than introducing stricter regulations or increasing areas where nature is protected. The role of protected areas in the opinion of Maltese respondents is more in terms of safeguarding nature's role in providing clean air and water. Damage or destruction of nature protection areas by economic development is according to 60% of Maltese respondents, to be only acceptable for developments of major public interest and if damage is fully compensated for. Table 14, overleaf compares results of the 2007 and 2010 surveys and indicate a slight increase in awareness. These figures point to the fact that when adequately made aware of the problems behind the loss of biodiversity and the implications of such loss, people may then be more supportive of efforts to address such loss and to conserve local biodiversity.

Question	2007 (Value in %)	2010 (Value in %)	Change /Trend
Q1 - Are you aware of the term "biodiversity"?			
I've heard of it and I know what it means	14.4	18	+3.6
I've heard of it but I do not know what it means	26.2	35.2	+9
I have never heard of it	57.3	46.6	-10.7
INTERVIEWER READ OUT: "Biological diversity or biodiversity is the term given to the variety of life on Earth (like plants, animals, oceans etc) which forms the web of life of which we are an integral part..."			
Q2 - Can you please tell me what the phrase "loss of biodiversity" means to you?			
Decline in natural habitats/less variety/in general	20.2	20.2	0
Forests will disappear /decline	10.1	9.4	-0.7
Certain animals and plants are disappearing/ will disappear	33	32.4	-0.6
Certain animals and plants are/will become endangered	14.3	12.8	-1.5
Loss of natural heritage like nature parks/endemic species/ natural landscapes, basically the natural environment that you can relate to in your country	10.4	8.9	-1.5
Change of the climate	6.4	6.6	+0.2
Problems with the clean air, water/CO_2 emissions	9.5	8.5	-1
Problems for the economy/Loss of material wealth	0.2	1.4	+1.2
Less opportunities for tourism	0.3	0.8	+0.5
Loss of potential for producing medicines, food and fuel	2.1	0.8	-1.3
Problems in my garden	0.4	0.2	-0.2
Don't care about this issue	0.7	0.1	-0.6
Others	8.8	8.4	-0.4
Q3 How informed do you feel about the loss of biodiversity?			
Very well informed	4.1	4.4	+0.3
Well informed	26.9	24.1	-2.8
Not well informed	34.1	38.5	+4.4
Not informed at all	32.7	30.8	-1.9
Q4. How much do you agree or disagree with the following statements:			
It is a moral obligation because we have a responsibility as stewards of nature			
Very much agree	85.3	83	-2.3
Rather agree	12.5	15.2	+2.7
Rather disagree	0.3	0.6	+0.3
Very much disagree	0.3	0.4	+0.1
Our well being and quality of life is based upon nature & biodiversity as it provides pleasure and recreation			
Very much agree	79.9	71.8	-8.1
Rather agree	16.8	21.3	+4.5
Rather disagree	1.9	2.5	+0.6
Very much disagree	0	1.1	+1.1
Biodiversity is indispensable for the production of goods such as food, fuel and medicines			
Very much agree	71.4	68.3	-3.1
Rather agree	19.9	22.7	+2.8
Rather disagree	3.5	2.6	-0.9
Very much disagree	1.2	1.5	+0.3
Europe will get poorer economically as a consequence of the loss of biodiversity			
Very much agree	60.8	52.1	-8.7
Rather agree	19.3	23.4	+4.1
Rather disagree	5.2	5.2	0
Very much disagree	4.4	6.1	+1.7

Question	2007 (Value in %)	2010 (Value in %)	Change/Trend
Biodiversity is essential in tackling climate change			
Very much agree		63.1	N/A
Rather agree		25.1	N/A
Rather disagree		3.1	N/A
Very much disagree		1.8	N/A
Q5 - How serious is the decline and possible extinction of animal species, flora and fauna, natural habitats and ecosystems in your [COUNTRY]?			
Very serious problem	51.8	51.4	-0.4
A fairly serious problem	32.6	32.1	-0.5
Not a serious problem	9	10.4	+1.4
Not a problem at all	1.4	1.6	+0.2
Q6 - Do you think that the decline and possible extinction of animal species, flora and fauna, will have an impact on you personally?			
Yes, I am already affected by the loss of biodiversity	25.8	25.8	0
Yes, it will have an effect on me, but not now, later on	33.8	34.1	+0.3
No, not on me personally but on my children	22.8	19.1	-3.7
No, it will not have an effect	13.1	15.1	+2.0
Q7 - From the following list, what threatens biodiversity the MOST?			
Intensification of agriculture, deforestation and over-fishing	5.5	7.5	+2.0
Pollution of air / water (seas, rivers, lakes, etc.)	25.6	30.5	+4.9
Man-made disasters (*e.g.* oil spills, industrial accidents, etc.)	23.6	23.4	-0.2
Plants and animals introduced into our ecosystems (that are not normally found in a region or country)	2.1	1.5	-0.6
Climate change	19.1	15.6	-3.5
Land use change and development (*e.g.* roads, housing, industry, etc.)	19.7	16.1	-3.6
[Others]	1.7	1.3	-0.4
Q8 - Have you heard of the Natura 2000 network?			
I've heard of it and I know what it is	5.3	8.5	+3.2
I've heard of it but I do not know what it is	10.9	20.4	+9.5
I have never heard of it	82.5	70.3	-12.2
Q9 - Where would you get information about biodiversity such as threats, losses etc?			
Television news and documentaries	55.2		N/A
Radio	10.8		N/A
Newspapers & magazines	22.9		N/A
Internet	25.1		N/A
School or university	5.6		N/A
Family/friends	3.4		N/A
Events (conferences, fairs / exhibition, festivals etc.)	1.7		N/A
Publications/books/brochures	6.6		N/A
[Other]	3.2		N/A
Q10 - Would you say that you personally make an effort to protect biodiversity?			
Yes, I do	35.6	47.2	+11.6
Yes but I would like to do even more	45.8	37	-8.8
No, because I do not know what to do	10.9	9.9	-1.0
No, for other reasons	5.5	3.1	-2.4
[Other]	0	0.6	+0.6

Question	2007 (Value in %)	2010 (Value in %)	Change/Trend
Q11 - What measure to protect biodiversity should the European Union take as a priority?			
Increase the areas where nature is protected in Europe		9.5	N/A
Create financial rewards (*e.g.* for farmers) for nature conservation		6.6	N/A
Introduce stricter regulation for economic sectors that impact nature		28.6	N/A
Allocate more financial resources to nature protection in Europe		10.3	N/A
Promote research on the impact of biodiversity loss		4.7	N/A
Better inform citizens about the importance of biodiversity		32.9	N/A
[Other]		2.3	N/A
[None]		0.3	N/A
Q 12 - What do you think are the two most important roles of nature protection areas, such as those included in Natura 2000 – Europe's largest network of nature protection areas?			
To protect endangered animals and plants		39.4	N/A
To stop the destruction of valuable areas – land and sea		34.2	N/A
Promote nature-friendly land-use		23	N/A
To stimulate eco-tourism and recreational opportunities		11.9	N/A
To safeguard nature's role in providing clean air and water		43.5	N/A
[Other]		1.2	N/A
[None of these]		0.2	N/A
Q 13 - Sometimes economic development results in damage or destruction of nature protection areas, such as Natura 2000 sites. Which of the following statements comes closest to your opinion?			
This is acceptable because economic development takes precedence		5.8	N/A
This should be prohibited because these are our most important nature areas		29.6	N/A
This is only acceptable for developments of major public interest and if damage is fully compensated for		60.3	N/A
Sample Size (Number of Respondents)	502	1003	

Table 14 - Comparing Eurobarometer Surveys 2007 and 2010 – Attitudes of Maltese people towards the issues of biodiversity

It is imperative that biodiversity concerns are further mainstreamed in national environmental education initiatives. Outreach activities need to be carried out on a frequent basis. In its project proposal submitted for funding under the Rural Development Programme for Malta 2007-2013, MEPA has included a communications component aiming at informing, educating, encouraging ownership and building momentum for the implementation of the EU Natura 2000 network of protected areas in the Maltese Islands. A three-year communications and training campaign will aim to stimulate direct involvement of the general public and of the relevant target stakeholder groups in the management planning exercise, and to equip key target stakeholder groups and the general public with the knowledge and skills necessary to participate in the management planning process more effectively. An increase in awareness amongst the general public and such groups will also enable and support the implementation of future site-specific educational and awareness actions, which will be linked to approved management plans. A series of onsite posters are also being prepared which will eventually be set up in a number of Natura 2000 sites.

A biodiversity information campaign was launched on 18 May 2010 as part of a number of initiatives to celebrate the 2010 International Year of Biodiversity. The scope of this campaign was to increase the public's understanding of the term "biodiversity", its importance and in what ways members of the public can contribute to safeguarding Malta's biodiversity. Activities

undertaken as part of this campaign included presentations and talks to schools, local councils, scout camps and hotel operators; the launch of the biodiversity logo; the issuing of a personalised stamp and a set of commemorative stamps depicting four species found in the Maltese Islands. A number of monthly tours to protected areas were also organised by MEPA between October 2010 and April 2011 (Table 15). During these tours, participants were shown various habitats and species present in Malta, some of which are endemic.

October 2010	An education tour was held at *Ta' Rapa*, a Natura 2000 site, having one of the important old holm oak remnants of the Maltese Islands. On this visit, participants were shown bay laurel matorral, buckthorn and lentisk maquis communities, relict riparian woodlands with elms and poplars as well as small pine woodlands.
November 2010	This education tour was held at *in-Nigret/Gebel San Pietru*, an area in the central of the Islands, where participants were shown watercourse vegetation, maquis formations, phrygana and steppic communities. The area which is rich with cultural and natural heritage including important species which the visitors were able to appreciate.
December 2010	During this tour participants visited the cliffs at *Il-Ħnejja/Wied il-Ħoxt* which harbours important garigue communities and a number of unique and endemic species. In addition, they were shown interesting maquis and reed communities, as well as one of the oldest stands of Sandarac Gum trees at the locality known as *Il-Maqluba*.
January 2011	This tour was held at *Wied il-Mizieb*, in the North of Malta and falls within a Natura 2000 site. Participants were shown one of the islands largest population of Sandarac Gum tree (Malta's National tree), as well as endemic phrygana communities with the Maltese Spurge and the Maltese Shrubby kidney Vetch.
February 2011	This tour visited the valley system of *Wied Ħas-Saptan*, which includes some unique Mediterranean scrub and rock-pool communities. Of interest here are the pear formations which are one of the oldest found on the Maltese Islands.
March 2011	In this tour participants were taken to the sister island of Gozo at *Il-Qortin tal-Magun*. This Natura 2000 site has one of the richest garigue and scrub communities of the Islands, having many different and rare threatened and/or endemic species and habitats.
April 2011	The final education tour in this series was to *Ta' Lippija* in the North of the Islands. This site has a unique variety of Mediterranean grassland species and here the public were able to appreciate the clay slope habitats and their typical species.

Table 15 – Educational Tours organised by MEPA

MEPA is also collaborating with a number of entities to target a wide range of audience as possible. Such outreach is deemed important in order to instil in all, a moral obligation to pass on to our future generations an earth teeming with a healthy and diverse natural environment. This campaign is now being extended to celebrate the UN Decade on Biodiversity.

3.11 Community-Based Nature Conservation

> Less biodiversity would exist today had not communities, NGOs, governments, and, to a growing extent, business and industry taken actions to conserve biodiversity, mitigate its loss, and support its sustainable use.
>
> Ecosystems and Human Well-Being: Biodiversity Synthesis
> Millennium Ecosystem Assessment, 2005

Local communities as well as civil-society organisations can play an important role in bringing forth biodiversity conservation in Malta. MEPA is legally obliged to follow a participatory approach in policy development. A consultation process is normally implemented when new legislation is proposed, compliant with Article 62 of the EDPA. Public participation in developing management plans is also integrated in LN 311 of 2006 and is practised for instance in a few protected areas (*e.g. l-Għadira*, *is-Simar*, and *Rdum tal-Madonna*) where local communities and land users are involved as stakeholders in the management planning process through an active participative approach. Locals are actively involved in the problem-solving process, and are encouraged to submit proposals for solutions, some of which may actually require them to take

responsibility themselves. Site managers may also involve volunteers to monitor activities within and around the protected area they manage. Where possible, site managers also involve local communities and government in the conservation of protected area under their management. Meetings within land users/owners may also be held; for instance Nature Trust works closely with the University of Malta; the latter being the land owner of the protected area - *Wied Għollieqa*.

Although there are some initiatives to engage local communities at the national level in conservation efforts, there is scope for enhancing community-based conservation in Malta. Efforts to engage key actors and stakeholders to integrate biodiversity concerns into other sectors outside the environment sector need to be stepped up, as well as the need to develop innovative participatory mechanisms.

3.11.1 Biodiversity Partnerships

Considering the cross-cutting nature of biodiversity, it is not surprising that partnerships across public, private and non-governmental sectors can significantly advance conservation efforts in Malta. Whereas on the one hand, biodiversity conservation can create green jobs and green SME businesses, the business sector, can, in return, deliver biodiversity benefits and can help create opportunities for innovation via investing in pro-biodiversity businesses (PPB) and by making informed choices when choosing raw materials through their supply chain, with the end goal of generating both positive financial and biodiversity returns. Indeed, over the past few years, attention is being increasingly drawn to the importance of establishing biodiversity-business partnerships. An EU Business and Biodiversity (B@B) Initiative was launched in November 2007 during a conference, organised by the Portuguese Presidency, on Business and Biodiversity in Lisbon, with the subsequent establishment of an online platform enable businesses to share their experience and best practices. The EU funded Biodiversity Technical Assistance Units (BTAU) Project provided assistance to businesses when developing and implementing pro-biodiversity projects and served as a pilot experience to the development of PBBs. The key activities of each BTAU are to identify enterprises which are eligible for funding within or around Natura 2000 sites and to explore a package of financing options to produce long-term, site and region-specific economic and nature benefits. One of the outcomes of this project was the "Handbook for developing and implementing pro-biodiversity business projects". Examples of PPB projects include ecotourism, breeding rare breeds of livestock, bee keeping and honey production, and organic wine production. Article 10(e) of the CBD calls on Parties to this Convention to encourage the cooperation between governmental authorities and the private sector in developing methods for the sustainable use of biological resources. Biodiversity mainstreaming in the private sector and partnerships with the private sector in implementing this Convention are also called for under Goal 4 of the CBD's Strategic Plan.

Contributing a small percentage of revenues or even staff time by businesses towards biodiversity conservation, in addition to the safeguard of ecosystem services based on the sustainable use of biological resources and use of best practices, can go a long way in the much needed mobilisation of resources for advancing conservation priorities and hence in building an enabling environment for conservation action in Malta. Moreover, the integration of biodiversity concerns and other environmental considerations into corporate strategies, can contribute to improved corporate image, lead to increased productivity, and can create and exploit new market opportunities such as offered by Green Public Procurement. However, incentives are also required such as ecolabelling and branding schemes. For instance, the European Commission is currently preparing a new award scheme entitled "NATURA 2000 PARTNER" which would be given to public or private institutions or organisations, cities, NGOs, enterprises, farms, land owners, tourism/recreation bodies who show special merits in contributing to the integrated management

of or the awareness raising on Natura 2000 sites (Source: Partnerships portal on DG Environment Website).

An example of a public-private partnership in Malta is what is known as the "Malta Embellishment and Landscaping Project" (MELP). The latter started operation on 1 November 2002 under the first agreement of a public-private partnership in Malta. The Environment Landscapes Consortium Ltd (ELC Malta) was chosen to run the function of the Urban and Rural Landscaping (URL) Section which was responsible for the urban and rural landscaping of various sites in Malta that fall under the responsibility of the Central Government. As a result of the agreement, all employees with URL, together with all operating sites and equipment, were loaned to the Consortium. The role of the Consortium under the agreement is:

- the embellishment of traffic islands, gardens, valleys and roundabouts, particularly by means of fountains and floral displays;
- the landscaping of major thoroughfares, public gardens and parks that fall under the responsibility of the Government;
- the carrying out of other landscaping and gardening operations, such as upgrading works in housing estates, environmental projects and upgrading works at main touristic areas;
- the improvement of afforested areas;
- the landscaping of specified public gardens;
- the development of the resources of *Wied Incita* Nursery and any other Government nursery to provide for the requirements of any assignment, undertaking or project under this Agreement; and
- any other assignment, undertaking or project as may be required by the Government from time to time.

The project is supervised by a Monitoring Unit within the Department of Agriculture. A Monitoring Board controls the running of the agreement. After five years the agreement was improved and extended up to the end of 2012. More innovative ways are needed to engage other private entities in biodiversity conservation.

When considering the engagement of the finance sector in biodiversity conservation one can mention the financial support provided by national banks to conservation projects (including in financially assisting the publication of awareness raising material on biodiversity). Some banks have also set up conservation trust funds such as the HSBC Cares for the Environment Fund. Bank of Valletta (BOV plc.) have a number of initiatives that positively impact the environment amongst which one can mention the '34U Campaign in Localities' launched in collaboration with the Ministry for Resources and Rural Affairs and undertaken in collaboration with various Local Councils. Staff members from Maltese Banks have also participated for instance in conservation activities, as well as in clean-up activities held on World Environment Day (*e.g.* BOV Clean-up Malta Campaign and the Underwater Clean-up).

Besides the private and finance sectors, partnerships can be built between government, NGOs, education and research institutions, conservation practitioners, landowners and users, and the media. MEPA liaises with both governmental and non-governmental organisation and a wide range of other stakeholders. Some networks at a national level (both informal and those that are formally established via a committee) exist.

Networking is very important for inter-departmental communication, and in creating the mechanism to exchange information and know-how. Resource mobilisation however is needed to further enhance, and build where needed, such networking among the relevant stakeholders in

order to further develop and adopt measures that can positively contribute towards biodiversity conservation action.

4. Biodiversity Concerns across Sectors and Cross-Sectors

Effective integration of biodiversity concerns into other policies is needed to (i) minimise damage (ii) maximise the positive contribution to nature conservation objectives and (iii) realise the potential of co-benefits resulting from the maintenance and enhancement of healthy ecosystems.

Extract from the Message from Athens, 2009

The dire need to protect, conserve and sustainably use biological and natural resources, for human-well being and economic growth, is not immediately apparent to all members of society. Indeed, impacts to the natural environment may only become evident when adverse effects are felt by primary sectors, such as agriculture and fisheries and service-providing sectors such tourism, and in particular when impacts have socio-economic repercussions. At such a stage, however, remedial action is not only financially taxing but may be all too late considering that certain impacts may possibly have irreversible consequences. To this end, conservation action must be pro-active, substantiated by sectoral policy integration of biodiversity concerns. Various sectors have adopted policies in compliance with EU obligations and which to some extent help to reduce anthropogenic pressures on the natural environment. Sectoral measures can also contribute towards slowing down the rate of biodiversity loss through efficient resource use. Chapter 4 describes sectoral and cross-sectoral measures, which have been implemented or are ongoing, and which in some way or another contribute towards biodiversity mainstreaming and help to alleviate pressures on biodiversity. Preliminary consultations have been carried with a number of entities. Feedback received (plus literature review) has helped towards the collation of information presented in this chapter.

4.1 Agriculture and Rural Development

The rural environment is first and foremost a living milieu in which fauna, flora, habitats and agricultural activities have been evolving interdependently. Over the centuries a real symbiosis has been developing: the maintenance of a number of species and ecosystems depends on the continuation of certain agricultural activities, and agriculture is also the first to benefit from biological diversity.

EU Biodiversity Action Plan for Agriculture,
COM [2001] 162 final

Agriculture and biodiversity are inexorably interlinked (Figure 23, overleaf). Whereas biodiversity underpins agriculture productivity, agroecosystems can provide an important habitat for many native species particularly those that rely on farmed land for their survival. In Malta, agriculture forms an important backdrop to the land-restricted and fragmented natural and semi-natural habitats. Farmland forms an integral part of the landscape and further serves as an essential ecological corridor between such fragmented habitats. Good farming practices can help sustain biodiversity, including other natural resources, such as water and soil. Malta's natural environment, and hence its biodiversity, in turn, contributes to the ecological services and functioning on which agricultural productivity essentially depends on, through for instance regulation of pests and diseases, nutrient cycling, maintenance of soil fertility, and crop pollination. As the main land user in the Maltese Islands (amounting to 51% of land cover based on CORINE Land Cover Data for 2006), farming is very important for Malta's natural environment.

Although the agriculture sector contributes little towards the domestic economy (2.6% to the GDP in 2005), it nonetheless imparts the country some degree of self-sufficiency in terms of food security. The various farming practices also contribute to the maintenance of the rural character and countryside recreation. In addition, this sector's potential to enhance other more economically prolific sectors such as tourism has been acknowledged. Strengths, weakness and needs of the Maltese agriculture sector have been documented by the Rural Development Strategy for Malta 2007-2013 and are reproduced in Table 16.

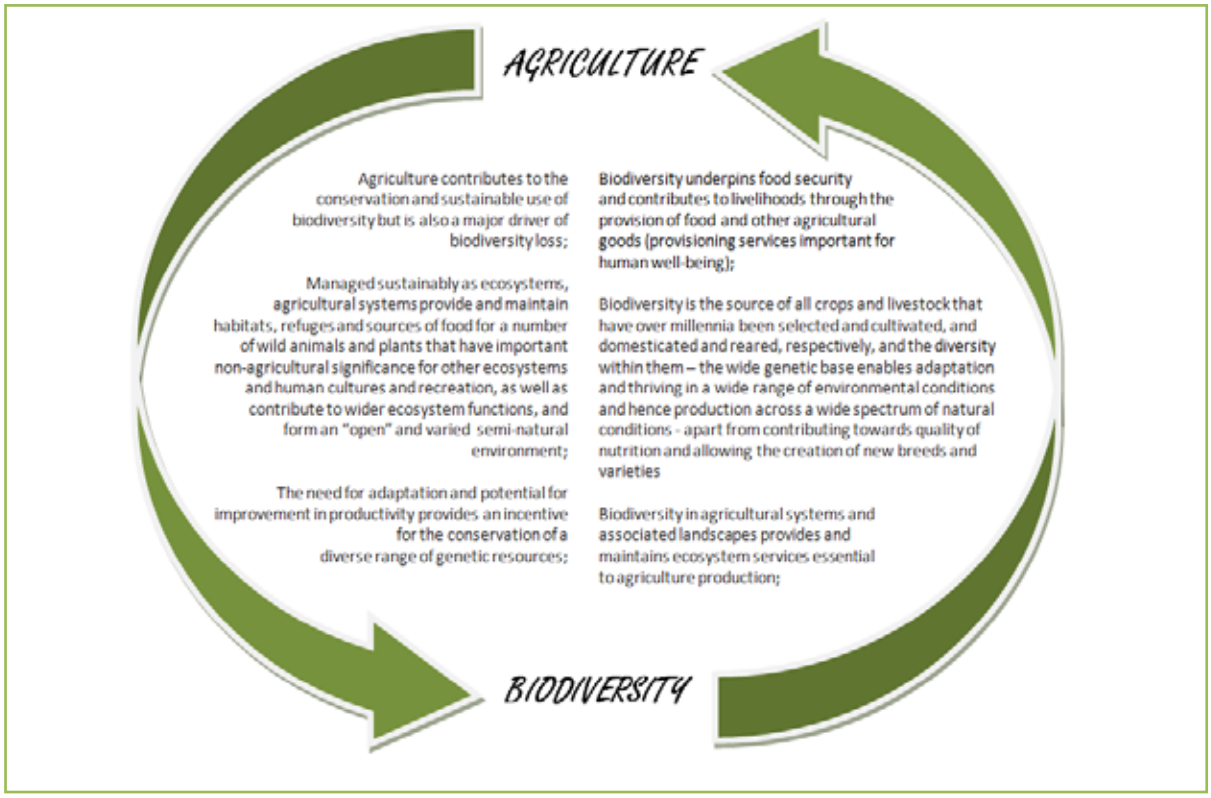

Figure 23 - Inter-linkages between Agriculture and Biodiversity
(Source: Based on information extracted from SCBD 2008 – Biodiversity and Agriculture: Safeguarding Biodiversity and Securing Food for the World)

Strengths:
▪ Rural areas that are not economically nor socially disadvantaged;
▪ Supply of basic services in inhabited rural areas at par with that of urban areas;
▪ Good road network to urban areas and facilities therein;
▪ Largely un-built with some localities retaining the traditional rural character;
▪ Strong agricultural activity immediately evident;
▪ Established cultural traditions;
▪ Unique landscape intermingling natural, rural and cultural elements;
▪ Numerous cultural heritage sites and archaeological remains scattered in rural areas;
▪ A variety of landscapes – rural and coastal - within close distance;
▪ High potential for the exploitation of rural areas for eco-friendly recreational and tourist activities;
▪ Crafts tradition still practised;
▪ Rural areas increasingly valued by local population;
▪ Increasing local demand for locally crafted items and typical gastronomic products;
▪ Increasing demand for recreational and leisure activities based in the countryside;
▪ Increased appreciation of natural and cultural heritage by locals;
▪ An established tourist destination with well developed tourist infrastructure and amenities.

Weaknesses[64]:
▪ Very high pressure on natural resources, habitats and rural landscape due to high population density coupled with small land area; ▪ Declining importance of agricultural activity due to high opportunity cost of land and the expansion of the secondary and tertiary sectors; ▪ Young people from farmer families opt for alternative employment attracted by secure income and more social esteem; ▪ Huge pressure for urbanisation on rural areas; ▪ Rural areas losing their distinct character due to increased urbanisation; ▪ Loss of cultural heritage; ▪ Loss of traditional crafts and skills; ▪ Limited funds for upgrading of rural areas and restoration of cultural and natural heritage; ▪ Weak enforcement leading to vandalism, littering, dumping of inert waste and the monopolisation of the countryside by a segment of its recreational users; ▪ Limited amenities for eco-friendly tourist and formal recreational activities in rural areas; ▪ Public access in the countryside is not safeguarded through legislative measures; ▪ Various competing land uses in rural areas such as urban settlements, farms, landfills, industrial and tourist development, quarrying and large scale projects of national importance, jeopardise the natural, environmental and rural character of such areas; ▪ Leisure, recreational, and tourist developments lead to trampling, disturbance, exploitation and destruction of wildlife, increased traffic flow and demand for parking facilities, and damage to rural features; ▪ Excessive recreational pressures on natural open spaces as they are very few; ▪ Lack of formal recreation sites and visitor management plans lead to uncontrolled negative impacts on the natural countryside and heritage resources; ▪ Rural man-made compositions falling in disrepair; ▪ Conflict between recreational activities that have a high negative impact, such as hunting and trapping, as well as offroading, and low impact recreational activities like sightseeing and nature appreciation, that require access and undisturbed surroundings; ▪ Rural areas also losing their distinct character due to an increase in building development zones.
Needs:
▪ Contain urban sprawl; ▪ Conserve the rural environment and natural resources; ▪ Preserve the character of rural villages and conserve built heritage; ▪ Preserve and upgrade the cultural and natural heritage in the countryside ; ▪ Manage sustainable tourism and recreation activities to cultural and natural sites and direct economic returns for their same up keeping; ▪ Ensure that rural crafts and skills are preserved and their economic potential is exploited; ▪ Development of quality agro-food products elaborated in a traditional manner and exploiting the link with rural character; ▪ Open access to the countryside for the enjoyment of all; ▪ Upgrade and manage the cultural and natural heritage creating economic returns for the rural areas through sustainable tourism and recreation activities; ▪ Ensure that agricultural activity is retained since farmers have an important role as stewards of the land; ▪ Involve Local Councils in rural areas in the social and cultural development of their localities through the Leader approach; ▪ Public awareness, communication and educational activities / campaigns related to greater appreciation of the natural and cultural heritage; ▪ Encourage sustainable agricultural practices, well designed agricultural features; ▪ The introduction of environmental mitigation measure and encouraging proper maintenance of traditional features such as rubble walls; ▪ Discourage agricultural malpractices such as littering, dilapidation, tilling malpractices and clutter around settlements.

Table 16 - Summary of Strengths, Weaknesses and Needs of the Rural Areas
Source: RD Strategy (2007-2013)

[64] Another weaknesses would include the significant pressure that is placed on groundwaters

Agricultural land in Malta is characterised by small-sized fragmented and usually terraced fields, bordered by rubble walls or hedged with the non-native Prickly Pear (*Opuntia* spp.). Farming in Malta is based on either dry farming dependent on rainwater, or irrigation farming. For the year 2007, the National Statistics Office (NSO, 2008 - Farm Structure Survey 2007) document 7,123ha of dry land and 3,203ha of irrigated land (Malta + Gozo). These farming practices differ in terms of farming intensity, source of water used for watering crops and land, types of cultivated crops and the number of crop cycles applied in a year. Total agricultural land can be described in terms of "utilised agricultural areas" (UAA) *i.e.* all the land used by the agricultural holding[65] for agricultural production (whether rented or family owned) or "unutilised agricultural areas". In 2007, 11,018 agricultural holdings with a total of 10,326 hectares of utilised agricultural area were recorded (NSO, 2009 - Agriculture and Fisheries 2007). UAA is further categorised into: arable land (*i.e.* cultivated under a system of crop rotation), land under permanent crops (*i.e.* crop occupies land for ≥ 5 years) and kitchen gardens (*i.e.* small plots of cultivated land for semi-subsistence). Different farming practices can result in a variety of agricultural habitats and related biodiversity. Cultivation of forage crops dominates the use of arable land. Apart from crop growing, livestock farming is also locally practised and is sectoral in nature, and divided according to the livestock reared: mainly sheep, goats, rabbits, poultry, swine and cattle. Production of swine, rabbit, poultry (and eggs) is intensive and Malta is self-sufficient for meeting local demands for such farmed-produce.

Most of the agricultural land (55.1%) is concentrated in the Western and Northern Districts of Malta which together with the Gozo and Comino District account for 74.3% of all agricultural land in the Maltese Islands. These districts also account for 64.0% of all farmers and 70.0% of the full-time farmers clearly indicating the importance of agricultural activity in these areas. As regards to livestock holdings or farms, these tend to be concentrated in the South Eastern District of Malta as well as Gozo and Comino Districts. However, the Southern and Northern Harbour districts still account for some 18.9% of all livestock holdings (Source: Rural Development Strategy for Malta 2007 to 2013). The 2005 State of the Environment Report identifies land abandonment, farm intensification, poor farming practices and fragmentation of ownership as the "most critical land-related agro-environment issues". The 2008 SOER identifies agricultural-related threats to rural areas: land abandonment, loss of rubble walls, dumping, agricultural land reclamation, blocking of countryside access, and the inappropriate design of rural buildings. The impacts on biodiversity caused by unsustainable forms of agriculture can be described using the DPSIR framework (Figure 24, overleaf).

All types of farming practices (crop cultivation plus livestock rearing) in Malta lead, in some way or another, to various environmental impacts at the ecosystem, species and genetic levels. However, the degree of impact can also be related to intensive production levels which entail high levels of chemical input to achieve increased production levels. The abandonment of certain farming practices can also negatively impact the environment. This is because extensive farming practices are linked with maintaining certain types of habitats and a range of species. Hence, their abandonment leads to the loss of semi-natural habitats (such as semi-natural grasslands) not to mention the biodiversity and landscape associated with them. The Communication from the Commission on Directions towards Sustainable Agriculture (COM/1999/22) states that '*The desired relationship between agriculture and environment can be captured by the term "sustainable agriculture"*'. Indeed, Malta's National Strategy for Sustainable Development (NCSD, 2006) highlights a number of important issues that need to be addressed in order to integrate sustainability into the agricultural sector in Malta.

[65] The agricultural holding is a single unit which has a single management and which produces agricultural products. A holding may have agricultural land in different localities. (NSO)

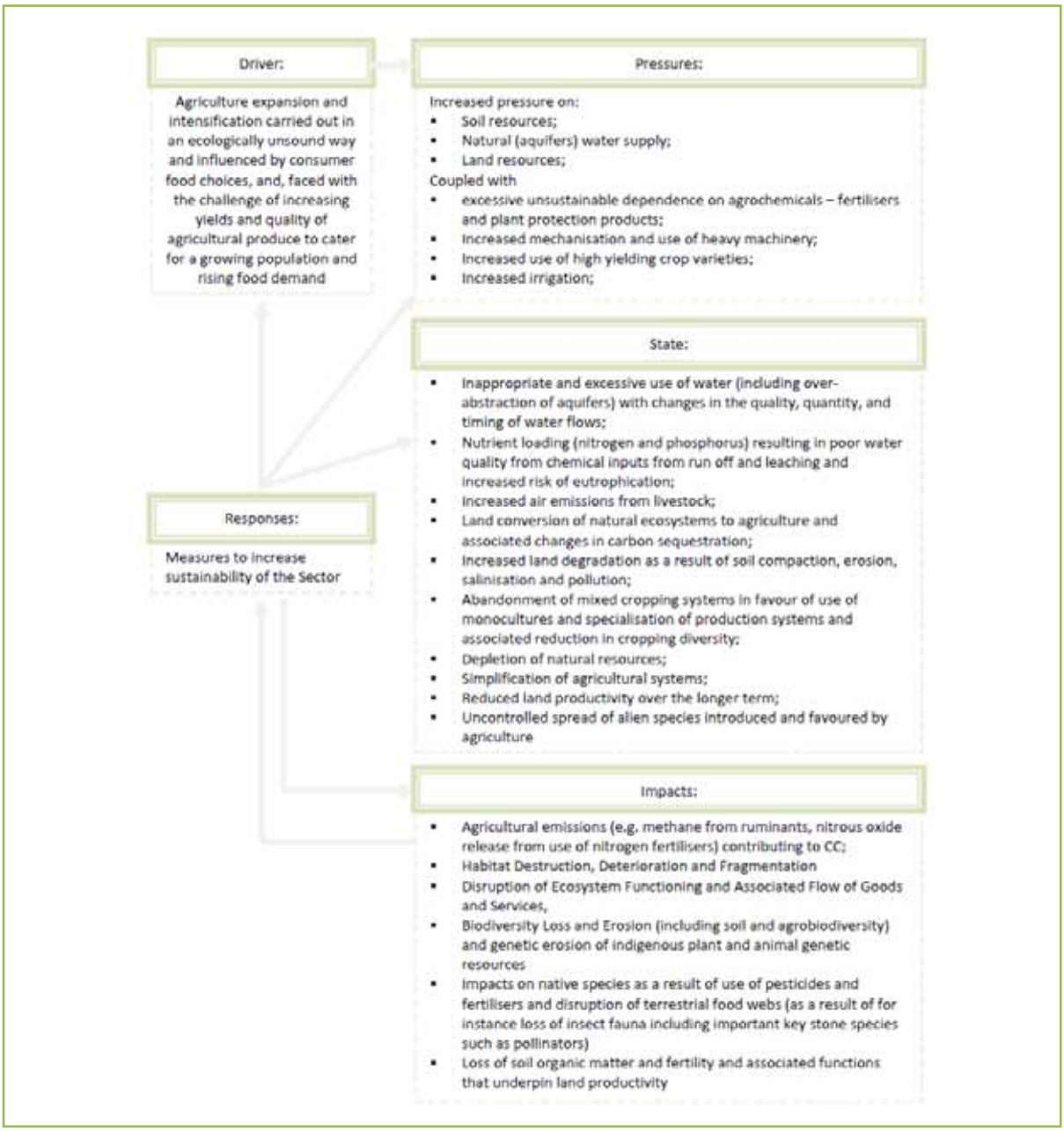

Figure 24 - Effects of Unsustainable Intensification of Agriculture on the Environment & Land Productivity

'*Sustainable agricultural management aims to:*

- *Use water, land, nutrients, and other natural resources efficiently or at the rate they are replenished so that resources are conserved. For example, using water efficiently means taking into consideration other ecosystem services that water provides (flood mitigation, nutrient cycling, drinking water supply, and sanitation);*
- *Manage biodiversity in such a manner that biological resources are sustained; and*

- *Minimise the impact of agriculture on the wider environment in order to sustain the other ecosystem services, such as, minimising chemical inputs, especially non-renewable sources, so there is minimal damage to the surrounding environment.'*[66]

Agriculture in Malta is affected by a variety of EU and national policies. From a land use perspective, the agricultural sector is affected by the Structure Plan for the Maltese Islands and the requirements of the EU Common Agricultural Policy (CAP), which also integrates environmental considerations since the 2003 reform (adopted on 26 June 2003). The latter had introduced, or strengthened, several measures that promote land use and farming practices compatible with the protection of environmental resources. Since then the CAP is built on two pillars.

Environmental-related policies include the Water Catchment Management Plan for Malta in compliance with requirements of the EC Water Framework Directive, and the Nitrates Action Plan as a requirement of the EC Nitrates Directive, which are both addressed later in this Chapter of the NBSAP. From a nature conservation perspective, relevant policies call for habitat and species protection (EU Nature Directives and transposing domestic legislation). An EU Biodiversity Action Plan for Agriculture was adopted by the Commission in March 2001 and prioritised action with respect to:

- promoting and supporting environmentally-friendly farming practices and systems that benefit biodiversity directly or indirectly;
- supporting sustainable farming activities in biodiversity-rich areas;
- maintaining and enhancing good ecological infrastructures, and
- promoting actions to conserve local or threatened livestock breeds or plant varieties.

The EC Biodiversity Action Plan to 2010 and Beyond also required measures in the agriculture and rural development sector with regards to *inter alia* financing Natura 2000, identifying high-nature-value farmland (HNVF), ensuring effective implementation of cross-compliance, ensuring that Rural Development Plans (RDPs) adopted by Member States comply with environmental legislation and the EU Nature Directives, as well as using the instruments of the CAP first pillar (decoupling, cross-compliance) to promote biodiversity actions.

4.1.1 Pillar I of the CAP: Cross-compliance

The first pillar of the CAP focuses on market and income policy. Payments under this pillar are based on the principles of decoupling from production, via a system of annual direct payments and a set of market measures. Farmers receiving direct payments are required to follow cross-compliance requirements in two ways:

- they are required to abide to "Statutory Management Requirements" (SMRs) in the field of the environment, food safety, plant and animal health, and animal welfare; and
- they are required to keep their land in "Good Agricultural and Environmental Conditions" (GAECs)[67] in compliance with standards established by Member States.

[66] Biodiversity and Agriculture: Safeguarding Biodiversity and Securing Food for the World - Secretariat of the Convention on Biological Diversity, 2008

[67] As part of the health check of the 2003 CAP reform, the Commission has proposed to strengthen the standard on landscape features under good agricultural and environmental conditions (GAECs) aimed at the promotion of biodiversity. This will contribute to retaining the environmental benefits of set-aside which the Commission proposes to abolish. It is also proposed to make available additional rural development funding for *inter alia* biodiversity, via an increased transfer of money from the first to the second pillar of the CAP (*i.e.* modulation).

The "Cross-Compliance Related to EU Aid Applications in terms of the Paying Agency Regulations, 2005" (LN 346 of 2005 as amended) lay down the structure for the management of cross-compliance, and EU obligations related thereto, in Malta. The Competent Authority is the Control Unit of the Paying Agency within the Ministry for Resources and Rural Affairs (MRRA). In its capacity as the Control Authority, this Unit ensures compliance with all SMRs and GAECs on a national level. GAECs were developed on the basis of the framework set up of Council Regulation (EC) No 73/2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers (repealed Regulation EC No 1782/2003), while taking into account the specific characteristics of Maltese conditions. The following ten national standards were established, targeting soil erosion, soil organic matter, soil structure and minimum level of maintenance:

- National Standard: On sloping land, ploughing should always be practiced in parallel with the contours of the field.
- National Standard: Load-bearing rubble walls that serve to retain soil on terraced slopes should be maintained in a good condition.
- National Standard: On irrigated land, crop rotation should be practised regularly, and crops belonging to the same botanical family should not be grown successively on the same parcel of land.
- National Standard: Stubble and vegetable residues should not be burnt on the soil, except where by order of the national plant health authority.
- National Standard: Machinery should not be used on the soil when it is flooded or water-saturated.
- National Standard: Unnecessary trampling on the soil with heavy machinery should be avoided at all times.
- National Standard: Uprooting of indigenous trees listed in Schedule I-III of Legal Notice 12 of 2001 is forbidden[68].
- National Standard: The deposition of soil or dumping of sublayer material on garrigue habitats is prohibited.
- National Standard: The encroachment of unwanted vegetation leading to abandonment of parts or all of the fields should be avoided.
- National Standard: Olive groves should be maintained in good condition.

At a national level, cross-compliance on all direct payments has been introduced since 1 January 2005. Farmers receiving direct payments were required to respect SMRs referred to in Annex II of Regulation (EC) 73/2009 (in accordance with 18 EU Directives and Regulations, which include the EC Nature Directives[69]) and the GAECs over a three year period. National guidelines have been developed to provide a general, user-friendly, summary of the cross-compliance requirements to farmers. In 2005, the GAECs, all the environmental SMRs and the identification and registration of SMRs were applied. As from 1 January 2006 a number of SMRs relating to public, animal and plant health came into force and started to be controlled, while in 2007 the same applied to the animal welfare SMRs. In Malta, the standards for each SMR were developed by the government department or agency with the most relevant experience of the issues covered by the SMR standards. The standards themselves were based on existing national legislation including that on nature protection which transposes the EC Nature Directives. In this respect, SMRs include those on related to wild birds (in terms of prohibiting disturbance to breed birds, keeping of protected birds, and hunting and trapping considerations) and on habitats (in terms of maintenance of rubble walls, prohibition of damage to natural habitats and trees, controlling the spread of invasive species and any development being covered by a permit).

[68] LN 200 of 2010 has repealed and replaced this.
[69] Article 3(1), Article 3(2)(b), Article 4(1), (2) and (4) and Article 5(a), (b) and (d) of the EC Birds Directive and Article 6 and Article 13(1)(a) of the EC Habitats Directive

On-the-spot checks are delegated to three specialised bodies: the Malta Resource Authority (MRA); the Rural Affairs and Paying Agency (RAPA) (previously the Agriculture Services and Rural Development) and the Food and Veterinary Regulatory Division. Each authority has developed its own checklist. The Control Unit acquires data from the Competent Authorities, either through a direct link with IT systems or via correspondence as agreed in a memorandum of understanding. The Control Unit carries out checks every year on a sample of farmers that would have applied for aid under both Pillar I and Pillar II measures of the CAP. Inspectors regularly carry out inspections and when in contact with the farmer explain what their mission is and what irregularities (if present) should be corrected. Inspectors assess their findings on the basis of standard checklists. The results of an inspection are then inputted in the control system software and in this way the outcomes are calculated in accordance to the "Cross-Compliance Related to EU Aid Applications in terms of the Paying Agency (Amendment) Regulations, 2009" (LN 207 of 2009). The farmers are informed about non-compliances found and breaches (if any).

Cross-compliance checks are carried out on a minimum of 1% of farmers receiving direct payments. Most of the penalties issued on GAEC breaches are generally related to the abandonment of agricultural land. From the 2008 controls, 293 farmers were selected for controls, out of which 23% were fully compliant with all the SMRs and GAECs. Although an intensive promotion campaign was conducted in 2008, 66% of the farmers were sanctioned with 1% and 5% of their direct payments. Nonetheless, there is evidence that cross-compliance is effective in terms of improving compliance with legislation. Evidence shows that cross-compliance induced a lot of farmer activities aimed at improving their farming practice to EU standards. Farmers are definitely more aware of what good agricultural practices entail as well as the adverse effects pollution may have on the environment in general (Source: Paying Agency, 2009).

4.1.2 Pillar II of the CAP: Agri-Environment Measures

The second pillar of the CAP focuses on the sustainable development of rural areas by enabling member states to adopt measures that help in curbing negative ecological impacts of agriculture and improving positive impacts via multi-annual rural development measures.

