RESPONSE Project 2003-2006

A review of legislation, policy and good practice for managing natural hazards (coastal erosion, instability and flooding) within coastal zones

LIFE Environment Project 2003-2006 'RESPONSE': LIFE 03 ENV/UK/000611

Isle of Wight Centre for the Coastal Environment & partners in the UK, Italy, France & Poland

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CONTEXT

This report forms part of the 2003-2006 LIFE-Environment Project RESPONSE (LIFE/03/ENV/UK/000611).

It has been prepared by the Project Leader, the Isle of Wight Centre for the Coastal Environment, Isle of Wight Council, UK, with the assistance of the Project Partners in the UK, Italy, France & Poland.

This report, and accompanying Matrix, is part of **TASK 4.1 'From Policy to Practice in the ICZM Framework'**, with it's stated objective as follows:

Immediate Objectives / Goals:
> To review successes and problems with policy, practice and management of natural hazards (instability, coastal flooding and erosion) in EU Member State coastal zones, identifying good practice to assist long term planning and risk management (Task 4.1)

Actions:
1) Identify good practice in national, EU & international legislation/administration relating to coastal natural hazards and their impact on developed & natural environments; identify potential policy modifications to assist long-term planning & risk management

2) Compare Member States' policy approaches to natural hazards in coastal areas (comparative matrix of Member States' policy approaches to coastal natural hazards)

Front cover – Coastal Landslide at Niton, Isle of Wight, UK, spring 2001

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ABBREVIATIONS

AAP	Area Action Plan
BAP	Biodiversity Action Plan
BGS	British Geological Survey
CAP	Common Agricultural Policy
CHaMP	Coastal Habitat Management Plan
CIRIA	Construction Industry Research and Information Association
CFMP	Catchment Flood Management Plan
CDOA	Coastal Defence Operating Authorities
CNR	Consiglio Nazionale delle Ricerche (Italian National Research Council)
DCLG	Department for Communities and Local Government
DEFRA	Department for the Environment, Food and Rural Affairs
DETR	Department of the Environment, Transport and Regions
DOMNR	Department of the Marine and Natural Resources
DOELG	Department of the Environment and Local Government
DTA	Directives Territoriales de l'Aménagement (Development Territorial Laws)
EA	Environment Agency
EMP	Estuarine Management Plan
EA	Environment Agency
EIA	Environmental Impact Assessment
EN	English Nature
ESDP	European Spatial Development Perspective
FRA	Flood Risk Assessment
GDPO	General Development Procedure Order

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GNDCI	Gruppo Nazionale per la Difesa dale Catastrofi Idrogeologiche (National Group for the Prevention of Hydrogeological Catastrophes)
ICZM	Integrated Coastal Zone Management
INU	National Institute of Town Planning (Italy)
IGN	Institut Geographique National (National Geographic Institute)
LA	Local Authorities
LPA	Local Planning Authorities
LDF	Local Development Framework
LDD	Local Development Documents
LEAP	Local Environment Action Plan
MA	Maritime Authority
MPGN	Minerals Planning Guidance Notes
NERC	National Environment Research Council
NPPG	National Planning Policy Guidelines (Scotland)
PAN	Planning Advice Notes
PPS	Planning Policy Statement
PPG	Planning Policy Guidance
PLU	Plan Local d'Urbanisme ~ Local Town Plan
POS	Plan d'Occupation des Sols ~ Use Land Plan
PPR	Plan de Prévention des Risques naturels ~ Natural Hazards Prevention Plan
RBMP	River Basin Management Plan
RGL	Referentiel Geographique Littoral (Geographic Coastal Referential)
RSS	Regional Spatial Strategy
SPA	Specially Protected Areas
SAC	Special Areas of Conservation
SCOPAC	Standing Conference on Problems Associated with the Coast
SHOM	Service Hydrographique et Oceanographique de la Marine (Hydrographical and oceanographic Marine Service)
SMP	Shoreline Management Plan
SNADT	Schéma National d'Aménagement et de Développement du Territoire (Territory Development and Planning National Scheme)
SMVM	Schemas de Mise en Valeur de la Mer (Sea Exploitation Schemes)
SCT	Schémas de Cohérence Territoriale ~ Territorial Coherence Scheme
SPD	Supplementary Planning Document
SRU	Solidarite et Renouvellement Urbain ~ Town Solidarity and Replenishment
TAN	Technical Advisory Notes
UDP	Unitary Development Plans
UDP	Unitary Development Plan
UKCIP	UK Climate Impacts Programme
ZAC	Zones d'Aménagement Concerté ~ Concerted Planning Area

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1. INTRODUCTION

The objective of the RESPONSE Project is to develop sustainable strategies for local authorities and stakeholders to manage natural risks within the coastal zone, by demonstrating an innovative regional-scale methodology for coastal evolution studies and risk mapping, taking account of the impacts of climate change. RESPONSE aims to transfer policy to practice by combining the physical and human factors with the impacts of national and European legislation, policy and administration, into an integrated system functioning within the Integrated Coastal Zone Management (ICZM) framework, allowing local authorities to assess the impacts of climate change on their coastlines and prioritise cost-effective preparatory action.