Local rural areas cover some 91% of the total surface area of the Maltese Islands harbouring 64% of the total population. The remaining 26% inhabitants live in the 42 urban localities, which occupy around 28% of the island's surface area (Source: Rural Development Strategy – 2007 to 2013, Republic of Malta, 2007). The Rural Strategy Topic Paper (MEPA, 2003) compiled under the review of the Structure Plan for the Maltese Islands, identifies the following key needs in local rural areas:

- conservation of the natural and built rural heritage;
- efficient use of extractive resources;
- protection and enhancement of the rural landscape;
- integrated rural development (with respect to agriculture);
- provision for countryside recreation;
- classifying rural settlements; and
- protection of the amenity and setting of the countryside.

In this respect, the proposed rural strategy defined the following objectives for rural areas:

- protection of the amenity and setting of the countryside and rural heritage;
- protection and reinstatement of traditional rural landscapes and enhancement of degraded rural areas;

- minimisation of conflicts among rural activities and between these activities and the environment;
- promotion of sustainable rural development and efficient use of rural resources;
- channelling development away from sensitive rural areas;
- protection and management of rural heritage according to specific conservation values; and
- management and promotion of the enjoyment of the countryside for recreational purposes.

The EU's rural development policy integrates agriculture within the broader rural context and strives to establish a coherent and sustainable framework for the future of Europe's rural areas. Farmers are required to adopt "good agricultural practices" with respect to certain aspects of agricultural production. The Code of Good Agricultural Practice (CoGAP) for Malta constitutes a comprehensive compilation of all good farming practices stemming as a requirement of a number of EU Directives and relevant national legislation as well as a number of potential practices under a voluntary basis. This document comprises 100 codes concerning all aspects of agricultural production namely: animal husbandry, manure handling, fertilization practice, irrigation practice, and plant protection, all grouped into 4 categories. Those farmers who commit themselves for a five-year minimum period, to implement "agri-environmental measures" that go beyond usual good farming practice, receive in return payments that compensate for additional costs and loss of income that arise as a result of altered farming practices (*e.g.* due to reduced production). These agri-environment payments are co-financed by the EU, via the European Agricultural Fund for Rural Development (EAFRD - Council Regulation EC No 1698/2005 as amended) and the Member States. The breakdown by Member States of the Community support for rural development for the period 2007 to 2013 is given in Decision 2006/636/EC **(**amended by Decision 2009/545/EC**).** Detailed rules for the implementation of Council Regulation (EC) No 1698/2005 as regards the implementation of control procedures and cross-compliance in respect of rural development support measures are specified in three regulations: (EC) No 1320/2006 (EC) No 1974/2006**,** and (EC) No 1975/2006**.**

Member States are required to draw up a national strategy plan in line with the strategic guidelines adopted by the Community and then submit their national strategy plan to the Commission before presenting their rural development plans. Implementing the national strategic plans is carried out through rural development programmes, which contain a package of measures grouped around the four axes of the Council Regulation (EC) No 1698/2005 as amended. The Managing Authority within MRRA is responsible for planning, implementation, delivery and evaluation of the Rural Development Programme funded by the EAFRD. National Rural Development Plans (RDP) have been compiled for the two consecutive EU financial programming periods: 2004-2006 and 2007-2013 under the reference frameworks provided by the national strategy plans and in line with the requirements of EU Rural and Environmental Policy. Essentially such national rural development policy seeks to encourage the multifunctional role of the agricultural sector within a wider framework for integrated rural development aiming at achieving sustainable development. The RDP for the period 2007 to 2013, links environmental measures to the objectives of the Sixth Community Environment Action Programme (6th EAP). National adopted measures under the four annexes of the EAFRD are shown in Table 17, overleaf. General guidance notes and others specific to certain measures are available online.

Measure		Nationally Applied Yes/No
Axis I – Improving the Competitiveness of the Agricultural and Forestry Sector "For Axis 1, greater emphasis shall be placed on restructuring, physical potential and innovation through measures that promote modernisation and added value with a qualitative drive that would strengthen competitiveness. Human resources shall also be supported to improve technical levels as a parallel approach" (RDP).		
(111)	vocational training, information actions, including diffusion of scientific knowledge and innovative practices for persons engaged in the agricultural, food and forestry sectors[70];	Yes
(112)	setting up of young farmers;	No
(113)	early retirement of farmers and farm workers;	No
(114)	use by farmers and forest holders of advisory services;	Yes
(115)	setting up of farm management, farm relief and farm advisory services, as well as forestry advisory services;	Yes
(121)	farm modernisation;	Yes
(122)	improving the economic value of the forest;	No
(123)	adding value to agricultural and forestry products;	Yes
(124)	cooperation for development of new products, processes and technologies in the agricultural and food sector;	Yes
(125)	improving and developing infrastructure related to the development and adaptation of agriculture and forestry;	Yes
(126)	restoring agricultural production potential damaged by natural disasters and introducing appropriate prevention actions;	No
(131)	helping farmers to adapt to demanding standards based on Community legislation;	No
(132)	supporting farmers who participate in food quality schemes;	Yes
(133)	supporting producer groups for information and promotion activities for products under food quality schemes;	Yes
(141)	supporting semi-subsistence farms undergoing restructuring;	No
(142)	setting up of producer groups;	Yes
Axis II – Improving the Environment and the countryside For Axis 2, the issue of sustainability use of agricultural land shall be addressed through a concerted focus on the measure for areas with handicaps that serves as the basic tool to ensure the continued use of agricultural land and that encourages the adoption of agri-environmental measures in order to ensure that environmental objectives are attained.		
(211)	natural handicap payments to farmers in mountain areas;	No
(212)	payments to farmers in areas with handicaps, other than mountain areas;	Yes
(213)	Natura 2000 payments and payments linked to Directive 2000/60/EC;	No
(214)	agri-environmental payments;	Yes
(215)	animal welfare payments;	No
(216)	support for non-productive investments;	No
(221)	first afforestation of agricultural land;	No
(222)	first establishment of agroforestry systems on agricultural land;	No
(223)	first afforestation of non-agricultural land;	No
(224)	Natura 2000 payments;	No
(225)	forest environment payments;	No
(226)	restoring forestry potential and introducing prevention actions;	No
(227)	support for non-productive investments;	No

[70] Under Measure (111) farmers benefit from training on a number of subjects, which may include:

- adherence to cross-compliance requirements,
- understanding and implementing a fertilizer plan,
- use of plant protection products,
- food handling, grading and traceability and
- the use of information technologies and modern production methods.

Measure		Nationally Applied Yes/No
Axis III – The Quality of Life in Rural Areas and Diversification of the Rural Economy For Axis 3, the drive is to promote an improvement in the quality of life in rural areas through a holistic investment in the rural cultural heritage. This would involve further investment in rural resources with accompanying synergy through tourism and conservation.		
(311)	diversification into non-agricultural activities;	No
(312)	support for the creation and development of micro-enterprises;	No
(313)	encouragement of tourism activities;	Yes
(321)	basic services for the economy and rural population;	No
(322)	village renewal and development;	No
(323)	conservation and upgrading of the rural heritage;	Yes
(331)	training and information for economic actors operating in the fields covered by Axis 3;	No
(341)	skills acquisition and animation with a view to preparing and implementing a local development strategy;	Yes
Axis IV - LEADER Measures[71] For Axis 4, it is envisaged that the Leader approach, which shall be adopted as a novelty, shall prove a tool with which to implement at a regional level, a more focused integrated approach that further complements desired rural improvements through multi-sectoral interaction.		
(41)	local development strategies;	No
(411)	competitiveness;	Yes
(412)	environment/land management;	Yes
(413)	quality of life/diversification;	Yes
(421)	Trans-national and inter-regional cooperation;	Yes
(431)	running the local action group, skills acquisition, animation;	Yes

Table 17 - Overview of measures in the New EU RD Regulation and how they have been applied in Malta's RDP (2007-2013)

Axis II on "Improving the environment and the countryside" was fully launched in Malta and is restricted to the adoption of Measure (212) and Measure (214) which together account for 25% of all the funds available under the RDP 2007-2013. Farmers who apply for measures under Axis II of the EAFRD are required to abide by minimum requirements on the use fertilisers and plant protection products. Beneficiaries from Measure (214) are also obliged to attend a minimum number of hours of training through this measure. Such training may also lead to improved knowledge and understanding by the farmer to better support biodiversity on his farmland. These measures were publicised with the distribution of numerous leaflets and publications. In conjunction with these initiatives, numerous posters were produced accompanied by billboards and audiovisual clips. In a national context, EAFRD's Axis II as considered in Malta's RDP '*intends to improve the environment and the countryside through encouraging the retention of agricultural activity and promotion of environmental friendly production methods in line with rural heritage*'. The current RDP acknowledges the importance of harmonising agricultural practices with biodiversity conservation in Natura 2000 sites. This need is evident when considering that over 32% of agricultural land falls within Natura 2000 sites in Malta. Notwithstanding this, there are no

[71] As regards Axis IV, the LEADER Programme under Malta's RDP 2007-2013 was characterised by the launch of several public-private partnerships. Three Local Action Groups have been chosen from established groups and accredited in order to implement their respective strategy: the *Majjistral* Action Group (Majjistral Local Development Strategy), the *Xlokk* Action Group (Galxlokk Local Development Strategy) and the Gozo Action Group (Gozo Local Development Strategy). A National Rural Development Agency (NRDA) was also formed by local councils and other entities to work together to propose a strategy and eventually implement projects under the LEADER initiative.

specific measures directly targeting nature and biodiversity more so since Measure (213) on Natura 2000 payments, was not adopted.

Agri-environment measures are designed at national, regional or local level and aim to encourage farmers to protect and enhance the environment on their farmland by following two approaches: either by reducing environmental risks associated with modern farming and/or preserving nature and cultivated landscapes. Agri-environment measures adopted under the former RDP 2004-2006 included the following:

- Preservation of Rubble Walls;
- Organic Farming;
- Conservation of Autochthonous Species: Maltese Oak & Maltese Ox Species.

Progress in implementing the 2004-2006 RDP during 2007 was reported to the Commission through the Annual Progress Report (APR) and via the submission of Malta's ex-post evaluation report, which is an evaluation process informing authorities, the general public, the EU and other stakeholders about the outcomes of the 2004-2006 RDP. With regards to the agri-environment measures, the ex-post report documents the findings as shown in Table 18.

Objective	Indicators	Targets as per RDP	Actual Realised Targets as at end 2008	%
Reducing Soil Erosion	Area of rubble walls restored	200,000m^2 of rubble wall restored	158,683*	79
Conservation of Autochthonous species	Number of Maltese Oxen conserved	Survival of 9 Maltese Oxen with projected natural increases as per breeding program	6	67
	Conservation of the areas with Holm Oak populations and their buffer zones	Conservation of at least 50% of the buffer area around Holm Oak Populations- Area around Holm Oak populations at least 13ha	3.243**	25
Promotion of organic farming	Applicants practising organic farming methods	A maximum of 30 applicants undertaking organic production signifying an increase of producers	6	20
Increasing records	Applicants keeping farm records through Whole Farm Management Plan	10% of the farming community keeping farm records (Total farmers – 17,969 FSS 2005)	952	53
*Based on spot control figures made in 2008 based on claim year 2004/05/06 **The area decreased comparing to end of 2006 due to the commitments were not continued Source: MRRA				

Table 18 – Extent of uptake of Agri-Environment Measure - Indicators and Results
(Source: Malta's ex-post report)

In the case of the sub-measure on rubble walls, uptake was considered to be overall good, although only 79% of the target had been reached by end 2008 and this was due to initial administration and control difficulties, which delayed the processing of payments for a time. The sub-measure on the conservation of the Maltese Ox met with a degree of success; this was the least complex, there being only one beneficiary involved. Although the target was not fully reached, due to reasons outside the control of the programme, the measure was still considered

to have been successful. The sub-measure on the Holm Oak met with very limited success, with only 25% of the original target having been achieved, this in spite of altering of the criteria for eligibility, which increased the degree of participation in 2006. This may be attributed to insufficient efforts towards animation, but may have also been due to the relatively small compensation being offered, when compared to costs. The sub-measure on organic farming also met with limited success, with only 20% of the original target having been achieved. According to MRRA statistics, the agri-environmental measure achieved a degree of success in enticing farmers to increase record-keeping, although this indicator was attained at only a 53% level compared to the original target. Some further improvement can however be expected with the continued outlays on the agri-environment measure in coming years (Source: Malta's ex-post report).

Agri-environment measures under the current RDP 2007-2013 include the following:

- AEM 1: Use of environmentally friendly plant protection products in vineyards
- AEM 2: Traditional cultivation of sulla through crop rotation
- AEM 3: Low input farming
- AEM 4: Suppress the use of herbicides in vineyards and fruit orchards
- AEM 5: Establishment and maintenance of conservation buffer strips
- AEM 6: Conservation of rural structures providing a natural habitat for fauna and flora
- AEM 7: Providing a healthy forage area for bees
- AEM 8: Support for Organic Farming
- AEM 9: Support for the Conservation of species in danger of genetic erosion

On a specific area a farmer can either apply for one of the above measures, or for a combination of two measures according to the following packages: AEM2 + AEM3 and AEM1 + AEM4. For every measure a minimum continuous utilisable agricultural land area (parcel area of 1 tumolo = 1124 m^2) is required; whereas, as regards vineyards and orchards, adjacent parcels can be considered as a whole to meet the 1 tumolo minimum requirement; excluding for AEM 9 since in the latter case the premium is also tied to the number of trees and not just based on land area. The farmer must be registered in the Farmer Register, which indicates the parcels under management by that farmer. The farmer is also requested to compile a Crop Plan for the land under his management. Livestock breeders must be registered with the Food and Veterinary Regulation Division.

A National Rural Network for Malta (MNRN) was officially launched during a seminar in 2009 with the aim of serving as a national networking forum, gathering rural stakeholders that are either are involved or have an interest in the actions and operations financed by the RDP, so as to discuss issues that relate to the four axes of the RDP and assist in driving forth the efficient and effective implementation of rural development policy in Malta. This national rural network (NRN) together with networks of other Member States will form the European Network for Rural Development (ENRD – Decision 2008/168/EC). The National Rural Network Action Plan was subsequently developed and mentions the following as functions of the MNRN:

- to ensure a wider participation of all actors and stakeholders in rural areas,
- to aid in the setting up and developing of the Leader programme in Malta,
- to warrant cooperation and dialogue necessary for bringing about change,
- to develop and promote common approaches and best practices,
- to synergise and maximise limited resources available in a sustainable manner,
- to maximise involvement and collaboration of all local rural actors in order to ascertain the successful implementation of the RDP 2007-2013 given its increased number of measures, the wider scope for action and broader spread of eligible beneficiaries, and
- to secure information flow.

One of the activities to be undertaken by the MNRN is the discussion of particular subjects relevant to Maltese rural development policy, especially in meeting the objectives of the four axis of the RDP and the challenges of the future CAP. Such discussions will be held under focus groups which in 2010 were expect to address: competitiveness, multi-functionality and adding value to agricultural products (under Axis 1); water management (under Axis 2) and rural tourism – how Malta could value and use agricultural resources to attract tourism (under Axis 3), while the two thematic areas identified for 2011 are climate change and renewable energy (under Axis 1 and 2) and the role of LAGs within rural areas (under Axis 4).

4.1.3 Biodiversity Considerations in the Post-2013 CAP Reform

A Health Check was undertaken in 2008 to assess the effectiveness of the CAP in the enlarged EU and, if need be, to adapt it to meet new environmental challenges (such as food security, sustainable management of natural resources, climate change and the need to reduce GHG emissions, increasing competitiveness faced with rising price volatility, and territorial balance) taking into account experiences gained in implementing the 2003 reform. In November 2011, the Commission issued the Communication on "The CAP towards 2020: Meeting the food, natural resources and territorial challenges of the future" (COM/2010/672) explaining the post-2013 reform path for a future CAP, which should contain a greener and more equitably distributed first pillar and a second pillar focussing more on competitiveness and innovation, climate change and the environment. This Communication puts forward three policy options for the CAP reform, all based on the two-pillar structure mentioned above, but with a different balance between pillars. The post-2013 reform is also intended to contribute to the EU 2020 Strategy in terms of smart, sustainable, green and inclusive growth in the agricultural sector and rural economy.

The EU Biodiversity Strategy to 2020 includes a specific target and accompanying actions for integration of biodiversity in the agricultural sector, by calling for a measurable improvement in the conservation status of species and habitats that depend on, or are affected, by agriculture. This is mainly to be achieved via the post-2013 CAP reform in the areas of direct payments rewarding the delivery of environmental public goods that go beyond cross-compliance, improving and simplifying the GAEC cross-compliance standards, including the Water Framework Directive within the scope of cross-compliance, and integrating quantified biodiversity targets into Rural Development strategies and programmes.

4.1.4 Organic Farming

Organic farming, in contrast to intensive farming (exemplified by the over-reliance and use of synthetic fertilizers and plant protection products for significantly increasing agricultural productivity and crop yields) is considered a sustainable agricultural practice. The benefits derived from practicing organic farming as opposed to high-input intensive farming are widely documented. Table 19 provides a summary of the positive impacts of organic farming on the environment.

Type of Impact	Impact expected by Organic Farming
Nature and Biodiversity	▪ Increase in biodiversity ▪ Enhancement of autochthonous species and varieties ▪ Ecosystem preservation and recovery
Water Resources	▪ Decrease in groundwater and surface pollutants ▪ Decrease in nitrates percolation in groundwater ▪ Increase in surface water quality ▪ Decrease in the loss of nutrients per unit surface

	▪ Elimination of risk of groundwater and surface water pesticide contamination
Air and Climate	▪ Reduction in the emission levels for almost all the relevant greenhouse gases (CO_2, NO_2 and CH_4) in addition to pesticides
Marine Environment	▪ Decrease in the levels of pollutants in surface water
Soil	▪ Defence of soil tillage ▪ Increase in soil fertility ▪ Greater biological activity ▪ Greater biodiversity at the microbial level ▪ Decreased soil erosion ▪ Reduced pollutants in the soil ▪ Decrease in nitrates percolation into groundwater ▪ Elimination of the risk of contamination with pesticides
Waste Management	▪ Retrieval and enhancement of organic waste ▪ Reduction of wastes to be disposed of
Urban Environment	▪ The increase in employment and the agricultural income reduces rural areas depopulation

Table 19 - Synopsis of environmental impacts of organic farming
Source: Adopted from Petruzzella and Verrastro (2002). *Strategy for promotion of organic farming in the Maltese islands* (MT-02-08.02)

The Organic Farming Unit was set up in 2003 within the Department of Agriculture (MRRA) and is entrusted *inter alia* with promoting and increasing awareness of organic farming in the Maltese Islands. Malta's Control Authority on organic farming is the Malta Competition and Consumer Affairs Authority (MCCAA). After accession to the EU, Malta embarked on the process of developing national legislation on organic farming, aligned with the EC requirements. In 2004, the "Organic Farming Regulations, 2004" (LN 237 of 2004, as amended by LN 180 of 2005 and LN 232 of 2007) were published in order to transpose Council Regulation (EC) No 834/2007 on organic production and labelling of organic products (which repealed Council Regulation (EEC) 2092/91). This enabled the establishment of the procedural measures to control the organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs. This hence resulted in the necessary setup enabling the certification of local organic products. In 2004, the EU Commission also published the European Action Plan for Organic Food and Farming (COM/2004/415).

Certification regarding payments/ subsidies under the RDP 2007-2013 for the agri-environment measure on organic farming (section 4.1.2 above) is issued by MCCAA following criteria which include: the size of the parcel, type of crop, and the conversion status (stating whether area is certified as being under conversion or already certified organic). An appraisal of organic agriculture in Malta is reported by Calleja (2004). Till the end of 2008 there were 14 approved and certified producers of organic products in Malta. In total, these producers farmed 21.78 ha of agricultural land (0.21% of UAA), compared to the 17.3 ha under organic farming by 12 producers in the previous year (State of the Environment Indicators 2007 and SOEI 2008).

4.2 Aquaculture

Aquaculture currently faces a significant challenge: how to fulfil the expectation of alleviating the pressure that fishing fleets exercise on fish populations and the increasing demand of sea products in local and international markets without leading to environmental problems.

Extract from Forward
Guide for the Sustainable Development of Mediterranean Aquaculture -
Interaction between Aquaculture and the Environment
IUCN, 2007

Aquaculture, the farming of aquatic organisms, is recognised as being one of the fastest growing food production systems in the world. The driving forces in aquaculture development are reflected in Europe's Environment: The Third Assessment (EEA, 2003), which essentially boil down to population growth, a strong market demand for fish as a healthy and luxury food, declining wild catches of high-value fish species, and more-effective trade, transport and communications. Aquaculture bestows nutritional, social and economic benefits for coastal communities in that it provides a high-protein rich food source and an added income.

Marine-based aquaculture (mariculture) is closely linked to the marine ecosystem especially when dealing with the practice of marine cage fish farming. The productivity of fish farming relies on several factors, including an unpolluted and healthy marine environment and good water quality in which to culture healthy fish. Aquaculture is also dependent on wild-caught fish for the production of fishmeal (such as wild mackerel), which is then used to feed the farmed species. In the case of tuna penning, tuna are wild-caught for eventual fattening in pens. In this respect, the need for sustainably sourced fish and fish feed, and sustainable fisheries, is undeniably important. Unsustainable practices of aquaculture however can impinge on the environment (Figure 24, overleaf)[72]. All the potential environmental effects of marine-based aquaculture are dependent on the sensitivity of a particular ecosystem, or its type. However, it must be borne in mind that different aquaculture practices generate different pressures on the environment and that the severity of impacts is however more pronounced in certain types, such as in intensive cage culture operations, and also depending on the sensitivity of the affected ecosystem. Examples of sensitive ecosystems include seagrass beds and specific benthic communities. Specific impacts will also depend on different carrying capacity requirements for various culture practices in any given ecosystem, which however are poorly known. It must be underlined that such environmental impacts would in turn affect the production potential of fish farming activities.

Since its inception in 1991 on a commercial scale, the aquaculture industry in Malta has experienced several developments. The aquaculture industry started off with the initial establishment of marine-based fish farming of European seabass (*Dicentrarchus labrax)* and Gilthead seabream (*Sparus aurata*) and then progressed to the introduction of tuna penning of wild-caught Atlantic bluefin tuna (*Thunnus thynnus*), where the first development permit was issued in 2001. The legal mandate for the regulation of the aquaculture industry in Malta is laid down *inter alia* by the EDPA (and EPA & DPA, where still relevant) and Chapter 425: Fisheries Conservation and Management Act (FCMA) of 2001 and subsidiary legislation thereto. In Malta, development in aquaculture, both on land and at sea, necessitates a development permit, while an environment impact assessment (EIA) is required before an aquaculture development is initiated. If such development is proposed to occur within or in the vicinity of a marine SAC, an

[72] Apart from the impacts depicted in this figure, other related impacts include alteration of trophic systems and depletion of natural seed stock.

appropriate assessment (AA) is additionally required in line with Article 6 of the EC Habitats Directive. Fish farms are required to fulfil and adhere to environmental monitoring programmes as required by the development permit conditions. Such terms and conditions also apply for the management of the fish farm in question. Provisions calling for the restoration of a site, in order to address the eventuality of the cessation of the fish farm, are also secured before development takes place. The role of granting development permission of aquaculture facilities is assigned to MEPA under its respective directorates.

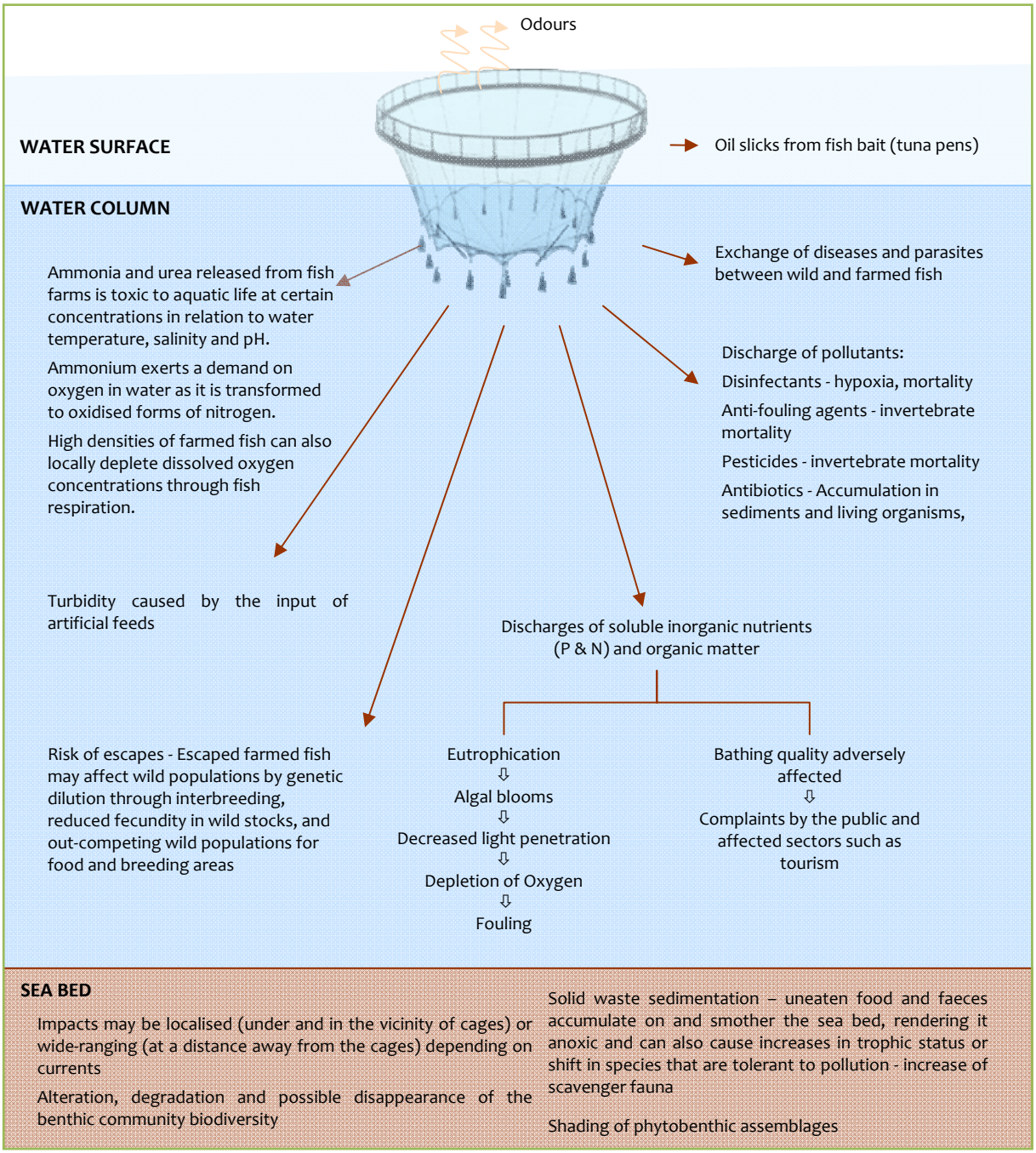

Figure 24 – Possible Impacts of Marine Cage Aquaculture

(Source: Information extracted from - EEA Fact Sheet trends in Aquaculture 2002 and CBD Secretariat 2004 – Technical Series No 12 - Solutions for sustainable mariculture - Avoiding the adverse effects of mariculture on biological diversity)

Careful cage siting in the marine environment can help to minimise environmental impacts by aquaculture. The site selection process in Malta compares very well with other Mediterranean regulatory frameworks. In Malta, the assessment of environmental impacts caused by fish farms has been initiated in 1994 through the adoption of the "Policy and Design Guidance for Aquaculture", originally developed to ensure the maintenance of healthy environmental conditions in and surrounding fish cages, and subsequently amended in 2001. One of amendments made, obliges that '*no new aquaculture development would be considered in areas less than 1 nautical mile from the shore, or in sites having a water depth of less than 50m (give or take 5m) whichever is the lesser*'. Since then, existing inshore aquaculture units have been encouraged to relocate at a greater distance from the shore and in deeper waters, to mitigate any environmental impacts. This was successfully done with two inshore farms in 2001. The establishment of an offshore aquaculture zone in the period 2004 to 2006 was made operationally following the issuance of a development permit.

Malta is also duty bound to follow EU policy on aquaculture under the Common Fisheries Policy and other related policy. Malta's Fisheries Operational Programme (2007-2013) prepared in accordance with Council Regulation (EC) No. 1198/2006 on the European Fisheries Fund (EFF), sets as one of its objectives under Priority Axis 2, the reduction of the negative impact of aquaculture on the environment. This axis also aims to contribute to the development and sustainability of the aquaculture, processing and marketing sectors. Support under this axis is available for aqua-environmental measures. The actions that are eligible under this measure are the implementation of aqua-environmental methods aimed at protecting and enhancing the environment and producing more eco-friendly aquaculture products. In 2002, the European Commission presented a Communication on a Strategy for the sustainable development of European aquaculture (COM/2002/511). This strategy details a ten year vision for aquaculture, aiming to:

- create long term secure employment, in particular in fishing-dependent areas;
- ensure the availability to consumers of products that are healthy, safe and of good quality;
- promoting high animal health and welfare standards; and
- ensuring an environmentally sound industry.

More recently, in 2009, the Commission in response to the stagnation of EU aquaculture production in contrast to high growth rates exhibited in other parts of the world, published the Communication on "Building a sustainable future for aquaculture - A new impetus for the Strategy for the Sustainable Development of European Aquaculture" (COM/2009/162). This aims '*to identify and address the causes of this stagnation, with a view to ensuring that the EU remains a key player in this strategic sector*'. This Communication also covers conditions for sustainable growth of environmentally-friendly aquaculture and in this context also links the aquaculture industry to Member State obligations under the Water Framework Directive and the Marine Strategy Framework Directive (addressed later in this chapter). Sustainable management of the aquaculture sector is also at the heart of a number of codes of practice and recommendations, including the FAO Code of Conduct for Responsible Fisheries (Article 9 on Aquaculture Development), the Code of Conduct for European Aquaculture adopted by the Federation of European Aquaculture Producers, and the Guide for the Sustainable Development of Mediterranean Aquaculture (IUCN, 2007), just to mention a few.

The Malta Aquaculture Research Centre (MARC) is involved in scientific research on hatching marine species for mariculture and aquaculture species diversification. Research is being carried out on *Seriola dumerilii* [Amberjack Project]. The MARC is also one of the marine research institutes participating in the EU-financed SELFDOTT Project (Self-sustained Domestication of

Bluefin tuna) which started in 2008 and deals with the reproduction, larval rearing and nutrition of the bluefin tuna.

Conflicts however can arise not only with environment sector but also between mariculture and other sea-based activities (Figure 25). Such conflicts would need to be addressed via strategic policy, as well as coordination and cooperation between various regulatory bodies. One of the measures that Member States will be required to undertake under the CFP Reform is the drafting of national strategic plans to remove administrative barriers and uphold environmental, social and economic standards for the farmed-fish industry. Presently, the aquaculture strategy for Malta is being implemented under the EFF Operational Programme.

In 2009, the Commission issued the strategy entitled "Towards an Integrated Maritime Policy for better governance in the Mediterranean" (COM/2009/466) with the purpose of improving maritime governance in the Mediterranean basin by way of addressing the different maritime challenges this region faces (e.g. security, fisheries, aquaculture, environmental protection, and climate change).

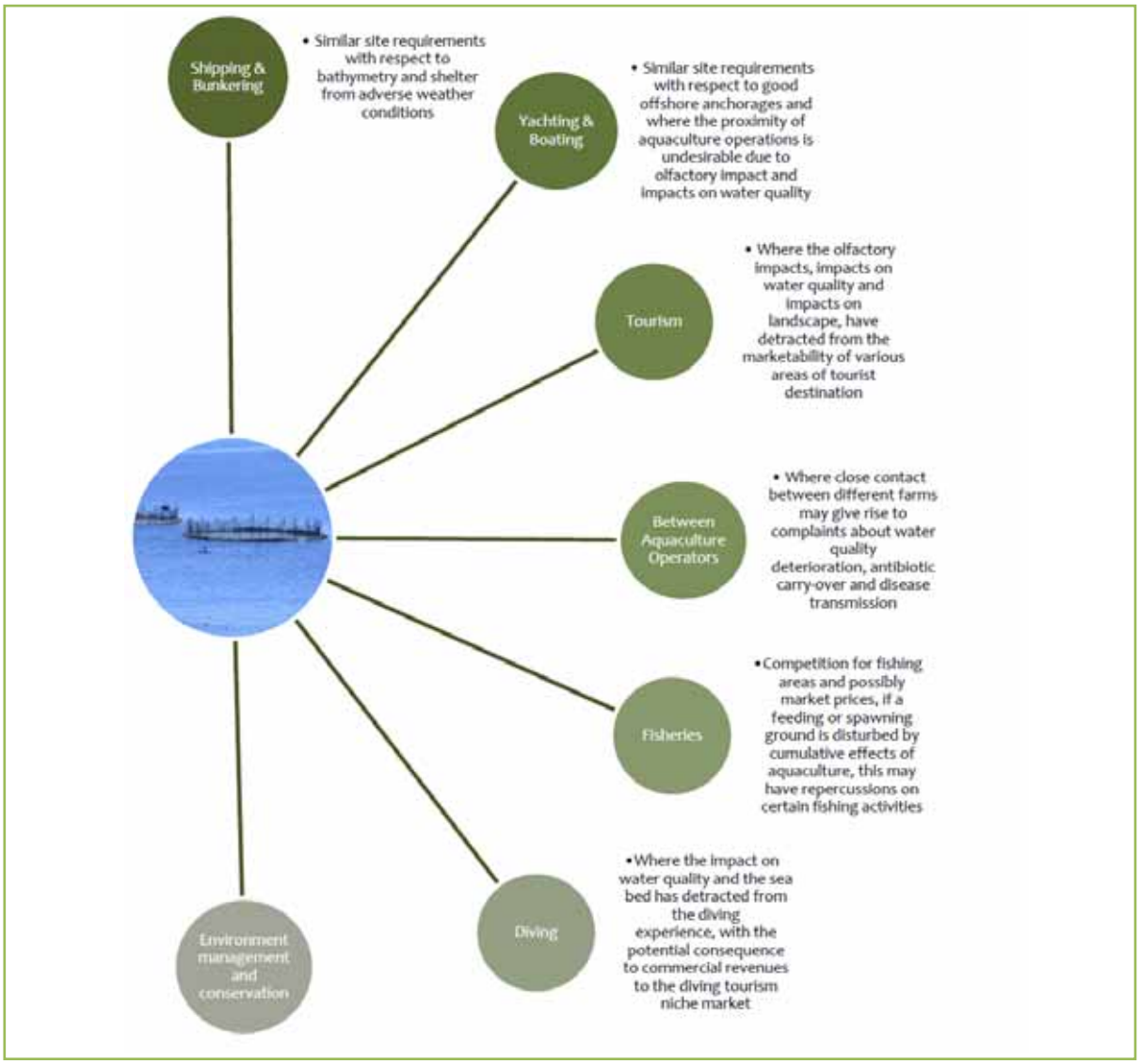

Figure 25 – Interaction between Aquaculture and other sea-based activities

4.3 Land Development

Land is not only considered as Malta's primary non-renewable natural resource, but is also viewed as one of the key resources for Malta's economy (SOER 2005 and 2008). Competing demands for land use arise from various sectors including increased use of private transport, increase in tourism infrastructure, demand for new housing, space requirements for industry, extensive quarrying and land intensive waste disposal. Yet, there is an over-supply in the residential, commercial and industrial sectors, with permanently vacant dwellings increased by 89 % (20,352) between 1995 and 2005, as documented by the 2008 SOER which also highlights that there is a significant potential for improving the overall efficiency of land use in the Maltese Islands. Human influence is the principal factor driving land use change in the Maltese islands. The main strategic factors affecting land use change in the countryside are urbanisation, quarrying, agriculture and recreation. Urbanisation is one of the most significant pressures on the Maltese countryside (2005 State of the Environment Report - Land). Land development contributes to the loss, fragmentation and degradation of habitats, with drastic effects especially on those species with high habitat specificity or with limited dispersal abilities. The disruption and fragmentation of intact ecosystems through land development can also undermine the maintenance of ecosystem services (*e.g.* flood control, beach stability).

Since March 2002, environment protection (under the remit of the Environment Protection Department) and land use planning (under the Planning Authority) have merged under the responsibility of one institution, the Malta Environment and Planning Authority (MEPA). The legal mandate was initially provided by the Environment Protection Act (EPA - Act XX of 2001 as amended by Act II of 2006) and the Development Planning Act (DPA - Act I of 1992 as amended), respectively and has now been recently strengthened via the publication of the "Environment and Development Planning Act, 2010" (EDPA - Act X of 2010) as one of the activities under the ongoing MEPA reform. This Act makes provision for the planning and management of development in the Maltese Islands.

The development framework for the Maltese Islands is currently laid out in the Structure Plan for the Maltese Islands adopted through the DPA, which shall be replaced by a "Strategic Plan for the Environment and Development" (SPED) via a review process. The scope and objectives of the SPED are defined in Article 51 of the EDPA. It shall regulate the sustainable management of land and sea resources together with the protection of the environment and shall be based on an integrated planning system. At present, seven Local Plans apply the Structure Plan policies at the local level: Marsaxlokk Bay Local Plan (MBLP); Grand Harbour Local Plan (GHLP); North Harbour Local Plan (NHLP); North West Local Plan (NWLP); Gozo & Comino Local Plan (GCLP); Central Malta Local Plan (CMLP) and South Malta Local Plan (SMLP). The review process of the Structure Plan comprises three phases:

- Phase 1 involved the preparation of topic papers on all land-use sectors that shall be addressed through the revised plan and the preparation of subject plans. Topic papers address the following key issues: demography; housing; social facilities and community care; employment (including an industry subject study, garages and warehousing); retail; tourism; leisure and recreation; minerals; waste; public utility services; urban conservation (including archaeology); rural strategy (including agriculture); coastal strategy (including aquaculture and fisheries); visual landscape and transport. The development of each topic paper has involved various stages of consultation with key players before a final draft was published for public consultation. These topic papers are available online. To assist the consultation process, a radio programme series was prepared in-house and aired live on a local radio station.

- Phase 2 includes the Strategic Growth Scenarios Paper and the Issues Paper. Whilst the former examines the implications of catering for alternative levels of housing and employment growth for the Structure Plan Review, the Issues paper collates and identifies the key issues raised in the topic papers.
- Phase 3 is the strategy and policy formulation stage and is complemented by the strategic environment assessment process. To this extent a scoping report has been prepared. This outlines the proposed SEA methodology and will initiate the environmental assessment process, which will be ongoing. The assessment will cover both the strategy formulation and policy formulation stages of the New Structure Plan process.

As the main strategic land use policy in Malta, it is imperative that the SPED integrates biodiversity concerns in line with the EU Biodiversity Strategy for 2020 which calls on the integration of species and habitats protection and management into such policies both within and beyond Natura 2000 sites. This is especially important also in view the new EU requirement of no net loss of biodiversity and ecosystem services. This will be particularly challenging for Malta.

Supplementary policy guidance to the DPA (and now the EDPA) is also developed and all guidance documents are available online. Approved guidance for instance includes the "Guidelines on trees, shrubs and plants for planting and landscaping in the Maltese Islands" which was issued in 2002. This policy guidance document promotes the planting of appropriate native trees, shrubs and plants to improve the rural and urban environment. The strategic objective for land use in Malta as set out in the National Strategy for Sustainable Development is '[to] *protect, maintain and improve the urban and rural environment and through the planning system protect the open countryside from uses, particularly residences, which can be more appropriately located in urban areas.*' This strategy recognises land development as a human-mediated activity whose consequences lead to undesirable ecosystem changes.

4.3.1 Development Control and Scheduling

Regulation of development in the countryside is achieved by prohibiting urban development outside the development zone (ODZ). Development in areas within ODZ is limited in accordance with Structure Plan policy and related guidelines. Development Control has been enhanced under the EDPA via a series of main changes to the development control process (Part V of the EDPA) whereby proposals for development are vetted with respect to their environmental impact. These changes are intended to ensure greater efficiency and improved consistency in the analysis and decision-making of development permission applications. In line with the main objectives of the MEPA reform process, the Planning Process, together with the proposed time frames, will start distinguishing between applications that are Simple (Inside Scheme – 12 weeks; Outside Scheme – 26 weeks), Complex (Inside Scheme – 26 weeks; Outside Scheme – 52 weeks) and Major Projects. It is also proposed that the planning application process is subdivided into 3 main functions: a Pre-Screening Process (before a development permission application is formally submitted to the Authority for consideration); a Validation Process, and a Planning Application Process and Decision. The Environment and Planning Commission (EPC) will be replacing the Development Control Commissions (DCCs). The role of the EPC is specified in Article 31 of the EDPA. The EPC is to be of different divisions which will each deal with analysing and processing different types of development applications and will issue development permissions or licenses.

The EDPA (previously the DPA) contains the powers necessary for the scheduling (statutory protection) and conservation of areas, buildings, structures and remains of geological, paleontological, cultural, archaeological, architectural, historical, antiquarian, or artistic or

landscape importance as well as areas of natural beauty, ecological or scientific value (Article 81 of the EDPA). Areas are scheduled as follows:

- Areas of Agricultural Value: areas comprised of high grade agricultural land including irrigated and partially irrigated land - None of these have been legally designated nonetheless such sites have been referred to in Local Plans.
- Areas of Ecological Importance: relatively large areas designated to protect typical and rare habitats. 187 AEIs have been scheduled to date – when those sites which are designated both as AEIs and SSIs are also considered, the number increases to 214.
- Sites of Scientific Importance: sites containing individual species and populations, species assemblages, and geological features. 87 SSIs have been scheduled to date – when those sites which are designated both as SSIs and AEIs are also considered, the number increases to 114
- Areas of Archaeological Importance: concentrations of valuable archaeological sites – 13 designated to date.
- Sites of Archaeological Importance: individual and/or isolated archaeological sites.
- National Parks: relatively large areas of national significance not materially altered by human use, with managed visitor access and amenities. The GCLP (2006) identified the Qawra/Dwejra area (Gozo) as a Heritage Park area. The Qawra/Dwejra Heritage Park Action Plan (2005) provides detail on the protection and planning parameters of this National Maritime Park area.
- Areas of High Landscape Value – cover a total of 61.69 square kilometres (combined cultural and natural heritage AHLVs) (Please note that the majority of these sites overlap since AHLV boundaries are normally delineated on areas covered by other scheduling.)

Areas of Ecological Importance (AEI) and Sites of Scientific Importance (SSI) cover a total of 61.27 square kilometres. However, several areas contain multiple levels of protection (for instance a site may be scheduled as a Level 1 AEI as well as a Level 2 SSI). Therefore, if the total area occupied by such overlap is eliminated the resultant scheduled natural heritage occupies a total land area of 48.89km^2 (the spatial extent of scheduled natural heritage). A further combined land area of 14.65km^2 is in the process of being considered for scheduling.

A database for scheduled property is available online. Scheduling ensures protection at a national level thus covering also those habitats and/or species that might not be covered by the EU Habitats Directive. In scheduled areas, development control is stricter and more specific. Development is guided by a number of Structure Plan policies including those aimed at the conservation of natural habitats, natural features and the landscape.

4.3.2 Planning Enforcement and Direct Action

"Planning enforcement" encompasses actions taken by the MEPA where there is illegal development. This could be either any development without a planning permission or breaches of conditions imposed in development permits. Monitoring is held on most sites by the Enforcement Directorate within MEPA as per requirements of Article 84 of the EDPA, with each inspection recorded on a database outlining the stage of development reached on site at that particular time. The planning enforcement officer (PEO) inspects the development sites to see whether development has been carried out in accordance with the approved plans and the conditions imposed by the development permit. New development cannot be provided with water and electricity services unless a compliance certification is issued by MEPA.

Direct Action operations are also carried out on a regular basis throughout the year in various localities around Malta, Gozo and Comino. A "Stop and Enforcement Notice" issued against the owner of the land or occupier under Article 86 of the EDPA allows a 15 to 30 day period from

receipt of the Enforcement Notice to the contravener to regularise his/her position by either submitting a "sanctioning application" or by removing the illegal works himself/herself. Once the 16-30 day period of the Enforcement Notice expires and no action has been taken by the contravener to either regularise his/her position or appeal lodged against the notice, the case would be listed for direct action. The Authority when deemed appropriate at its discretion and assisted by the police force may take the necessary action by entering the land to reinstate the site back to the condition it was in before the illegal development was carried out. Direct action may also involve the use of official MEPA seals to close off premises to cease works and/or prevent further unauthorised land use. Expenses incurred during direct action are considered as civil debt and therefore billed to the owner of the land. As from 2011, certain typologies of illegal development in sensitive areas will no longer be allowed for sanction, meaning that these would need to be demolished once served by an enforcement notice. MEPA will no longer be required to await the outcome of appeals against these enforcement notices prior to taking remedial action. Fines for sanctioning have also increased, while a permit fee procedure has been established by the "Development Planning (Fees) Regulations, 2010" (LN 356 of 2010) which requires payment of development permit fees (DPF) and environment fees in respect of applications for permission to carry out development at the rates set out in Schedule 1 to the said regulations.

MEPA, in collaboration with interested Government agencies, has also embarked on an exercise to clear eyesores and illegal structures from the countryside. Such action has included the direct removal of scrapped vehicles from various rural locations, including the clean-up of scrap (rusty oil drums etc) which had for years injured the appearance of the rural landscape and damaged protected traditional rubble walls. Enforcement action by MEPA and the PARKS department has yielded the removal of 6,812 objects from the countryside over a span of 13 months. 5,867 of these objects were oil drums from fields situated in ODZ sites across 26 localities. MEPA identifies the sites and asks the owner to remove the oil drums. Usually owners cooperate, but if this does not happen, then enforcement action is taken.

The Enforcement Directorate is also highly involved in the investigation of complaints concerning planning enforcement issues regularly received from the general public, media and NGOs. All received complaints with subsequent results, replies and action taken by the enforcement officers are regularly maintained in a Database by the Enforcement Complaints Office. The quantity of yearly complaints exceeds the 2000 mark.

4.3.3 Environment Assessments

One way of foreseeing and hence preventing/mitigating adverse affects of land development on biodiversity is by undertaking environmental assessments. Environment Assessment comprises the carrying out of environment impact assessments (EIA) for development projects that may have significant impacts on natural and human populations, and, the undertaking of strategic environment assessments (SEA) for plans or programmes that may result in significant effects on the environment. MEPA is the competent authority responsible for the environmental assessment of projects, whilst the SEA Audit Team within the Office of the Prime Minister (OPM) is the competent authority responsible for Strategic Environmental Assessment on plans and programmes. Malta's EIA and SEA procedures reflect the requirements of the relevant EU directives as well as national legislation particularly the "Environmental Impact Assessment Regulations, 2007" (LN 114 of 2007) and "Strategic Environmental Assessment Regulations, 2005" (LN 418 of 2005 as amended by LN 327 of 2008; currently under review for repeal and replacement as communicated by GN 748 of 2010).

As reported by the 2008 SOER, '[b]*etween 2004 and 2008, 64 planning applications required an EIA*'. With regards to SEAs, '*Between 2005 and August 2009, 27 plans or programmes were screened, five scoping reports submitted for review, and two environmental reports submitted, both concerning EU funding programmes*'(2008 SOER).

Biodiversity concerns are integrated in the development and review of EIA and SEA reports. Although there is no specific national guidance on environmental assessments and biodiversity, a comprehensive set of guidance for the implementation of the EIA procedure and another on SEA, are under preparation. It is envisaged that such guidance will complement the existing legislation and ensure greater consistency in the application of the related EU Directives and good practice. EIA procedures and related legislation are also constantly under review in order to improve such good practice.

MEPA, in line with the EU Directive 85/337 (as amended) on the assessment of the effects of certain public and private projects on the environment, undertakes screening for projects requiring an EIA. MEPA holds scoping meetings with applicants, consultants and stakeholders, including NGOs and Local Councils, prior to the finalisation of terms of reference for EIAs. Public hearings related to EIAs are also held, during which stakeholders and the public are given the opportunity to voice their views on the findings of a respective EIA. All decisions are taken during a public meeting, where the findings of the Environmental Statement and all feedback from consultation processes are presented to the decision-making body. MEPA's Environmental Assessment Unit also provides its technical assistance to the SEA Audit Team by screening proposals for the preparation of plans and programmes, and reviewing scoping reports and environment reports.

The development of the EIA and SEA processes adopted in Malta has been assisted by capacity building which has involved training courses and workshops. For instance, a three-day training course on EIA techniques was organised by MEPA in conjunction with the Institute of Environmental Management and Assessment (IEMA) of the UK. The course was attended by graduates and professionals working in the field of EIAs. A two-day course for EIA consultants in government departments and agencies also followed.

Appropriate assessment (AA) is also another type of Environmental Assessment which is carried out when dealing with development proposals in the context of Special Areas of Conservation (SAC) and Special Protection Areas (SPA) as per requirements of Article 6 of the EC Habitats Directive are also. The rationale of the AA process is ultimately similar to that behind the better-known EIA, albeit the scope is strictly related to the EC Habitats Directive and the EC Birds Directive. The AA process is regulated by LN 311 of 2006 (as amended). As per Regulation 19, an AA is required when an operation or activity which is or forms part of a plan or project:

- is not directly connected with or necessary to the management of a protected site (SAC and/or SPA), and
- is likely to have a significant effect thereon, either individually or in combination with other plans or projects.

The AA is required to assess the implications of such operation or activity on the site in view of the site's conservation objectives. The AA is neither a substitute for the EIA, nor *vice versa*. If the development qualifies for both AA and EIA, then both need to be carried out and submitted as

free-standing documents (whilst striving to avoid any unproductive duplication of studies). Similarities between the EIA procedure and the AA procedure include:

- Screening - Both EIA and AA involve screening of proposals to verify whether an assessment report is required or otherwise. The screening processes are however somewhat different.
- Scoping - Both EIA and AA involve a scoping stage where Terms of Reference for the assessment report are drawn up.
- Assessment reports - Both EIA and AA procedures involve the drafting of an assessment report that describes the project and assesses the likely impacts as a result of a proposed development. The AA is more focused than the EIA in that it deals only with impacts of proposals on Natura 2000 sites. Moreover, while the EIA report assesses and predicts the significance of a likely impact on the environment without concluding whether a development proposal should be approved or otherwise, the AA report is to provide a clear conclusion on whether a proposal will have an impact on Natura 2000 site or otherwise. Both assessments however are aimed for decision-makers to take an informed decision.

The EIA and AA procedures are major components of the wider development permitting/control (DC) process in Malta. The mainstream DC process is in itself an important vehicle for environmental assessment, broader in scope and also addressing other environmentally-relevant developments which may still have significant impacts both individually and cumulatively.

Essentially, the assessments carried out by the Environment Protection Directorate within MEPA are an integral part of the development control process and are important for determining whether a development should be considered in principle and/or on the basis of more detailed merits, as relevant. If in the affirmative, the terms under which development may proceed are defined (*e.g.* amendment/adaptation/downscaling of the project for improved compatibility with its environmental context; inclusion of pre-emptive safeguards and mitigation/compensation measures in permit conditions; inclusion of bank guarantees and other deterrent measures to secure effective compliance with environmentally-relevant specifications; etc.). This EPD assessment as packaged through the DC process also provides a holistic framework for comprehensive screening for more detailed requirements as may be relevant, including EIA, AA, operational/nature permitting, exploration of alternatives, and environmental monitoring.

4.4 Energy and Transport

4.4.1 Reducing Air Emissions

Air is a valuable and basic life-supporting natural resource. Air quality is one of the major environmental issues being discussed worldwide in view of the fact that numerous environmental and health problems are linked with poor air quality as a result of air pollution. Whence in the past, the cause of air pollution was namely attributed to industrial activities involving the burning of fossil fuels, over the last few years attention has also been drawn to the severity of vehicular emissions as a result of the alarming rise in the use of road vehicles. This is also observed in Malta where road transport is a significant contributor of air emissions. Malta has indeed experienced a dramatic increase in the level of motorisation in the last years. The Transport Statistics Unit within the National Statistics Office (Press Release No 19/2008) reports that '*The stock of motor vehicles rose by 1,767 in the fourth quarter of 2007, to stand at 287,120*'. The 2008 SOER acknowledges that the increased growth in vehicle numbers, which increased by 8.7% between 2004 and 2008, is a matter of concern due to the environmental and social impacts of private motor vehicle use. Petrol and diesel engines emit an extensive range of pollutants, namely carbon monoxide (CO),

oxides of nitrogen (NO_x), volatile organic compounds (VOC) and particulates, which degrade urban air quality. The importation and use of a large number of second hand vehicles is exacerbating this concern.

Air pollution is mainly associated with certain anthropogenic activities that act in either or both of the following ways: by increasing the concentration of naturally occurring gases (such as carbon dioxide) to levels above the norm, or by directly producing gaseous or particulate matter, which are not normally found in the air. The latter category is what poses major impacts on air quality. The monitoring of air pollution in ambient (outdoor) air (excluding indoor air) and the coordination of abatement measures in Malta falls under the responsibility of MEPA. Air monitoring activities in Malta fall under two categories:

- *Passive Monitoring*: A monitoring network was launched in 2000 as a National Air Monitoring Programme. Passive diffusion tubes installed in a number of streets around 44 localities in Malta and Gozo are used. Such sites can be considered to be representative of "roadside", "urban intermediate" and "urban background" sites. Air pollutants monitored by this method are: SO_2, NO_2, O_3, and hydrocarbons (benzene, toluene, ethylbenzene and xylenes).
- *Real Time Monitoring*: Currently carried out by using four air monitoring stations at fixed sites to complete the real time measurement network, representing different air pollution regimes, *e.g.* background, suburban, traffic *etc.* Real time data is available online.

The Background Report on Air Quality, compiled as part of the development of the 2005 State of the Environment of Malta, illustrates the sources, situation and trends of the following major pollutants, which were identified to be of concern to the health of the Maltese population - Sulphur Dioxide, Nitrogen Oxides, Benzene, Ozone and Suspended Particulate Matter. This Report, presents and analyses the recorded results of air monitoring from passive diffusion tubes (from January 2003 until December 2004 from 124 locations in 31 towns and villages across Malta and Gozo) and real time measurements recorded by the three fixed air monitoring stations. Diurnal and seasonal variation patterns for certain gaseous and particulate pollutants are also described. This report shows that '*… positive results can be achieved with the introduction of abatement measures, albeit with increased costs*'.

The 2007 and 2008 SOEIs on air emissions for Malta document the improvement in reducing the concentration of certain air pollutants (*e.g.* sulphur dioxide), whilst a worsening trend is observed for a number of others (*e.g.* particulate matter, nitrogen dioxide and ozone). National annual sulphur dioxide concentrations fell by 38.0% between 2004 and 2007.The annual average concentration of O_3 increased by 19% between 2005 and 2006 as it rose from 85.9µg/m^3 to 102.2µg/m^3 respectively, while it decreased by 1.0% to 101.3µg/m3 between 2006 and 2007.The main sources of O_3 precursors are transport, followed by energy and industry, however the majority of O_3 affecting Malta is of transfrontier origin. Average national NO_2 concentrations remained below the 40µg/m^3 EU annual limit value for human health protection in 2006, although concentrations increased by 12.0% from 22.8µg/m^3 in 2005, while between 2004 and 2005 the increase was 13.0%. National annual average NO_2 concentrations were below the EU annual limit value in 2007, but exceeded the limit value in 27 localities.

Obligations[73] on assessing and reporting on the air emissions in Malta with respect to certain air pollutants stem from:

- the provisions of the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP)[74] which Malta ratified on 14 March 1997,
- the provisions of the Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer, and,
- EU policy on air emissions namely through the Air Quality Framework Directive (Directive 2008/50/EC and its four daughter directives), as well as the National Emission Ceilings Directives (NEC Directive 2001/81/EC as amended).

The EU Biodiversity Action Plan to 2010 and beyond addressed air pollution under Policy Area: "Biodiversity and the EU Objective", which called on Member States to implement the NECD and the Thematic Strategy on Air Pollution in order to conserve and restore biodiversity and ecosystem services in the EU.

National legislation on ambient air quality transposes the legislation of the European Commission, and thus aims to develop a long-term, strategic and integrated policy to protect against significant negative effects of air pollution on human health and the environment. The EU legislative framework on air quality is mainly based on the Directive 2008/50/EC on ambient air quality and cleaner air for Europe (repeals 96/62/EC) and its four daughter directives. Malta is required to undertake a preliminary investigation of ambient air quality prior to the implementation of the Daughter Directives, which set limit values regulating specified ambient air pollutants within Europe. The Maltese agglomeration is composed of Valletta, Sliema districts and some surrounding environs. These sites were chosen on the grounds of being the most significant continuous urban area in Malta with an assumed population of greater than 250,000 inhabitants. All other territories and urban areas outside of this agglomeration form part of the Maltese zone. This preliminary investigation of air quality within Malta was conducted for the pollutants regulated by the 1st, 2nd and 3rd Daughter Directives on ambient air quality in 2002 by Stacey and Bush (2002) in order to establish estimates for the overall distribution and levels of pollutants, and to identify monitoring necessary to fulfil the required obligations. Based upon the observations made for the Maltese agglomeration, Stacey and Bush (2002) concluded that certain pollutants at the time were above, or, in cases where measurements were not available, they were likely to be above thresholds; and thus required fixed measurements to be made for compliance with the Daughter and Framework Directives. Based on emission inventory calculations for 1997, the most significant sources contributing to emissions of NO_x, SO_2 and PM_{10} were combustion in the energy and transport sector. With respect to complying with the requirements of the 4th daughter directive, an interim report was published by MEPA in 2007 presenting the findings of a preliminary assessment of arsenic, cadmium, nickel and mercury in the air.

[73] Apart from the above commitments, there are also those concerning the green house gases under the UNFCCC and is Kyoto Protocol. These are addressed Section 4.4.2 in the NBSAP.

[74] Convention website: http://www.unece.org/env/lrtap/welcome.html; Handbook of Convention and its protocols available from: http://www.unece.org/env/eb/Handbbok.E.pdf

Environmental problems linked to air emissions include *inter alia* acidification and eutrophication as a result of emissions of SO_2, NO_X and NH_3, anthropogenic climate change, ground-level ozone and, the associated damage to ecosystems and wildlife. The air pollutants, sulphur dioxide and nitrogen oxides, upon reacting further to produce sulphuric acid and nitric acid, contribute to acidification (occurring either as wet or dry deposition). Acidification causes direct damage to aerial plant structures and also degradation of aquatic ecosystems by reducing the water pH. Soil acidification can result in the leaching out of certain nutrients whereas others may become more tightly bound to the soil resulting in their increased concentration, causing root damage and reduced decomposition in the soil. An exposure of plants to high concentrations of SO_2 can lead to the breakdown of chlorophyll and eventually to the death of plant tissue. Deposition of nitrogen as excess nitrate and ammonium causes eutrophication leading to oxygen depletion and dwindling numbers of aquatic populations. It is important to bear in mind that certain species (such as lichens, bryophytes, fungi, and soft-bodied aquatic invertebrates) and ecosystems (especially those that have a low buffering capacity) are particularly sensitive to the adverse effects of air pollutants (see for instance Dudley & Stolton,1996). Measures aimed at reducing such emissions can hence also benefit biodiversity. Malta' national programme prepared as per requirements of the Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants (NEC Directive) provides information on policies, adopted and envisaged, and quantified estimates of the effect of these policies and measures on the emissions of those pollutants in 2010.

A number of activities are currently being implemented or are planned by the Land Transport Directorate (previously the Malta Transport Authority - ADT) within Transport Malta[75] to address vehicular emissions. Amongst ongoing activities the following are mentioned:

- The Vehicle Roadworthiness Test (VRT) which was gradually introduced in Malta since October 1999 is now fully obligatory (as from the 1st January 2005).
- The ongoing SMS Based Emission Alert Campaign which was initially launched in August of 2005 is contributing to raising public awareness, including amongst all road users, on the negative impact of high vehicular emissions on health and the environment. This campaign also serves as an enforcement tool. This campaign essentially involves the participation of members of the general public who report excessive vehicular exhaust emissions from private, commercial and public vehicles by sending (whilst not driving) an SMS bearing the registration number of the vehicle in question. The reports are then followed up by the Land Transport Directorate, who will call in the vehicle for an inspection during which an emission test is carried out. If the vehicle fails the test, the owner is required to address the problem and is then obliged to return within one week for another emission test. Failure in the second test will result in a licence restriction. The same applies to those vehicles that do not turn up for the test in which case final notices are sent and if the owner of the vehicle in question fails again to show up, a restriction on the vehicle license will be issued and the vehicle road license will not be renewed until the vehicle is tested.
- Apart from the above, the Land Transport Directorate also carries out random road-side checks on private and passenger-carrying and goods-carrying vehicles to ensure compliance with the Motor Vehicle Regulations, 1994 (Subsidiary Legislation 65.11), including testing for emission levels.
- The Land Transport Directorate has also started implementing the "Valletta Strategy", aimed at reducing traffic into the historical capital city of Malta. During the last three years the Government has also granted an operating license for the use of electric mini-cabs in Valletta. Although this service is still not fully carbon-neutral unless the battery powering the mini cab is charged through a photo-voltaic system, they still contribute to cleaner air in terms of NO_x and PM_{10}. Other measures that have been taken to reduce emissions in Valletta include a controlled vehicular access system, extension to the Valletta pedestrianisation and the operation of a Park & Ride facility.

[75] Malta Transport is the Authority for Transport in Malta set up by Act XV of 2009

- The liberalisation of the minibus and coaches sector has included a number of measures to ensure modernisation of the fleet of public transport vehicles. Changes made to the regulatory framework by means of the "Passenger Transport Services Regulations, 2009" (LN 149 of 2009), stipulate that as of January 2015, coaches and minibuses will not be able to be older than 28 years, and any bus that is imported from 19 May 2009, cannot be older than five years.
- Tourists now can also avail themselves with the use of open-top tour sightseeing buses which have been in operation on various localised routes around Malta. This will also minimise the use of smaller vehicles such as taxis to larger passenger capacity vehicles therefore meaning, less vehicles making use of the roads at any given time. This will create competition within the various modes and making transport more sustainable.

Key EU policy developments in the transport sector include the Greening Transport Package, which addresses *inter alia* the greening of transport and the internalisation of external costs. Further achievements include the adoption of a Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles, which aims towards a broad market introduction of environmentally-friendly vehicles, an Action Plan for the Deployment of Intelligent Transport Systems (ITS) and Directive 2010/40/EC, as well as the launch of new actions as a follow-up to the Green Paper "Towards a new culture for Urban Mobility". Malta is responding to these new developments. For instance, the Land Transport Directorate has also submitted a project proposal for ERDF funding to set up an ICT-based Intelligent Transport Management System (ITMS) in Malta as an attempt to alleviate traffic congestion and hence contribute directly to less time travel and therefore less emissions. The project, if approved, will cover the main arterial roads sections in Malta. Its operations will be intelligently coordinated through a central control hub. All traffic light junctions will be synchronised together in such a way that vehicles will move into platoons from one junction to the next. Moreover, traffic will be monitored all day long seven days a week through high powered CCTV cameras placed alongside the road network to monitor traffic congestion. The system will see the installation of electronic variable message signs that will provide road users with information about congested sections of road, journey times and suitable alternative routes that motorists can take to avoid congestion. This will also assist in the lessening traffic congestion. In order to promote public transport usage and achieve a modal shift from car-passenger usage to public transport system, the ITMS will also positively discriminate in favour of public transport buses such that at traffic junctions, traffic lights will signal priority to that bus, onto bus lanes (where available).

A reform of the public transport service is also ongoing and is aimed at a high standard of public transport provision and which will contribute to making public transport a more viable alternative to the private car and hence should lead to a modal shift to more environmentally sustainable means of travel. The Land Transport Directorate had in fact issued a competitive tender for a 10 year public service contract which has resulted in a single operator providing the national network of bus services. The contract includes a number of requirements including *inter alia* the requirement to use low floor, low emission buses and the redesign of the bus network to better cater for travel demand. Furthermore Government is also reforming the rest of the transport modes including the maritime and the aviation sector by setting up one regulatory authority through which all modes of transport are integrated to provide a sustainable seamless transport system where the commuter will find it easier to travel and make use of public transport modes, through a mix and match of various modes, in cases even by the use of his private car.

An Air Quality Plan was recently issued by MEPA and outlines ways in which the quality of the air around the Maltese islands can be improved. The plan outlines initiatives that aim to reduce vehicle emissions; to encourage a change in travelling patterns and habits; to reduce the traffic impact of new developments; to better manage the road network and to promote cleaner vehicle

technologies. This Plan is primarily focused to reduce concentrations of PM10, with the aim to bring the daily averages in line with the thresholds present in Directive 1999/30/EC relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air. However in 2006 and 2007 the annual limit value for nitrogen dioxide (NO_2) has been exceeded in the traffic site within the agglomeration. Therefore, these measures are also targeted to bring concentrations in this site in line with the annual limit value for NO_2.

Another EU policy that affects air emissions from industrial activities is the Integrated Pollution Prevention and Control Directive (IPPC Directive 2008/1/EC), which has been transposed by the "Integrated Pollution Prevention and Control Regulations, 2002" (LN 234/2002 as amended by LN 230/2004 and LN 56/2008). The aim of the IPPC Directive is to achieve integrated prevention and control of pollution arising from industrial activities listed in Annex I of the Directive. It does this by establishing measures designed to prevent or, where that is not practicable, to reduce emissions in the air, water and land from the abovementioned activities, including measures concerning waste, in order to achieve a high level of protection of the environment taken as a whole (Article 1 of the Directive). Since accession, ten of the fourteen national operational installations have been IPPC permitted. These are two landfills, three pharmaceutical companies, two chemical plants, two power stations and an incinerator. Such permits include conditions which control emissions to the air including requests for self-monitoring and compliance with specified emission limit values (Source: MEPA 2009).

4.4.2 Reducing Greenhouse Gas Emissions

Since the beginning of the Industrial Revolution in the mid 1700s to this day, natural levels of atmospheric greenhouse gases (GHGs), in particular carbon dioxide (CO_2), have been increasingly supplemented by emissions arising from a number of anthropogenic activities particularly the burning of fossil fuels - oil, gas, and petroleum - mostly by the energy and transport sectors. The consequent burgeoning levels of GHGs accumulating in the atmosphere, which considerably exceed pre-industrial levels, are with increasing confidence, being linked with the abnormally elevated global temperatures (the "enhanced greenhouse effect") and the observed unprecedented man-induced changes in global climate.

Nationally, MEPA is entrusted with the task of maintaining the national greenhouse gas inventory and addressing national reporting requirements in respect of Decision 280/2004/EC which establishes a mechanism for the monitoring of GHG emissions in EC Member States. The "Annual National GHG Emissions Inventory" identifies trends of past and present emissions providing useful information to drive the development of mitigation measures to combat climate change. Activity data used for the preparation of this inventory has been mainly obtained from the National Statistics Office, from government entities, from other public bodies such as regulatory authorities and from private establishments.

The present inventory includes emissions and removal estimates for the time series 1990 to 2007 from the following sectors: Energy, Industrial Processes, Solvents and Other Products Use, Agriculture, Waste and the Land Use, and the Land-Use Change and Forestry (LULUCF) sector. Emission estimates are worked out for the direct GHG: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) as well as for the indirect GHG: carbon monoxide (CO), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC) and sulphur dioxide (SO_2). Data from the GHG inventories reveals that throughout the whole period 1990-2007, the major contributors to the total emissions for Malta were energy generation, transport, waste and fuel combustion in the industrial, commercial and

residential sectors, with minimal contributions by other sources. In general, per capita emissions have risen from around 5.5 tonnes per head in 1990 to 7.3 tonnes per head in 2007. Malta contributes around 0.1% to the EU-27 GHG emissions. From 1990 to 2007, the GHG emissions in Malta have increased by 49% and amount to 3034 Gg in 2007, where the most significant contributor to this increase being the increase in CO_2 emissions. The CO_2 removal portion through the LULUCF sector accounts for an average annual figure of -58 Gg CO_2 sequestered by local vegetation.

By far the largest contributor to national emissions is the energy sector (includes energy generation, transport and other fuel combustion in industry and commercial and residential sectors) with a share in 2007 of 88.7% of gross national emissions. The second highest contributing category is waste, with a share of 6.6 % of overall emissions. The industrial processes, agriculture and the solvent and other product use sectors have together an overall share of less than 5.0%. The agriculture sector in Malta contributes around 5.0% of the total national GHG emissions. The mean annual GHG emissions from the agriculture sector, as reported in Malta's latest GHG Inventory covering the time series 1990 to 2007 (MEPA 2009), amount to 68.0 Gg CO_2 equivalence. Enteric fermentation is the major source of GHG emissions, followed by the emissions from manure management. The contribution from agriculture soils is relatively small and amounts to about 5.0 Gg CO_2 equivalence annually.

In 2007, emissions of CH_4 represent a share of 8.5% of overall national emissions. CH_4 emissions mainly originate from the waste sector and to a lesser extent from the agricultural sector. Emissions of N_2O amount to an average of 1.0% of the overall national GHG emissions. Over the inventory time series, N_2O emissions have remained fairly constant. The major source of N_2O emissions is the waste sector, followed by the contribution from the energy sector. The fluorinated gases (HFCs and SF_6) have an almost zero % contribution to the total national GHG emissions in 1990. This contribution increased in an exponential way to 2.3% in 2007, where the main source of emissions is the consumption of refrigerants in refrigeration and air-conditioning equipment. CO and SO_2 have the highest share of emissions among the indirect GHG. The trend in CO emissions is highly linked with the level of combustion of petrol in road transport. The activity that contributes almost all SO_2 emitted in Malta is fossil fuel combustion in power generation.

Although Malta does not have any quantified targets for reducing or limiting GHG emissions over the 2008-2012 period (also known as the first Kyoto Protocol commitment period) under the Kyoto Protocol or under EU Decision 2002/358/EC, as a Member State of the European Union, Malta is still bound by the obligations set out in European Union legislation on various issues related to addressing climate change. Of particular significance is Directive 2003/87/EC transposed into national law via the "European Community Greenhouse Gas Emissions Trading Scheme Regulations, 2005" (Legal Notice 140 of 2005, as amended by LN 73 of 2006 and LN 274 of 2006). The implementation of the EU ETS is regulated by MEPA. The two Maltese installations currently participating in the scheme are the power plants operated by EneMalta Corporation; these plants are also, by far, the largest contributors to overall emissions of GHG in Malta. In response to obligations stemming from Article 9 of Directive 2003/87/EC, Malta has prepared and submitted to the EU commission National Allocation Plans for the trading periods 2005-2007 and 2008-2012 pursuant to the ETS Directive. Both NAPs have as a basis an extrapolation of the "business-as-usual" correlation between energy generation, time and GDP. This extrapolation presents a projection of electricity demand over the course of the respective trading phases.

As part of the Climate and Energy Package, the EU is committed to sourcing 10% of its transport fuel consumption from renewable energy sources by 2020. Furthermore, agreement was reached on the inclusion of aviation in the EU ETS from 2012 onwards. Among the various proposals, are to revise Directive 2003/87/EC so as to improve and extend the EU ETS and the proposal for a decision on the effort of Member States to reduce their GHG emissions to meet the Community's GHG reduction commitments up to 2020 (also known as the "effort-sharing" Decision). The former proposal brings about a number of changes in the running of the EU ETS of particular interest for Malta, the most significant being the provision for mandatory levels of auctioning in the allocation of allowances, especially in respect of electricity generation. These should lead to a more realistic reflection of the cost of carbon emissions in the price associated with consumption of electricity users, while representing a truer approach to the polluter-pays-principle. Under the effort-sharing Decision, Malta will, from 2013 up to 2020, have annually binding emission limiting targets for all emitting anthropogenic sectors and activities that do not fall within scope of the EU ETS Directive. The end-target for Malta has been set at emissions limited, in 2020, to a maximum +5% compared to 2005 levels, with the interim binding annual targets being determined on the basis of a linear trajectory starting at the average of annual emissions for 2008, 2009 and 2010 and ending at the 2020 target.

Awareness of the issue of climate change has increased and discussions have gained momentum in the past months. The Biennial Report on Climate Change policies and measures (PAMs) covers information on national policies and measures considered as most effective in reducing GHG emissions or in raising awareness on the need to reduce emissions from the various sectors. Malta submitted its 2009 PAMS report on projections and national programmes in fulfilment of the obligations arising from Article 3(2) of Decision 280/2004/EC concerning a monitoring mechanism for GHG emissions in the European Community. The report was prepared by MEPA in collaboration with various entities involved in developing and implementing policies and measures affecting emissions of direct GHG. This Report presents the state of play as at the end of 2008, and in particular addresses measures targeted the energy sector, which is the main emitting sector. Estimated projections of GHG emissions until 2020 for the various sectors, ranging from energy to waste agriculture, are also included in the Report. The Report describes both implemented as well as planned measures; however, policies and measures still under discussion or at consultation stage have not been included.

4.4.3 Promoting Energy Efficiency in Malta

The Malta Resources Authority (MRA) is the authority responsible for the regulation of energy utilities and management in the Maltese Islands. MRA is responsible for overseeing legislation related to energy efficiency, reduction of sulphur content of fuels, and renewable sources, amongst others. Such measures contribute to a decrease in the use of fossil fuels, and thus a reduction in emissions. A National Energy Efficiency Action Plan (EEAP) in accordance with the requirement of the Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services has also been developed. The scope of this action plan is savings in energy end use, in line with the Directive. This plan of action notes that '*Energy efficiency finds synergy in the achievement of all Government's energy policy objectives - it assists the economy, as well as help to achieve social and environmental goals.*' A number of measures aimed at energy efficiency are in the pipe line and include:

- Installation of new and efficient generating capacity in response to increasing electricity demands and in order to reduce the output from the less efficient plants;
- Submarine electrical interconnection to the European grid;

- Supply and installation of an automatic meter management system complete with smart electricity meters enabling the implementation of time-of-use tariffs, believed to contribute to reduction in energy demand (and ultimately a reduction in CO_2 emissions);
- A contribution to maximise use of efficient base-load generation and reduce the need for spinning reserves;
- Energy efficiency measures in street lighting considering that street lighting consumption accounts for more than 1% of the total MWh of energy generated in the Maltese Islands, while also exploring the possibility of energy saving in street lighting through dimming in view of the national target of 9% energy end-use savings by 2016, in line with Directive 2006/32/EC.

Malta is also currently assessing the potential of renewable energy generated by wind farms and is also actively following the ongoing development of deep water offshore technologies.

4.4.3.1 Plant Loading and Fuel Switching

EneMalta Corporation (EMC) is Malta's only electricity producer and distributor on the island. This corporation is responsible to monitor and, where possible, reduce emissions from the two power plants located in Marsa and Delimara by respecting the relevant emission limit values present in the Directive 2001/80/EC on Large Combustion Plants (LCPD) and operating the power plants at best available techniques, where practicable and possible, as outlined in the IPPC Directive. EneMalta made the switch to a more expensive low sulphur fuel in January 2004 - a sulphur content of 1% bringing a drastic reduction in SO_2 emissions. The Marsa Power Station (MPS) steam boilers with a total capacity of 240MW have been subject to the 20,000 hours operation time limit since 1 January 2008, in line with the requirement of the LCPD. The complete shutdown of this plant has to occur by not later than 31 December 2015. Due to this requirement, the plant dispatch and load management of EneMalta has changed, with a larger proportion of the load being met by the Combined Cycle Gas Turbine (CCGT) plant in the Delimara Power Station (DPS). The effect has been a reduction in the overall GHGs emitted per MWh generated, in view of the higher efficiency of this plant and the lower emissions per TJ of gas oil compared to heavy fuel oil.

4.4.3.2 Grant schemes for energy efficiency and renewable energy projects

Various grant schemes are ongoing and which target both the non-residential and residential sectors. Looking first at the non-residential sector, the energy grant scheme, under financial assistance of the European Regional Development Fund (ERDF), was launched in February 2009. Funds of €10,000,000 are available under this scheme. This incentive scheme aims to assist companies to implement projects related to energy efficiency (such as the installation of intelligent lighting systems, solar heating, thermal insulation, building management systems and energy-saving lighting) and electricity generation from renewable sources such as solar and wind energy. The scheme is being administered by the Malta Enterprise, the government agency responsible for the promotion of foreign investment and industrial development in Malta. Approved and selected projects (through a competitive call) will be refunded 50% of their investment cost on renewable resources and energy efficiency, with a minimum investment of €25,000 and not exceeding €200,000. This scheme is being run in parallel with another scheme aimed at assisting companies to carry out energy audits for their systems and energy use. This second scheme is funded by the Maltese Government through the Malta Enterprise. Energy audits can identify measures which can then be funded through the energy grant scheme. The grant amounts to 40% up to a maximum of €300 on audits for small enterprises and up to €1,000 for large enterprises.

Considering next the residential sector, since January 2006, Malta has been implementing financial incentives for the passive use of renewable energy. In 2009, the financial support in the form of grants for solar energy products for domestic premises was increased from 25% to 66% on the capital costs of these products. The capping to this grant was also increased from €233 to €465. In addition, in the case of solar water heaters installed in new households, EneMalta is waiving €163 from the connection fee.

Malta has also continued to adopt measures to increase the uptake of micro-generation from wind and solar photovoltaic (PV). The capital grant schemes for micro wind and solar photovoltaic systems introduced in 2006 continued to be applied up to the end of 2008. In 2009, the previous capital grant scheme for the residential sector was replaced by the following financial support mechanism:

- Capital grants of 30% on the purchase price of micro-wind turbine generating systems for installation in residential premises (subject to a maximum grant of €750).
- Capital grants of 50% on the purchase price of solar PV systems for installation in residential premises (subject to a maximum grant of €3,000). A fund of €500,000 was allocated for this grant.

In addition to these grants:

- the cost for the installation of the meter necessary to monitor the output of these technologies is waived by the Maltese Distribution System Operator (EneMalta Corporation); and
- a net metering mechanism exists for electricity generated from renewable energy sources with a spill tariff of €0.07/kWh for any excess electricity fed into the grid.

4.4.3.3 Raising Awareness on Energy Efficiency

MRA, MRRA, Transport Malta and other entities are collaborating in a sustained educational campaign to generate awareness and instil a new culture on ideal behaviour in energy consumption. Media was used in the widest possible manner to target the general public at large. Energy Saving Tips were published on local newspapers and in local magazines. Media coverage included discussions over local radio stations as well as TV programs broadcasted over a span of several months. Talks on energy saving in everyday lives were given at public places and Local Councils. These talks proved to be very successful and requests were made by schools, private companies and government green leaders for other similar talks to be given. Demonstration videos were used in the talks and TV programs. Popular material has also been developed. Flyers have been distributed at homes and around all Maltese youths.

A booklet entitled "Concern for the environment requires us to take energy efficiency very seriously" was published by MRA. The booklet delivered the message: '*The environment benefits from less pollution and you can get lower bills while enjoying same or better comfort in our homes.*' The booklet guides the consumer on how to save energy as well as provides information on available grants. An evaluation of the energy saving campaign was undertaken by MRA in order to provide *inter alia* insight as to how the Maltese public received TV commercials, as well as to deduce whether action was taken by the public to save energy, and if not, why. Another booklet was published on "Tips about reducing green house gases and climate change" by the former Ministry for Rural Affairs and the Environment. Tips cover ways of reducing GHGs on the road and at home.

The ongoing campaign on "SWITCH To efficiency" is one of the green initiatives led by the Government. This campaign includes a number of information spots with national TV personalities indicating how one can save energy in his/her everyday life. An e-mail and free phone helpline have also been set up for any queries posed by members of the general public, along with articles, a booklet and a presentation on the topic. Significant work has thus been carried out to promote energy efficiency in Malta. More CEPA activities are in the pipeline such as on building energy efficient homes and renewable energy. Opportunities for investing in a low-carbon economy must be reaped by promoting energy efficiency and the uptake of green products.

4.5 Capture Fisheries

Many commercial fish stocks in European waters are still outside safe biological limits – a situation which requires a significant reduction in overall fishing pressure to sustainable levels within the framework of the Common Fisheries Policy (CFP).

2008 Mid-term assessment of the EU BAP

The fisheries industry in Malta is considered mainly to be artisanal, that is, predominantly non-industrial. Maltese fisheries are also considered as multi-species and multi-gear fisheries, whereby fishers alter between fishing gears throughout the year, depending on the species they target. The majority of Maltese fishers operate on a part time or leisure basis and as such, their livelihood does not depend solely on catching and selling fish. Nevertheless, the social and cultural importance of the Maltese fishing industry far outweighs its negligible economic contribution. In 2007, the National statistics Office (NSO) published the "Census of Fisheries 2006" which provides detailed information on the structure of fishing vessels used by fishers in Malta and Gozo including data on the production, expenditure and labour force relating to this sector. In addition NSO also generates annual data on capture and land statistics. Data on fish landings is also collected on a monthly basis.

Fish resources targeted by fishers are a component of biodiversity. To this end, the removal of targeted species will inevitably interfere with the natural structure and functioning of marine ecosystems. The degree of anthropogenic interference brought about by fishing will depend on several factors including the intensity of fishing, the biology of the species being targeted, the type of fishing gear employed as well as the degree of fishing capacity of the gear/technique used. Potential direct and indirect impacts of fishing are summarised in Figure 26 (overleaf). It is also important to note that certain impacts are cumulative, long term and often interlinked.

The Fish and Farming Regulation and Control Division within MRRA regulates and manages capture fisheries. This regulatory body promotes an ecosystem-based approach to fisheries by applying sound fisheries management in order to safeguard the sustainability of living marine resources. With respect to fisheries, it aims to manage marine areas and preserve fisheries stocks, including their means of sustenance. The Fisheries Conservation and Management Act (CAP. 425) makes provision for the regulation, conservation and management of fisheries in Malta and matters incidental thereto. The scope of this Act extends beyond the safeguard of fish that are captured for direct consumption, in that certain provisions of the Act also provide a legal basis for the protection of turtles, dolphins and other aquatic organisms [Article 38(2) h]. The Armed Forces of Malta (AFM) in collaboration with the Fisheries Division are responsible for fisheries enforcement within Malta's jurisdiction.

Figure 26 – Potential Impacts of Fishing on Marine Biodiversity

National fisheries policy is also modelled on the EU Common Fisheries Policy. The Green Paper on the reform of the Common Fisheries Policy outlines the state of Europe's fisheries and analyses the current CFP. The green paper notes that the objectives agreed in 2002 to achieve sustainable fisheries have not been met overall due to five main structural failings:

- a deep-rooted problem of fleet overcapacity;
- unacceptable high level of discards;

- imprecise policy objectives resulting in insufficient guidance for decisions and implementation;
- a decision-making system that encourages a short-term focus;
- a framework that does not give sufficient responsibility to the industry;
- insufficient integration of environmental considerations;
- lack of reliable data to assess all stocks and fleets
- lack of political will to ensure compliance and poor compliance by the industry.

Subsequently, the Commission issued various communications in 2011 including the Communication on the Reform of the CFP (COM/2011/417) and a proposal for a regulation (COM/2011/425). The reform puts forward a number of proposals in favour of the sustainable management of fish including *inter alia* measures against over-fishing and ensuring productivity of fish stocks to maximise sustainable yield (MSY), multi-annual recovery and management plans[76] governed by the ecosystem approach, ending the practice of discards and reducing unwanted catches, up-to-date information on state of marine resources, as well as contribution to other environmental policies, such as contributing to the good environmental status of the seas under the Marine Strategy Framework Directive (MSFD). The changes under this reform are aimed at the exploitation of living marine biological resources that restores and maintains fish resources at levels which can produce the maximum sustainable yield, by not later than 2015. This has also been entered as one of the targets of the EU Biodiversity Strategy to 2020.

The three most important commercial species in Malta are bluefin tuna (*Thunnus thynnus*), swordfish (*Xiphias gladius*), and dolphinfish (*Coryphaena hippurus*). Malta has observed the 1994 Recommendation on blue fin tuna catch limits set by the International Commission for the Conservation of Atlantic Tunas (ICCAT) and has in place regulations specified in Government Notices 206/1934 and 148/1935 which lay down detailed licensing and operational regulations for the fisheries sector in Malta. In March 2003, the Fisheries Division issued a Government Notice stating that it was ready to receive a maximum of four applications for the fishing of tuna. Subsequently, two licenses were issued to fishing vessels already registered in the Maltese Fishing Vessel Register to target blue fin tuna using purse seine nets. In 2007 the number of authorised purse seiners was also 2. With respect to surface long line fishing of blue fin tuna 89 vessels were authorised in 2007 to operate in the ICCAT Convention area. This number of vessels has been stable for the last eight years. With respect to blue fin tuna fishing, Article 4.2 of Council Regulation (EC) No 1559/2007 establishing a multi-annual recovery plan for Bluefin Tuna in the Eastern Atlantic and Mediterranean, states that for those quotas smaller than 5% of the Community quota, Member States may adopt a specific method to manage their quota in their fishing plan (Source: Fisheries Operational Programme for Malta 2007-2013). In 2008, Commission Regulation (EC) No 530/2008 was issued which, through Article 1, prohibited fishing for bluefin tuna in the Atlantic Ocean, east of longitude 45°W, and the Mediterranean by purse seiners flying the flag of or registered in Greece, France, Italy, Cyprus and Malta as from 16 June 2008. This prohibition was applicable for duration of six months. A proposal put forward by Monaco and the United States to establish an international trade ban for the Atlantic blue fin tuna under the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) by listing it as an Appendix I species, was rejected at the 2010 Doha Conference, with 20 countries in favour and 68 against (and with 30 abstaining).

[76] Such plans incorporate clear objectives and harvest rules with the aim of balancing ecological requisites (state of the stocks and exploitation rates) and economic and social considerations (stability of catches). Effort management and specific inspection and monitoring provisions are introduced in these plans where relevant.

Swordfish is known to be an over-exploited species. The size of the fish landed over the years appears to involve a large number of smaller fish and immature stages. In view of this a close season in force from 15 October to 15 November has been instituted in an attempt to save juveniles. Another important species (in terms of catch) is the Mediterranean dolphin fish which is also a GFCM priority species. During a recent study on the species, it was found that dolphin fish fisheries mostly target 'age 0' fish (2 to 8 months) thus depending on annual recruitment which is considered to be very variable. It was also concluded that the relationship between maturity and size is not regular and that the important parameters in the measurement of the fishing effort for this FAD fishery is the number of FADs deployed and the number of fishing trips made (Source: Fisheries Operational Programme for Malta 2007-2013).

Given the importance of both blue fin tuna and swordfish to the local fishing industry, it is clear that a shift towards less threatened species as well as aquaculture species will need to take place over the coming years (Source - Fisheries Operational Programme for Malta 2007-2013, p. 8). The adjustment of fishing effort is included as one of the objectives under priority Axis 1 "Adaptation of the Community fishing fleet" of the Fisheries Operational Programme for Malta 2007-2013. The result indicator is a 6% Reduction in fishing capacity of Malta fleet sector for declining species (blue fin tuna and swordfish) by 2015. This axis includes the following measures:

- Measure 1.1: Public aid for permanent cessation of fishing activities - The general objective of the measure is to adjust the fishing capacity of the Maltese registered fishing fleet as well as to manage the fishing effort in accordance with the aims of the CFP.
- Measure 1.2: Public aid for temporary cessation of fishing activities - The general objective of this measure is to provide temporary support to fishers and owners of vessels who in the context of the fishing adjustment plans referred to in Article 21(a) of Regulation No 1198/2006 must temporarily cease their fishing activities.
- Measure 1.3: Investments on board fishing vessels and selectivity - The general objective of this measure is to enhance safety and improve working conditions on board fishing vessels. It is also aimed at safeguarding the environment by reducing the impact of fishing.
- Measure 1.4: Socio-economic compensation for the management of the Community fishing fleet - The general objective of the measure is to support the management of the Community fishing fleet through the diversification of skills and activities and the upgrading of professional skills.

Since 1971, Malta has managed a 25 nautical mile management zone *i.e.* an extended fisheries management zone, beyond the 12nm territorial waters. Throughout all these years a strict licensing system was maintained within this zone, keeping large-scale industrial fishing, such as trawling, at a minimum. On the 28 June 2002, Malta and the European Union reached an agreement that the 25nm management zone will continue to be managed by the Maltese Authorities. During the negotiations it was argued that unrestricted access to the 25nm zone would undermine the sustainability of the fish stocks in this ecologically important area, more so since fishing fleets of other neighbouring countries are known to be better equipped and more technologically advanced as opposed to Maltese fishing fleets. The Malta-EU negotiations on the Fisheries Management Zone (FMZ) have led to the adoption of Council Regulation EC 1967/06 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea. This regulation lays down detailed conservation measures in connection with the zone's management regime (see Chapter X – Measures for the Waters around Malta – Articles 26 and 27) and also calls for the designation of Fisheries Restricted Areas in zones beyond or partly within the jurisdiction.

The Malta Centre for Fisheries Sciences (MCFS – now the Malta National Aquaculture Centre), actively participates in FAO subregional projects such as the FAO-COPEMED Tuna Programme

initiated 1998, the ongoing MedSudMed Project, which was launched in 2001 to investigate the ecosystem approach to fisheries (EAF) in the Mediterranean, and the Mediterranean International Bottom Trawl Survey (MEDITS Trawl survey), which has been collecting information on the status of a number of commercially important species in the Mediterranean Sea. The MEDITS survey collects data on abundance and other biological parameters of 38 species of the priority MEDITS list, including fish, crustaceans and cephalopods. MEDSUDMED also finances two research survey programmes in Maltese waters: the echo-surveys and ichtyoplankton survey.

As an EU member state, Malta is required to conduct an annual National Fisheries Data Collection Programme (NFDCP), in line with the EU Data Collection Regulations (DCR) – Council Regulations EC 1639/2001 and EC 1581/2004, amended by Council Regulation EC199/2008 followed by the Commission Decision 2008/949/EC. The programme contributes to a better knowledge of the main fishery resources of Malta from biological, managerial, economical and social aspects. In this regard, three species are studied in detail: blue fin tuna, swordfish and dolphinfish. Data collected under the NFDCP will also feed into the monitoring under the MSFD. Data on blue fin tuna and swordfish length by sex are reported to ICCAT for their use in the respective stock assessment exercises. Data on pelagic sharks are also sent to ICCAT as requested. Besides the monitoring obligations stemming from EU fisheries policy, there is also the requirement under the EC Habitats Directive for Member States to set up a system to monitor the incidental capture and killing of marine animals as by-catch of fishing operations. By-catch undermines the conservation status of protected marine turtles, cetaceans and various endangered shark species. The MARC houses the Turtle Rehabilitation Unit which is involved in the rehabilitation of marine turtles that are injured by fishing operations. Surgical intervention is carried out on injured turtles (generally to extract swallowed hooks), and the said turtles are kept for rehabilitation and under observation for a number of weeks, as deemed necessary, before their actual release. Data on by-catch of marine turtles is collected by MARC. The MARC also embarked on a research project on the incidental by-catches of seabirds under the now completed EU LIFE+ Garnija project in collaboration with Birdlife Malta. Cetaceans injured by fishing operations can also end up stranded on the coast. In 1999, MEPA published a Cetacean Stranding Protocol in order to ensure timely and coordinated action to increase the chances of survival of stranded cetaceans. On the basis of the same Protocol another network dealing with marine turtle strandings has been developed.

Another issues of increasing concern in the fisheries sector is illegal, unreported and unregulated fishing (IUU), which encompasses a wide a range of illegal activities such as fishing without a license or out of season; harvesting prohibited species; using unlawful types of fishing gear; or non-reporting or underreporting catch weights. A national plan of action to combat IUU has been developed. Malta's commitment to fight against IUU activities was reiterated during a national seminar held in 17 April 2008 with the theme "Preventing, Deterring and Eliminating IUU", and attended by both the Minister Responsible for the Environment and the European Commissioner for Fisheries and Maritime Affairs (DOI Press release 0552).

Several activities aimed at raising awareness amongst Maltese fishers have been undertaken. The Fisheries Division as the National Focal Point to the FAO's Code of Conduct for Responsible Fisheries published the code in Maltese and launched it during a national seminar. The Sea Turtle Handling Guidebook for Fishermen (UNEP/MAP/RAC-SPA, 2001) has also been translated in Maltese and distributed amongst fishers.

4.6 Health

> Those who live in materially comfortable, urban environments commonly take for granted ecosystem services to health. They assume that good health derives from prudent consumer choices and behaviours, with access to good health care services. But this ignores the role of the natural environment: of the array of ecosystems that allow people to enjoy good health, social organization, economic activity, a built environment and life itself.
>
> "Ecosystems and Human Well-being – Health Synthesis"
> World Health Organisation
> Millennium Ecosystem Assessment

There are strong linkages between human health (physical, mental and social well-being) and the provision of ecosystem services. Indeed, basic requirements for human health and quality of life, such as clean air, food, clothing, medicines, security, shelter and access to clear water, all depend on the functioning of healthy ecosystems. Notwithstanding this, increasing human pressures on the environment, as a result of growing populations, and related higher demands for natural resources, has lead to ecosystem disruptions, which in turn affect human health. Direct health impacts such as floods and heat waves for instance stem from the disruption in climate and disruptions of certain ecosystems such as wetlands. The latter play an important natural regulatory role in terms of climate mediation and flood control. Human health consequences of ecosystem changes (Figure 27) are reviewed by the report entitled "*Ecosystems and Human Well-being – Health Synthesis*" which was prepared by the World Health Organisation (WHO) as a contribution to the Millennium Ecosystem Assessment (MA).

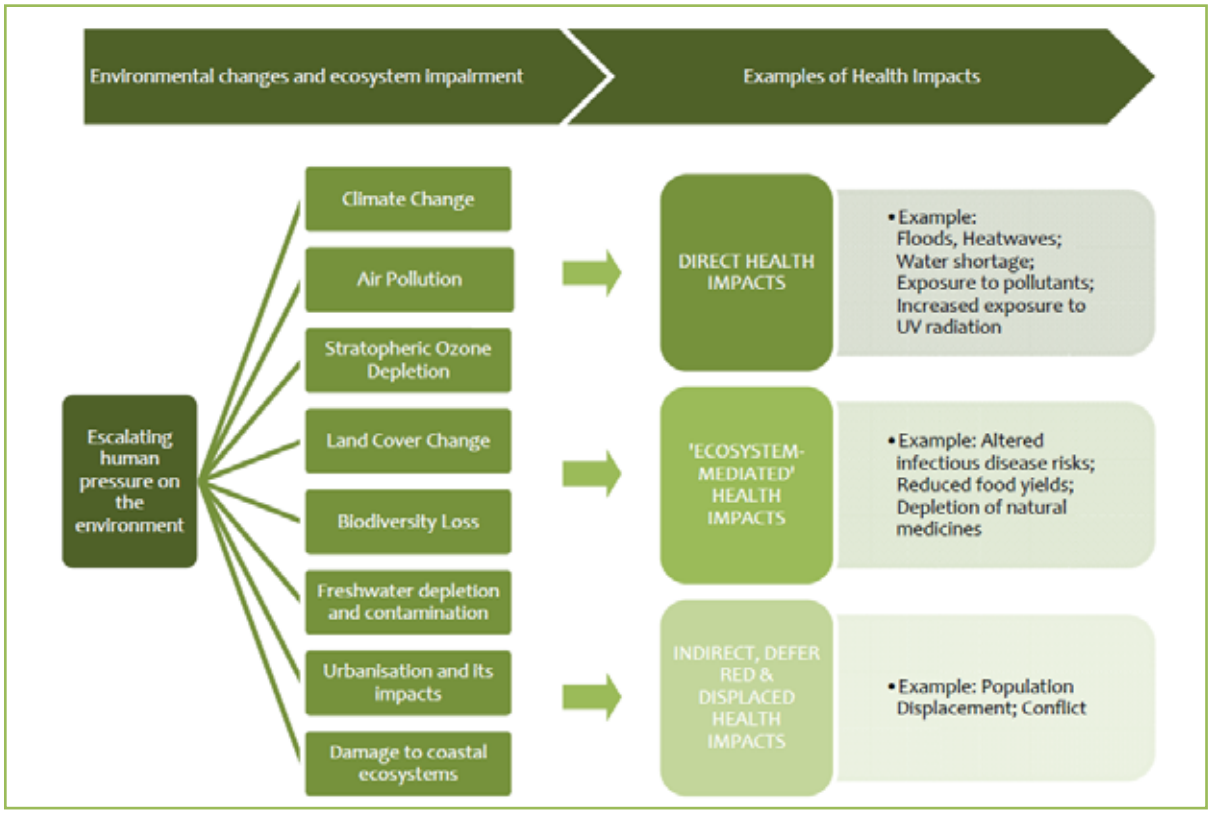

Figure 27 - Human health consequences of ecosystem changes
(Adapted from the Millennium Ecosystem Assessment - "Ecosystems and Human Well-being – Health Synthesis")

The EU Commission launched the "Communication on a European Environment and Health Strategy" (COM/2003/338) in June 2003. This Communication proposed an integrated approach involving closer co-operation between the health, environment and research sectors. The ultimate goal of this Strategy is to develop an environment and health "cause-effect framework" that will provide the necessary information for the development of Community policy dealing with sources and the impact pathway of health stressors. The 2004-2010 Environmental and Health Action Plan, in support of this Environment and Health Strategy, aims to integrate environment and health and to ensure that human health aspects are duly taken into account in environmental policy and *vice versa*. In fact, it focuses on the causal links between environmental risk factors and those priority diseases (respiratory diseases, neuro-developmental disorders, cancer and endocrine disrupting effects) where environmental factors can play a role in their development and aggravation. The AP has the following three main themes:

- Improving the information chain by developing integrated environment and health information to understand the links between sources of pollutants and health effects;
- Filling the knowledge gap by strengthening research on environment and health and identifying emerging issues;
- Reviewing policies and improving communication by developing awareness raising, risk communication, training and education to give citizens the information they need to make better health choices, and to make sure that professionals in each field are alert to environment and health interactions.

The mid-term review of the Action Plan (COM/2007/314) identified some areas of concern such as climate change. The effective implementation of the Environmental and Health Action Plan is dependent on specific environment and health policies. Environmental policies can contribute towards a clean and healthy environment, and hence, can also positively impact human health and quality of life such as through reduction of air emissions, waste management and conservation and sustainable use of natural resources. The EU legislative framework to minimise environmental threats to human health is essentially based on the following instruments:

- the Water Framework Directive (Directive 2000/60/EC – addressed later in this Chapter of the NBSAP), which establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater, and which *inter alia* contributes to the provision of the sufficient supply of good quality surface water and groundwater as needed for sustainable, balanced and equitable water use;
- the Regulation on the Registration, Evaluation and Authorisation of Chemicals (REACH - EC 1907/2006), which aims to improve the protection of human health and the environment from the risks of chemicals, while enhancing the competitiveness of the EU chemicals industry;
- the Directive on ambient air quality and cleaner air for Europe (Directive 2008/50/EC), which sets binding standards for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM10 and PM2,5), lead, benzene and carbon monoxide pollution in the European Union; and
- the Proposal for a Framework Directive on the Sustainable Use of Pesticides (COM/2006/373) which will lay down a framework for the sustainable use of pesticides and by reducing the risks and impacts of pesticide use on human health and the environment.

According to information documented in the 2008 SOER (Environmental Health Sub-report), main health challenges in Malta related to the environment include respiratory diseases, which may be related to air pollution. Noise is also potentially a health challenge, although public awareness of its effects on human health is currently limited. While there is awareness of the fact that some health concerns are directly or indirectly related to the quality of the environment, there is a strong need for increased education, awareness and research into the link between human health and the environment. In recognition that the majority of environmental health issues in Malta

originate in other sectors such as transport, waste and energy, the 2008 SOER calls for an augmented inter-sectoral approach to arrive at effective policy solutions. Action has already been initiated in these areas through the running of joint transport, health and environment monitoring projects and the setting up of a formal cooperative committee between MEPA and the Department for Environmental Health within the Ministry for Health, the Elderly and Community Care. Latest developments include the preparation of a National Environmental Health Action Plan (NEHAP), which is in the process of being revised and a national seminar, which was held to raise awareness on the health effects of climate change (and for instance associated risks of extreme weather events and also on vector borne and water borne illnesses).

Leading healthy lifestyles is also important as is the provision of urban green space and other recreational facilities. Creating green spaces in villages and towns would not only be beneficial for the health of village and town dwellers but would also create support for biodiversity in urban settings.

4.7 Tourism

> For many, the loss of species and natural habitats matters because they take an ethical view that we do not have the right to decide the fate of nature. More tangibly nature is valued for the pleasure and inspiration it provides. While this value can be difficult to quantify, it provides a basis for much of our tourism and recreation industries.
>
> Communication on Halting the loss of Biodiversity by 2010 – and Beyond
> COM (2006) 216
> Commission of the European Communities, 2006

The travel and tourism industry is very important for the Maltese social and economic development as well as for the growth of other related services (such as accommodation, entertainment and recreation, restaurants, services of travel agencies). Tourism contributes in the region of 12% to the national gross domestic product (and 24.3% of the country's GNP). In 2007, the number of inbound tourists was estimated at 1,243,510 - an increase of 10.6% over 2006. The purpose of visit was primarily as a holiday experience (1,046,176) followed by business trips (98,811) (NSO 2008). A saturation stage in the tourist area life cycle for Malta was documented by Mallia *et al*. (2002) in the 2002 SOER. Reasons given for this saturation stage include the small size of the islands, coupled with land resource constraints limiting further tourism growth, and, the ever increasing population density. The organisation of the public sector side of tourism and the upgrade and promotion of tourism in the Maltese Islands is entrusted to the Malta Tourism Authority (MTA), which was set up in 1999 (following a merger of various organisations) under the mandate of the "Malta Travel and Tourism Services Act, 1999" [Cap. 409 - Act XII of 1999].

Tourism is one of the world's fastest growing industries. Europe is one of the most visited tourist destinations on a global level, with strong performance also exhibited by the Mediterranean region. Among Europe's leading sun and beach destinations, Malta's performance is documented by the World Tourism Barometer 2008 at +11% in view of strong benefits derived from the introduction of low cost airlines in late 2006, which boosted individual travel. Tourism is dynamic in terms of seasonal and annual fluctuations in numbers of visiting tourists (depending on various factors such as tourist preferences, global mobility, and the economic situation in terms of changes in prices and exchange rates). Over the years, tourist preferences have diverted to specific types of tourism (niche tourism) rather than mainstream/mass tourism, which nonetheless predominates in terms of quantity. '*Growing interest in natural and cultural heritage sites, for example, has led to the development of market segments such as natural tourism, agro-*

tourism, religious and cultural tourism. Development of ecotourism strategies is particularly evident in new emerging destinations where a balance between generation of income from tourism, environmental protection and preservation of the cultural heritage is targeted' (EEA, 2007 – Fourth Assessment Report).

All forms of tourism can impact biodiversity and the wider environment both positively and negatively. Impacts may be direct and/or indirect, temporary or of a more long-lasting effect, with variations in scale, sites affected as well as other parameters such as visiting densities. Tourism is one of the four economic sectors in Malta considered by the 2005 SOER to have the most significant impacts on the environment. The large inflow of tourists (the number of tourists visiting Malta in 2007 was circa 2.8 times the population)[77,78] coupled with the inherent characteristics of insularity, plus increasing population densities and associated consumer demands, places significant burdens on resources, in particular water and electricity supplies as well as fragile ecosystems. A heavy toll is also seen on the sewerage system, public transport and certain coastal ecosystems, in particular beaches. One of the messages delivered by the 2008 SOER with regards to this industry is that a focus is needed '*on ensuring a quality product that prevents undue pressure on Malta's natural resources such as by attracting more tourists in the shoulder months and penetrating those niche markets that are generally more sensitive and supportive towards conservation.*'

Tourism infrastructure development has also grown over the years mainly in terms of construction of new accommodation facilities. Tourism is in fact one of the major users of coastal areas lapping Malta and Gozo and to a lesser extent Comino. Threats to coastal and marine biodiversity by mass tourism are mentioned in Malta's National Report on the Strategic Action Plan for the Conservation of Maltese Coastal and Marine Biodiversity (SAPBIO Report). The CAMP-Malta Inception Report also noted that '[t]*he increase in the tourism industry also led to increased pollution and waste discharge, high pressure on infrastructure and to socio-cultural impacts on the local population.*' Approximately 5% of Malta's 1km coastal buffer area was developed between 1990 and 2004, indicating significant development pressures coming mainly from tourism and recreation (SOER 2005). Low-lying areas, beaches and sand dunes are under continuous pressure from tourism and recreational activities, which have led to the obliteration of certain areas (see Coastal Strategy Topic paper). The 2005 SOER acknowledged the need for developing a sustainable tourism strategy. The report further draws attention to the potential to improve national coastal and marine policy by better integrating sectoral policies such on tourism and recreation, and the environment.

Malta's Structure Plan identifies three interrelated objectives for tourism, namely market diversification, seasonality reduction and product/tourist upgrading. The Tourism Topic Study prepared under the Structure Plan Review process was adopted in 2001. This study examines trends in the tourism sector including land use implications, current policies and future demands and options. Various surveys were carried out to obtain the required data. This Topic Study acknowledges the importance of embracing tourism product development with the environment as well as the safeguard of both natural and cultural heritage. Although the Tourism Topic Study touches on the topic of tourism activity along the coast, it is dealt with in greater detail in the Coastal Strategy Topic Paper, which reviews tourism as one of the coastal uses and acknowledges

[77] In 2006, inbound tourism was estimated at 1,124.2 million, whereas 'the total population of Malta at the end of 2006, as estimated on the basis of figures produced from the 2005 Population and Housing census, amounted to 407,810 persons' (Vide NSO – Demographic Review 2006).

[78] The 'Dossier on Tourism and Sustainable Development in the Mediterranean' by UNEP/MAP/Blue Plan (2005) reports that islands are becoming 'monoculture areas with high concentrations of tourists' with certain countries (such as Malta) being quoted to sometimes reach a density of over 3 000 tourists per km^2 per year.

the need for measures to protect existing sandy beaches and low-lying rocky shorelines within popular bathing areas from development.

CAMP-Malta was initiated in February 2000 and aimed to introduce and apply the principles, methodologies and practices of sustainable coastal management in Malta. The project area dealt with the island of Malta on a first level and its northwest area as the operational level. Due to a high demand for further economic development and intensive expansion of all kind of activities, in particular tourism, the NW is subject to increasing pressures and user conflicts, requiring therefore urgent sustainable management measures. The Programme involved 5 thematic project activities, amongst which was the thematic area on environment health impacts on tourism, and which included the following objectives:

- to contribute to a sustainable development of tourism in Malta, reducing/eliminating potential impacts on health of the resident population and tourists, and in particular related to the NW area,
- to contribute to the protection of the environment and rational use of tourism resources, improving health conditions and increasing the level of sanitary protection and control,
- to formulate recommendations for land use and future development of tourism taking into consideration the relevant health aspects identified, and
- to formulate proposals for a follow up of the activity.

This programme resulted in the formulation of an integrated resource plan on the NW of mainland Malta.

Tourism at peak periods in the summer can overpower the carrying capacity of vulnerable ecosystems. Therefore, efforts are needed to reduce the seasonality of tourism by minimising the peak flow in the summer months (June to September and peaking in August) and hence diminishing associated pressure on the infrastructure during these months (in terms of energy consumption, roads, traffic, visits to cultural sites) and increasing the share of tourist arrivals in the winter and shoulder months. Guidelines for tourist scheduling and policies were presented in the 2002 Carrying Capacity Assessment published by the Ministry of Tourism. Recommendations included *inter alia* the need to adopt the limited-growth scenario and to stabilise the total accommodation capacity and directing commercial policies to low season.

Mismanagement of tourism activities can adversely impact biodiversity in a number of ways such as through coastal squeeze resulting from development of infrastructure in coastal areas[79], habitat disruption, littering and waste accumulation, traffic congestion[80], as well as overcrowding in certain places such as beaches in the summer and places of cultural interest. Pressure on sewerage systems can lead to increased pollution and the possibility of eutrophication, whereas increased water demand places considerable pressure on reverse osmosis plants as well as groundwater resources. It must be borne in mind that consequences of such impacts may undermine the overall tourist product and hence lead to diminished visitation of the Maltese Islands as a tourist destination. Despite the adverse effects associated with unplanned and mismanaged tourist activities, tourism can play an important role in fulfilling benefits in terms of biodiversity conservation and sustainable use of its components by way of revenue creation for the maintenance of natural heritage (by means of economic instruments such as entrance and/or user fees, environmental taxes on certain activities, voluntary payments and donations which at

[79] As noted by Mallia *et al*., (1999), '*Around 94% of the tourist accommodation supply in terms of beds are found in coastal areas and some developments have facilities occupying stretches of foreshore in terms of hotel developments and beach concessions*'

[80] In Malta, 40% of the tourists use rental cars. (quoted from UNEP/MAP/Blue Plan: Dossier on Tourism and Sustainable Development in the Mediterranean. MAP Technical Report Series No. 159, UNEP/MAP, Athens, 2005.)

the same time would help control the access of tourists to biodiversity); provision of funds for the development or maintenance of sustainable practices and enhancing an understanding on the value (both use and non-use) of biodiversity and ecological services and hence build support for conservation action.

Promoting sustainable tourism as a leading economic sector is advocated as one of the seven priorities of fields of action that require progress to be achieved under the Mediterranean Strategy for Sustainable Development (MSSD)[81] which was adopted in 2005 within the context of Mediterranean Action Plan. The recently adopted National Strategy for Sustainable Development (NSSD) has raised a number of issues that need to be addressed in order to achieve sustainability and long term product development of the tourism industry in Malta.

Endeavours aimed at strengthening Malta's tourism industry in terms of competitiveness and offering innovative tourist products and services, have mainly focused on the diversification of the national tourism market, with the following marketing segments receiving particular attention: meetings, incentives, conferences and events business (MICE); leisure and tour-operating business; sports tourism; Gozo-based holidays; culture and heritage; English language learning, as well as other growth niche markets (including cruise and stay, film production, health and wellness, short breaks and vacation ownership). A number of other initiatives are being undertaken by the MTA in collaboration with other national organisations. Such initiatives encompass the heritage scene through restoration of historic buildings and other features of cultural interest; the rural scene involving for instance an assistance scheme for landscaping projects, and the issuance of booklets laying out a series of planned countryside walks for Malta and Gozo, as well as a branding exercise aiming at more effective marketing of Malta in the various tourism segments. Part of the latter branding exercise has involved a detailed questionnaire-based study - Malta Brand Survey - which contributed to determine the three core values of Malta's brand platform: *Heritage*, *Diversity* and *Hospitality*. There are also various ongoing activities of quality assurance. A noteworthy activity is the ongoing Eco-certification Scheme. This scheme encourages tourist accommodation establishments that are interested in reducing operational costs and their impact on the environment, apart from improving their image, '*to deliver a better product to meet the demand of the ever increasing environmentally aware tourist*.' In order to participate, hotels must comply with a number of criteria in the following 10 areas of assessment and that are all aimed at improving the hotels' environmental performance and increasing environmental awareness amongst employees:

- Environmental management systems
- Waste management
- Products and materials
- Energy use
- Water use
- Air quality
- Noise protection
- Buildings and green areas
- Local culture
- Guest information

[81] http://www.planbleu.org/publications/smdd_uk.pdf

Another scheme that is of particular relevance in linking nature protection and tourist-related activities, is the international voluntary Blue Flag certification scheme run by the Foundation for Environmental Education (FEE). This scheme has recently been adopted in Malta. Beaches and marinas achieve a Blue Flag status if they conform to the following criteria:

- Bathing water quality
- Environment protection and management (nature protection, waste separation, sewage treatment)
- Environment education and awareness
- Safety and services

Blue Flag International is represented by Nature Trust. To date the following beaches are Blue Flag certified: St George's Bay (St Julians – the first certified beach in 2007) and the perched beach in Qawra. Other beaches are currently engaged in the process of getting the Blue Flag Award. These beaches include Ramla Bay in *Xagħra* (Gozo) and l-*Għadira* Bay in Mellieħa. In this context the 2008 SOER reports the following: 'Although the trend towards improved beach management and Blue Flag certification can have positive environmental benefits related to safeguarding coastal ecological processes and resources, the focus on artificial beach creation and beach replenishment has still left some knowledge gaps as to their long-term ecological effects.'

Over the past few years, attention has increasingly been drawn towards the importance of sustainable tourism development. Sustainability in the tourism sector is advocated by national policy including the National Strategy for Sustainable Development. The National Strategic Reference Framework 2007-2013 encompasses initiatives to sustain the tourism industry and promote culture under the strategic direction "Sustaining a growing, knowledge-based, competitive economy".

The Tourism Policy for the Maltese Islands (2007-2011) has been developed in response to four key areas: governance, competitiveness, sustainability and macroeconomic matters. It puts forward the guiding principles as a basis for future decisions, actions and other matters related to tourism in Malta. The accompanying Tourism Plan outlines a series of actions that are to be implemented mainly by the government and the private sector over a five year period in order to drive forth the achievement of the objectives set out in the Tourism Policy. The latter promotes sustainable tourism with a view to ensure an improved quality of life through the conservation and maintenance of environmental and socio-cultural resources. It does this by incorporating a number of central priority areas which include *inter alia*:

- Providing direction to the tourism industry and implementing better regulation initiatives;
- Deepening the tourism offer focusing on the existing product elements and on those activities which improve quality and service provision;
- Favouring construction for tourism purposes that respects the cultural and natural heritage;
- Developing synergies between tourism and other development sectors, ensure an integration of tourism policies within the other development sectors' policies and plans, and vice versa;
- Incentivising local tourism business to operate and invest responsibly and sustainably;
- Improving the quality and depth of information available through tourism statistics;
- Managing tourism zones by ensuring that basic facilities are available, well preserved and maintained;
- Identifying the most important niches in the different zones and directing investment accordingly;
- Develop and implement a tourism zone management plan;
- Ensuring adherence to set standards by the tourism service providers and clamp down on practices which harm tourism (*e.g.* littering and illegal dumping, illegal hunting, vandalism, lack of maintenance);
- Taking initiatives which address the seasonality issue;

- Marketing Gozo as a unique rural destination; and
- Ensuring that all the initiatives and project development undertaken by the public sector and by the wider private sector in the tourism industry contribute towards the Sustainable Development Strategy for the Maltese Islands.

A number of salient tasks that are given continuous priority include *inter alia*:

- active participation in Agenda 21 for Tourism and European Tourism Sustainability Group;
- the continued carrying out of EIAs for major tourism projects;
- regular monitoring of tourism impacts on the environment;
- corrective measures to rectify damage;
- issuance of legislation on environmental management of construction sites;
- criteria for assessing public and private sector proposals;
- eco-certification of tourism service providers; and
- seeking ways of how tourism can benefit the environment (curbing illegal development, strengthened enforcement, encouraging participation of the private sector).

A series of measures targeting beaches, coastal shores and the marine environment are established under the theme "Our product offer and destination management" as well as measures targeting the landscape (protecting and managing rural areas, afforestation projects). Of these, the following are mentioned hereunder:

- Action 8.1 - Managing existing and new beaches;
- Action 8.12 – Working towards blue flag status for all prime exiting and new beaches;
- Action 8.17 – Undertaking anti-pollution measures particularly by eliminating the outflow of sewage into the sea through waste water treatment plants;
- Action 8.20 – Designating marine protected areas and ensuring their management and protection (2009);
- Action 8.21 – Increasing tourists' and locals' awareness about the fragility of marine environments (June 2007 and beyond);
- Action 8.33 – Increasing efforts to protect native flora and fauna (2007 and beyond);
- Action 8.35 – Implementing the tourism zone policy and taking actions accordingly, including the maintenance of such zones; and
- Action 8.39 – Encouraging afforestation projects which respect our natural environment including programmes such as the Tree4U campaign and other initiatives involving the private sector.

A tourism awareness campaign for children entitled in Maltese as "Apprezza", *i.e.* "appreciate" has been launched. It targets children and aims to increase their awareness on Malta's history, culture, heritage and natural environment. The Campaign aims to engage and educate young children towards a future in tourism by exposing them to its multifaceted nature. The campaign aims at achieving substantial results in the long run. It is understandable that what the project i setting out to achieve is in essence a cultural change which is not something that can happen overnight.

The Rural Development Plan for Malta (2007-2013) acknowledges the rural landscape as an important backdrop for tourism. Encouragement of tourism activities is included as an eligible measure (measure 313, alongside two other measures) under "Axis 3 – Improving the Quality Life in Rural areas and Diversification of the Rural Economy". This axis, through its three measures, aims to contribute to '*… the enhancement and rehabilitation of rural areas and landscape amenities that will provide the opportunities for diversification associated with tourism and informal*

recreation.' The legal basis for measure 313 stems from Article 55 of Council Regulation (EC) No. 1698/2005.

Since the mid-1990s, policy development at an EU level has been focusing on increasing the sustainability of tourism. Article 6 of the treaty establishing the European Community also requires the integration of environmental protection. Furthermore, there are several Community policies that have a positive significant effect on the various activities of the tourism sector (such as policy on integrated coastal zone management – ICZM, and environmental policy such as the Bathing Water Directive). European Community funding under the financial perspective 2007-2013 (such as ERDF and EAFRD) also provides support for measures targeting sustainable tourism development. Under the financial support of the European Regional Development Fund a €10 million Grant Scheme is available for Sustainable Tourism Projects undertaken by tourism enterprises in Malta. This scheme is managed by the Tourism and Sustainable Development Unit within the Ministry for Tourism, Culture and the Environment. To be eligible for funding projects must not only strengthen Malta's competitive advantage in tourism, but must also increase good environmental practice by these enterprises. The rural tourism project entitled "Malta Goes Rural: Sustaining Rural Tourism" for instance, has been submitted by the Malta Tourism Authority under the European Agricultural Fund for Rural Development (2007-2013). This project was submitted by the MTA during May 2009 and currently awaits approval by the Managing Authority. The project aims to strengthen the rural tourism offer whilst diversifying the rural tourism product; it seeks to achieve an effective reduction in the seasonality problem of tourism demand and shall contribute towards fairer distribution of tourism generated income.

The EU Action Plan to 2010 and Beyond adopted by the European Commission in 2006 (annexed to COM/2006/216) required Member States from 2006 onwards to integrate concerns for biodiversity and ecosystem services, given their economic importance in terms of jobs and growth for some sectors such as tourism, into Lisbon National Reform Programmes and the development of policies and budgets under these NRPs (Action B.2.2.1). This action falls under the target: 'New policies benefit biodiversity and ecosystem services, and their negative impact on biodiversity and ecosystem services prevented or minimised, from 2006 onwards.' The CBD addresses "Tourism and Biodiversity" as a cross-cutting issue and various relevant decisions that look into the relationship between tourism and biodiversity have been adopted by its Conference of the Parties (COP) taking into account of recommendations put forward by SBSTTA. Moreover the CBD Programme of Work on Island Biodiversity (annexed to Decision VIII/I) advocates the promotion of the implementation of sustainable tourism best practices appropriate to islands, based on the rationale that 'many island economies are based on tourism'. An assessment of the interlinkages between biodiversity and tourism was endorsed at COP5 (annexed to Decision V/25). This assessment looked into the economic importance of tourism and its interrelationship with the conservation and sustainable use of biological diversity, as well as the potential impacts of tourism on biological diversity, including economic, social and environmental impacts. Several guidelines have also been published by the Secretariat of the CBD. The EU Action Plan to 2010 and Beyond requires Member States to promote, adopt and implement the CBD Guidelines on Sustainable Tourism (vide Action A.4.4.1) with the overall target of achieving a significant increase in proportion of tourism which is ecologically sustainable by 2010 and again by 2013.

4.8 Waste

Waste is clearly an environmental issue. Every time a rotten lettuce is thrown in the bin, a broken toy discarded, or industrial scrap carted away, resources are being used up. This all contributes to the environmental pressures on our planet. And once a product is thrown away, and becomes waste, a whole new set of impacts are involved in treating it.

Extract from "EU Waste Policy - The Story behind the Strategy"
European Commission

Household, industry and commercial practices, all contribute to the generation of waste. In line with EU standards, generated waste is divided into four principal categories: municipal waste; hazardous waste; construction and demolition waste; and, commercial and industrial waste. Fluctuating trends in waste generation in Malta are reported between 1996 and 2007 (NSO News Release 19 Jan 2009) in view of changes in waste management practices. As reported by the 2008 SOEI – WS2 Waste Generation – '*Between 2006 and 2007 municipal waste generated increased by 5%, to 265,947 tonnes, while commercial and industrial waste generated increased by 46% during the same period. Hazardous waste generated amounted to 53,600 tonnes in 2006, 97% of which was stored for export.*' Concerns over the increasing trends in waste generation are documented in the mid-term Review of the EU's 6th EAP, which states: '*The amount of waste continues to grow and the inability to break the link between economic growth and the environmental impacts of resource use, consumption and waste remains an essential concern.*' The highest recorded amount of generated solid waste in Malta was in 2004, when 3.2 million tonnes were deposited into treatment and disposal sites. The bulk of this waste was made up of non-hazardous mineral waste and debris, mainly composed of construction and demolition material and which amounted to 2,780,418.73 tonnes (see waste generation data accompanying the 2008 SOEI). The generation of waste in Malta increased by 93% in 2007, when compared to 1995; this is the highest growth in waste generation of the EU-27 recorded for that year as reported by EEA, 2009 (EEA Report 7/2009 - Diverting waste from landfill - Effectiveness of waste-management policies in the European Union; Figure 28). Illegal dumping is another concern; for instance in 2004, 20,000 tonnes of waste were dumped illegally.

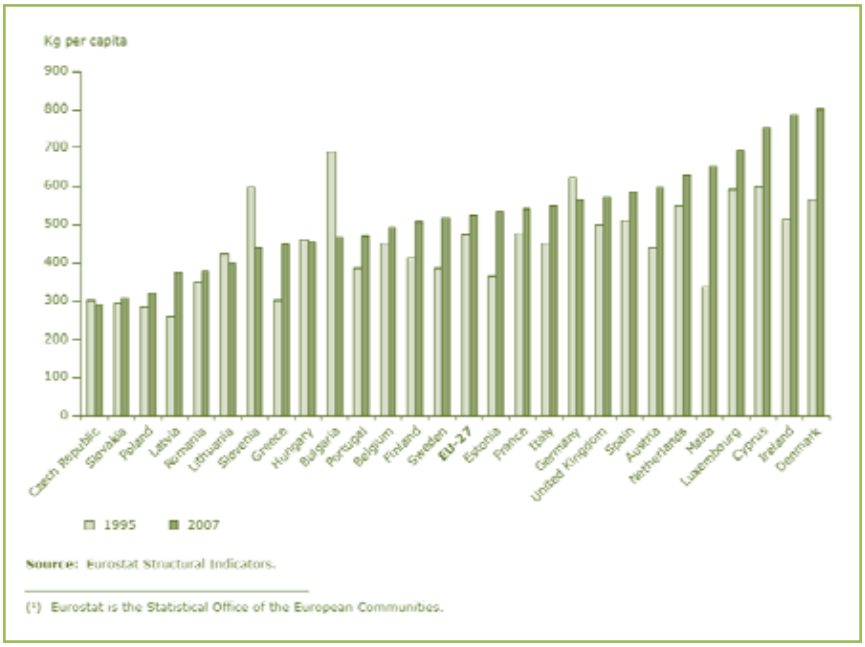

Figure 28 – Waste generation in the EU -27 (Source EEA Report 7/2009)

As noted in the Waste Management Subject Plan (Planning Authority, 2001), '*The nature and management of waste arising within the Maltese Islands are a reflection of the settlement patterns, type and distribution of industrial, commercial and agricultural activities, and the physical characteristics of the landscape*'. Increasing waste volumes is a significant concern not only because it reflects the inefficient use of natural resources with disruptions in ecosystems as mentioned earlier in Chapter 3 of the NBSAP, but also because it impacts health, society, the environment and the economy (Figure 29), especially when taking note of the significant costs to manage waste generation. Different ways of treating and disposing of waste can be potentially polluting and hence can also adversely affect the environment. Another way of viewing waste generation is from a business perspective in terms of job creation. The recycling of waste can also generate resources that are then used by the manufacturing industries, while energy can also be recovered from waste.

Figure 29 – Waste Generation Impacts

Sustainable waste management via waste prevention, re-use and recycling, can significantly benefit the environment, by for instance reducing GHG emissions and ensuring resource use efficiency. The "waste hierarchy principle", a guiding principle in waste policy, calls for waste prevention, re-use and recycling in descending order of priority, as desirable steps in dealing with waste (Figure 30, overleaf). Disposal in a land-fill is viewed as the most environmentally unfriendly way of dealing with waste. As noted by the 2008 SOER, '*At present, Malta's waste management practice depends relatively heavily on landfilling*' and '*In 2006, the majority (80 %) of this waste was landfilled, while the rest was recycled, stored, exported or dumped at sea*' (SOER 2008).

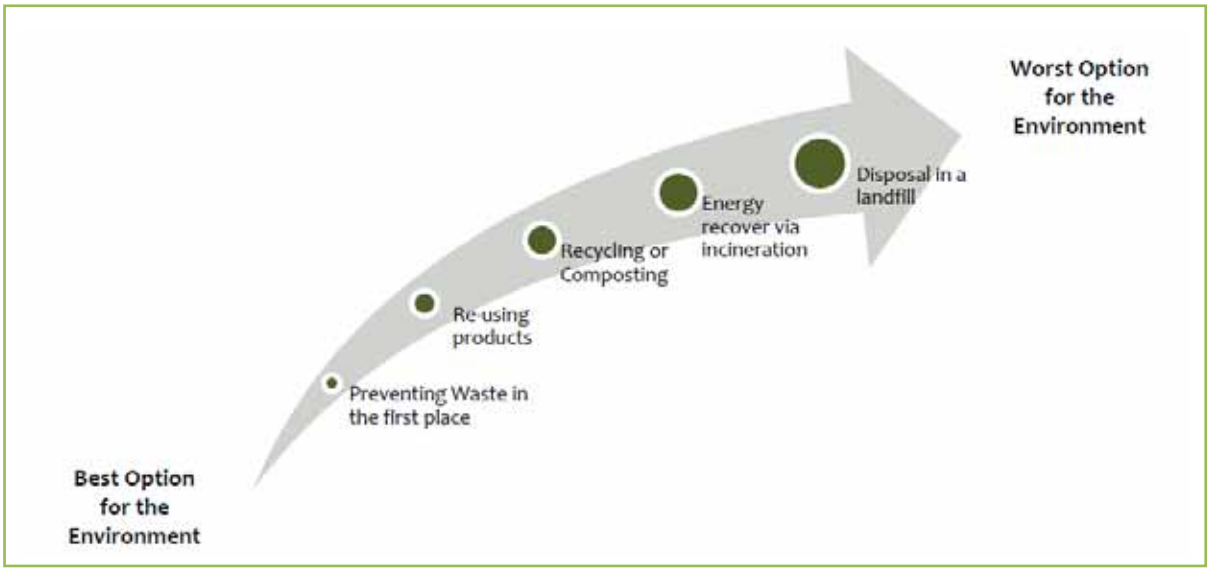

Figure 30 – The different steps in dealing with waste

The statutory and regulatory waste management functions on the Maltese Islands are divided between:

- the Ministry for Tourism, Culture and the Environment/Malta Environment and Planning Authority - Competent Authority regulating waste management (regulation of all waste management facilities and activities) in the Maltese Islands, and
- the Ministry for Resources and Rural Affairs/WasteServ Malta Ltd - responsible for organising, managing and operating integrated systems[82] for waste management.

MEPA is also responsible for the provision of planning guidance, issuing planning permits and requiring the carrying out of EIAs of those developments applications for waste management facilities that are likely to have a significant impact on the environment. Both entities also liaise with other governmental departments and Local Councils. The Waste Management Subject Plan, prepared in 2001 is built on the recognition that the effective management of waste is vital to ensure that environmental damage is minimised. It incorporates a "Code of Practice for the Operation of Waste Management Facilities" directed at operators to ensure that environmental impacts of waste handling, treatment and disposal operations are kept to a minimum and that all waste management facilities are operated in accordance with best current practice at all times.

Since EU accession, Malta has built a waste management regulatory regime based on the EU Waste Policy, which is in turn based on the objectives of preventing waste and promoting re-use, recycling and recovery so as to reduce the negative environmental impact. EU waste policy includes horizontal legislation on waste management, which is then complemented by more detailed legislation concerning waste treatment and disposal operations as well as legislation to regulate the management of specific waste streams. The long-term goal is for the EU to become a recycling society, which seeks to avoid waste, and uses waste as a resource. The Thematic Strategy on Waste Prevention and Recycling (COM/2005/666) provides the basis for future EU waste management policy. The revised Waste Framework Directive (Directive 2008/98/EC), which is transposed by the "Waste Regulations, 2011" (LN 184 of 2011), is an important stepping stone to help the EU move towards better management of material resources and improved resource

[82] These are systems for the minimisation, sorting, re-use, utilisation, recycling, treatment and disposal of solid and hazardous waste.

efficiency. It clarifies the basic concepts such as the waste hierarchy, the prevention of waste, and the incorporation of life-cycle thinking. The Directive lays down important targets for the recycling of waste for the year 2020: 50% for household waste recycling and 70% for construction and demolition waste. It also obliges operators of waste management facilities and other operators that engage in waste management activities to be permitted by the Competent Authority. In 2010, 15 operational permits were issued to Waste Management Facilities of which 11 were new permits and the remaining 4 were renewals.

Progress has been achieved nationally in setting-up waste management systems such as permitting, improved landfill management, and better enforcement (SOER 2005 – Key message delivered by the Sub-report on Waste). Up until 2003, all solid waste was discarded in the public landfills of *Magħtab* and *Qortin*. In March 2004, the three landfills at *Magħtab*, *Qortin* and *Wied Fulija* were closed. The phasing in of new sustainable waste management practices means that waste minimisation and separation tactics need to be introduced at various levels. EU funds have been secured to fund a project, which involves the control of aerial emissions and initial rehabilitation of the three largest landfills: *Magħtab*, *Qortin* and *Wied Fulija*. The Rehabilitation of *Magħtab* involves for example, the shifting of material within the landfill itself for the creation of stability and also to provide access for the installation of pipes and steel wells for the collection of gases at a depth of 12 metres. The end goal is the rehabilitation of *Magħtab* into a public recreational park, and will include the landscaping of the area, the capping of the entire landfill, the creation of a number of water reservoirs and ponds to cater for the irrigation of the entire area and a new access to the site.

Principal waste management facilities are those found at *Ta' Żwejra* (Malta's interim engineered facility)[83], *Għallis* (l/o Naxxar)[84] approved as the site for the development of a long-term engineered landfill facility and the *Sant' Antnin* Solid Waste Treatment Plant[85] (SASWTP - built in 1993). Changes in waste management practices over the years have included the diversion of non-hazardous mineral waste from public landfills to disused quarry sites, the disposal of the solid part of sludge and slurry following natural evaporation of the fluid component (in contrast to previous practices of disposing sludge and slurry in the liquid state) and waste separation. The Marsa Thermal Treatment Facility[86], inaugurated in December 2007, treats waste by incineration at high temperatures, thereby adding another essential contribution to waste treatment in Malta. Its aim is to provide a means by which Malta can dispose of all waste requiring treatment by incineration.

The absolute amount of waste going into landfill is now decreasing ever since inert waste is being diverted to spent quarries on a monthly basis. Between May 2003 and December 2007, over 6 million tonnes of construction waste was disposed of in approximately 19 quarries across the island, which were permitted for this activity and dedicated for public use. These quarries, which previously had a negative visual impact, have now been rehabilitated and are being used primarily for agricultural purposes. Also, since many of these quarries have their lower levels very close to the water table, by filling them with similar material to that originally extracted, the risk of contaminating the water table through other illegal uses of these cavities was eliminated (Source: Sustainable Waste Management for the Maltese Islands 5 Years of Achievements - WasteServ Malta Ltd. 2003 – 2008).

[83] http://www.wasteservmalta.com/facilities.aspx?id=118
[84] http://www.wasteservmalta.com/facilities.aspx?id=119
[85] http://www.wasteservmalta.com/facilities.aspx?id=120
[86] http://www.wasteservmalta.com/facilities.aspx?id=121

Malta has also benefited structural funds from the European Union to finance a nationwide waste separation project entitled "Establishing Civic Amenity and Bring-In Sites, a separate household waste collection and an integrated communications strategy". Bring-in sites were introduced in July 2003. Since then, WasteServ has established a network of bring-in sites (for the disposal of paper, plastic, metal and glass for recycling) and civic amenity sites (for the separate collection of bulky waste such as tyres, refrigerators, electronic products, waste from DIY activities and garden waste). By end 2007, 197 bring-in sites had been set up in various localities in Malta and Gozo, and the amount of material collected had risen by 24.6% between 2006 and 2007, from 2,255 to 2,810 tonnes (2007 SOEI – Indicator WS3). The bring-in sites consist of four containers: blue for plastic, white for paper, brown for glass and black for metal. Paper, paperboard and paper products constitute the largest waste type collected at bring-in sites. Currently there are in the region of 227 bring-in sites[87]. Materials from these bring-in sites are collected separately and taken to SASWTP where they are further sorted by hand and then sent for recycling.

Until the end of 2007, there were two Civic Amenity Sites in operation - one at the *Magħtab* Complex and another in *Mrieħel*. '*By end 2008, 4 (Magħtab, Mrieħel, Ħal Far and Luqa) out of the 5 civic amenity sites planned were operational. These centres received 23,318 tonnes of waste between December 2006 and December 2008*' (SOEI 2008). There are now 5 operational Civic Amenity Sites and are situated at *Magħtab*, *Mrieħel*, *Ħal Far*, *Luqa* and *Xewkija* (Gozo)[88]. The investment for the development of these facilities amounts to €1.63 million, while the cost of containers, equipment and vehicles used in these centres amounts to €3.3 million. This project is co-financed through the European Regional Development Fund (ERDF). A Materials Recovery Facility was also established to enable further sorting of recyclables.

The 2008 SOEI – WS4 Waste Recycled – reports that '*Between 2007 and 2008 recycling decreased by 13% to 5,317 tonnes, due to a drop in demand for recyclables, which is highly dependent on international markets. Tyres made up 39% by weight of all recycled waste in 2008, followed by paper and cardboard at 37%, while recycling of plastics increased almost threefold in the last year*'. Trends in recycling between 2002 and 2008 are shown depicted in Figure 31. WasteServ Malta Ltd. is also registering the recovery and utilisation of landfill gases from the *Ta' Żwejra* Engineered Landfill as the first Clean Development Mechanism (CDM) project in Malta. The gases collected will either be flared or used to generate electricity, and this depends on the percentage of methane present. This project will pave the way for more CDM projects in Malta.

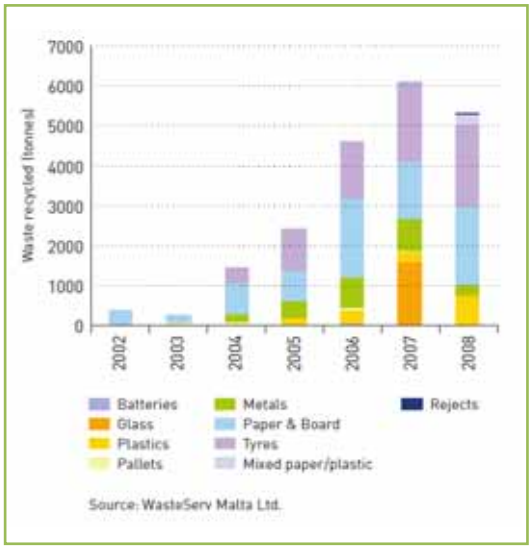

Figure 31 – Trends in Waste Recycling in Malta

In 2006, WasteServ participated in a twinning project with Germany with the aim of providing the technical assistance required by Malta to improve its national waste management competence in order to implement the National Waste Management Strategy (2001). The latter strategy provided a comprehensive overview of the principles, legal basis and changes that prevailed or required to be set up in order to deliver the required changes in this sector and to bring it up to European levels. The Strategy has set out the targets to be achieved over a period of years up to

[87] http://www.wasteservmalta.com/facilities.aspx?id=117
[88] http://www.wasteservmalta.com/facilities.aspx?id=116

2014. Three years after the publication of this Strategy and its adoption by Government, it has been decided to update the Strategy to reflect present day circumstances and technologies. The results of a Situation Audit of this Strategy were published in 2005. The audit provides an overview of the present scenario in relation to the Strategy, indicating key issues to be tackled. Out of the 57 initiatives assessed, the following findings are documented:

- 9 initiates have been completed;
- 4 initiatives are in progress;
- 34 initiates are in progress albeit late;
- no progress made in 5 initiatives ;
- no information on 3 initiatives;
- 1 initiative is on hold; and
- 1 initiative has been abandoned.

In Malta, the incorporation of sustainability principles in waste management policy is done through a process of strategic waste management planning, which includes the preparation of the National Solid Waste Management Strategy (WMS) for the Maltese Islands, which was under consultation in January 2009 and for which an Environment Report has been published. For key impacts of the draft WMS on the environmental receptor "biodiversity, flora and fauna", the Environment Report concludes that '[t]*he implementation of the Waste Hierarchy including waste minimisation and better hazardous waste management practices is expected to result in a general positive impact on the natural environment*.' The Report however also draws attention to the need to ensure careful site selection when developing new waste management facilities in order to reduce negative impacts.

Besides capacity-building and innovation, public cooperation is also pre-requisite for making progress in sustainable waste management in Malta. Extensive activities aimed at enhancing and promoting public awareness and action to minimise, manage and recycle waste have been undertaken by WasteServ. A children's TV programme about waste, called "Skart Raiders", and broadcasted in 2004 was met with great success. WasteServ also produced two radio programmes ("SkarTagħna" and "SOS Skart") aired on two local Radio Stations. In February 2005, the SkarTagħna radio programme was transformed into TV programme focusing on waste management and broadcast on a national TV station. More recently, a series of seventeen programmes entitled "*Mill-Ghatba 'l Barra*" was broadcast on a national TV station and focused on various aspects of waste management, ranging from the separation of waste in households, to the construction of an engineered landfill, and to the creation of art from recycled material. This same series has now been distributed to schools and Local Councils in order to serve as an educational tool. An information booklet on waste management has been published as part of an EU funded project. This informative booklet provides the general public with practical ways on how one can reduce the amount of household waste and on home composting, apart from re-using and recycling materials. Malta's waste awareness campaign also includes interactive and educational talks by WasteServ representatives to schools as well as to organisations, including MEPA. WasteServ, in cooperation with a Maltese youth singer, has also released a song entitled 'Waste Matters'. This song confers an educational message with regards to the environment and waste separation. WasteServ is also implementing a Battery Buster Campaign, which is being sponsored and supported by FIMBank plc. Initially targeted at school children, the campaign is extending its audience to supermarkets, shopping complexes and other centrally-located retail outlets in Malta and Gozo. The campaign encourages consumers to dispose of their used batteries in an environmentally sustainable manner, while at the same time they are participating in a prize-awarding competition. Around 200 schools in Malta and Gozo have also started to separate waste within their premises. Throughout the past years, WasteServ has also supported

EkoSkola by means of sponsorship. An example of collaboration between schools and WasteServ is the "Waste Patrollers Initiative". This communications activity entailed the patrolling of bring-in sites in various localities by primary school children. Apart from guarding the area, the children were also actively involved in the assistance of the public when they visited the sites to separate waste.

4.9 Water

> Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such.
>
> (Preamble to the EU Water Framework Directive – 2000/60/EC)

Water, which makes up the earth's hydrosphere, is a primary resource upon which all life on earth, including man, essentially depends for survival (and development). Yet, only some 2.5% of all the water on earth is actually freshwater and not necessarily accessible. Water resources vary, in terms of availability, both spatially (across geographic regions) and temporally (inter- and intra-seasonally, and inter-annually). The multi-sectoral nature of water use by man is reflected by the basic water requirements of many different sectors (*e.g.* domestic, tourism, agriculture, recreation, industry, fisheries, and aquaculture). Water is used for instance for irrigating crops, as a medium for fish farming, as a medium for shipping, for basic human needs (provision of drinking water, for food production and for general sanitation and hygiene purposes) and for bathing as well as other forms of recreation. Deterioration of the quantitative and qualitative status of such resources, including seawater, would negatively impinge on the Maltese community, the environment, the economy and in the end the sustainable development of the country.

Water-related issues (together with other environmental issues) are interlinked with biodiversity concerns, and degradation of ecosystem services, including water provision and regulation. Man's actions for development poses a significant pressure on such services and related ecosystems as highlighted by the Communication on Halting the Loss of Biodiversity by 2010 – and Beyond (COM/2006/216). The latter integrates water-related measures of action in the 2010 EU Biodiversity Action Plan under Policy Area 1, calling for:

- substantial progress towards 'good ecological status' of freshwaters by 2010 and further substantial progress by 2013;
- substantial reduction of principal pollutant pressures on (terrestrial and) freshwater biodiversity by 2010, and again by 2013;
- the setting up and design of flood risk management plans in such a way as to prevent and minimise biodiversity loss and optimise biodiversity gains, by 2015.

More recently, the EU Biodiversity Strategy for 2020 calls for as an action under target 1, the further integration of species and habitats protection and management requirements into key (land and) water use policies, both within and beyond Natura 2000 areas.

In Malta, the management of all practices, operations and activities relating to groundwaters and flood waters is entrusted to the Malta Resources Authority (MRA) established through the "Malta Resources Authority Act, 2000". Activities carried out annually by this authority are documented in their published annual reports. MEPA on the other hand is responsible for the management of coastal waters, transitional waters, and inland surface waters in scheduled and/or protected areas. The production and distribution of potable water is under the responsibility of

the Water Services Corporation (WSC) established by the "Water Services Corporation Act, 1991". Activities carried out by this corporation are also annually reported. An annual water production of around 31,000,000 cubic metres is documented by the WSC. An estimated breakdown of water production by sector (MRA Annual Report 2002-2003) is given in Figure 32, which shows that the greatest water production is through desalinisation by the WSC, followed by groundwater abstraction also by the WSC. Although the major source of potable water comes from desalination from three reverse osmosis plants located across the Islands, Malta also heavily relies on groundwater supply from aquifers, which are tapped both by private entities and by the WSC. Looking at water production and supply between 2002 and 2007 (NSO, 2008) reveals that on average 54.88% was generated by desalination plants while 45.12% of all water production in Malta came from groundwater. MRA (Annual Report 2003-2004) provide a breakdown of estimated full water demand from various economic sectors, that is, consumption of billed water, ground water abstraction, private desalinisation and rainwater harvesting. The agriculture sector is the major user of water resources in Malta followed by the domestic sector. More recent figures on water demand also reiterate the major consumption of biller WSC water by households, agriculture and industry (see SOEI 2008 – W1 Billed Water Consumption by Sector).

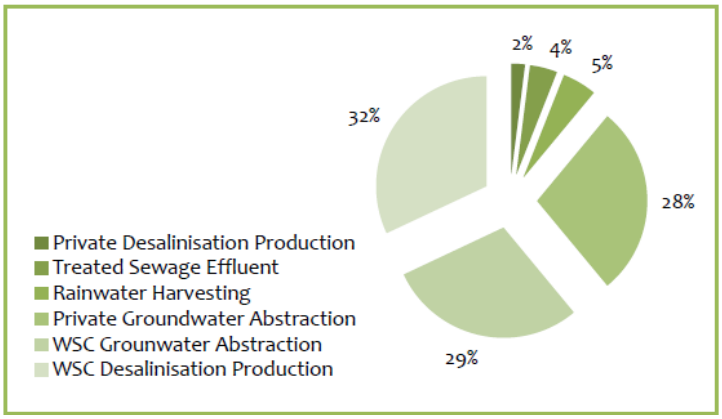

Figure 32 - Water Production by Sector (MRA, 2003)

4.9.1 Freshwater Quality with a Focus on Groundwaters[89]

Freshwater (including groundwater) is a finite but valued natural resource as well as a social and an economic good. Access to a sufficient amount of good-quality water is essential for both human and ecosystem health. In turn, productive inland water ecosystems provide a range of ecological services to people. In Malta, freshwater essentially occurs either as surface water (stored in surface springs, and temporary or permanent freshwater pools) or as groundwater (stored as soil moisture or in aquifers). Freshwater is naturally scarce in Malta. Precipitation (*e.g.* rainfall, which is in turn dependent on evaporation from the ocean) is the main source of water for use by the natural environment and, hence by man. However, total annual rainfall fluctuates from year to year, and hence exhibits quite an irregular pattern. Annual rainfall has averaged at 466.10 mm over a fifteen year span (1990 to 2005) (NSO, 2006). When compared to other Mediterranean countries, Malta has the lowest natural water resource per capita (less than 100 m^3 per year per inhabitant) and is hence considered below the extreme poverty threshold of 500 m^3 per year per inhabitant (MED-EUWI WG on Groundwater, 2007). The scarcity of freshwater in Malta, '*… is attributed to the local hydro-climatological conditions including low rainfall, relatively long dry season, small surface area, topographic relief and the characteristics of the aquifers*' (Sammut, 2002)[90]. Other factors that contribute to the water scarcity in Malta are the high population density and increased economic activity, and overall alteration of the national water

[89] Further Reading: EEA's 10 Messages for 2010 – Freshwater Ecosystems

[90] Sammut (2002): Section 5.4: Freshwater Resources. In: Axiak & Sammut (2002). The Coast and Freshwater Resources. In: *State of the Environment Report for Malta, 2002.*

balance. Man can interfere with particular stages of the water cycle (as well as sediment related processes), for instance:

- by affecting the amount of precipitation that actually reaches the soil/ground, *i.e.* water interception, by for instance paving the ground with impermeable material and built up areas in general. This in turn will affect the amount of water that reaches aquifers *i.e.* ground water recharge not to mention soil moisture recharge;
- through alteration of surface runoff and interflow patterns brought about as a consequence of structural modifications such as chanellisation of water channels and by paving of ground as above;
- through other changes in land use such as urbanisation and agriculture, and associated nutrient and chemical inputs that impinge on water quality as a result of pollution (whether point source or diffuse).

Higher demands and increased competition impinge over the limited freshwater resource. Demand is highest in the summer period whence it is tapped both by the Maltese as well as by the increased number of tourists visiting the islands during that time of the year. From a water quality and human environmental health perspective, the control of both chemical and biological pollution is crucial, and is also imperative for protecting ecosystems and biodiversity. This applies to both surface and groundwater quality. The two principal pressures on Malta's freshwater resources are the over-abstraction of groundwater and water pollution, namely by nitrates and chlorides. Groundwater in Malta is exploited via a system of galleries and boreholes of Maltese aquifers (Figure 33, overleaf). These are recharged entirely by rainfall. Two types of aquifers are found on the islands:

- Perched Aquifer – lies in the western and north western regions of the island, and is located above the blue clay layer and effectively sustains the small temporary springs in the main watercourses; primarily exploited for irrigation; in the northern part of Malta, this aquifer is in direct contact with seawater.
- Mean Sea Level Aquifer (MSLA) – situated in the lower coralline limestone layer and is the main freshwater body for the Maltese Islands, covering about 70% of the territory. This freshwater lens floats on saline water because of its lighter density; in this respect, this type of aquifer is in direct contact with seawater making it highly prone to the intrusion of saline waters through natural diffusion processes and also in response to pumping activities; a network of sea level galleries and deep boreholes extract water from this aquifer.

Such aquifers are under threat from over-abstraction from boreholes. Perched aquifers are more vulnerable to chemical pollution in view of direct seepage of water and, and the majority of these aquifers are deemed to be overexploited in the Maltese Islands. Overexploitation of groundwater occurs when abstraction exceeds the recharge rate of aquifers and can lead to saltwater intrusion resulting in the deteriorating groundwater quality. A review of the impacts of groundwater demand is given by Gatt (2004)[91].

[91] Gatt, K. (2004). Quantifying Water Consumption as a Basis for Determining its Impact on Groundwater Resources in the Maltese Islands. Draft FAO Commissioned Report. 34pp.

Figure 33 - Bodies of Groundwater and their distribution within the Maltese WCD Water - MRA ©

Looking next at the sources of water pollution, these are numerous, and their effects vary depending on the severity of the pollution source and its location. MRA's Annual Report 2003-2004 documented the groundwater chemical status by assessing the chloride concentration and nitrate concentration of groundwater abstracted from lower coralline limestone (LCL) and upper coralline limestone (UCL) aquifers in 2003. Severe salinisation of groundwater abstracted from several boreholes and also from certain pumping stations in the LCL is reported, reaching up to 1000mg/l. On the other hand, the principal sources of nitrates in groundwater are waste from animal husbandry units and the excessive use of nitrogenous fertilizers (SOER 2008). The bulk of groundwater abstracted from boreholes and pumping stations in the LCL falls in the 50-100mg nitrate/l range whereas as regards groundwater abstracted from the UCL, sampled groundwater predominantly contains very high levels of nitrate reaching up to 1000mg/l. MRA's Annual Report 2006-2007 documents an increasing trend in nitrate concentrations in groundwater: '*Average nitrate concentrations are often exceeding the 50mg/l Groundwater Quality Standard, with values as high as five times this value being reported in the perched aquifer systems.*' The Directorate for Water Resources Regulation actively monitors the practices related to resource development aiming at improving the qualitative and quantitative status of all groundwater bodies as a renewable source of freshwater. Monitoring of nitrate levels between 2002 and 2007 mainly focused on the three groundwater bodies utilised for the abstraction of drinking water, with available data mostly relating to sea-level groundwater bodies which discharge groundwater directly to the sea (*i.e.* they do not feed any surface springs, which could sustain terrestrial ecosystems). The 2008 SOEI - W2 – Nitrate Levels at WSC Pumping Stations - documents that

'*Nitrate values in two thirds of WSC pumping stations exceeded the EU limit value of 50mg/l in 2007, although nitrate concentrations declined marginally between 2000 and 2007 (by 0.6mg/l)*'.

In 2009, groundwater monitoring networks have been expanded to cover all groundwater bodies in the islands, including all the perched groundwater bodies, as part of the implementation of the Water Framework Directive (addressed below). More recent data covering the period 2009/2010 indicates that all these water bodies still show high nitrate content (well in excess of the 50mg/l limit) .

Groundwater quality has a direct impact on the quality of surface waters as well as on associated aquatic and terrestrial ecosystems. This importance of safeguarding groundwater resources is advocated by the Ramsar Convention on the protection of wetlands, and including guidance thereto (*e.g.* Ramsar Handbook 9)[92].

Over-abstraction of aquifers in the Maltese Islands is a burgeoning concern as evidenced by one of the key messages delivered by Malta's SOER 2005. The latter documents that groundwater reserves are severely threatened by overexploitation, not to mention pollution. This concern is also mirrored in Malta's National Strategy for Sustainable Development, which in turn recommends that: '*Information on and awareness of the importance of groundwater and the risks posed to its integrity by over-exploitation and pollution need to be more widely disseminated. The "polluter pays principle", as well as the EU Environmental Liability Directive provisions, need to be more extensively used and enforced*'.

National policy on addressing groundwater over-abstraction and pollution is essentially modelled on the requirements of the water-related EU directives including *inter alia* the following:

- Surface Water Abstraction Directive (75/440/EEC) - transposed by the "Quality required of Surface Water intended for the Abstraction of Drinking Water Regulations, 2001 (LN 339 of 2001 as amended by LN 426 of 2007);
- Dangerous Substances Directive (76/464/EEC) – transposed by the "Pollution Caused by Certain Dangerous Substances Discharged Into the Aquatic Environment Regulations, 2001" (LN 213 of 2001) and the "Regulations for the Protection of Groundwater against Pollution caused by Certain Dangerous Substances, 2002" (LN 203 of 2002);
- Nitrates Directive[93] (91/676/EEC) - transposed by the "Protection of Waters against Pollution Caused by Nitrates from Agricultural Sources Regulations, 2001" (LN 343 of 2001 as amended by LN 233 of 2004 and LN 426 of 2007) and the "Nitrates Action Programme Regulations, 2011" (LN 321 of 2011); and
- Groundwater Directive (2006/118/EC) – transposed by the "Protection of Groundwater against Pollution and Deterioration Regulations, 2009" (LN 108 of 2009).

All of Malta is designated as a nitrate vulnerable zone (NVZ) through an amendment to Subsidiary Legislation 435.40 of the Laws of Malta by LN 233 of 2004. A 50mg/l limit value has been set in the Nitrates Directive concerning nitrates in groundwater. The competent authority for the Nitrates Directive is MEPA however the implementation measures of the Directive are entrusted to three entities in Malta. MEPA is responsible for surface water monitoring while MRA is the agency responsible for groundwater monitoring and regulation. The coastal and inland surface nitrates monitoring programme commenced in 2005 and continued intermittently through 2008. A total of 26 coastal and 12 inland surface water monitoring stations were selected.

[92] *Managing groundwater: Guidelines for the management of groundwater to maintain wetland ecological character* - Ramsar Convention Secretariat, 2007

[93] See also Factsheet on the EU Nitrates Directive – January 2010

Various departments under the Ministry for Resources and Rural Affairs (MRRA) are responsible for the CoGAP and the Nitrates Action Programme. Since the whole of Malta is designated a NVZ, the Action Programme is obligatory for all farmers on the islands. The first Nitrates Action Programme was implemented through the Rural Development Plan for 2004-2006 and the current RDP (2007-2013) and essentially was derived from measures included within the CoGAP. A second Nitrates Action Programme is currently under consultation, and in light of lessons learnt from the implementation of the first Nitrates Action Programme, it focuses on the prevention of future pollution with nitrates by agriculture, particularly on reduction of nitrogen fertilisers and the elimination of pollution from "hot spots". The main requirements of the revised Action Programme include measures relating to periods when the land application of certain types of fertilisers is prohibited; the capacity of storage vessels for livestock manure; design details of storage clamps and cesspits; record keeping of manure transport; on-site slurry management, as well as disposal and measures relating to the limitation and application procedures of the land application of fertilisers. The implementation of the Nitrates Directive in Malta from accession to date is summarised in the reporting document required by Article 10 of the Directive and submitted to the EU in 2008[94]. '*As at today, only 50% of farm holdings are subject to the monitoring and enforcement procedures, required by Cross-Compliance regulations related to the Nitrates Directive*' (Source Nitrates Action Programme 2010).

Malta is currently in the process of developing a threshold value for chlorides in groundwaters as per the obligations of the Groundwater Directive (SOER 2008). Other legislation has been enacted that addresses unauthorised drilling and abstraction:

- "Notification of Groundwater Sources Regulations, 2008" (LN 254 of 2008 - as amended by LN 274 of 2008) , and
- "Borehole Drilling and Excavation Works within the Saturated Zone Regulations, 2008" (LN 255 of 2008) - Regulation 4 states: '*The drilling of a borehole or any form of excavation works carried out partly or totally within the saturated zone is prohibited, unless a permit to this effect is issued by the Authority.*'

'*Solving over-abstraction problems will require reducing groundwater abstraction by different sectors - either by increasing water use efficiency or procuring alternative sources of water such as treated sewage effluents and rainwater*' (MRA Annual Report 2006-2007). An EU-Funded Twinning Light Project - Development of Programme of Measures in Maltese Water Catchment District was implemented in 2007. The project focused on groundwater resources and aimed at identifying the least cost option for restoring the status of groundwater resources in line with the requirements of the Water Framework Directive (addressed below). This project involved a number of tasks:

- Task 1 – Identification of the main water management issues
- Task 2 - Risk-assessment for inland water bodies (those falling under the responsibility of MRA)
- Task 3 – List and quantification of basic measures
- Task 4 – List and quantification of potential supplementary measures
- Task 5 – Programme of measures draft framework
- Task 6 – Cost assessment
- Task 7 – Efficiency assessment
- Task 8 – Cost-effectiveness analysis
- Task 9 – Draft programme of measures

[94] See Report from the Commission on implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2004-2007 COM(2010)47 final

The Directorate for Water Resources Regulation has developed a new database system using proprietary software *Hydrogeoanalyst* which combines point data with GIS (spatial) data. It is envisaged that this data management tool will facilitate the determination and visualisation of the chemical status of the aquifers. MRA have also participated in a number of EU-funded projects amongst which one can mention the Interreg III B Archimed Funded Project - PRODIM – Proactive Management of Water Systems to face drought and water scarcity in islands and coastal areas of the Mediterranean, and the Interreg III A Funded Project INWATERMAN - Sustainable management of water resources in an arid and semi-arid insular context and the use of treated sewage effluent.

With the support of FAO, MRA has been undertaking other studies and consultations to articulate a national water policy and formulate a suite of water-related regulations. A Malta Water Resources Review was carried out with the purpose of *inter alia* assessing the current status of water resources and evaluating the demand trends of different sectors. This review shows that, although the demand for groundwater is outstripping supply, there is scope to reverse current trends. In fact this report lists 20 practical options and opportunities for improving the sustainable management of Malta's water resources. Studies undertaken as part of the water resources review indicate that an effective water policy will require:

- improved governance;
- improved awareness;
- staged and adaptive implementation;
- demand management;
- supply augmentation;
- the ensuring of equity and justice; and
- targeted interventions.

It is suggested that a water policy should aim to achieve the following vision by 2015:

- levels of water use regulated according to sustainable abstraction levels;
- aquifers restored to a status that represents a strategic reserve;
- water quality of all aquifers restored to within permissible limits;
- widespread use of local and decentralised solutions (*e.g.* rainwater cisterns, grey water recycling, and pollution control); and
- high levels of collective responsibility for managing and protecting Malta's water resources.

Subsequently MRA has drafted a "Water Policy for the Future", which focuses on three main strategic objectives: the efficiency in water use and maximisation of benefits; the fair allocation of water resources across different sectors and, environmental sustainability. This Policy identifies ten key areas, with accompanying strategic measures. The key areas are:

- Supply of good quality water for human consumption;
- Sustainable groundwater use;
- Reduction and management of flood-risk;
- Rainwater harvesting;
- Use of non-conventional sources;
- Water demand management;
- Effective and transparent regulation of the water industry;
- Protection of freshwater ecosystems;
- Efficient fair and equitable pricing; and
- Public participation and stakeholder involvement.

4.9.2 Coastal and Marine Water Quality[95]

There are inexorable linkages between the freshwater environment and the coastal and marine environment due to interrelated processes that occur in the hydrological cycle. Land-based activities may adversely affect both the coastal and marine environment. Nutrients as well as pollutants are carried from inland water and other terrestrial ecosystems down to the coastal and the marine environment through water flow. In recognition of such risks being posed to the marine environment from adverse effects such as leaching of chemicals and dumping of waste, the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) was adopted in 1995. This GPA is an inter-governmental programme which addresses nine land-based threats to the marine environment, namely sewage, persistent organic pollutants (POPs), radioactive substances, heavy metals, oils (hydrocarbons), nutrients, sediment mobilisation, marine litter and the physical alteration and destruction of habitats. This programme acknowledges the interlinkages between freshwater and the marine environment.

The GPA is required to be translated into National Programmes of Action (NPAs) in order to protect the marine environment from land-based activities on a national level. As a contracting party to the Barcelona Convention, Malta signed and ratified the revised Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities (LBS Protocol), which covers watersheds on the landward side of the Mediterranean. The whole of Malta falls within the remit of this LBS protocol. Within the framework of the Strategic Action Programme (SAP) to address pollution from land-based activities, Malta formulated its "National Action Plan for the Protection of the Marine Environment from Land-Based Activities". The designated national authority for the coordination of this task is the Environment Protection Directorate within MEPA. One key objective for this action plan is to eliminate by the year 2025, discharges of contaminants from point sources, in conformity with the LBS Protocol. In order to be in a position to assess such progress, the first phase in the formulation of the NAP was to prepare a "National Baseline Budget" (BB) of emissions and/or releases for the targeted pollutants. The base year for this inventory of emissions or releases is the year 2003. In order to be in a position to compile the BB, A "National Diagnostic Analysis" (NDA) with baseline date relating to 2003, was previously carried out in 2004 on the basis of existing information. This NDA identifies and assesses national conditions, the nature and severity of problems, contaminants and their sources, physical alterations and degradation of habitats, sources of degradation, as well as geographical areas of concern. The inventory and the NDA served as the basis for the elaboration of the NAP. Malta's goals under this NAP are:

- To protect human health;
- To reduce the degradation of the marine environment;
- To remediate degraded areas;
- To promote the conservation and sustainable use of coastal and marine resources; and
- To maintain the productive capacity and biodiversity of the marine environment.

This NAP should serve as a national strategic tool to secure a more collaborative approach in implementing the shared responsibilities of those entities having jurisdiction on aspects affecting the protection of the coastal areas and the marine environment.

[95] Further Reading: EEA's 10 Messages for 2010 – Marine Ecosystems

It is noteworthy that apart from the designation of the nitrate vulnerable zone (addressed under Section 4.9.1), Malta has also designated 8 nutrient sensitive protected areas in line with the Urban Waste Water Treatment Directive (Council Directive 91/271/EEC as amended by 98/15/EC; transposed by the "Urban Waste Water Treatment Regulations, 2001" - LN 340 of 2001, as amended), which aims protect the environment from the adverse effects of sewage discharges from urban and industrial conglomerates. This Directive obliges member states to achieve emission standards for discharges to these areas within seven years of the designation of that area, which in the case of Malta is by 2012.

An initiative that merits mention here is the Euro-Mediterranean 'Horizon 2020' initiative through which Euro-Mediterranean governments aim to de-pollute the Mediterranean by 2020. This umbrella initiative covers four elements, one of which comprises investment projects intended to reduce the most significant pollution sources focussing on industrial emissions, municipal waste and urban waste water, responsible for up to 80% of pollution in the Mediterranean Sea. A review of the first phase of development (2006-2009) is available and reports that '*Of the 27 actions agreed for the current period all can be considered as underway (17 actions) or completed (10 actions). It should be underlined that this is only the first phase of the initiative. It still has 11 years to run.*'

In the maritime sector, the recent adoption of the third Maritime Safety Package, will contribute towards improving the effectiveness of existing measures to prevent accidents and on the management of their consequences. From the aspects of prevention, EU Member States are required to control that ships flying their flags effectively respect standards adopted by the International Maritime Organisation (IMO).

4.9.3 Bathing Waters

Another water-related issue of relevance to human health is the quality of bathing waters which encompass both fresh waters or parts thereof and seawater in which bathing is explicitly authorised. In Malta, bathing waters are those intended for recreational use by the public along the Maltese coastline, with 36 coastal bathing areas identified around the Maltese Islands. In this respect, bathing water quality is also key indicator of coastal water quality. EU Member States, including Malta, are required to ensure that the bathing waters comply with mandatory values established by the Bathing Water Directive (76/160/EEC, until 2014) and the new Bathing Water Directive (2006/7/EC), which have been transposed by the "Quality of Bathing Water Regulations, 2003" (LN 380 of 2003) and the "Management of Bathing Water Quality Regulations, 2008" (LN 125 of 2008). A bathing water monitoring programme is carried out jointly between the Health Inspectorate Services through the Environmental Health Unit within the Department for Environmental Health (DEH) (which carries out monitoring of microbiological parameters) and the Environment Protection Directorate within MEPA (which carries out monitoring of physico-chemical parameters). The total number of monitoring points for bathing waters is 86.

According to the Bathing Waters report for the 2007 season, 95.4% of Malta's coastal waters met minimum standards and 89.7% met guideline standards. These compare with 99.6% that met minimum standards and 83.9% that met guideline standards in the 2006 season. Four bathing waters were listed as "not complying" in the 2007 season. MEPA commissions regular monitoring of coastal water quality. A report in 2005 however notes that more frequent monitoring at a larger number of sites would be necessary to assess marine water quality particularly from developments (*e.g.* fish farming). The 2008 SOEI – CM1 Bathing Water Quality – reports that

'[w]*hile in 2007, 5% of bathing sites were non-compliant with mandatory EU values, only 1% was non-compliant in 2008.*'

4.9.4 Integrated Water Management

The previous sections have shown that man can affect both water quality and quantity, especially when realising that land use management is closely linked with water management. Issues related to the use and conservation of water resources, types of land use, the treatment and re-use of sewage and waste-water, as well as flood management all have a direct impact on biodiversity, and terrestrial and aquatic ecosystems. The need for sustainable actions addressing these issues in an integrated manner has been recognised on a national and EU level. Malta's National Strategy for Sustainable Development also underlines the crucial importance of integrated management of water resources at a water catchment level. Having said this, water management still remains one of those areas where Malta is facing growing pressures and threats by anthropogenic forces (and natural variability) as reported by the 2008 SOER. Such pressures and threats to water security are further exacerbated by the uncertain nature of the multi-faceted effects of climate change on water availability and quality, and added pressures on biodiversity. This calls for improved and cost-effective water demand management by reducing wastage and increasing efficiency levels of water use as well as more effective water governance. The Directorate for Water Resources Regulation within MRA is focusing attention on the following three strategic policy areas with the objective of improving the sustainable management of water resources and ensuring more effective delivery of water services by putting good water governance into practice:

- Resource development, protection and control;
- Regulation of service providers; and
- Stakeholder consultation, public participation and data-base management.

At EU level, the Water Framework Directive (WFD – Directive 2000/60/EC amended by Directive 2008/105/EC) and the Marine Strategy Framework Directive (MSFD - Directive 2008/56/EC) are two very important water policy instruments that establish legal and holistic frameworks for protecting, and preventing further deterioration of waters based on the principles of integrated water resource management and the ecosystem-based approach. While the WFD applies to surface waters (rivers, lakes, transitional waters and coastal waters) and ground waters, the scope of the EU water policy is broadened further to marine waters by way of the MSFD. Both instruments make cross-reference to one another, and also to the Birds and Habitats Directives thereby linking water policy to nature policy. The WFD and MSFD use the terms "Good Ecological Status" and "Good Environmental Status", respectively, and both relate to the "Favourable Conservation Status" of the Nature Directives. Although the definitions are different and assess different aspects of biodiversity, the attainment of their respective environmental goals is mutually-supportive, since the maintenance or improvement of the status of waters is an important factor in the protection and maintenance of water-dependent ecosystems, water-related ecosystem services as well as the management of Natura 2000 sites, and *vice versa*.

4.9.4.1 Water Framework Directive (WFD)

The WFD[96] is transposed nationally by the "Water Policy Framework Regulations, 2004" (LN 194 of 2004, as amended by LN 24 of 2011), with administration entrusted to two designated national competent authorities – MRA and MEPA[97]. The recent amendment in the legislation transposes the requirements of Council Directive 2008/105/EC on environment quality standards (EQS) in the field of water policy, and Council Directive 2009/90/EC which lays down the technical specifications for chemical analysis and monitoring of water status. The WFD defines three types of objectives: "Good Ecological Status" in surface waters, "Good Chemical Status" for groundwater and surface waters, and "Good Quantitative Status" for groundwater bodies. The following timelines are set under the WFD:

- Achieving good status for all water bodies by 2015; and if this is not possible, aim to achieve good status by 2021 or 2027;
- The reduction and progressive removal of hazardous pollutants and priority substances into the aquatic environment within a 20 year time frame from the date of adoption of the WFD; and
- The achievement by 2015 of all objectives and compliance with relevant threshold values for areas that are protected under other European directives.

Bearing in mind that the conservation status of water-dependent species and habitats requires good water quality as well as the need to adequately conserve water bodies within protected areas, a national register is available of protected areas that are covered by the WFD in Malta. The register not only comprises areas designated for the protection of habitats or species but also includes waters used for the abstraction of drinking water, recreational waters and nutrient sensitive areas. The water register incorporates the following water-dependent protected habitat types:

- Habitats that occur entirely within surface water systems, such as watercourses (*e.g. Baħrija*, *Wied Il-Luq* and *Wied Lunzjata*) and standing water pools (*e.g. L-Għadira*);
- Habitats that depend on the frequent inundation of coastal waters, such as transitional marshlands and wetlands (*e.g. Is-Salini*, *Il-Magħluq ta' Marsascala* and *Il-Ballut ta' Marsaxlokk*), and
- Habitats that depend on a connection with percolating water, such as permanent freshwater pools (*Il-Qattara* and *L-Għadira ta' Sarraflu*).

The WFD is to be implemented at the river basin or water catchment scale. The Maltese Islands, including a one nautical mile buffer from the baseline, were designated as one water catchment district (equivalent to a River Basin District). Member States are required to draw up a "River Basin Management Plan" for each water catchment district within their territory. A number of different stages however need to be first considered in the WFD planning process to eventually lead to the formulation of this management plan. The stages include the characterisation of the water catchment, the development of a monitoring programme, the definition of environmental objectives, the development of a programme of measures, and the carrying out of an economic analysis. Progress by Malta in implementing some of these stages is detailed in the following paragraphs. In 2007, the EU Commission assessed progress by Member States in implementing the WFD (SEC/2007/363). With respect to Malta the following is documented:

[96] A Common Implementation Strategy for the WFD was also set up and aims to build common understanding and application amongst the MS as regards to the required measures and at what level they should be carried out in order to achieve common goals as set under this Directive.

[97] MEPA's portal on water presents a stakeholder map, which illustrates the various organizations /entities and the role they play in the implementation of the multifaceted WFD.

- The performance indicator for Malta as regards the implementation of the administrative set up was ~ 65% (with respect to Art. 3 of WFD);
- The performance indicator for Malta as regards the implementation of the environmental and economic analysis was again ~ 65% (with respect to Art. 5 of WFD); and
- The performance indicator for Malta as regards to its reporting performance was ~ 50%.

In 2005, Malta carried out its characterisation of both surface and groundwater bodies in compliance with Article 5 of the WFD, with the purpose of presenting the actual status of water bodies in the Maltese Islands along with the main pressures and impacts. With regards to surface waters the results of this characterisation assessment as conducted by MEPA, indicated that 8 out of the 29 surface water bodies are considered under the category: "Water bodies for which it is already relatively clear that the objectives will be failed (Water bodies at risk)". On the other hand, the characterisation assessment of groundwaters conducted by the MRA, indicated that all the bodies of groundwater in the Maltese water catchment district can be considered to be 'at risk' of failing to achieve the objectives of the WFD.

The WFD requires the establishment of a monitoring network or programme in order to assess the status of all water bodies and whether defined environmental objectives are being effectively achieved within the period 2009 to 2015. Three types of monitoring programmes or networks are required for all water bodies, each with a different goal: "surveillance monitoring" (background monitoring of a water body), "operational monitoring" (targets individual pressures or groups of pressures in water bodies and is required only in those water bodies that are considered to have a status less than the good status required by the Directive) and "investigative monitoring" (used to determine the magnitude and the impacts of accidental pollution). As regards surface water quality monitoring, a comprehensive monitoring network has been set up to cover physico-chemical, hydrological and biological parameters, with a total of 11 established surveillance and operational monitoring sites within the coastal waters of the Maltese Islands, with one to two monitoring sites per water body. The first cycle of surveillance and operational monitoring will be launched in 2011. For the inland surface waters identified by Malta in 2005, baseline studies will be carried out as a first step to accumulate enough data to enable the development of national monitoring programme in line with the objectives of the WFD. As regards groundwaters, different approaches for establishing monitoring networks have been adopted in the Maltese water catchment district, in order to take into consideration the relative importance of the groundwater bodies with particular reference to those water bodies which sustain freshwater ecosystems and those which are utilised as sources of water intended for human consumption (MRA Annual Report 2006-2007). As a result of the characterisation analysis, groundwater bodies in the Maltese Water Catchment District were grouped in seven agglomerations. In the sea-level groundwater bodies a monitoring density of one site per sixteen square kilometres was established, while in the perched groundwater bodies a minimum threshold of three monitoring points for each groundwater body grouping, with at least one monitoring point in each groundwater body was established. The groundwater monitoring strategy adopted in Malta envisages a six-year cycle starting with a surveillance monitoring exercise which is then complemented by five years of operational monitoring. The surveillance monitoring was carried out in 2009.

Article 11 of the WFD requires Member States to draw a programme of measures (PoM) such as to achieve good environmental status of all water bodies by 2015. Certain measures defined under Malta's PoM have been developed with the aim of safeguarding terrestrial and freshwater biodiversity. The measures aim at the ecological restoration of natural valleys and the restoration of hydraulic balances within surface water bodies. The PoM also aims at strengthening the

existing planning and environmental regulatory processes related to land and water use planning and management. Environmental policy integration is also another major aim. A preliminary analysis of the linkages between climate change and water was addressed through a climate checking exercise of the WFD Programme of Measures whereby each measure is climate checked. The aim was to climate proof measures in order to ensure the sustainability of investments over their lifetime taking an explicit account of a changing climate.

The implementation of the WFD will require effective enforcement of sustainable practices, strengthened cooperation between stakeholders, and integration of water policy with other policy areas especially those affecting land-use and economic development. As part of the process to develop Malta's Water Catchment management Plan, a questionnaire was prepared by MEPA and MRA. In their response, members of the public expressed their opinions and concerns on the way water is being managed in the Maltese Islands. Amongst trends that emerged, the following are noteworthy:

- Almost 30% of respondents said that their main concern was saving water, while 12% were mainly concerned about the issue of over-abstraction and the pollution of water;
- 29% of respondents would be willing to build a reservoir to reduce their water demand, while 27% thought it would be best to install water flow reducers; and
- 30% believed that government should increase water storage capacity, while over 20% believed that there should be increased controls over private groundwater abstractors.

Measures involved in implementing the WFD are subject to public consultation, and necessary reports developed through the implementation process are also publicly available. There has been a joint initiative between the MRA and MEPA to create a series of web pages on the WFD hosted on the MEPA website. Active participation is also being sought during the different stages of implementation of the WFD. Various bilateral and multilateral meetings, workshops and seminars are organised to promote participation targeting different levels of stakeholders.

The Water Catchment Management Plan for Malta (WCMP) was launched in 2010 for public consultation and subsequently finalised and published in March 2011. The preparation of this plan resulted in the revision of the water bodies designated in 2005 under the characterisation task based on consideration of updated information and better understanding of the WFD requirements. In terms of surface waters the WCMP designates 9 coastal water bodies, classified into 4 different types defined by the predominant physical characteristics of the water mass, namely exposure, water depth and predominant currents, and 15 groundwater bodies. The WCMC provides detail on the monitoring programmes established by Malta for surface waters and groundwaters and defines the environmental objectives for each designated water body and what basic and supplementary measures are needed to achieve them as part of the POM. These measures were formulated taking into account of the following management issues:

- The non-sustainable management of groundwater resources with over abstraction been considered are problematic for 4 out of 15 groundwater bodies;
- The deterioration of groundwater quality in view of high levels of nitrate and chloride concentrations;
- The need to ensure the protection of coastal waters and the conservation of ecologically significant surface water systems;
- Major challenges with the regulatory and institutional frameworks, and a need to move towards integrated management of water resources;
- Financing costs in the water sector to invest in the required infrastructure and monitoring systems;
- The limited understanding of the nature and magnitude of current water management problems in the Maltese Islands; and

- The need to enhance the knowledge base, beyond what is currently known in order to effectively implement the WFD.

4.9.4.2 Marine Strategy Framework Directive (MSFD)

The MSFD has been transposed into domestic law via the "Marine Policy Framework Regulations, 2011" (LN 73 of 2011) enacted under the auspices of the Environment and Development Planning Act (Cap. 504), the Territorial Waters and Contiguous Zone Act (Cap. 226), the Continental Shelf Act (Cap. 194), the Fishing Waters (Designation) and Extended Maritime Jurisdiction Act (Cap. 479), the Fisheries Conservation and Management Act (Cap. 425), the Authority for Transport in Malta Act (Cap. 499) and Malta Resources Act (Cap. 423). The Competent Authority is the Office of the Prime Minister. An invitation to tender has been issued by MEPA for the socio-economic assessment of the marine waters under the MSFD as per requirements of its Article 8.1(c).

Under the MSFD, Malta along with other Member States will be required to achieve and maintain "good environmental status" (GES) in the marine environment by the year 2020 at the latest and will be required to prepare a national marine strategy by 2016, in cooperation with neighbouring Member States. The marine strategy is to be developed and implemented in accordance with a plan of action (see Regulations 4 and 5 of LN 73 of 2011) and a programme of measures (Regulation 10). GES requires that all relevant human activities are carried out in coherence with the requirement of protecting and preserving the marine environment and the concept of sustainable use of marine goods and services as further defined in the Directive (Art. 3.5) GES shall be determined at the level of the marine region or sub-region (for Malta this is the Ionian Sea and the Central Mediterranean Sea marine sub-region), and on the basis of the following 11 qualitative descriptors and by practicing adaptive management on the basis of the ecosystem approach with the aim of attaining GES (also listed in Schedule I of LN 73 of 2011):

- Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
- Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.
- Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
- All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.
- Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.
- Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.
- Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems.
- Concentrations of contaminants are at levels not giving rise to pollution effects.
- Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.
- Properties and quantities of marine litter do not cause harm to the coastal and marine environment.
- Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.

The Commission Decision of 1 September 2010 specifies the criteria to be used by the Member States to assess the extent to which GES is being achieved, accompanied with references to applicable methodological standards where available, as set out in the Annex to this Decision. LN 73 of 2011 integrates these requirements into Maltese law and lays down the timelines by when

specific tasks are to be completed. For instance, by 15 July 2012, an initial assessment (Regulation 6 based on the list of characteristics, pressures and impacts in Schedule II of the LN) and determination (Regulation 7) of the current environmental status of Malta's marine waters, as well as the establishment of a series of environmental targets and associated indicators providing guidance to reaching GES (Regulation 8), would need to be completed. Coordinated monitoring programmes (Regulation 9 and Schedule IV of the LN) needs to be in place by 15 July 2014, while the programme of measures designed to achieve and maintain GES needs to be developed by 2015 at the latest with entry into operation by 2016 at the latest (Regulation 10 and Schedule IV of LN). For the monitoring programmes, the legislation elaborates that these should build upon and be compatible with monitoring requirements under the EC Nature Directives, while in the case of the programme of measures, this should take into account relevant measures *inter alia* under the WFD, the Urban Waste Water Directive, and the Bathing Water Quality Directive, as well as include spatial protection measures for designated areas include Natura 2000 sites.

5. Conserving and Mainstreaming Biodiversity – Current Gaps and Proposed Strategic Directions

Integration of biodiversity considerations into other sectoral policies remains a key challenge.

2008 EU BAP Mid-Term Assessment Report

Chapters 3 and 4 have provided some information on the various past and ongoing sectoral and cross-sectoral activities that have been, or are being, implemented at a national level and which contribute, whether directly or indirectly, to safeguard Malta's biodiversity and environment and to promote the conservation and management of biological and natural resources. Although this is Malta's first NBSAP, over the past years several national documents of a strategic nature have been developed such as the State of the Environment Reports (SOERs), the National Strategy for Sustainable Development (NSSD) and the National Report on the Strategic Action Plan for the Conservation of Maltese Coastal and Marine Biodiversity (SAPBIO National Report). These documents have put forward a number of recommendations on biodiversity-related issues as well as measures for achieving policy integration in the Maltese Islands. In this respect these documents have served a similar purpose as the NBSAP, that is, that of recommending activities for mainstreaming biodiversity across sectors. In addition, conservation endeavours have been undertaken nationally; these positively contribute toward achieving the goals laid out by the Programmes of Work (PoW) under the framework of the CBD as well as its objectives. Chapter 5 assesses progress made in pursuing recommendations proposed by relevant national policy and also evaluates Malta's status of implementation of relevant PoWs and other initiatives under the CBD. Based on the findings, this chapter identifies gaps as well as areas that require further momentum, and concludes by defining a number of thematic strategic directions/goals and accompanying measures.

5.1 State of the Environment Reports for Malta

Since 1998, Malta has published reports documenting the state of the environment (SOE) including the state of biodiversity during the reporting period under review. The SOER of 1998 and 2002 provided in-depth analyses of various sectors that in a way or another impact biodiversity. Each report puts forward a suite of recommendations in support of biodiversity in Malta. In certain cases recommendations are also aimed at mainstreaming biodiversity into sectors, in particular, the agriculture and fisheries sectors. The SOER of 2005 and 2008, adopted a new approach, which focuses on providing easily understandable information to policy makers, organisations and the general public, contrary to the more technical information provided by its preceding reports. When comparing the 2005 and 2008 reports, it is worth mentioning that the latter, took a further innovative and broader approach by exploring new issues, such as the relationship between the environment and economic activity, which traces out the different ways the economy and the environment are inter-related, as well as a chapter on environmental health.

The 2005 SOER identified the following areas for priority action, which are deemed of relevance to the NBSAP:

- Focusing on environmental impacts that have a serious effect on human health, such as air pollution from particulates;
- Protecting renewable natural resources such as the water table;

- Promoting eco-efficient economic growth by decoupling growth from material resource use and waste generation, and in particular addressing environmentally-damaging trends in the energy and transport sectors;
- Promoting formal as well as community-based environmental education;
- Drawing on public environmental concern to gain support for public and private initiatives, particularly to address countryside and coastal issues;
- Improving the knowledge base to support the development of environmental policy, particularly in the areas of biodiversity, waste and environmental health, by building up a structured ambient monitoring information system for state of the environment reporting;
- Leveraging finance to fund environmental improvements across government and the private sector;
- Better coordination between government ministries and agencies to improve the coherence and effectiveness of policy, by means of early integration of environmental considerations into all government policies and plans;
- Improving capacity for implementation and enforcement;
- Setting up a multi-actor process to develop a government-led environmental action plan to coordinate the activities of the principal players and identify investment priorities and short and medium term objectives and targets in the environmental field.

The 2005 SOER is supplemented by the 2006 and 2007 State of the Environment Indicators (SOEI 2006 and SOEI 2007), which update the set of indicators that were published in 2005. The 2008 SOER is also supported by a suite of indicators. These indicators provide concise information on key environmental trends to policymakers, organisations and the public in an active, user-friendly and systematic way and are summarised in Chapter 1 of the NBSAP. An indication of the state of uptake of 1998, 2002 and 2005 SOER recommendations specific to biodiversity is provided in Table 20 below.

LEGEND:

Recommendation being successfully implemented	Ongoing work but recommendation not yet fully implemented	Recommendation not being successfully implemented

Summary of SOER Recommendations specific to Biodiversity	Status
1. The rich biodiversity of the Maltese Islands should be better publicised as an important component of our national heritage. Endemic species in particular should be regarded with the same esteem as are other unique features of the national heritage. In particular, most should be granted a "protected species" status, in order to safeguard them and highlight their importance and uniqueness – SOER 1998 & 2002	
2. Research aimed at gaining a better understanding of the diversity of the biota of the Maltese Islands should be promoted and funded. In particular, funding should address existing gaps in knowledge – SOER 1998 & 2002	[for marine]
3. Existing inventories and databases of local biota should be reviewed, updated and extended to cover the whole of the Maltese Islands and their territorial waters. The Red Data Book for the Maltese Islands should be revised, updated and published with urgency – SOER 1998 & 2002	
4. Threatened species of local biota, and the majority of endemic species, should be included in the list of protected species. Different species should be given different protection ratings depending on their particular conservation status – SOER 1998	
5. Locally occurring habitats and ecosystems of international importance, particularly in the Mediterranean region, should be protected as required by the various conventions and agreements to which Malta is party, and managed according to internationally accepted standards – SOER 1998	

Summary of SOER Recommendations specific to Biodiversity	Status
6. The *Environment Protection Act 1991* should be reviewed and revised in order to remedy certain deficiencies and bring it in line with modern international practice. In particular, the designation "Nature Reserve" in the *Environment Protection Act 1991* should be totally revised as it does not conform to internationally accepted definitions of nature reserves. It is strongly recommended that the various categories of protected areas that are internationally accepted and used, be incorporated into local legislation (the *Environment Protection Act 1991*). Schedule IV sites declared as "Nature Reserves" (in effect "Tree Reserves") by the Tree and Woodland Protection Regulations should be mapped as soon as possible, in order to effectively protect the sites listed, and render the provisions of Schedule IV enforceable – SOER 1998 & SOER 2002	☺
7. Certain discrepancies between the *Environment Protection Act 1991* and the *Development Planning Act 1992* and subsidiary legislation should be resolved – SOER 1998	☺
8. Malta' implementation of the various international conventions and agreements concerned with the protection of nature and natural resources to which it is party should be reviewed. This review should also include sites and species declared under these conventions – SOER 1998 & 2002	☺
9. Local agencies that have the responsibility of implementing the various international conventions and agreements concerned with the protection of nature and natural resources to which Malta is party, should be given the necessary resources to carry out the required work. In some cases, implementation requires the concerted efforts of a number of different agencies, in which case the necessary administrative machinery for taking such concerted action should be set up – SOER 1998 & 2002	😐
10. An official policy concerning the importation of alien species for commercial and other purposes needs to be formulated and local legislation enacted and/or amended accordingly.	😐
11. All efforts should be made to prevent invasion of natural ecosystems by aliens and genetic contamination of native species, subspecies, races, varieties and stock by alien genetic material. Apart from other implications, the use of genetically modified organisms (GMOs) poses a potential threat to natural ecosystems and their biota and therefore GMOs should be included in any policy and/or legislation on alien species. Where local ecosystems have become invaded by alien species, all efforts should be made to eradicate the invaders and to prevent reinvasion – SOER 1998 & 2002	😐
12. Existing inventories (including cartographic ones and GIS databases) of local habitats and biocoenoses should be reviewed, updated and extended to cover the whole of the Maltese Islands and their territorial waters, and aligned to international land use and biotope classifications, with possible local adaptations – SOER 1998 & 2002	😐
13. Scientifically important, rare, and/or threatened ecosystems and habitats and areas with complexes of such ecosystems and habitats that are not already legally protected should be should be included in the list of protected sites; Locally occurring habitats and ecosystems of international importance, particularly in the Mediterranean region, should be protected as required by the various conventions and agreements to which Malta is party, and managed according to internationally accepted standards – SOER 1998	☺ [😐 in terms of management]
14. Marine protected areas should be declared – SOER 1998	☺
15. Bodies, governmental or non-governmental, entrusted with the management of a protected site should be closely monitored by the central authority responsible for protected sites to ensure that national policy is being met. It is recommended that a Board of Management for each protected site be set up – SOER 1998	😐
16. Deficiencies in the present legislation regulating hunting and trapping need to be addressed – SOER 1998	☺
17. An official policy, backed by legislation, concerning the exploitation of wildlife (other than hunting and trapping) needs to be formulated – SOER 1998	😐
18. All regulations concerning biota and habitats need to be effectively enforced – SOER 1998	😐
19. An official nation-wide "vision", with stated national objectives and strategies concerning Malta's biodiversity (and environment in general) is urgently required. A Maltese 'Biodiversity Strategy' should be adopted as soon as possible – SOER 2002	😐
20. Resources and infrastructure, including funds and the human resources, should be appropriately increased and ameliorated so as to cater for the considerable work related to nature protection. A well-trained, well-remunerated scientific civil service should be set up, such as exists in other countries – SOER 2002	☺

Summary of SOER Recommendations specific to Biodiversity	Status
21. There should be better communication between the many different institutions [environment protection, development planning and land-use, agriculture, fisheries, aquaculture, tourism, maritime affairs, public research institutions, public health, law enforcement, museums, etc.] whose work in some way involves living resources – SOER 2002	☺
22. There should be strengthening of the existing infrastructure for biological collections, and the transfer of modern technologies for taxonomic research and capacity-building should be encouraged and supported. Responsible authorities should adopt internationally agreed levels of collection housing (climate control, fire protection systems, pest control, acceptable levels of workplace health and safety) that ensure protection of collections and the well-being of all people working on and/or accessing the collections, and avoid further loss of collections valuable for biodiversity study and protection – SOER 2002	☹
23. National, and possibly regional, training programmes on local biological diversity should be developed at different education levels. This is particularly relevant for staff of the main governmental institutions – SOER 2002	😐
24. A local "Clearing-House Mechanism" web-site on the lines set in the CBD should be set up – SOER 2002	☺
25. The Planning Authority and the Environment Protection Department should as a matter of priority finalise the draft EIA Regulations – SOER 1998	☺
26. A national study on the environmental impact of quarrying and on the state of the local quarrying industry is urgently required – SOER 1998	☺
27. Existing treaties should be transposed into local legislation and implemented, especially the provisions related to alien species included in the Convention on Biological Diversity, the Cartagena Protocol on Biosafety, the Bern Convention and the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention – SOER 2002	☺
28. A nature wardening or ranger service should be set up as soon as possible, and fees ('*multi*') should be increased for infringement of particular regulations, so as to provide an effective disincentive – SOER 2002	☹
29. Valuable trees should be identified and afforded protection through legislation – SOER 1998	☺
30. Information on the environment (especially data on environmental quality) should be made public and access to all records facilitated. Public entities should be encouraged to make use of the latest technology to facilitate public access to information and justice – SOER 2002	☺
31. Malta should ratify and implement the Cartagena Protocol on Biosafety in order to prevent any possible invasive behaviour of GMOs – SOER 2002	☺
32. For every protected area of whatever status, a management plan should be formulated, and a body or agency charged with its implementation. A monitoring programme to ensure that the objectives of the plan are being met should be set up. Any deficiencies should be assessed and addressed. Existing management plans for protected sites should be revised and updated. In particular there needs to be a clear statement of the objectives of the protected site on which to base management. – SOER 1998	😐
33. Declaring protected areas is not enough; it is also necessary to manage, monitor, draw up action plans, protect and enforce all the legal requirements for the protection of the site. This is also an obligation of a number of international conventions to which Malta is a party. Therefore all protected areas should have an associated management plan to include these requirements – SOER 2002	😐
34. Although most of the sustainability indicators developed to monitor and report on the conservation and use of biodiversity are inter-related, Malta needs to commence data collection according to international standardised procedures, including CORINE procedures and IUCN criteria. However, it should also be borne in mind that many of the criteria employed by the OECD, United Nations (including the CBD and Mediterranean Action Plan), and the European Union are not suitable for the Maltese Islands, either because of the very small size of the Maltese archipelago, or else because of differences in the economic infrastructure. In this respect local versions of indicators should be developed, as close as possible to the original indicators, in order to allow comparability – SOER 2002	😐

Summary of SOER Recommendations specific to Biodiversity	Status
35. Incentive measures should be introduced as a "soft" method to ensure the conservation and sustainable use of biological diversity. The introduction of appropriate financial incentives, including fiscal measures such as tax deductions, should be explored – SOER 2002	😐
36. The "Polluter Pays Principle" should be rapidly introduced to cover activities affecting biodiversity – SOER 2002	🙂
37. The possibility of public-private partnerships for increasing investments in biodiversity relevant projects and programmes should be more thoroughly explored – SOER 2002	😐
38. As a sound basis for policymaking, there is a need for more baseline and trend data about Malta's biological heritage … there is also need for wider and continuous monitoring of the condition of Malta's natural heritage – SOER 2005	😐
39. Communication, awareness-raising and educational measures are also required to complement activities related to monitoring, designation and management of protected areas and species – SOER 2005	🙂

Table 20 – Extent of Progress in meeting SOER recommendations (1998, 2002 and 2005)

Significant progress has been made in implementing 49% of the SOER biodiversity-related recommendations considered in the table above. The recommendations essentially relate to CEPA activities, enactment of legislation and legal protection of species and habitats and designation of protected areas as expounded in Chapter 3 of the NBSAP. A Better Regulation Initiative is ongoing and consists of reviewing legislation in light of experiences gained in implementing and enforcing the respective regulations. One of the outcomes of the ongoing MEPA Reform process is of harmonising the DPA and EPA into a single Act via the enactment of the Environment and Development Planning Act in 2010 (Act X of 2010). This new Act re-establishes MEPA and defines its core functions, role and responsibilities in promoting sustainable development.

Some 5% of the recommendations mentioned in the table are however not being successfully implemented. These relate to the need for recruiting nature wardens and strengthening infrastructure and capacity-building on new technologies. Enforcement needs to be urgently strengthened via resource mobilisation targeting the relevant entities, including strengthening collaboration. The Administrative Law Enforcement (ALE) Section within Malta's Police Force assists in wardening; nonetheless resource constraints still challenge effective and timely enforcement. Compliance and enforcement are being addressed as a priority through the MEPA Reform process. Indeed, enforcement is being considered as the forth pillar of the Reform process focusing on actions that are required in order to ensure that MEPA's activities are indeed effective more so when considering the challenging nature of regulating land use and other activities affecting the environment in a country that has inherent land and other nature resource constraints. Resources are also needed to better house biological collections in Malta as well as to maintain the running of a seed bank. In 2005 the project "A Biological Collection Access Service for Europe (BIOCASE)" financed by the 5th Framework Programme (FP5), was completed. MEPA was the National Node for Malta. Through BioCASE, collectors had the opportunity to describe the nature of their collections (both flora and fauna). Preliminary discussions have also been held with concerned entities on strengthening the infrastructure of biological collections.

Although 46% of the recommendations have not yet been fully implemented there is ongoing work in terms of adopting indicators and strengthening monitoring, as well as implementing research projects, building partnerships, preventing and controlling IAS and reviewing existing

inventories. The SOER 2008 addresses the coastal[98] and the marine[99] environment, as one of the thematic issues under review. This Report notes as one of its key messages that '*There is lack of information about the status of Malta's coastal and marine environment, including that of the priority species and habitats within them.*' This message is reiterated here. In fact, when considering the findings of Malta's first Article 17 report under the Habitats Directive, the majority of species and habitats with an "unknown" conservation status are those which pertain to the marine environment. Further research is therefore needed to address the paucity of knowledge on the status of marine biodiversity in Maltese waters and to enable elucidation of population trends. While selected biodiversity indicators have been compiled in Malta, additional indicators shall be considered especially in line with the process of Streamlining European 2010 Biodiversity Indicators (SEBI 2010) and the 2010 biodiversity baseline. There are also ongoing efforts to improve access to information on the state of biodiversity, namely through the establishment of a National Database on Biodiversity. The updating of the RDB is also envisaged through the development of Red Data Lists. Although some investments in resources have been made, such as recruitment of staff and capacity building measures, additional resources are needed especially in the field of monitoring and enforcement. There are also limited incentive measures current in place, an example of which is the incentive targeting fishermen to land injured turtles for their safe rehabilitation and later release back into the wild. Other incentives include agri-environment measures under the Rural Development Plan. Additional incentives are however required especially to help mobilise private and public investing in biodiversity conservation.

5.2 National Report on the Strategic Action Plan for the Conservation of Maltese Coastal and Marine Biodiversity (SAPBIO National Report 2002)

Malta's SAPBIO report presents an in-depth account of the state of coastal and marine biodiversity of the Maltese Islands and identifies the problems that affect biodiversity and their proximate/ultimate causes, and relative importance. It also puts forward a suite of measures for the conservation of threatened and vulnerable species and habitats in the Maltese Islands in response to the findings of a gap analysis. The SAPBIO report also proposes national action plans for certain taxonomic groups. At the time of its compilation, it was noted that the SAPBIO report would be instrumental in forming the basis for Malta's NBSAP. The state of uptake of priority actions is provided in Table 21.

LEGEND:

Priority action being successfully met

Ongoing work but priority action not yet fully met

Priority action not being successfully met

Summary of Priority Actions Proposed in the SAPBIO Report		Status
1.	Creation and expansion of checklists and databases, compilation of lists of threatened and alien species, and suggestion of ways for managing and tackling threatened or alien taxa	
2.	Preparation of Species Action Plans (SAPs)	
3.	Mapping of marine or coastal communities and phytosociological study	
4.	Preparation of Habitat Action Plans	
5.	Declaring marine or coastal protected areas	
6.	Regulating the harvest of biodiversity resources and exploitable species	

[98] The coastal zone is taken to contain both coastal land and coastal waters, with the latter extending to 12 nautical miles (Nm) offshore, which corresponds with Malta's territorial sea boundary.
[99] The marine environment is taken as the area between the 12Nm boundary and Malta's 25Nm Fisheries Conservation Zone.

Summary of Priority Actions Proposed in the SAPBIO Report	Status
7. Creation of experts in the fields of marine biology and the need for training	😐
8. Monitoring plans and programmes	😐
9. Addressing accidental captures and other fisheries interactions with protected or important biodiversity	😐
10. Policies addressing particular problems, improvement and updating of legislation and effective enforcement	😐
11. Addressing marine aquaculture and tuna penning effects on biodiversity	😐
12. Development of ecotourism for the marine and coastal environment should be recommended and promoted	😐
13. Monitoring of artificial reefs and the adoption of a policy governing scuttling of wrecks or other artificial reefs for the purpose of establishing an ecosystem	🙂
14. Communication, Education and Public Awareness	🙂

Table 21 – Extent of Progress in meeting SAPBIO Priority Actions

Table 21 shows that work has been initiated in the areas identified by the SAPBIO report for priority action (72% of priority actions).

5.3 National Sustainable Development Strategy

The three objectives of the Convention on Biological Diversity call to mind the three dimensions of sustainable development (the environmental dimension – maintain environmental integrity, the economic dimension – improve economic efficiency, and the social dimension – develop social equity), making the Convention a real lever for the implementation of sustainable development.

Guide to Developing a Biodiversity Strategy from a Sustainable Development Perspective
Prescott, Gauthier, & Nagahuedi Mbongu Sodi, 2000

Sustainable development (SD) acquired worldwide recognition when the report entitled "Our Common Future" was published in 1987 by the World Commission on Environment and Development (otherwise known as the Brundtland Commission). The Brundtland Report defined the term "sustainable development" (SD) as: '*... development which meets the needs of the present without compromising the ability of future generations to meet their own needs*' (WCED, 1987). For development to be sustainable, social equity, economic efficiency and environmental protection should be addressed in a concerted manner since they are interdependent. In addition, striking a balance between the goals of all three pillars is necessary for implementing the concept of SD.

The European Council in Göteborg (2001) adopted the first EU Sustainable Development Strategy (SDS). In June 2006, the European Council adopted a renewed Sustainable Development Strategy (SDS) for an enlarged EU and presented a framework for a long-term vision of sustainability. The renewed SDS identifies seven key challenges, amongst which is the "Conservation and Management of Natural Resources" with the objective: '*To improve management and avoid overexploitation of natural resources, recognising the value of ecosystem services*'. In July 2009 the Commission adopted the 2009 Review of EU SDS, which was preceded by the 2007 review. The 2009 review notes that '*... despite considerable efforts to include action for sustainable development in major EU policy areas, unsustainable trends persist and the EU still needs to intensify its efforts*'. To this end, it looks at ways how the 2006 EU SDS could be taken into the future.

Suggestions include that the SDS could focus on the EU's long-term goals in crucial areas by *inter alia* intensifying environmental efforts for the protection of biodiversity, water and other natural resources.

The environmental pillar of sustainable development is enshrined in the 2001 EPA and the 2010 EDPA. Regulation 4 in fact states: '*It shall be the duty of the Government to protect the environment for the benefit of the present and future generations and to that effect: (a) to manage the environment in a sustainable manner by integrating and giving due consideration to environmental concerns in decisions on socioeconomic and other policies*'. Achieving sustainability across sectors would positively impact biodiversity in the Maltese Islands. The Communication on "Halting Biodiversity Loss by 2010 – and Beyond: Sustaining ecosystem services for human well-being" underlined the importance of biodiversity protection as a pre-requisite for sustainable development.

In 2002 the Maltese Government set up the National Commission for Sustainable Development (NCSD). The potential of this Commission to act as a powerful tool for creating the impetus for environmental policy integration was recognised by the 2005 SOER. However, for such a potential to materialise, it was noted that the NCSD would require "better resourcing and a permanent secretariat". That same year, a task force was appointed by the NCSD at its fifth meeting, to oversee the preparation of a strategy for sustainable development, with its initiated in December 2002. The overarching goal of the strategy is '*primarily aimed at helping society work towards improving the quality of life of all members of society, promoting convergence between the interests of different sectors and layers of society and between the interests of current and future generations*'. The Strategy underlines the need of a multi-faceted approach to sustainable development based on long-term views and not on short-term economic gains. The National Sustainable Development Strategy (NSSD)[100], was adopted by the Commission in 2006 and by the Cabinet of Ministers in 2007. It is currently being updated with a view to publication.

Malta's NSSD addresses the environmental pillar of sustainable development through the following eight priority areas:

- Climate Change - Take steps to reduce greenhouse gas emissions through transport policy and an energy policy that seeks to promote environmental protection, competitiveness and security of supplies and, as a result, decouple the rate of growth of GHG emissions from economic growth.
- Air Quality - Take remedial action to control emissions of air pollutants (ambient levels of particulate matter, sulphur dioxide, carbon monoxide, benzene, lead, ozone, heavy metals and nitrogen oxides), and achieve compliance with European standards.
- Nature and Biodiversity - Halt loss of biodiversity by 2010, and achieve management of protected areas by 2008.
- Freshwater - Adopt a policy with the aim of ensuring the utilisation of water resources in a manner that is environmentally and economically sustainable, while safeguarding the water needs of the population, and of the agricultural, commercial and industrial sectors, and achieve good quantitative status by 2015.
- Seawater - Sustain compliance with the Bathing Water Directive and achieve compliance with Barcelona Convention standards.
- Wastes - Prevent and minimise waste by achieving EU waste-related objectives and targets, reviewing Malta's Waste Management Strategy by 2007.

[100] The report entitled "Contributions of the Regional and Local Authorities to Sustainable Development Strategies, Committee of the Regions" (RIMAS, 2009) provides a detailed analysis of national sustainable development strategies (NSDS) including Malta's.

- Land use - Protect, maintain and improve the urban and rural environment and, through the planning system, protect the open countryside from uses, particularly residences, which can be more appropriately located in urban areas.
- Transport - Reduce car ownership rates to the EU average by 2014. Attain 1995 bus patronage levels by 2014 (40 million passengers).

One of the policy drivers identified by the NSSD is the NBSAP. An evaluation was carried out of progress made in implementing the NSSD strategic directions on "Nature and Biodiversity" so as to identify gaps in implementation that would then be covered by the implementation of the NBSAP. The results of the evaluation are show in Table 22. Similar to the national policy documents considered in the previous sections of this Chapter, the implementation of the NSSD strategic directions for biodiversity, is by and large ongoing, with most progress made in terms of awareness and research in view of the recent activities and projects embarked on since 2006.

	Strategic direction being successfully implemented		Ongoing work but strategic direction not yet fully implemented		Strategic Direction not being successfully implemented

NSSD Strategic Directions identified for the Policy Area on "Nature & Biodiversity"	Status
Monitor and protect all rare and/or threatened endemic species and their habitats, as well as other locally occurring species of international importance, and take active measures for their conservation and restoration.	
Designate additional habitats for protection (including marine areas), based on sound scientific information, in order to protect these habitats from incompatible development.	
Draw up and implement the required management plans for Special Areas of Conservation	
Draw up a National Biodiversity Strategy for Malta based on the aims of the CBD	
Fulfil all obligations under existing environmental treaties concerning biodiversity and equip local agencies responsible for implementing these treaties with the necessary resources, personnel and administrative machinery to enforce legislation.	
Set up a nature wardening service and introduce or increase fines for infringement of particular regulations, so as to provide an effective deterrent.	
Adopt an official policy on the introduction and eradication of alien species (including genetically modified organisms).	
Promote and fund research to gain a better understanding of local biodiversity, including the establishment and funding of a national inventory/database of biodiversity.	
Devise schemes to improve awareness on the richness of local biodiversity	
Ratify and implement the Cartagena Protocol on Biosafety.	
Discourage land reclamation in ecologically sensitive areas and encourage re-use of abandoned fields.	
Encourage organic farming, thereby reducing use of pesticides.	
Promote the use of ecological corridors.	
Promote awareness that biodiversity is an economic resource of value to tourism, and that is enjoyed by tourists and the local population alike.	

Table 22 – Extent of Progress in meeting NSSD Strategic Directions for Biodiversity

The 2008 SOER acknowledges Malta's NSSD as representing '*... an important road map for achieving sustainability in Malta*'. It also draws attention to the fact that '*... ownership of the Strategy by all policy sectors is crucial, and these now need to take up the priorities of the strategy, particularly in terms of new policy, legislation and practices in key sectors such as energy, transport, land use planning, and tourism. Administrative mechanisms are necessary to ensure this takes place.*'

The House of Representatives shall soon be debating a Sustainable Development Bill in Parliament. This Bill aims to set a framework 'to mainstream sustainable development across the workings of government, to raise awareness of sustainable development issues and practices across society and to promote the adoption thereof, as well as to set up a Guardian of Future Generations.' Biodiversity and the ecosystems, which fall within the scope and concept of sustainable development promoted by the Bill, are additionally indirectly safeguarded through the provision 6(g) in Part Two of the said Bill, which points out that the competent authority shall be in a position to propose directives amongst others, but not solely, to public procurement and sustainable production and consumption patterns to the Permanent Secretary in the Ministry responsible for Finance in terms of the Financial Administration and Audit Act.

5.4 Programmes of Work, Initiatives and Strategies under the CBD Framework

The following sections indicate to what extent Malta is contributing to the attainment of objectives and/or goals, which are established under the CBD framework, depending on Malta's context, priorities and needs. To this end, not all the thematic programmes of the CBD are assessed here, seeing that some would not be applicable (*e.g.* the PoW on Mountain Biodiversity).

5.4.1 CBD Programme of Work on Island Biodiversity

This PoW addresses biodiversity-related characteristics and problems that are specific to islands (*e.g.* small and concentrated populations of island fauna and flora, endemism, vulnerability to natural and anthropogenic pressures, uniqueness and close connectivity of island ecosystems). Islands and their surrounding near-shore marine biodiversity are considered by this PoW as '*self-contained, bounded ecosystems, each with their own unique, often very limited, assemblage of biodiversity*'. The PoW describes islands as '*microcosms that offer great scope for the application, testing and refinement of a wide range of conservation tools and approaches, including the ecosystem approach*'. The PoW details a number of global targets and areas of priority action, grouped under 11 goals to address island biodiversity loss. It also suggests supporting actions for implementation by Parties, who are further urged to integrate these into NBSAPs and to mainstream the PoW into sustainable development strategies (CBD Decision VIII/1). One of the mechanisms identified to implement this PoW is the Global Island Partnership (GLISPA). The status of implementation of the PoW in Malta is provided below.

LEGEND:

Priority action being successfully met

Ongoing work but priority action not yet fully met

Priority action not being successfully met

Goals and Targets of the PoW on Island Biodiversity		Status
Goal - 1: Promote the conservation of the biological diversity of island ecosystems, habitats and biomes	**Target 1.1:** At least 10% of each of the island ecological regions effectively conserved	[considering % at national level]
Goal – 2: Promote the conservation of island species diversity	**Target 2.1:** Populations of island species of selected taxonomic groups restored, maintained, or their decline substantially reduced	
	Target 2.2: Status of threatened island species significantly improved	
Goal – 3: Promote the conservation of island genetic diversity	**Target 3.1:** Genetic diversity of crops, livestock, and other valuable island species conserved, and associated indigenous and local knowledge maintained	

Goals and Targets of the PoW on Island Biodiversity		Status
Goal – 4: Promote sustainable use and consumption	**Target 4.1:** Island biodiversity based products are derived from sources that are sustainably managed, and production areas managed, consistent with the conservation of biological diversity	
	Target 4.2: Unsustainable consumption of island biological resources and its impact upon biodiversity is reduced	
	Target 4.3: No species of wild flora and fauna on islands is endangered by international trade	
Goal - 5: Pressures from habitat loss, land-use change and degradation, and sustainable water use, reduced on islands	**Target 5.1:** Rate of loss and degradation of natural habitats in islands significantly decreased (target 5.1 of the 2010 framework)	
Goal – 6: Control threats to island biological diversity from invasive alien species	**Target 6.1:** Pathways for major potential alien invasive species are identified and controlled on islands	
	Target 6.2: Management plans in place and implemented for major alien species that threaten ecosystems, habitats or species	
Goal - 7: Address challenges to island biodiversity from climate change, and pollution	**Target 7.1:** Resilience of the components of biodiversity to adapt to climate change in islands maintained and enhanced	
	Target 7.2: Pollution and its impacts on island biological diversity significantly reduced	
Goal – 8: Maintain capacity of island ecosystems to deliver goods and services and support livelihoods	**Target 8.1:** Capacity of island ecosystems to deliver goods and services maintained or improved	
	Target 8.2: Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people living on islands, maintained	
Goal – 9: Maintain socio-cultural diversity of indigenous and local communities on islands	**Target 9.1:** Measures to protect traditional knowledge, innovations and practices associated with island biological diversity implemented, and the participation of indigenous and local communities in activities aimed at this promoted and facilitated	
	Target 9.2: Traditional knowledge, innovations and practices regarding island biodiversity respected, preserved and maintained, the wider application of such knowledge, innovations and practices promoted with the prior informed consent and involvement of the indigenous and local communities providing such traditional knowledge, innovations and practices, and the benefits arising from such knowledge, innovations and practices equitably shared	
Goal – 10: Ensure the fair and equitable sharing of benefits arising out of island genetic Resources	**Target 10.1:** All access to genetic resources from islands is in line with the CBD and its relevant provisions and, as appropriate and wherever possible, with the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements	
	Target 10.2: Benefits arising from the commercial and other utilisation of island biodiversity genetic resources shared in a fair and equitable way with the island countries providing such resources in line with the CBD and its relevant provisions	
Goal – 11 - Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention	**Target 11.1:** New and additional financial resources are allocated to all islands, in particular small Islands developing States and for developing country Parties, to facilitate the effective implementation of this programme of work and, in general, their commitments under the Convention in accordance with Article 20	
	Target 11.2: Technologies are transferred to developing country Parties, in particular small island developing States, to allow for the effective implementation of this programme of work and, in general, their commitments under the Convention, in accordance with Article 20, paragraph 4	

Goals and Targets of the PoW on Island Biodiversity		Status
	Target 11.3: Capacity of islands to implement this programme of work on island biological diversity and all its priority activities is significantly strengthened	

Table 23 – Extent of Progress in meeting Targets of the CBD PoW on Island Biodiversity

Looking at Table 23, 24% of the PoW Targets on Island Biodiversity have been attained, 67% are being attained whereas 9% are not being attained.

5.4.2 CBD Programme of Work on Inland Waters Biodiversity

This PoW deals with biodiversity that is associated with "inland waters"[101] bearing in mind that anthropogenic activities such as water pollution and over-abstraction would be harmful to biodiversity, and noting that biodiversity maintains ecosystem services including the water cycle and flood management. Being ecologically dynamic systems, inland water ecosystems are best treated via a landscape or ecosystem approach. To this end, the aim of this PoW (as revised – CBD Decision VII/4) is *inter alia* to further enhance the implementation of the CBD in this area at the catchment/watershed levels. The revised PoW identifies goals, objectives and activities within three programme elements: conservation, sustainable use and benefit-sharing; institutional and socio-economic enabling environment; and knowledge, assessment and monitoring. The relevance of this POW in the context of the WFD and the Ramsar Convention on Wetlands is also noteworthy. Indeed, measures to implement this Directive, and also the Ramsar Convention, at a national level would also positively contribute to the implementation of this PoW by Malta. Other EU Directives would also apply such as the EC Nitrates Directive. This PoW also acknowledges the role of inland waters in the mitigation of, and adaptation to, climate change. An in-depth review of this PoW[102] was considered at the 14th meeting of SBSTTA. The CBD COP10 acknowledged that implementation of this PoW needs to be significantly enhanced through *inter alia* better coherence between land- and water-use policies. The status of implementation of the PoW in Malta is reviewed below.

LEGEND:

Goal being successfully met

Ongoing work but Goal not yet fully met

Goal not being successfully met

Programme Element	Goals of the PoW on Inland Waters Biodiversity	Status
1: CONSERVATION, SUSTAINABLE USE AND BENEFIT-SHARING	**1.1:** To integrate the conservation and sustainable use of biological diversity into all relevant sectors of water-resource and river-basin management, taking into account the ecosystem approach	

[101] *i.e.* aquatic-influenced environments located within land boundaries; and include those located in coastal areas, even where adjacent to marine environments. Inland water ecosystems also encompasses land that aids in stages of the water cycle (*e.g.* water runoff and infiltration), and also land that is influenced by water that lies in proximity (*e.g.* riparian habitats, valley watercourses).

[102] The Executive Summary of this in-depth review documents: *'The priority needs are for enhanced implementation. Weaknesses with the programme of work include: (i) the limited connection between ecosystem services and climate change; (ii) the lack of emphasis on the relationships between water and biodiversity, ecosystem services and sustainable development; and (iii) its limited impact on other programme areas and in other policy forums'.* The document also notes that *'"Integrated water resources management" (IWRM) remains a key tool to address the multiple objectives associated with the conservation and sustainable use of inland waters biodiversity'.*

Programme Element	Goals of the PoW on Inland Waters Biodiversity	Status
1: CONSERVATION, SUSTAINABLE USE AND BENEFIT-SHARING	**1.2:** To establish and maintain comprehensive, adequate and representative systems of protected inland water ecosystems within the framework of integrated catchment/watershed management	☺
	1.3: To enhance the conservation status of inland water biological diversity through rehabilitation and restoration of degraded ecosystems and the recovery of threatened species	😐
	1.4: To prevent the introduction of invasive alien species, including exotic stocks that potentially threaten the biological diversity of inland water ecosystems, and to control and, where possible, eradicate established invasive species in these ecosystems	😐
2: INSTITUTIONAL AND SOCIO-ECONOMIC ENABLING ENVIRONMENT	**2.1:** To promote the integration of conservation and sustainable use of the biological diversity of inland water ecosystems into relevant sectoral and cross-sectoral plans, programmes, policies and legislation	😐
	2.2: To encourage the development, application and transfer of low-cost appropriate technology, non-structural and innovative approaches to water resource management and the conservation and sustainable use of the biological diversity of inland water ecosystems, taking into account any decision taken by the Conference of the Parties at its seventh meeting on technology transfer and cooperation	😐
	2.3: To provide the appropriate incentives and valuation measures to support the conservation and sustainable use of inland water biological diversity, and to remove, or reform appropriately, any perverse incentives opposing such conservation and sustainable use of ecosystems, as it relates to biodiversity conservation	😐
	2.4: To implement the programme of work for the Global Initiative on Communication, Education and Public Awareness (as adopted by the Conference of the Parties to the Convention on Biological Diversity in its decision VI/19), giving particular attention to matters relating to the conservation and sustainable use of the biological diversity of inland water ecosystems	☺
	2.5: Promote the effective participation of indigenous and local communities and relevant stakeholders in the conservation and sustainable use of biological diversity of inland water ecosystems in accordance with national laws and applicable international obligations	😐
3: KNOWLEDGE, ASSESSMENT AND MONITORING	**3.1:** To develop an improved understanding of the biodiversity found in inland water ecosystems, how these systems function, their ecosystem goods and services and the values they can provide	😐
	3.2: To develop, based on inventories, rapid and other assessments applied at the regional, national and local levels, an improved understanding of threats to inland water ecosystems and responses of different types of inland water ecosystems to these threats	😐
	3.3: To ensure projects and actions with the potential to impact negatively on the biological diversity of inland water ecosystems are subjected, in accordance with national legislation and where appropriate, to suitably rigorous impact assessments, including consideration of their potential impact on sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities	☺
	3.4: To introduce and maintain appropriate monitoring arrangements to detect changes in the status and trends of inland water biodiversity	☺

Table 24 – Extent of Progress in meeting the Goals of the CBD PoW on Inland Waters Biodiversity

In a nutshell, 31 % of the PoW Targets have been attained, while 69% are being attained. Details of inland water biodiversity-related activities are given in Chapter 4 of the NBSAP – Section 4.10.

5.4.3 CBD Programme of Work on Marine & Coastal Biodiversity

This PoW strives to halt the loss of marine and coastal biological diversity and secure its capacity to provide goods and services. Parties are urged to take the necessary short-, medium- and long-term measures to respond to the loss or reduction of marine biological diversity. Measures encompass:

- marine and coastal protected areas (viewed as '*one of the essential tools and approaches in the conservation and sustainable use of marine and coastal biodiversity*' and that '*should be part of a wider marine and coastal management framework*' [Decision VII/5]);
- marine protected areas in areas beyond national jurisdiction (ABNJ);
- assessment, monitoring and research;
- mariculture;
- conservation and sustainable use of deep seabed genetic resources beyond national jurisdiction; and
- conservation and sustainable use of biological diversity in marine areas beyond the limits of national jurisdiction.

Scientific criteria for identifying ecologically or biologically significant marine areas in need of protection and scientific guidance for designing representative networks of MPAs were adopted at COP 9 (Decision IX/20). The goals and targets set out by this PoW under 5 programme elements, should be viewed as a flexible framework within which national targets may be developed, according to national priorities and capacities. This POW is relevant in the context of the EU MSDF, the surface waters of the WFD and also coastal and marine aspects of the Nature Directives. Indeed, measures to implement these directives at a national level would also positively contribute to the implementation of the PoW by Malta. An in-depth review of this PoW[103] was considered at SBSTTA-14. CBD COP10 noted that although progress has been made in implementing this PoW, efforts have not been able to prevent the serious decline in marine and coastal biodiversity and ecosystem services. Concern was also expressed with respect to the slow progress towards achieving the 2012 target of establishing MPAs. Table 25 presents the status of implementation of the PoW in Malta. The table shows that 7% of the PoW Targets have been attained, 73% are being attained whereas 20% are not being attained. Measures undertaken that contribute to the implementation of this PoW are addressed in Chapter 3 (Sections 3.3, 3.6 and 3.8) and Chapter 4 (Sections 4.2, 4.3, 4.5 and 4.10) of the NBSAP.

LEGEND:

Operational Objective being successfully met	Ongoing work but Operational Objective not yet fully met	Operational Objective not being successfully met

[103] The document recommends some areas to be considered in updating the existing PoW, in regards to, *inter alia* : (i) biodiversity conservation in marine areas beyond national jurisdiction; (ii) aspects of marine biodiversity related to climate change and addressing ocean acidification; (iii) impacts of unsustainable fishing; and (iv) improving the representativity of the global system of marine and coastal protected areas.

Programme Elements and Operational Objectives of the PoW on Marine and Coastal Biodiversity		Status
1: Implementation of integrated marine and coastal area management (IMCAM)	**1.1:** To apply appropriate policy instruments and strategies, including building of capacity, for the effective implementation of IMCAM	
	1.2: To undertake direct action to protect the marine environment from negative impacts	
	1.3: To develop guidelines for ecosystem evaluation and assessment, paying attention to the need to identify and select indicators, including social and abiotic indicators that distinguish between natural and human-induced effects.	
2: Marine and coastal living resources	**2.1:** To promote ecosystem approaches to the conservation and sustainable use of marine and coastal living resources, including the identification of key variables or interactions, for the purpose of assessing and monitoring, first, components of biological diversity; second, the sustainable use of such components; and, third, ecosystem effects.	
	2.2: To make available to the Parties information on marine genetic resources in marine areas beyond national jurisdiction and, as appropriate, on coastal and marine genetic resources under national jurisdiction from publicly available information sources.	
	2.4: To enhance the conservation and sustainable use of biological diversity of marine living resources in areas beyond the limits of national jurisdiction	
3: Marine and Coastal Protected Areas	**3.1:** To establish and strengthen national and regional systems of marine and coastal protected areas integrated into a global network and as a contribution to globally agreed goals.	
	3.2: To enhance the conservation and sustainable use of biological diversity in marine areas beyond the limits of national jurisdiction	
	3.3: To achieve effective management of existing marine and coastal protected areas	
	3.4: To provide support for and facilitate monitoring of national and regional systems of marine and coastal protected areas	
	3.5: To facilitate research and monitoring activities that reflect identified global knowledge gaps and priority information needs of management of marine and coastal protected areas.	
4: Mariculture	**4.1:** To promote use of techniques, which minimise adverse impact of mariculture on marine and coastal biological diversity.	
5: Invasive alien species	**5.1:** To achieve better understanding of the pathways and the causes of the introduction of alien species and the impact of such introductions on biological diversity	
	5.2: To put in place mechanisms to control all pathways, including shipping, trade and mariculture, for potential invasive alien species in the marine and coastal environment	
	5.3: To maintain an incident list on introductions of alien species	

Table 25 – Extent of Progress in meeting the Operational objectives of the CBD PoW on Marine and Coastal Biodiversity

5.4.4 CBD Programme of Work on Agricultural Biological Diversity

The term "agricultural biodiversity" encompasses all components of biological diversity of relevance to food and agriculture, including components of biological diversity that constitute, and sustain the agro-ecosystem, its structure and processes. The objectives of this PoW are the following:

- To promote the positive effects and mitigate the negative impacts of agricultural systems and practices on biological diversity in agro-ecosystems and their interface with other ecosystems;
- To promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture; and
- To promote the fair and equitable sharing of benefits arising out of the use of genetic resources.

The status of implementation of the PoW in Malta is provided below.

LEGEND:

Operational objective being successfully met

Ongoing work but operational objective not yet fully met

Operational objective not being successfully met

Programme Elements and Goals of the PoW on Agricultural Biodiversity	Status
Programme element 1. Assessments	
Operational objective: To provide a comprehensive analysis of status and trends of the world's [in this case national] agricultural biodiversity and of their underlying causes (including a focus on the goods and services agricultural biodiversity provides), as well of local knowledge of its management.	
Programme element 2. Adaptive management	
Operational objective: To identify management practices, technologies and policies that promote the positive and mitigate the negative impacts of agriculture on biodiversity, and enhance productivity and the capacity to sustain livelihoods, by expanding knowledge, understanding and awareness of the multiple goods and services provided by the different levels and functions of agricultural biodiversity.	
Programme element 3. Capacity-building	
Operational objective: To strengthen the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage sustainably agricultural biodiversity so as to increase their benefits, and to promote awareness and responsible action.	
Programme element 4. Mainstreaming	
Operational objective: To support the development of national plans or strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration in sectoral and cross-sectoral plans and programmes.	

Table 26 – Extent of Progress in meeting the Operational objectives of the CBD PoW on Agricultural Biodiversity

Genetic diversity exists at multiples levels, *i.e.* within individuals, among individuals within a population, and among populations. Genetic diversity in each level is of potential importance to conservation. This is because, genetic diversity endows species with the ability to adapt and evolve in response to environmental changes. Loss of genetic diversity means that a species may not be able to adequately adapt to changes in environmental conditions as well as those brought about by man. Different land uses and also climate change bring about changes in environmental conditions. The maintenance of genetic diversity is also of socio-economic importance especially for ensuring food security in the face of environmental uncertainties. Plant and animal genetic resources for food and agriculture are of critical importance to the food security of the present

and future generations. Wild relatives and early landrace varieties and breeds have long been recognised as an essential pool of genetic variation for improving plant and animal breeding and hence to ensure that the genetic diversity of plants and animals is conserved and available for utilisation. Genetic studies assist biodiversity conservation in terms of setting conservation priorities, understanding how to sample populations for conservation *in situ* and *ex situ,* and in maintaining viable populations. Knowledge of genetic diversity is equally important when selecting and breeding to improve domesticated species and hence is equally applicable to the conservation of crop plants and animal breeds. Tools for maintaining genetic diversity include *in situ* protection (*e.g.* in protected areas, or on farm conservation) and through management of *ex situ* collections (*e.g.* in gene banks).

When considering plant and animal genetic resources for food and agriculture on a national level, modern varieties of both plants and livestock have been imported throughout the years to Malta in favour of local varieties. This has resulted in Maltese genotypes being eroded or entirely lost. Nevertheless, certain varieties of cultivated crops remain that are considered to be authochtonous. For this reason, characterisation trails have recently been launched for selected varieties as reported by the RDP 2007-2013. Growers in Malta out of personal interest maintain and conserve plant genetic resources that they possess. Some growers have a cultural habit, or out of personal interest, to retain indigenous seeds and plants for themselves (*e.g.* vegetables, cereals, fodder plants, fruit trees, *etc*). Maintenance of Maltese varieties is not known since almost all of the plant material is not marketed but kept by the farmer to be used for the next growing season. However, the Plant Health Department has gathered and shall continue to gather information of local varieties as part of initiatives and projects that deal with conserving varieties, such by way of marketing local varieties of seeds of agricultural plants in Malta, the identification and collection of accessions of vines and peaches, and identification, collection and sanitation of citrus. Also of relevance here is Project Primo, which aims to propagate the indigenous olive variety called *Tal-Bidni*, and includes the planting of *Tal-Bidni* olive orchards, and establishing an olive oil production industry. The Annual Report for 2008 issued by the Ministry for Resources and Rural Affairs (MRRA) reports production of around 1,000 *Tal-Bidni* olive trees during the year. *Tal-Bidni* olives were harvested from olive trees growing on farm grounds for the first time and an oil sample was obtained. Another project is that involving the Viticulture and Oenology Unit within the Department of Agriculture and funded by FP7. The project, which deals with the identification of local vine varieties, will be carried out in conjunction with the University of Malta. It will mainly focus on the Maltese indigenous varieties of vines – *Girgentina* and *Ġellewża*.

There are various wild relatives of cultivated species known from the Maltese Islands. These include for instance, the wild Sulla (*Hedysarum coronarium*) known in Maltese as "*Tan-nebbieta*" found mainly on clay slopes in the north and northwest of Malta. One can also mention Wild Leek (*Allium commutatum*) and Maltese Leek (*Allium melitense*) which grow in rocky steppe, Wild Artichoke (*Cynara cardunculus*), Wild Carrot (*Daucus carota*), and Fennel (*Foeniculum vulgare*). The Crop Husbandry Unit within the Department of Agriculture is responsible for the setting up and execution of trials and experiments performed both in the open field and also under protected cultivation. These trials consist in the growing and demonstration of vegetables, herbs, flowers, fruit trees and forage crops. In 2008, various crops were grown besides the maintenance of fields and surroundings.

There has been an increasing interest in the reintroduction and preservation of authochtonous livestock breeds. Amongst these one can mention the Maltese cow ('*Il-Baqra Maltija*' - critically endangered indigenous breed listed in the FAO's World Watch list for Domestic Animal Diversity

for the year 2000), the Maltese goat, the Maltese sheep (a small population still exists in parts of the country), the Maltese 'black' chicken (renowned for its prolific production of large white eggs and its reluctance to brood) and the Maltese turkey (well adapted to backyard production systems). Of interest is also an endemic subspecies of honey-producing bees (*Apis mellifera rutneri*) which is phenotypically different from other Mediterranean bees. The Apiculture Unit (AU) within the Department of Agriculture assists all registered beekeepers in Malta and Gozo in aspects of beekeeping, including any bee disease problems that might occur. A new mating station has also been set up. The main work at the mating station at Romeo Romano Gardens involves the breeding of selected drones of the Maltese taxon in order to congest the surrounding congregation area and hence guarantee as much as possible the controlled mating of selected virgin Maltese queen bees with these drones. This work aims to conserve the local honey bee subspecies. The AU is collecting samples of Maltese bees from different apiaries for further analysis to determine the level of hybridisation of *A. m. ruttneri* with imported *Apis mellifera* in the Maltese Islands to date. (Source: MRRA Annual Report 2008)

When considering wild relatives of domesticated species, the distinct Maltese race of the European Rabbit (*Oryctolagus cuniculus*[104]) is noteworthy for its distinct red colour. Although found in the wild in small numbers on the larger islands, the rabbit is found in considerable numbers on the smaller island of Comino.

5.4.5 CBD Programme of Work on Dry & Sub-humid Land

The overall aim of this PoW is to promote the three objectives of the CBD in dry land, Mediterranean, arid, semi-arid, grassland, and savannah ecosystems. The programme is divided into two parts, one on "assessments" and another on "targeted actions in response to identified needs"; both elements are to be implemented in parallel. The status of implementation of the PoW in Malta is provided in Table 27.

LEGEND:

🙂	Operational Objective being successfully met	😐	Ongoing work but operational objective not yet fully met	☹	Operational Objective not being successfully met

PoW on Dry and Sub-humid Land	Status
Assessments	
Operational Objective: To assemble and analyse information on the state of the biological diversity of dry and sub-humid lands and the pressures on it, to disseminate existing knowledge and best practices, and to fill knowledge gaps, in order to determine adequate activities.	😐
Targeted actions in response to identified needs	
Operational Objective: To promote the conservation of the biological diversity of dry and sub-humid lands, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of its genetic resources, and to combat the loss of biological diversity in dry and sub-humid lands and its socio-economic consequences.	😐

Table 27 - Extent of Progress in meeting the Operational objectives of the CBD PoW on Dry and Sub-Humid Land

[104] *Oryctolagus cuniculus* is an introduced species

5.4.6 CBD Programme of Work on Protected Areas

Protected areas are viewed as "cornerstones of biodiversity conservation" and their establishment and management are called for not only by the CBD (Article 8), but also other MEAs, EU and domestic policy. Protected areas are addressed under the CBD framework as a cross-cutting issue and also feature as an integral element of CBD PoW on thematic Areas. This PoW proposed measures under four interlinked elements, which are intended to be mutually reinforcing and cross-cutting in their implementation:

- Programme element 1 – this deals with what protected area systems need to conserve and where;
- Programme elements 2 and 3 – these address the enabling activities that will ensure successful implementation of the other programme elements;
- Programme element 4 – this covers the steps needed for assessing and monitoring the effectiveness of actions taken under programme elements 1 to 3;

This PoW also takes into account the ecosystem approach in the context of a framework within which the relationship of protected areas to the wider landscape and seascape can be understood, and the goods and services flowing from protected areas can be valued.

An in-depth review of this PoW[105] was considered at SBSTTA-14 and in the run up to the tenth meeting of the Conference of the Parties (October, Nagoya). This document provides a global snapshot of progress towards achieving this PoW's targets. Good progress is reported for targets 1.1, 3.5 and 4.4; fair progress for targets 1.3, 1.4, 1.5, 3.1, 3.2, 3.3, 4.1, 4.2 and 4.3; while some progress is reported for 1.2, 2.1 and 2.2; and very little progress for 3.4. The revised and updated CBD Strategic Plan for 2011-2020 includes Target *11*: By 2020, at least 17% of terrestrial and inland water, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes. The status of implementation of the PoW in Malta is provided below.

LEGEND:

Priority action being successfully met

Ongoing work but priority action not yet fully met

Priority action not being successfully met

Programme Elements and Goals of the PoW on Protected Areas		Status
Programme Element 1: Direct Actions for planning, selecting, establishing, strengthening and managing protected area systems and sites		
Goal 1.1: To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals	**Target:** By 2010, terrestrially and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals - particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation.	

[105] This document is accompanied by an addendum.

Programme Elements and Goals of the PoW on Protected Areas		Status
Goal 1.2: To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function	**Target:** By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks.	
Goal 1.3: To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries	**Target:** Establish and strengthen by 2010/2012 transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation.	[for strengthening regional PA networks] [for designation of PAs in ABNJ]
Goal 1.4: To substantially improve site-based protected area planning and management	**Target:** All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement.	
Goal 1.5: To prevent and mitigate the negative impacts of key threats to protected areas	**Target:** By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.	
Programme Element 2: Governance, Participation, Equity and Benefit Sharing		
Goal 2.1: To promote equity and benefit-sharing	**Target:** Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas.	
Goal 2.2: To enhance and secure involvement of indigenous and local communities and relevant stakeholders	**Target:** Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas	
Programme Element 3: Enabling Activities		
Goal 3.1: To provide an enabling policy, institutional and socio-economic environment for protected areas	**Target:** By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems.	
Goal 3.2: To build capacity for the planning, establishment and management of protected areas	**Target:** By 2010, comprehensive capacity building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards.	
Goal 3.3: To develop, apply and transfer appropriate technologies for protected areas	**Target:** By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation.	
Goal 3.4: To ensure financial sustainability of protected areas and national and regional systems of protected areas	**Target:** By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing states.	

Programme Elements and Goals of the PoW on Protected Areas		Status
Goal 3.5: To strengthen communication, education and public awareness	**Target:** By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased.	☺
Programme Element 4: Standards, Assessment and Monitoring		
Goal 4.1: To develop and adopt minimum standards and best practices for national and regional protected area systems	**Target:** By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted.	😐
Goal 4.2: To evaluate and improve the effectiveness of protected areas management	**Target:** By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties.	😐
Goal 4.3: To assess and monitor protected area status and trends	**Target:** By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets.	😐
Goal 4.4: To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area Systems	**Target:** Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management.	😐

Table 28 - Extent of Progress in meeting Targets of the CBD PoW on Protected Areas

12% of the PoW Targets have been attained, 65% are being attained whereas 23% are not being attained. Time-bound targets on a national level are essentially those under the obligations of the EU Habitats Directive. Action to establish or expand protected areas in any relatively unfragmented or highly irreplaceable natural areas, or areas under high threat, was significantly stepped up with the designation of areas that fall part of the EU Natura 2000 network and other regional networks. Interim measures to protect highly threatened areas are also addressed through the issuance of a conservation order under the Environment and Development Planning Act. Further information is provided in Chapter 3 – Sections 3.2 and 3.3. In 2009, Malta estimated the costs and benefits of implementing Natura 2000. This exercise which was requested at EU level, provides an overview of the financial resources and needs required for protected area planning, establishment and management. At the national level, market research was carried out in 2008, prior to the development of the Natura 2000 Communications Strategy. This survey provided a baseline assessment of public awareness on protected areas.

5.4.7 Global Strategy on Plant Conservation

Wild and cultivated plants provide us with a number of goods (such as food, fibre, clothing, genetic resources, medicines, oils) and services (such as climate regulation through the production of oxygen and removal of atmospheric carbon dioxide emissions, creation and stabilisation of soil, creation and protection of watersheds by promoting water infiltration and slowing down run off) that are indispensible to our well being and comfort, apart from being of economic, scientific and cultural value and essential for food security and serving as an important natural asset. Plants underpin primary productivity, provide a habitat and food source for wildlife and are a vital structural component of ecosystems that drives their functioning. The native plant

diversity that characterises the Maltese Islands amounts to some 1,200 species with some 25 species being endemic. In 2002, the Global Strategy on Plant Conservation (2002-2010) was adopted under the CBD framework. The Strategy incorporates 16 outcome-oriented global targets for 2010 and encompasses five themes:

- Understanding and documenting plant diversity;
- Conserving plant diversity;
- Using plant diversity sustainably;
- Promoting education and awareness about plant diversity, and
- Building capacity for the conservation of plant diversity.

It ultimately aims to halt the current and continuing loss of plant diversity, a concern which is also evident on a national level, bearing in mind that addressing the challenges posed by threats to plant diversity is a common concern (especially climate change and nutrient loading). A review of progress made in implementing this strategy has been undertaken. The status of implementation of the GSPC (2002-2010) in Malta is provided below.

LEGEND:

Priority action being successfully met | Ongoing work but priority action not yet fully met | Priority action not being successfully met

GSPC Targets	Status
1: A widely accessible working list of known plant species, as a step towards a complete world flora	😐
2: A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels	😐
3: Development of models with protocols for plant conservation and sustainable use, based on research and practical experience	😐
4: At least 10 % of each of the world's ecological regions effectively conserved	😐
5: Protection of 50 % of the most important areas for plant diversity assured	🙂 (terrestrial) 😐 (marine)
6: At least 30 % of production lands managed consistent with the conservation of plant diversity	😐
7: 60 % of the world's threatened species conserved *in situ*.	🙂
8: 60 % of threatened plant species in accessible *ex situ* collections, preferably in the country of origin, and 10 % of them included in recovery and restoration programmes	☹
9: 70 % of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained	😐
10: Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems	😐
11: No species of wild flora endangered by international trade	🙂
12: 30 % of plant-based products derived from sources that are sustainably managed	😐
13: The decline of plant resources, and associated indigenous and local knowledge innovations and practices that support sustainable livelihoods, local food security and health care, halted	😐
14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes	🙂
15: The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy	😐
16: Networks for plant conservation activities established or strengthened at national, regional and international levels	😐

Table 29 - Extent of Progress in meeting Targets of the GSPC

In a nutshell, 23% of the GSPC Targets can be considered as attained, 71% are being attained whereas 6% are not being attained.

COP10 has adopted the Global Strategy for Plant Conservation for the period 2011-2020 with the following outcome-oriented global targets:

- Target 1: An online flora of all known plants;
- Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action;
- Target 3: Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared;
- Target 4: At least 15% of each ecological region or vegetation type secured through effective management and/or restoration;
- Target 5: At least 75% of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity;
- Target 6: At least 75% of production lands in each sector managed sustainably, consistent with the conservation of plant diversity;
- Target 7: At least 75% of known threatened plant species conserved *in situ;*
- Target 8: At least 75% of threatened plant species in *ex-situ* collections, preferably in the country of origin, and at least 20% available for recovery and restoration programmes;
- Target 9: 70% of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge;
- Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded;
- Target 11: No species of wild flora endangered by international trade;
- Target 12: All wild harvested plant-based products sourced sustainably;
- Target 13: Indigenous and local knowledge innovations and practices associated with plant resources, maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care;
- Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes;
- Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy; and
- Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.

Parties are required to translate these into national targets according their national priorities and capacities, and taking into account differences in plant diversity between countries. The GSPC should be implemented in harmony with the updated Strategic Plan of the Convention for the period 2011- 2020 and with other PoWs, instruments and protocols, and initiatives of the Convention.

5.4.9 Global Taxonomy Initiative (GTI)

Taxonomy, that is, the science of naming, identifying and classifying components of biodiversity based on observing a number of characteristics of the organism (*e.g.* morphology, behaviour, genetics, biochemistry), is indispensable to biodiversity conservation and resource management. Taxonomic expertise are needed to catalogue native species on a national level, to develop inventories of species found within existing or planned protected areas, and to timely detect and monitor new introduced species with a potential for invasiveness (essential for timely assessment and mitigation of impacts) as well as for identifying biological control agents. Taxonomic information is also the basis for taking informed policy decisions on biodiversity and its

sustainable use. Specimens housed in biodiversity collections such as found in natural history museums are also important as reference material in taxonomy, apart from serving as education tools.

The Global TaxonomY Initiative established under the CBD Framework aims to address taxonomic knowledge gaps, the shortage of trained taxonomists and curators, and the impacts these deficiencies (taxonomic impediments) have on a country's ability to conserve, use and share the benefits of biodiversity. Taxonomy features as a cross-cutting issue under the CBD and is essential for implementing the obligations of the Convention (particularly Article 7 on identification and monitoring). The adopted programme of work on the GTI, which lists 19 planned activities grouped within five operational objectives, also provides support to other CBD thematic areas and cross-cutting issues (such as on protected areas, island biological diversity, and access and benefit sharing). The CBD has also published a comprehensive guide to the GTI. The status of implementation of the GTI in Malta is provided below.

LEGEND:

Priority action being successfully met

Ongoing work but priority action not yet fully met

Priority action not being successfully met

Operational Objective of the GTI	Status
1: Assess taxonomic needs and capacities at national, regional and global levels for the implementation of the Convention.	
2: Provide focus to help build and maintain the human resources, systems and infrastructure needed to obtain, collate, and curate the biological specimens that are the basis for taxonomic knowledge.	
3: Facilitate an improved and effective infrastructure/system for access to taxonomic information; with priority on ensuring countries of origin gain access to information concerning elements of their biodiversity.	
4: Within the major thematic work programmes of the Convention include key taxonomic objectives to generate information needed for decision-making in conservation and sustainable use of biological diversity and its components.	
5: Within the work on cross-cutting issues of the Convention include key taxonomic objectives to generate information needed for decision-making in conservation and sustainable use of biological diversity and its components.	

Table 30 - Extent of Progress in meeting the Operational Objectives of the GTI

On a national level, taxonomic expertise are limited, excluding in the fields of botany, entomology, ichthyology, ornithology, mammalogy and conchology. Taxonomic information on soil biodiversity (endogean species) is very limited, with available information being mostly limited to selected group of insects (mostly Coleoptera), molluscs, fungi (mostly macrofungi) and some invertebrate species (such as millipedes and isopods) associated with leaf litter, particularly in wooded areas. This limited knowledge is mostly due to the cryptic nature of soil inhabiting species, which are often small, if not minute, and not easily found. Nonetheless, a number of soil-inhabiting species have found in soil at 10-30cm depths, often under trees, many of which have been recently described as new species to science, endemic to the Maltese Islands.

Assessment of the taxonomic status of species of flora and fauna in the Maltese Islands was done with the publication of the 1989 Red Data Book for the Maltese Islands (Schembri & Sultana editors, 1989). From the time of this publication, many new records have been added to the Maltese list of species as a consequence of better exploration of the islands, thus contributing to

the improvement of our knowledge of certain groups. In addition, the taxonomic status of several taxa has been revised since then. The work of national experts has been pivotal in the discovery of new species and hence adding on to list of documented species for the Maltese Islands, compiling checklists or their review, as well as other studies related to taxonomy undertaken nationally or in liaison with fellow experts from other countries. Indeed the participation of national organisations in regional research programmes with a taxonomic component has also been of essence. Of these one mention the following projects:

- Biodiversity Collection Access Service for Europe (BIOCASE) Project (financed by FP5) - aimed to set up a concerted access to the science knowledgebase embodied by European biological collections.
- FAUNA EUROPAEA-NAS Extension project - aimed to produce a central database with a unique comprehensive list of valid accepted scientific names of the terrestrial and freshwater multicellular animal species that currently live in Europe, and information about their distribution at least at a European country level.

An accessible and exhaustive list of species native to the Maltese Islands however is yet to be compiled. The commissioned studies on the setting up of lists on native and endemic species pertaining to certain taxonomic groups provide the necessary taxonomic baseline to revise the 1989 Red Data Book for the Maltese Islands and instead compile an IUCN National Red Data List. This list will prioritise the species to be covered by the Biodiversity Action Plan Programme.

Although a number of taxonomic studies have been or are being undertaken locally, the lack of human and financial resources still impedes access to and generation of taxonomic information locally. There is the need to strengthen the existing infrastructure for biological collections, and also, to invest in innovative tools for taxonomic research and further capacity building so to create an enabling environment for embarking on further biodiversity-related projects and initiatives with a taxonomic component.

5.4.9 Plan of Action on Sub-national Governments, Cities and Other Local Authorities for Biodiversity (2011-2020)[106]

Biodiversity is not limited to natural, semi-natural and rural settings. Urban areas also support biodiversity. Indeed urban habitats or green spaces such as city parks, public gardens, and private gardens, not only are important for human enjoyment and recreation, but also serve as important areas for species that over the years have adopted to living alongside man. Appropriate design and management of green areas of cities and towns (including blue areas such as wetlands) are essentially not only for the maintenance and recovery of existing biodiversity but also for re-connecting people with nature and to build healthier societies. Cities, towns and local authorities such as local councils can play an important role in implementing the CBD and adopting measures in support of biodiversity at a local level and in urban environments.

[106] "Local authorities" in the Plan of Action include all levels of government below the subnational, national or federal level (prefectures, districts, countries, municipalities, cities, towns, communes, etc), while "subnational governments" (states, provinces, domains, territories, regional governments) applies only to the first immediate level of government below the national.

COP9 Decision IX/28 provides the following reasons for promoting the engagement of Cities and Local Authorities in the implementation of the CBD:

- The accelerated rate of urbanization, particularly in developing countries, increasingly concentrates decision-making and resources in cities, creating opportunities for managing better the consumption of resources that impact on biological diversity;
- Urban experiences in ecosystem conservation and sustainable use can contribute to strengthening national policies, regional strategies, and global agendas on biodiversity;
- Cities and local authorities play a critical role in designing and implementing land-use and zoning planning tools, urban development and infrastructure guidelines, investment promotion, and consumer awareness campaigns, all of which have direct effects on biodiversity, and in particular on water, climate change, protected areas, agriculture and forests, marine and coastal biodiversity and communication, education, and public awareness; and
- Cities and local authorities are in direct contact with, and have direct influence on biodiversity managers and users at the local level.

COP10 adopted this Plan of Action, which has the following objectives:

- Increase the engagement of subnational governments and local authorities, in support of their Parties, in the successful implementation of national biodiversity strategies and action plans, the Strategic Plan under the Convention on Biological Diversity for the period 2011-2020, the 2020 target and the programmes of work under the Convention on Biological Diversity;
- Improve regional and global coordination and exchange of lessons learned between Parties to the Convention on Biological Diversity, regional and global organizations, United Nations and development agencies, academia, and donors on ways and means to encourage and support local authorities to manage biodiversity sustainably, provide ecosystem services to citizens and incorporate biodiversity concerns into urban planning and development;
- Identify, enhance and disseminate policy tools, guidelines, and programmes that facilitate local action on biodiversity and build the capacity of local authorities to support their national Governments in implementing the Convention on Biological Diversity; and
- Develop awareness-raising programmes on biodiversity for local residents (including major groups such as business, local administrators, non-governmental organizations, youth and indigenous and local communities) in line with communication, education and public awareness strategies.

This Plan of Action includes examples of activities which may be implemented by cities and local authorities. Leaders from more than 200 local governments who attended the City Biodiversity Summit 2010 also adopted the Aichi/Nagoya Declaration on Local Authorities and Biodiversity.

5.5 Way Forward

Table 31 summarises the state of progress in the targets, goals and objectives considered in the previous sections. In light of the previous chapters of the NBSAP, sectoral policies, plans and programmes at EU and national level that are relevant to reaching biodiversity-related goals, whether directly or indirectly are summarised in Table 32.

☺ Priority action being successfully met	😐 Ongoing work but priority action not yet fully met	☹ Priority action not being successfully met	

Document	☺	😐	☹
State of the Environment Report - Recommendations	49%	46%	5%
SAPBIO – Priority Actions	21%	72%	7%
NSSD – Strategic Directions for Biodiversity	21%	72%	7%
CBD PoW Island Biodiversity - Targets	24%	67%	9%
CBD PoW Inland Waters Biodiversity - Goals	31%	69%	0%
CBD PoW Marine & Coastal Biodiversity – Operational Objectives	7%	60%	33%
CBD PoW Agricultural Biodiversity – Operational Objectives	0%	75%	25%
CBD PoW Dry & Sub-humid Land – Operational Objectives	0%	100%	0%
CBD PoW Protected Areas	12%	65%	23%
GSPC - Targets	23%	71%	6%
GTI – Operational Objectives	0%	80%	20%

Table 31 – Overall Summary of Progress

Sector	Policies, Plans and Programmes	
	EU Level	National Level
Agriculture	▪ Common Agriculture Policy (CAP) ▪ Regulation (EC) No 73/2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers ▪ Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) (as amended) ▪ Regulation (EC) No 834/2007 on organic production and labelling of organic products ▪ European Action Plan for Organic Food and Farming (COM/2004/415) ▪ Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (Sewage Sludge Directive as amended) ▪ Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (Nitrates Directive as amended) ▪ Framework Directive on the Sustainable Use of Pesticides (COM/2006/373) ▪ Thematic Strategy for Soil Protection (COM/2006/231) ▪ Thematic Strategy on the Sustainable Use of Pesticides (COM/2002/349)	▪ Maltese Code of Good Agricultural Practice ▪ Cross-Compliance Related to EU Aid Applications in terms of the Paying Agency Regulations, 2005 (LN 346 of 2005 as amended by LN 207 of 2009) ▪ National Rural Development Plan 2004-2006 ▪ Rural Development Strategy for Malta 2007-2013 ▪ National Rural Development Plan 2007-2013 ▪ Organic Farming Regulations, 2004 (LN 237 of 2004, as amended by LN 180 of 2005 and LN 232 of 2007) ▪ The Sludge (Use in Agriculture) Regulations, 2001 (LN 212 of 2001) ▪ Nitrates Action Plan ▪ Agriculture Waste Management Plan for the Maltese Islands ▪ Rural Strategy Topic Paper ▪ National Rural Network Action Plan ▪ Protection of Waters against Pollution Caused by Nitrates from Agricultural Sources Regulations, 2001 (LN 343 of 2001 as amended by LN 233 of 2004 and LN 426 of 2007) ▪ Nitrates Action Programme Regulations, 2011 (LN 321 of 2011)

Sector	Policies, Plans and Programmes	
	EU Level	National Level
Aquaculture & Capture Fisheries	▪ Common Fisheries Policy ▪ Regulation (EC) No 1198/2006 on the European Fisheries Fund (EFF) ▪ EU Strategy for the sustainable development of European aquaculture (COM/2002/511 & COM/2009/162) ▪ Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture ▪ Regulation (EC) No 1005/2008 establishing a system to prevent, deter and eliminate illegal, unreported and unregulated fishing ▪ Strategy to prevent, deter and eliminate illegal, unreported and unregulated fishing (COM/2007/ 601) ▪ Regulation (EC) No 1559/2007 establishing a multi-annual recovery plan for bluefin tuna in the Eastern Atlantic and Mediterranean ▪ Regulation (EC) No 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the CFP (as amended) ▪ Regulation (EC) No 1936/2001 laying down control measures applicable to fishing for certain stocks of highly migratory fish (as amended) ▪ Regulation (EC) No 812/2004 laying down measures concerning incidental catches of cetaceans in fisheries and amending Regulation (EC) No 88/98 ▪ Policy to reduce unwanted by-catches and eliminate discards in European fisheries (COM/2007/136) ▪ Implementing sustainability in EU fisheries through maximum sustainable yield (COM/2006/360) ▪ European Community Action Plan for the Conservation and Management of Sharks (COM/2009/40) ▪ Regulation (EC) No 1967/06 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea ▪ Community Action Plan for the conservation and sustainable exploitation of fisheries resources in the Mediterranean Sea under the CFP (COM/2002/535) ▪ Regulation (EC) No 199/2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the CFP. ▪ Decision 2010/93/EU adopting a multiannual Community programme for the collection, management and use of data in the fisheries sector for the period 2011-2013 ▪ Regulation (EC) No 1224/2009 establishing a Community control system for ensuring compliance with the rules of the CFP	▪ Fisheries Conservation and Management Act (FCMA – Cap. 425) and subsidiary legislation thereto ▪ Policy and Design Guidance for Aquaculture (amended in 2001) ▪ Fisheries Operational Programme for Malta 2007-2013 ▪ National Plan to combat illegal, unreported and unregulated fishing ▪ Enforcement of Sea Fishing Conventions Order, 2011 (LN 209 of 2011 as amended by LN 282 of 2011) ▪ Fishing Vessels Regulations, 2004 (LN 407 of 2004 as amended by 313 of 2008)
Land Development	▪ Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage (as amended) ▪ Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment (EIA Directive as amended) ▪ Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive) ▪ Thematic Strategy on the Urban Environment (COM/2005/718)	▪ Environment and Development Planning Act ▪ Development Planning (Procedure for Applications and their Determination) Regulations, 2010 (LN 514 of 2010) ▪ Development Planning (Fees) Regulations, 2010 (LN 356 of 2010) ▪ Environmental Management Construction Site Regulations, 2007 (LN 295 of 2007 as amended by LN 358 of 2007 and LN 371 of 2007) ▪ Structure Plan for the Maltese Islands (1990) ▪ Local Plans ▪ EIA Regulations, 2007 (LN 114 of 2007) ▪ SEA Regulations, 2010 (LN 497 of 2010) ▪ Prevention and Remedying of Environmental Damage Regulations, 2008 (LN 121 & 126 of 2008)

Sector	Policies, Plans and Programmes	
	EU Level	National Level
Health	▪ European Environment & Health Action Plan 2004-2010 (COM/2004/416)	▪ Draft Environmental Health Action Plan (2006)
Tourism		▪ Coastal Strategy Topic Paper ▪ Tourism Topic Study ▪ Tourism Policy for the Maltese Islands (2007-2011)
Energy & Transport (Air pollution and Climate Change)	▪ Directive 2008/50/EC on ambient air quality and cleaner air for Europe (repeals 96/62/EC) ▪ Thematic Strategy on Air Pollution (COM/2005/446) ▪ Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants (NEC Directive as amended) ▪ Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC ▪ Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants ▪ Directive 96/61/EC on Integrated Pollution Prevention and Control ▪ Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) ▪ Directive 2006/32/EC on energy end-use efficiency and energy services ▪ Action Plan for Energy Efficiency: Realising the Potential (COM/2006/545) ▪ Energy efficiency: delivering the 20% target (COM/2008/772) ▪ Energy 2020 A Strategy for competitive, sustainable and secure energy (COM/2010/639) ▪ Directive 2009/28/EC on the promotion of the use of energy from renewable sources ▪ Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond (COM/2008/768) ▪ An EU Strategy for Biofuels (COM/2006/34) ▪ Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles ▪ A European strategy on clean and energy efficient vehicles (COM/2010/186) ▪ Limiting Global Climate Change to 2 degrees Celsius - The way ahead for 2020 and beyond (COM/2007/2) ▪ Regulation (EC) No 443/2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles ▪ Reducing the Climate Change Impact of Aviation (COM/2005/459) ▪ Adapting to Climate Change: Towards a European Framework for Action (COM (2009) 147 final) ▪ Climate and Energy Package	▪ Ambient Air Quality Regulations, 2010 (LN 478 of 2010) ▪ Air Quality Plan ▪ 2009 PAMS report on projections and national programmes ▪ National Emission Ceilings for Certain Atmospheric Pollutants Regulations, 2002 (LN 291 of 2002 as amended by 232 of 2004 ▪ European Community Greenhouse Gas Emissions Trading Scheme Regulations, 2005 (LN 140 of 2005 as amended by LN 73 of 2006, LN 274 of 2006, LN 263 of 2010 and LN 486 of 2010) ▪ European Community Greenhouse Gas Emissions Trading Scheme for Aviation Regulations, 2010 (LN 445 of 2010 as amended by LN 4 of 2011) ▪ Large Combustion Plants Regulations, 2010 (LN 172 of 2010) ▪ National Allocation Plans for the trading periods 2005-2007 and 2008-2012 ▪ Integrated Pollution Prevention and Control Regulations, 2002 (LN 234/2002 as amended by LN 230/2004 and LN 56/2008) ▪ National Energy Efficiency Action Plan (2008) ▪ Cleaner and More Energy-Efficient Road Transport Vehicles Regulations, 2011 (LN 175 of 2011) ▪ Promotion of Energy from Renewable Sources Regulations, 2010 (LN 538 of 2010) ▪ Biofuels (Sustainability Criteria) Regulations, 2010 (LN 553 of 2010) ▪ Use of Biofuels or Other Renewable Fuels for Transport Regulations, 2004 (LN 528 of 2004) ▪ First and Second National Communications to the UNFCCC ▪ National Strategy for Policy and Abatement Measures to the Reduction of Greenhouse Gas Emissions ▪ National Climate Change Adaptation Strategy ▪ Integrated Pollution Prevention and Control Regulations, 2002 (LN 234 of 2002 as amended by LN 230 of 2004, LN 56 of 2008)
Waste	▪ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste (repeals 2006/12/EC) ▪ Thematic Strategy on the prevention and recycling of waste (COM/2005/ 666) ▪ Directive 1999/31/EC of 26 April 1999 on the landfill of waste (as amended) ▪ Directive 2008/1/EC concerning integrated pollution prevention and control	▪ Waste Regulations, 2011 (LN 184 of 2011) ▪ Waste Management (Landfill) Regulations, 2002 (LN 168 of 2002 as amended by LN 289 of 2002, LN 70 of 2007, LN 146 of 2007) ▪ Waste Management Subject Plan ▪ Solid Waste Management Strategy for the Maltese Islands (September 2001)

Sector	Policies, Plans and Programmes	
	EU Level	National Level
Water	▪ Directive 75/440/EEC concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (as amended) ▪ Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (as amended) ▪ Directive 2006/118/EC on the protection of groundwater against pollution and deterioration ▪ Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community ▪ Directive 91/271/EEC concerning urban waste water treatment (as amended) ▪ Directive 2006/7/EC concerning the management of bathing water quality ▪ Directive 2007/60/EC on the assessment and management of flood risks ▪ Flood risk management - flood prevention, protection and mitigation (COM/2004/472) ▪ Directive 2000/60/EC establishing a framework for Community action in the field of water policy (Water Framework Directive as amended) ▪ Towards sustainable water management in the European Union - First stage in the implementation of the WFD (COM/2007/128) ▪ Directive 2008/105/EC on environmental quality standards in the field of water policy ▪ Directive 2009/90/EC laying down technical specifications for chemical analysis and monitoring of water status ▪ Directive 2008/56/EC establishing a framework for Community action in the field of marine environmental policy (Marine Strategy Framework Directive) ▪ Establishing an environment strategy for the Mediterranean (COM/2006/475)	▪ Quality required of Surface Water intended for the Abstraction of Drinking Water Regulations, 2001 (LN 339 of 2001 as amended by LN 426 of 2007) ▪ Borehole Drilling and Excavation Works within the Saturated Zone Regulations, 2008 (LN 255 of 2008) ▪ Pollution Caused by Certain Dangerous Substances Discharged Into the Aquatic Environment Regulations, 2001 (LN 213 of 2001) ▪ Regulations for the Protection of Groundwater against Pollution caused by Certain Dangerous Substances, 2002 (LN 203 of 2002) ▪ Protection of Groundwater against Pollution and Deterioration Regulations, 2009 (LN 108 of 2009) ▪ Urban Waste Water Treatment Regulations, 2001 (LN 340 of 2001 as amended) ▪ Quality of Bathing Water Regulations, 2003 (LN 380 of 2003) ▪ Management of Bathing Water Quality Regulations, 2008 (LN 125 of 2008) ▪ Water Policy for the Future ▪ National Action Plan for the Protection of the Marine Environment from Land-Based Activities ▪ Water Policy Framework Regulations, 2004 (LN 194 of 2004 as amended by LN 24 of 2011) ▪ Water Catchment Management Plan for Malta ▪ Marine Policy Framework Regulations, 2011 (LN 73 of 2011)

Table 32 – Sectoral Policies, Plans and Programmes

Constraints in implementing the CBD PoWs at a national level can be summarised into technical (limited data, tools and technologies), financial (limited biodiversity financing), institutional (the need for more sectoral coordination and limited institutional capacity and capability) and regulatory (lack of resources for engaging in effective and timely enforcement). Despite the enactment of legislation on nature protection, implementation and enforcement, and policy development and integration is fraught with difficulties due to constraints in financial, human, administrative, technical and technological resources. In addition threat mitigation, habitat and resource management and restoration measures, including various forms of population manipulation such as species reintroductions and reinforcement programmes, need to be stepped up in order to achieve more comprehensive protection. Such measures are also dependent on the investment and securing of resources. A number of EU funds serve this purpose. These should be tapped as much as possible.

5.5.1 Strategic Goals of the NBSAP

Although, throughout the past years several milestones have been achieved at a national level, there is scope for further improvement via strengthened collective and cost-effective action to safeguard Malta's biodiversity. Future national efforts need to focus on additional sectoral

integration, on addressing policy and knowledge gaps and on fostering innovative and concrete ways to motivate progress in initiatives that benefit biodiversity. The following issues are deemed as pre-requisites to achieve this:

- The full range of values (including economic) of biodiversity and ecosystem services, as well as the potential role of biodiversity in addressing other environmental challenges (such as climate change), should be recognised at all levels and be fully reflected in decision and policy-making, where relevant;
- A coherent biodiversity monitoring regime is required to build a stronger knowledge base on the conservation status and trends of species and habitats of European community and national importance, in particular for those currently assigned an "unknown" status;
- Enhanced national implementation of relevant programmes of work (PoW) under the framework of the Convention on Biological Diversity necessitates collaborative projects and enabling activities;
- Strengthening the relationship between policy making and scientific research would ensure that research addresses the needs of policy makers and that in turn, policy development responds to research findings;
- Resource mobilisation is needed to improve national capacity in the fields of enforcement, site management, monitoring as well as research and development;
- Coordinated action and positive incentives, which promote local participation and private-public partnerships, and which drive forth successful conservation and sustainable use of biological and natural resources are called for, both within and outside protected areas;
- Greater awareness of the linkages between biodiversity, economic prosperity and human welfare is needed as it can empower changes in consumer behaviour based on informed-choices and, hence contribute towards a more sustainable-oriented and resource-efficient economy and society;
- The right market signals are required to support the sustainable use of biological and natural resources, and to leverage private investment as well as reward practices that safeguard biodiversity; and,
- Further policy integration of biodiversity concerns in relevant sectors is essential; such mainstreaming should address direct and indirect drivers of biodiversity change, and should build on mutually-supportive measures, which in turn contribute to the achievement of the CBD and EU 2020 targets at a national level.

The challenge for Malta is to meet future demands of an increasingly growing population, for land, water, food and energy, whilst at the same time halting in relative term the loss of biodiversity. Increasing demand places pressures on nature and in the end also pressures on the supply of ecosystem goods and services.

5.5.2 National Measures

> The achievement of sustainability in national development requires a strategic approach, which is both *long-term* in its perspective and *integrated* or 'joined-up' in linking various development processes so that they are as sophisticated as the challenges are complex.
>
> Dalal-Clayton and Bass, 2002
> *Sustainable Development Strategies – A Resource Book*

The above-mentioned strategic goals are translated into the following action-based and outcome-oriented measures, which are grouped into 18 thematic areas, reflecting the requirements of the CBD Convention text. Measures are also accompanied by colour coding to reflect the respective theme and also the timeline when the measure is expect to be implemented/achieved as follows: red: 2012-2014; amber: 2015-2017, green: 2018-2020 and blue: 2012-2020 since certain measures are

required throughout the time span covered by the NBSAP. An indication of where measures are related or dependent on other measures is given throughout the document.

Theme 1: Genetic Resources and Diversity (Code - GR)

- **GR1:** Distinct plant and animal genetic resources for food and agriculture (i.e. local livestock breeds and crop varieties, as well as wild relatives/landraces) are conserved as a genetic insurance in the face of environmental and climate risks as well as for food security. This is mainly achieved via the uptake of appropriate agri-environmental measures to support genetic diversity in agriculture.
- **GR2:** The genetic diversity of endemic species, particularly those characterised by small and isolated populations, is safeguarded against risks of natural disasters and climate change. This is mainly achieved via the maintenance of a gene/seed bank, and any other *ex situ* measures, in support of *in situ* conservation (see BI3).
- **GR3:** Domestic legal provisions on access to genetic resources and benefit sharing (ABS) are strengthened via a national framework, which sets out the administrative, procedural and policy requirements to provide legal certainty and transparency to providers and users of genetic resources, based on prior informed consent (PIC) and mutually agreed terms (MAT).

Theme 2: Species and Habitats (Code - SH)

- **SH1:** The integrity, structure and functioning of important ecosystems is maintained and, where required, restored, thereby securing the continued flow of ecosystem goods and services. This is done by mapping and assessing the state of ecosystems and their services in the Maltese territory by 2014.
- **SH2:** Species and Habitats of European Community and National Importance are maintained across their natural range via the implementation of adequate conservation measures (see SH3, SH4 and SH5), which support the existing legal protection regime. Maintenance or improvement in the status of Maltese species and habitats of European Community Importance, when compared to current assessments, is achieved by 2020, in so far as feasible.
- **SH3:** Opportunities for species reintroduction or reinforcement are explored and adopted, where feasible and where deemed of added value. Such endeavours should be designed following guidance issued by the IUCN and, should also be supported by secured resources and stakeholder engagement (links with SH2).
- **SH4:** Priority species, especially endemic species, and rare specialised habitats, are covered by species and habitat action plans, respectively. These plans of action should recommend tailored conservation measures and where required, management/restoration (links with SH2 and SH3).
- **SH5:** A strict protection regime is in place, in line with requirements of the EC Nature Directives, and which incorporates measures to address the illegal and the incidental capture and killing of protected species, including those that are migratory (links with SH2).
- **SH6:** Guidelines on habitat management and restoration are adopted and provide information on best practices for managing the different terrestrial and aquatic habitat types in Malta bearing in mind guidelines established by multilateral environmental agreements (MEAs), such as the Ramsar Convention in the case of wetlands.
- **SH7:** Urban biodiversity in villages and towns is safeguarded through the uptake of community initiatives, such as green rooftops, green open spaces, and other incentives, such as competitions for the best gardens and open spaces in urban areas, which promote the use of indigenous species (as opposed to invasive non-native plants). Such initiatives contribute to increase green urban areas.
- **SH8:** The "2002 Guidelines on Trees, Shrubs and Plants for Planting and Landscaping in the Maltese Islands" are updated to include guidance on context sensitive landscaping and planting, and to establish new standards on the basis of experience gained over the past years since their publication.

Theme 3: Ecological Network of Protected Areas (Code - EN)

- **EN1:** Efforts are continued to ensure that Malta's National Ecological Network constitutes a comprehensive and ecologically representative national system of protected areas, with improved sufficiency in affording protection to Maltese habitats and species.
- **EN2:** Conservation objectives and management plans are defined (by 2014 for terrestrial areas[107]) and implemented in a timely manner for Natura 2000 sites, which are also supported by sectoral policies and planning instruments that allow a fully integrated ecosystem approach.
- **EN3:** The capacity of linear features in the landscape (such as dry stone walls, watercourses, field margins, vegetated road verges) to serve as ecological corridors between fragmented areas and protected areas and for maintaining their vital role as important microhabitats for wild species and their dispersal, is maintained, more so in the face of climate change.
- **EN4:** Components for building a green infrastructure (as a holistic framework for resource planning and conservation) are strengthened to improve the ecological coherence of Natura 2000, via integration into the broader landscape, and hence curb habitat fragmentation, improve adaptation to climate change and aid in integrated flood management (links with EN2 and EN3).
- **EN5:** A zoning system (which in the case of terrestrial areas builds on adapted principles of the scheduling process) is in place for protected areas and applies temporal and spatial restrictions so as to direct anthropogenic pressures away from particularly sensitive habitats and species, or away from particularly sensitive periods of the year (links with EN2).
- **EN6:** A range of governance types for long term management of protected areas is in place, based on good governance principles.
- **EN7:** Standards, criteria and indicators are established to evaluate the effectiveness of protected area management.

Theme 4: Biological Introductions (Code - BI)

- **BI1:** A national information and early warning system (e.g. species black list + existing border controls and permitting procedures) is in place to prevent the introduction and spread of invasive non-native species via priority pathways. Accidental introductions are addressed by way of contingency planning thereby avoiding/minimising any socio-economic and environmental impacts.
- **BI2:** A systematic and coherent national strategy on invasive non-native species is in place by 2015 and is based on the CBD's three-stage hierarchical approach, which includes prevention, early detection of the species, and rapid action by eradication, containment and control (where feasible). This strategy is supported by other policy guidance on the removal of invasive species.
- **BI3:** Endemic species and areas of conservation value at risk by invasive species are identified, and prioritised for targeted, well-planned, ecologically and financial feasible remedial action, with the goal of reinstating self-sustaining native communities and healthy ecosystems.
- **BI4:** Key stakeholder groups, such as traders (pet shops, breeders and nurseries), as well as land and sea users cooperate to prevent the unwanted release/escape and spread of non-native and invasive species into the environment. To assist this, national codes of best practices are established in consultation with key stakeholders and adopted for those sectors that can aid the introduction and spread of invasive species. The drawing up of such codes builds on European Codes of Conduct as adopted under the Bern Convention.
- **BI5:** Measures are in place to implement the recommendations made in the National Biosafety Framework, and by strengthening legislation describing rules and procedures to further safeguard the environment from potential damage resulting from genetically modified organisms (GMOs).

[107] In the case of marine sites the timeline will be after 6 years from designation as SCIs through listing in a Commission Decision.

Theme 5: Sustainable Use of Biological Resources (Code - BR)

- **BR1:** A sustainable and diversified local source of native plant stock is available to cater for the increasing demand for native species of trees and shrubs for use in forestation, landscaping and planting for site stabilisation and restoration.
- **BR2:** Malta cooperates with the European Commission, EU Member States as well as Mediterranean Countries to maintain and restore fish stocks to levels that can produce maximum sustainable yield in line with the Common Fisheries Policy (CFP) and in support of the Marine Strategy Framework Directive (MSFD).
- **BR3:** Plant-based products are derived from sources that are sustainably managed in line with EU obligations.
- **BR4:** Exploitation of wildlife for trade is based on sustainable practices in line with CITES regulations and is supported by the continued provision of information on biodiversity trade and protection regulations by the CITES management authority to importers, exporters and other stakeholders. Where required, the provision of information is enhanced through the development and dissemination of guidance/awareness material, which contribute towards adequate implementation of national legislation on wildlife trade.
- **BR5:** The regulation of capture and killing of protected species builds on sustainability principles and is in line with provisions of national law and the EC Nature Directives. This is ensured via the better regulation initiative and also in light of conservation status assessments.

Theme 6: Sustainable Use of Natural Resources: Soil, Water and Land (Code - NR)

- **NR1:** Criteria for identifying and mapping High Nature Value Farmland (HNVF) in Malta are further defined, so that good agricultural and low-intensive practices, including organic farming, are applied to preserve such land and associated agrobiodiversity (links with SI2 and SI3).
- **NR2:** Land uses are commensurate with the management of soil and by inference, water resources across the Maltese Islands. This is required in order to promote: the build-up of soil organic matter; the enhancement of soil biodiversity; the reduction (and reversal, where possible) of soil erosion, contamination and compaction; the minimisation of salinization/sodification levels (where applicable); the mitigation of flood-induced soil mass displacement/ land sliding; and the increase in infiltration and moisture retention in the soil. Measures incorporated in a soil action plan are formulated by 2014 to address these goals in terms of how to mitigate the threats to Maltese soils and adopt measures aimed at soil conservation. The soil action plan and other national relevant policies shall contribute towards the requirements of the Convention to Combat Desertification (UNCCD) to develop desertification national action programmes.
- **NR3:** Transposition and implementation of the Pesticides Framework Directive (2009/128/EC), which advocates the sustainable use of pesticides and integrated pest management, supported by the completion of a national action plan by 2012, assists in reducing the potential damage on biological and water resources caused by pesticides.
- **NR4:** Effective measures are in place and implemented to address the over-abstraction and pollution of groundwaters, namely by nitrates and chlorides, in line with the Groundwater Directive (2006/118/EC), the Nitrates Directive (91/676/EEC), the Dangerous Substances Directive (76/464/EEC), transposing national legislation, the National Water Policy for the Future, and the Water Catchment Management Plan for Malta.
- **NR5:** Appropriate and cost-effective rainwater harvest technologies are adopted, where feasible, in urban and rural areas as an environmentally sound approach to address imbalances between water supply and demand, and thus ensure long term water security in Malta (links with NR4).
- **NR6:** Integrated water resources management, based on the ecosystem approach, is achieved via the full implementation of the Water Framework Directive (2000/60/EC amended by 2008/105/EC) and its programme of measures (which shall be updated in 2015) as well as the Marine Strategy Framework Directive (2008/56/EC). Such implementation shall be in a mutually supporting manner in the case of coastal waters. The successful implementation of measures in the Water Catchment Management Plan

for Malta results in the attainment of "Good Ecological Status" in surface waters, "Good Chemical Status" for groundwater and surface waters, and "Good Quantitative Status" for groundwater bodies, all by 2015 (and if this is not possible, by 2021 or 2027). "Good Environmental Status" in the marine environment is achieved by 2020, at the latest, via drawing up a national marine strategy by 2016, and, where possible supported by other policies in line with relevant Regional Seas Conventions. Implementation of the MSFD on a national level also contributes to the goals of the EU's Integrated Maritime Policy.

Theme 7: Climate Change (Code - CC)

- **CC1:** The interlinkages of climate change and biodiversity are taken into account when designing adaptation and mitigation activities, so as to ensure that such activities are both compatible with policies for the protection of biodiversity in Malta and the goals of creating a climate-resilient and low-carbon economy.
- **CC2:** The adaptive capacity of species and the sequestering ability of key habitats that act as sinks or carbon reservoirs are maintained or restored in so far as feasible (links with SH4), by way of forward planning, climate proofing management plans, where possible (links with EN2) and via the pro-active management of resources to reduce both non-climatic stresses (links with NR2, NR3 and NR4) and climate-related stresses.
- **CC3:** Existing data limitations (e.g. specific time series data for projections and to shed light on population trends) are addressed through biodiversity research and monitoring (links with RD1 and BM1) and other relevant environmental monitoring in order to provide quantitative data on vulnerability analyses based on climate projections and national impact scenarios which factor in Malta's small island state characteristics. This allows for prioritising measures to safeguard those species and habitats most at risk or most vulnerable to climate change (links with GR2 and SH4).
- **CC4:** Forestation for climate change mitigation is carried out on land of low biodiversity value or ecosystems largely composed of non-native species (following appropriate removal of invasive species using established guidelines – see BI2), and preferably degraded ones, and taking into account of the Pan-European Guidelines for Afforestation and Reforestation. Ecologically-sensitive forestation schemes, strategically located within the landscape, also enhance habitat connectivity (links with SH8 and EN4).
- **CC5:** The linkages between inland water ecosystems and climate change are assessed and the risks of water shortages for freshwater-dependent species are identified and rectified, where possible, especially during the hot summer months.

Theme 8: Pro-biodiversity Businesses and a Green Economy (Code - BE)

- **BE1:** Increased cooperation and involvement of the private sector and businesses in biodiversity conservation is encouraged, including the promotion of private sector voluntary initiatives/green business schemes, the support/uptake of pro-biodiversity business projects and by including biodiversity safeguards in corporate plans and programmes following guidance issued by the World Business Council for Sustainable Development and other organisations as well as initiatives such as the EU Business and Biodiversity (B@B) Initiative.
- **BE2:** Eco-efficient facilities, which adopt the cleaner production approach, and use environmentally-sound and innovative technologies, are increasingly established.
- **BE3:** The economic valuation of ecosystem services is assessed and integrated into green accounting and reporting systems at a national level by 2020.

Theme 9: Financing Biodiversity (Code - FB)

- **FB1:** European Community and new funding opportunities for biodiversity, including public and private investment and innovative financing of biodiversity conservation and protected areas, are identified at

a national level bearing in mind the findings of "The Economics of Ecosystems and Biodiversity" (TEEB) study, and incorporated in a national biodiversity financing plan by 2014. The purpose of this biodiversity financing plan is to assist resource allocation and uptake of funds towards supporting projects that adopt innovative approaches to advancing biodiversity conservation and sustainable use in the Maltese Islands.

- **FB2:** Market-based instruments (such as economic incentives, fiscal instruments, environmental certification schemes, labelling/branding and green public procurement) that have the potential to support the conservation and sustainable use of biodiversity, as well as improve the sustainability of supply chains, are established and implemented. Moreover instruments that recognise the value of goods of production systems that sustain biodiversity and the diversification of niche markets at a local level are also identified and fostered, including for those goods and services produced by protected areas (links with FB1).

Theme 10: Communication, Education and Public Awareness (Code - PA)

- **PA1:** Malta continues its biodiversity campaign to celebrate the UN Decade for Biodiversity via audience-targeted programmes on communication, education and public awareness (CEPA), which adopt a wide range of communication tools and media following guidance by the CBD CEPA Toolkit. Such a campaign aims at increasing communication (i.e. gaining cooperation in motivating actions in support of biodiversity), education (i.e. empowering people by promoting behavioural changes in support of biodiversity) and awareness (i.e. drawing attention about key issues to people who can influence outcomes in support of biodiversity).
- **PA2:** A National Biodiversity Database incorporating updated red data lists is completed by 2016 as a mechanism for maintaining and organising data on biodiversity. It is launched on Malta's Clearing House Mechanism (CHM) thereby creating a one-stop shop for access to updated biological information on species and habitats, and measures in place to protect them.
- **PA3:** A communication campaign on Natura 2000 is launched by 2013/2014.

Theme 11: Participatory Conservation (Code - PC)

- **PC1:** Members of society view Malta's biodiversity and its conservation as a "national insurance policy" and actively engage in resource efficient lifestyles and practices as well as participate in conservation measures, coordinated by voluntary bodies entrusted with the role of inspiring and engaging the public in conserving biodiversity within their locality (links with IE1).
- **PC2:** The positive and active role of Maltese farmers as stewards of agrobiodiversity and in the maintenance of the countryside and rural environment is encouraged.
- **PC3:** Outreach to farming, fisheries and aquaculture cooperatives, as well as hunting associations, helps to foster new partnerships and new projects or other collaborative work in support of biodiversity.
- **PC4:** The CBD Plan of Action on Sub-national Governments, Cities and Other Local Authorities for Biodiversity (2011-2020) is implemented by:
  - engaging local councils in the development and implementation of Malta's NBSAP, and encouraging them to reach out to major groups such as children and youth, women, NGOs and businesses, by raising awareness and promoting local action and synergistic partnerships for biodiversity in their locality; and
  - recognising and rewarding efforts of local councils and communities in implementing the NBSAP in their locality; and
  - integrating biodiversity considerations into urban infrastructure investments and procurement choices.

Theme 12: Enforcement (Code - EF)

- **EF1:** Resource constraints in the enforcement sector are addressed resulting in more timely and effective interception and deterrence of illegalities by way of *inter alia* setting up a centralised call centre on environmental contraventions and by setting up a task force assigned with the role of strengthening consolidation between environmental enforcement agencies (links with CB1).
- **EF2:** The polluter pays principle and principles of liability and redress are applied wherever environmental damage has resulted from an occupational or other activity of an operator.
- **EF3:** A National Enforcement Directorate is set up and effectively deals with curbing illegalities in Out of Development Zone (ODZ) areas.
- **EF4:** Environmental illegalities such as, but not limited to, the illegal alteration of water flows that is detrimental to freshwater-dependent biodiversity, illegal land conversion, as well as the illegal capture and killing of species, are addressed through strengthened enforcement and corrective action (links with EF1).

Theme 13: Environmental Assessment (Code - EA)

- **EA1:** The carrying out of environment impact assessments (EIA), strategic environment assessments (SEA) and appropriate assessments (AA) ensures that potential adverse and significant effects of projects, plans or programmes, and activities (including those with EU funding) on biodiversity (protected areas and species) are prevented/mitigated.
- **EA2:** Environment assessments are undertaken with due consideration of established guidelines by the CBD and other multilateral environmental agreement (MEAs) and, the Natura 2000 sectoral guidelines issued by the Commission.

Theme 14: Research & Development (Code - RD)

- **RD1:** Working partnerships with research institutions are developed or strengthened in order to undertake targeted interdisciplinary research that improves an understanding of biodiversity in ecological, social and economic aspects, and in line with policy demand.
- **RD2:** Attainment of know-how of environmental technologies and use of best practices assist in the fulfilment of national compliance and implementation requirements of the EU Environmental Acquis.
- **RD3:** Research is undertaken in cooperation with other Mediterranean Countries in order to identify marine areas beyond the limits of national jurisdiction eligible for designation as protected areas in accordance with international law, especially the UN Convention on Law of the Sea (UNCLOS) and taking into account of scientific guidance under the CBD.

Theme 15: Biodiversity Monitoring (Code - BM)

- **BM1:** A national biodiversity monitoring strategy is formulated by 2013 taking into account of established indicators such as the EU 2010 Biodiversity Baseline and relevant updated Streamlining European 2010 Biodiversity (SEBI) Indicators as well as bearing in mind other national environment monitoring activities undertaken in line with requirements of EU Directives (such as the WFD and MSFD) in order to avoid duplication of effort, while maximising best use of resources. The implementation of such a strategy will help Malta fulfil its monitoring obligations under the EC Nature Directives and biodiversity-related MEAs in a coordinated and coherent manner.
- **BM2:** Set up, and support via training, a national volunteer network that carries out biological recording on selected taxonomic groups of terrestrial species throughout the Maltese Islands.

Theme 16: Networking & Information Exchange (Code - IE)

- **IE1:** Existing (and where of added-value, new) national fora serve as a platform to maximise the involvement of relevant stakeholders in discussions on environmental issues, as well as to assist information flow to guide decision-making and to share expertise/experiences.
- **IE2:** Inter-departmental information exchange and cooperation is enhanced by means of direct communication channels, designation of national focal points and inter-institutional cooperation agreements, setting up an integrated environmental website as well as the setting up inter-agency committees, where required. Such activities also result in the streamlining of responsibilities.
- **IE3:** Bilateral and multilateral cooperation with other CBD Parties and EU Member States is continued to advance global and regional progress in biodiversity conservation.

Theme 17: Capacity Building (Code - CB)

- **CB1:** National authorities responsible for overseeing the sustainable use of resources (environment, agriculture, fisheries and water) and, for the regulation of species trade and the movement of non-native species, are well-equipped with adequate human, financial and technical means. An enabling environment is created that allows for effective conservation of biological resources, by way of capacity building including via training and continued professional development; reviewing administrative structures, where required; adopting mechanisms for adequate support in line with the CBD Resource Mobilisation Strategy, where relevant; and via a flexible and adaptable framework which promotes inter-sectoral planning, cooperation and synergy (links with FB1, EF1 and IE2).
- **CB2:** Site managers entrusted with the responsibility of managing protected areas, where applicable, are well-trained and appropriately equipped to carry out their duties effectively and based on best-practice.
- **CB3:** The mandate of environmental management partnerships/consortia is duly tied, both to, environmental requirements and priorities, and to a clear set of objectives, forming part of a holistic area management plan, which enables better-gearing toward area management, environmental restoration, and high-quality ODZ planting, with proper differentiation made between urban and rural landscaping, and, between landscaping, forestation and environmental restoration (links to SH8 and CC4).
- **CB4:** Gaps in taxonomic knowledge are addressed by strengthening taxonomic expertise and urging uptake of taxonomic research (links with RD1 and CB5).
- **CB5:** Scientific capacity in conservation biology tools for the recovery of endangered species is strengthened.

Theme 18: Other Sectoral Integration (Code - SI)

- **SI1:** Governmental entities involved in environmental management lead by example through various initiatives and by ensuring that green policies in support of biodiversity are adopted within their portfolio.
- **SI2:** Emerging biodiversity goals are integrated into future national Rural Development Plans, tailoring action to national and local needs whilst still maintaining an economically viable agricultural activity built on sustainable production.
- **SI3:** Farmers receiving financial assistance under the Common Agricultural Policy are compliant with Good Agricultural and Environmental Conditions (GAECs) and Statutory Management Requirements (SMR) in line with EU and national legislation.
- **SI4:** Good-management practices and aqua-environmental measures for sustainable management of the aquaculture sector and for preventing inadvertent release of aquaculture species are adopted on the basis of a national strategy on aquaculture (being implemented under the operational programme of the European Fisheries Fund). This strategy on aquaculture upholds environmental, social and economic standards for this industry in Malta.

- **SI5:** The principles and recommendations on integrated coastal zone management (ICZM) in the Coastal Strategy Topic Paper are developed further by way of a maritime spatial plan in line with the EU's Integrated Maritime Policy.
- **SI6:** The role and importance of spatial planning as an instrument for wider biodiversity conservation is reflected in new policy on spatial planning. The latter builds on the principles of integrated land use planning and devises measures to safeguard the wider countryside from urban sprawl, to support urban biodiversity and, to contribute towards the EU priorities on a Green Infrastructure (links with EN4).
- **SI7:** Proposals for the development of renewable energy facilities are evaluated against obligations stemming from the EC Nature Directives, through appropriate assessments and EIAs (links with EA 1 and EA2). By way of site planning, mitigation and monitoring in line with guidance issued by the EU and MEAs, any impacts on wildlife (such as bats, birds and marine mammals) are minimised.
- **SI8:** Sustainable tourism in Malta is promoted as one of the strongholds of the local economy and is attuned with biodiversity conservation, with an overall increased trend seen in the quality of Malta's tourism offer combined with evenly distributed temporal and spatial tourist flows and in-keeping with the carry capacity of fragile ecosystems. Implementation of relevant actions under the future Tourism Policy for the Maltese Islands, and taking into account the recommendations and guidelines under the CBD thematic area "Tourism and Biodiversity", contributes to a significant increase in the proportion of tourism activities which are ecologically sustainable.
- **SI9:** Sustainable waste management via waste prevention, re-use and recycling results in a general positive impact on the natural environment and is supported by increased public awareness and cooperation to adopt more resource efficient lifestyles thereby reversing trends of waste generation across the different waste streams.
- **SI10:** The consideration of healthy and biodiverse ecosystems in protecting against natural disasters (such as floods) is integrated into relevant risk reduction and preparedness policies.

All the afore-mentioned 18 thematic areas and accompanying actions, contribute to the 19 targets, where one theme may contribute to more than one target, while some targets are addressed by several themes as indicated in Annex I of this document. The timeline for implementing or achieving the measures is summarised in Annex II.

Progress in biodiversity conservation needs to be measured against a set of indicators. An AHTEG on indicators for the Strategic Plan for Biodiversity 2011 to 2020 has been set up under the CBD framework. The group met from 20 to 24 June 2011 in High Wycombe, United Kingdom. The results of the AHTEG were used in the preparation of the document on "Suggested Indicators for the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets" (UNEP/CBD/SBSTTA/15/2) which will be discussed during the sixteenth meeting of the Subsidiary Body on Scientific and Technical Advice (SBSTTA16). The indicators that will be used to assess progress in implementing the NBSAP will be based on adapted CBD and EU indicators, including the EU 2010 Biodiversity Baseline. Since these are still being elaborated at the CBD and EU level, Annex III provides examples of possible applicable (and adapted) indicators for the NBSAP.

5.6 Concluding Remarks

Implementation of the NBSAP will require collective action across sectors and at all levels using existing or updated environmental and relevant sectoral policy instruments. New policy instruments for biodiversity are envisaged at EU level as required by the EU Biodiversity Strategy to 2020, amongst which one can mention a coherent framework on addressing invasive non-native species, and the forthcoming EU Strategy on a Green Infrastructure.

A review of the implementation of the NBSAP will be undertaken in 2014 and then in 2020 in line with the reporting cycles of the CBD and the EU on progress in implementing the CBD Strategic Plan 2011-2020 and the EU Biodiversity Strategy to 2020.

As a concluding note, Malta's NBSAP is intended to be a living document evolving itself to refine its contents and add further information on the basis of feedback received via consultations with stakeholders, especially with respect to the further development of strategic directions and formulation of NBSAP measures. The ultimate goal is to reach agreement on a set of practical and implementable targets and measures that reflect national aspirations for the conservation and sustainable use of biodiversity in the Maltese Islands.

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(N.B. Additional references to those listed hereunder are presented in the form of web hyperlinks throughout the document)

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7. Annexes

Annex I – Linkages between the NBSAP Targets and Thematic Areas

Target	Thematic Areas
Target 1: Awareness	**Theme 10:** Communication, Education and Public Awareness (Code - PA)
Target 2: Valuation of biodiversity & ecosystem services	**Theme 8:** Pro-biodiversity Businesses and a Green Economy (Code - BE)
Target 3: Positive incentives for the conservation and sustainable use of biodiversity	**Theme 8:** Pro-biodiversity Businesses and a Green Economy (Code - BE) **Theme 9:** Financing Biodiversity (Code - FB)
Target 4: Mainstreaming	**Theme 5:** Sustainable Use of Biological Resources (Code - BR) **Theme 6:** Sustainable Use of Natural Resources: Soil, Water and Land (Code - NR) **Theme 18:** Other Sectoral Integration (Code - SI)
Target 5: Loss of habitats	**Theme 2:** Species and Habitats (Code - SH) **Theme 3:** Ecological Network of Protected Areas (Code - EN) **Theme 12:** Enforcement (Code - EF) **Theme 13:** Environmental Assessment (Code - EA)
Target 6: Overexploitation	**Theme 5:** Sustainable Use of Biological Resources (Code - BR) **Theme 6:** Sustainable Use of Natural Resources: Soil, Water and Land (Code - NR) **Theme 12:** Enforcement (Code - EF)
Target 7: Sustainable agriculture & aquaculture	**Theme 6:** Sustainable Use of Natural Resources: Soil, Water and Land (Code - NR) **Theme 18:** Other Sectoral Integration (Code - SI)
Target 8: Pollution	**Theme 6:** Sustainable Use of Natural Resources: Soil, Water and Land (Code - NR) **Theme 18:** Other Sectoral Integration (Code - SI)
Target 9: IAS	**Theme 4:** Biological Introductions (Code - BI)
Target 10: Protected Areas	**Theme 3:** Ecological Network of Protected Areas (Code - EN) **Theme 9:** Financing Biodiversity (Code - FB) **Theme 13:** Environmental Assessment (Code - EA)
Target 11: Species Loss	**Theme 1:** Genetic Resources and Diversity (Code - GR) **Theme 2:** Species and Habitats (Code - SH) **Theme 3:** Ecological Network of Protected Areas (Code - EN) **Theme 4:** Biological Introductions (Code - BI) **Theme 5:** Sustainable Use of Biological Resources (Code – BR) **Theme 12:** Enforcement (Code - EF) **Theme 13:** Environmental Assessment (Code - EA)
Target 12: Genetic diversity important for food and agriculture	**Theme 1:** Genetic Resources and Diversity (Code - GR)
Target 13: Restoration of ecosystems	**Theme 2:** Species and Habitats (Code - SH) **Theme 3:** Ecological Network of Protected Areas (Code - EN) **Theme 4:** Biological Introductions (Code - BI) **Theme 6:** Sustainable Use of Natural Resources: Soil, Water and Land (Code - NR)
Target 14: Climate change	**Theme 7:** Climate Change (Code - CC)
Target 15: Access to Genetic Resources	**Theme 1:** Genetic Resources and Diversity (Code - GR)
Target 16: NBSAP	**Theme 18:** Other Sectoral Integration (Code - SI)

Target 17: Contribution of local communities	**Theme 11:** Participatory Conservation (Code - PC)
Target 18: Scientific knowledge of status and trends	**Theme 13:** Environmental Assessment (Code - EA) **Theme 14:** Research & Development (Code - RD) **Theme 15:** Biodiversity Monitoring (Code - BM)
Target 19: Capacity for national implementation	**Theme 8:** Pro-biodiversity Businesses and a Green Economy (Code - BE) **Theme 9:** Financing Biodiversity (Code - FB) **Theme 16:** Networking & Information Exchange (Code - IE) **Theme 17:** Capacity Building (Code - CB)

Annex II – Timeline for implementation of NBSAP Actions

	Implementation Period	Applicable Actions
	2012-2014	SH1; SH4; SH5; SH6; SH8; EN6; BI4; BR1; NR2; NR3; CC4; CC5: FB1; PA3; EF1; EF3; BM1; CB3; SI1; SI2; SI5; SI6;
	2015-2017	GR2; GR3; SH3; EN4; EN7; BI2; BI5; BR2; NR1; CC2; CC3; BE2; BE3; FB2; PA2; RD3;
	2018-2020	SH2, EN3; EN5; NR4; NR5; BE1; BI3; BM2; CB2; CB4; CB5; SI9;
	2012-2020	GR1; SH7; EN1; EN2; BI1; BR3; BR4; BR5; NR6; CC1; PA1; PC1; PC2; PC3; PC4; EF2; EF4; EA1; EA2; RD1; RD2; CB1; IE1; IE2; IE3; SI3; SI4; SI7; SI8; SI10

Annex III – Examples of Indicators to Assess Progress in Implementation of the NBSAP

(Adapted from CBD, EEA, SEBI and EU indicators, including the EU 2010 Biodiversity Baseline, which are subject to revision)

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
STATE	What changes are occurring in the distribution of Malta's habitats, ecosystems and their services and what are the causes?	Trends in extent, condition and vulnerability of habitats, as well as ecosystems and their services	Trends in the extent (coverage – surface area) and degradation of natural and semi-natural ecosystems and habitats (including agroecosystems)	- CORINE land cover data - Data from mapping and assessment of ecosystem services - National Assessment under Habitats Directive Article 17 Reporting and Data on Natura 2000	**Target 5** **Theme 2**
	Are habitats of European Community interest found in the Maltese territory in an improved conservation status?		Trends in conservation status of habitats of European Community interest in the Maltese territory	National Assessment under Habitats Directive Article 17 Reporting i.e. Number of habitats in green, amber or red status	**Targets 5 & 13** **Theme 2**
	How many native species are threatened?	Trends in diversity, abundance, distribution and extinction risk of species	Trends in threat status of selected groups of species	- Red Data Lists (using IUCN criteria) - Data from biodiversity monitoring	**Targets 11 & 18** **Theme 2 & 15**
	What is the species richness and proportion of endemism of selected taxonomic groups?		Trends in species richness in selected taxonomic groups (e.g. plants, insects, mammals etc.)	Taxonomic data/Species Inventories as kept in the National Biodiversity Database	**Target 11** **Theme 2**
	What is the status of breeding birds in Malta?		Trends in number of breeding birds in Malta	Rare Breeding Bird Reporting	**Target 11** **Theme 2**
	What is the conservation status of species of European Community interest?		Trends in conservation status of species of European community interest	National Assessment under Habitats Directive Article 17 Reporting i.e. Number of habitats in green, amber or red status	**Target 11 & 18** **Theme 2 & 15**

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
STATE CONT.	What is the status of soil biodiversity in Malta?	Trends in diversity, abundance, distribution and extinction risk of species (Cont.)	Trends in diversity and abundance of selected above and below soil macro and micro species according to functional group	Data from environmental monitoring baseline survey (e.g.): - Species abundance within sampled horizon - Species evenness within sampled horizon - Presence of microorganisms, small and large invertebrates, small mammals and plant roots (incl. composition of microflora), within sampled horizon	**Targets 7 & 13** **Theme 6 & 18**
	Are fewer local breeds and crop varieties being used in Malta?	Trends in genetic diversity of species	Trends in genetic diversity of cultivated plants, and farmed animals and their wild relatives	- Number of crop varieties and livestock breeds conserved - Agri-environment measures on genetic diversity in agriculture & their uptake	**Targets 7 & 12** **Theme 1**
	How many endemic species are at risk of local extirpation and what are the reasons?		Population trends in endemic species	- Data on Endemic Species from biodiversity monitoring - Data from genetic research	**Targets 11 & 18** **Theme 1 & 15**
PRESSURES	Has the share of total utilised agricultural area (UAA) occupied by organic farming increased over the years?	Trends in pressures from agriculture, aquaculture, fisheries, trade and illegal capture and killing	Trends in organic farming	Percentage Organic Farming (State of Environment Indicator)	**Target 7** **Theme 6**
	Has the share of agricultural land under agri-environment and cross-compliance schemes increased?		Trends in the uptake of agri-environment measures and cross-compliance by Maltese farmers	- Number and effectiveness of measures developed in the National Rural Development Plans in support of agrobiodiversity and ecosystem services - Compliance rate for Statutory Management Requirements	**Target 7** **Theme 18**
	What is the extent of High Nature Value Farmland in Malta?		Trends in the extent and distribution of high nature value farmland (HNVF)	Mapping data on HNFV	**Target 7** **Theme 6**

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
PRESSURES CONT.	Has the share of fish farms under aqua-environment schemes increased?	Trends in pressures from agriculture, aquaculture, fisheries, trade and illegal capture and killing (Cont.)	Trends in the uptake of aqua-environment measures by Maltese farmers	Uptake of aqua-environment support under the National Operational Programme under the European Fisheries Fund and the future Maritime and Fisheries Fund	**Target 7 Theme 18**
	Has by-catch increased in fishing operations in Malta?		Trends in by-catch of selected species by certain fishing practices (e.g. turtles by long-lining)	Data from on-board observer schemes and number of turtles landed for rehabilitation	**Target 11 Theme 2**
	What is the status of Mediterranean commercial fish stocks?		Trends in catches for selected species	Biological data gathered in line with reporting requirements under the Common Fisheries Policy and national fisheries data collection programme to evaluate catches and landings	**Target 6 Theme 5**
	Has fishing capacity increased in Malta?		Trends in fishing effort capacity	Data gathered on Maltese fishing fleet in line with reporting requirements under the Common Fisheries Policy	**Target 6 Theme 5**
	What is the demand for the trade of CITES-listed species in Malta?		Trends in the number of CITES permits issued	Data from CITES permitting	**Target 6 Theme 5**
	To what extent is Malta succeeding in curbing illegal capture and killing of protected species?		Trends in illegal capture and killing of protected species	Number of prosecutions for species-related offences under the Environment and Development Planning Act	**Target 11 Themes 2 & 12**
	Is Malta succeeding in achieving no net loss of its countryside?	Trends in pressures from habitat conversion, invasive species, climate change, and pollution	Trends in loss of natural and semi-natural habitats (trends in land cover change)	- CORINE land cover data - Measures in place to offset habitat loss - Development permitted in ODZ by type - Development permitted in protected areas by type - Percentage of damaged ecosystems which are restored	**Target 5 Themes 2, 13 & 18**

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
PRESSURES CONT.	Is Malta succeeding in minimising habitat fragmentation?	Trends in pressures from habitat conversion, invasive species, climate change, and pollution (Cont.)	Trends in terms of fragmentation levels from 'very high' to 'very low'	- CORINE land cover data - Data adapting modalities from EU Biodiversity Baseline - Area forested with native species - Percentage of damaged ecosystems which are restored	**Target 5 & 13** **Theme 2 & 7**
	What percentage of Maltese soils is affected by sealing, soil organic matter decline and erosion?		Trends in proportion of land affected by soil sealing, soil organic matter decline and soil erosion	- Data from soil monitoring - Percentage uptake of measures concerning soil conservation	**Target 5 & 6** **Theme 6**
	Is the number of non-native species listed as "worst invasive species" in Malta increasing?		Trends in number/extent and impacts of invasive non-native species	- Number of new records of potentially invasive species - Number of species eradicated, controlled or contained	**Target 9 & 18** **Theme 4 & 15**
	How is climate change affecting Malta's biodiversity?		Trends in integrity of vulnerable ecosystems and response to climate change (e.g. changes in seasonal patterns of flowering, migration, shifts in distributions etc.)	- Data from biodiversity monitoring - Data from mapping and assessment of ecosystem services	**Targets 14 & 18** **Theme 7 & 15**
	Is Malta succeeding in mitigating green house gas (GHG) emissions and curbing air pollution?		Trends in GHG emissions by sector and trends in emissions of Ozone, Carbon Dioxide, Nitrogen Dioxide, Nitrogen Oxides and Sulphur Dioxide	- Data from Greenhouse Gas Inventory - Data from Air Quality Monitoring - State of Environment Indicators	**Target 8 & 14** **Theme 7**
	Is the nitrogen surplus (the difference between all nutrient inputs and outputs) from agriculture being reduced?		Trends in pollutant releases from agricultural activities into the environment	- Data from Reporting under Nitrates Directive - Data on the Nitrogen Balance for Malta	**Target 8 &** **Theme 6**
	Are water bodies in the Maltese territory in a good status?		- Trends in surface and groundwater quality - Trends in Nitrate and Chloride Levels in Groundwater Bodies	- Data in line with requirements of Water Framework Directive - Data gathered in line with Bathing Water Quality Directive - State of Environment Indicators	**Target 8** **Theme 6**

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
PRESSURES CONT.	Is Malta making progress towards achieving good environmental status in the marine environment?	Trends in pressures from habitat conversion, invasive species, climate change, and pollution (Cont.)	Trends in the environmental status of the marine environment in the Maltese territorial waters	Data gathered in line with Marine Strategy Framework Directive	**Target 6** **Theme 6**
BENEFITS	What are the implications of biodiversity loss on the well-being of Maltese citizens?	Trends in distribution, condition and sustainability of ecosystem services for human well-being	Trends in the capacity of ecosystems to provide benefits in terms of life-supporting services to Maltese citizens	Data from mapping and assessing the state of ecosystems and their services	**Target 13** **Theme 2**
	Are Maltese citizens using more than their share of Malta's biological and natural resources?	Trends in the water and ecological footprint	Trends in natural capital that delivers multiple ecosystem services	- Data from mapping and assessing the state of ecosystems and their services - CORINE land cover data	**Targets 6 & 13** **Themes 2, 5 & 6**
	Are freshwater resources in Malta used in a sustainable and equitable manner?		Trends in abstraction levels from aquifers	- Reporting under Surface Water Abstraction Directive - Extent of rainwater harvesting in Malta	**Target 6** **Theme 6**
	Are Maltese citizens increasingly reliant on material benefits?		Trends in waste generation by type of waste stream	SOER data on waste generated by type annually	**Target 17** **Themes 11 & 18**
	Is access to Malta's genetic resources based on prior informed consent (PIC)?	Trends in access and equity of benefit sharing of genetic resources	Trends in applications requesting for access to Malta's genetic resources	Number of PIC Applications	**Target 15** **Theme 1**
	Are the benefits derived from the use of genetic resources equitably shared between the providers and users of genetic resources?		Trends in the finalisation of mutually agreed terms (MAT)	Number of MATs (by type)	**Target 15** **Theme 1**

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
RESPONSES	Are Maltese citizens aware of the meaning of the term "biodiversity"?	Trends in awareness, attitudes as well as public and sectoral engagement in support of biological diversity and ecosystem services	Trends in public awareness and education on biodiversity issues	- Public Attitudes Survey - Eurobarometer surveys on "Attitudes of Europeans towards the Issue of Biodiversity" - Number of educational courses which include biodiversity - Number of initiatives undertaken such as biodiversity tours and number of persons who attended	**Target 1** **Theme 10**
	How well engaged are Maltese communities in support of biodiversity in their locality?		Trends in number of community initiatives in support of biodiversity in localities	- Number of community initiatives - Number of local sustainability strategies which include biodiversity safeguards - Number of schools participating in EkoSkola (State of Environment Indicator)	**Target 17** **Theme 11**
	What is the level of awareness of the Natura 2000 Network by Maltese citizens?		Trends in awareness of Natura 2000	Eurobarometer survey on "Attitudes of Europeans towards the Issue of Biodiversity"	**Target 1** **Theme 10**
	What is the uptake of green public procurement in Malta?		Trends in sustainable consumption and production of goods and services	Implementation of the National Action Plan on GPP	**Target 3** **Theme 9**
	What is being done to implement Malta's NBSAP?	Trends in integration of biodiversity, ecosystem services and benefits sharing into sectors plans, programmes, policies and incentives	Trends in implementation of NBSAP actions	NBSAP Review on progress on the implementation of actions	**Targets 4 & 16** **Theme 18**
	To what extent is biodiversity integrated in incentive systems?		Trends in incorporation of biodiversity and ecosystem services into incentive systems	- Number and effectiveness of positive incentives developed - Number of adverse incentives removed, reformed or reoriented	**Target 3** **Themes 8 & 9**
	To what extent is biodiversity integrated in decision and policy making?		Trends in reflection of biodiversity and ecosystem services in policy decisions, planning and reporting processes	Number of sectoral policies that include considerations for biodiversity and ecosystem service	**Target 4** **Theme 18**

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
RESPONSES CONT.	To what extent is the value of biodiversity integrated in green accounting?	Trends in integration of biodiversity, ecosystem services and benefits sharing into sectors plans, programmes, policies and incentives (Cont.)	Trends in knowledge of values of biodiversity and ecosystem services and extent to which the economic value is integrated in national accounting	Value of biodiversity in National Accounts	**Target 2** **Theme 8**
	Has the level of taxonomic and other scientific knowledge of Malta's biodiversity increased over the years?	Trends in accessibility of scientific and technical knowledge and its application	Trends in number of research projects and commissioned studies on components of biological diversity	- Number of taxonomic groups for which taxonomic expertise is adequate or is lacking - Research dissertations, commissioned studies and EIAs - Number of habitats and species for which good data exists and status assessments undertaken - Number of ongoing research and survey programmes on biodiversity - Number of volunteers engaged in monitoring	**Target 18** **Themes 13, 14 & 15**
	Are there conservation measures in place to adequately safeguard threatened species?	Trends in conservation action targeting threatened species	Trends in species-related conservation measures	- Number of species action plans in place and being implemented - Number of protected species in *ex situ* conservation	**Target 11** **Theme 2**
	What is the progress with the national designation of protected areas as a tool for biodiversity conservation?	Trends in coverage, condition, representativeness and effectiveness of protected areas and other area-based approaches	Trends in protected areas coverage and representation	- Number and area of designated protected areas by type as reported on the Common Database on Designated Areas (CDDA) - Data on Natura 2000	**Target 10** **Theme 3**
	Are protected areas effectively managed in Malta?		Number of protected areas covered by a management plan	- Number of sites for which management plans are prepared and implemented - Number of site conservation objectives achieved by type	**Target 10** **Theme 3**

Policy Question		Headline Indicator	Indicator Sub-topic	Data Source	Applicable NBSAP Target & Thematic Areas
RESPONSES CONT.	How much of Malta's public funds are being committed to the conservation of biodiversity?	Trends in mobilisation of resources, capacity building and networking	Trends in public financial flows of biodiversity-related funding	Data from Government of Malta	**Target 19** **Theme 9**
	How many private entities and businesses invest in biodiversity conservation in Malta?		Trends in private financial flows of biodiversity-related funding	Number of corporate plans which incorporate safeguards on ecosystem services	**Target 19** **Themes 8 & 9**
	How much of the EU allocated funds are used to finance biodiversity conservation projects in Malta?		Trends in number of uptake of EU funds in support of biodiversity	- Data from National Management Authorities of EU funds - Amount of funding in support of the Natura 2000 network	**Target 19** **Theme 9**
	How does biodiversity contribute to green jobs in Malta?		Trends in job opportunities in the environmental sector	Employment in the biodiversity-related fields	**Target 19** **Theme 17**
	What extent of networking is there amongst governmental entities?		Trends in national committees established on environmental issues	Number of established committees	**Target 19** **Theme 16**