Natural hazards have significant impacts on coastal zones throughout Europe. The United Nations Development Programme (UNDP) 2004 states that a '*natural hazard is one among many potential threats to life and livelihood*'. A hazard exists where '*humans and the things that humans value are detrimentally affected*' (Lee and Jones 2004). Of equal importance is the notion of vulnerability which can be defined as '*the degree to which a systems is susceptible to, and unable to cope with, injury damage or harm'* (European Environment Agency 2005). The RESPONSE Project methodology aims to manage 'risk', which can be defined as the '*expected losses (of lives, persons injured, property damaged and economic activity disrupted) due to a particular hazard for a given area and reference period'* (European Environment Agency 2005), risk is therefore, the product of hazard and vulnerability.

Hazards at the coastal zone are the result of coastal change and the impact of this change on life and assets on the human and built environment. Natural hazards occurring within the coastal zone include coastal erosion, landslides and flooding. A landslide can be described as '*a movement of a mass of rock, earth or debris down a slope*' (Lee and Jones 2004). The type of coastal landslide will depend on the geological structure of the land, topography, lithology, hydrogeology, vegetation and climate. The latter component is being assessed in the RESPONSE project. Climate and climate change have a significant impact on landslides and the predicted changes in climate will lead to an increase in landslide risk (Lee and Jones 2004).

The LIFE Project 'Coastal Change, Climate and Instability' (McInnes *et al* 2000) notes that whilst major landslide events inevitably lead to significant loss of life and damage to property in developed areas, minor, longer term failures can also have costly implications through disturbance of structures and damage. This is particularly true for those EU coastal communities which do not have even the most basic monitoring systems and movements may go largely unnoticed, possibly leading to irreversible damage and substantial costs. This accentuates the importance of integrating natural hazard management into land-use development and planning policies, particularly as there are few mitigation measures that can be implemented to combat large, spontaneous ground movements that occur with little or no warning. The policies behind the management of landslide risk on an international, national and local scale are assessed in this report.

Coastal erosion can be described as '*the encroachment upon the land by the sea'* (EUROSION 2004a). The processes of coastal erosion and accretion have always existed and have contributed to the coastal landscape of Europe; however, climate change will have a significant effect in accelerating coastal erosion in

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some areas. Coastal erosion imposes hazards through the loss of land and the destruction of natural and artificial sea defences, potentially leading to flood risk. Climate change is likely to increase flood risk, through the effects of rising sea levels and more stormy weather (Environment Agency 2005). Management policies and practices, in terms of erosion control, are considered in his report.

The costs associated with natural hazards are expected to continue to rise in the future in the context of predicted climate change. Public expenditure in Europe dedicated to coastal protection against the risk of erosion and flooding reached an estimated 3,200 million euros in 2001 (EUROSION 2004a). In the same year about 7600 km benefited from coastal erosion mitigation schemes. Such mitigation schemes combine a wide range of techniques and approaches (EUROSION 2004a). In April 2004, foresight published a long term vision for the future of flood and coastal defence in the UK. This report states that coastal erosion will increase substantially if spending on coastal defence continues at present levels. The annual average damage is set to increase by 3-9 times by the 2080s to £126 million per year in the worst case scenario (Foresight 2004). Richardson (2005) claims that '*coastal erosion is going to be a major issue for the future with £10 billion of assets at risk in the UK'*. Flood management costs the UK £2.2 billion each year; even with £800 million per year spent on flood and coastal defences, the UK still experiences on average £1,400 million of damage (Foresight 2004). In order to protect assets in the coastal zone it is necessary to establish the extent of climate change and implement sustainable management policies in order to reduce the risks for future generations. Case study examples have been reviewed in this report to review legal frameworks in Europe and Internationally.

There is a need to adopt a more proactive and integrated approach to hazard management, based on planning, monitoring, evaluation, and ICZM in view of the impacts of climate change. This report reviews the legislation, policy and management of natural hazards (in particular coastal erosion, instability and flooding) on an international, national and local scale. In addition the report identifies examples of good practice in EU Member State coastal zones to assist long term planning and risk management. For a more detailed review of good practice, see the RESPONSE publication "Responding to the risks from climate change: a good practice guide".

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2. INTERNATIONAL LEGISLATION AND GUIDANCE

2.1 Introduction

Legislation and guidance at the international level provides an over arching framework, which is translated into national and local legislation and guidelines. The legislation, policy and guidelines influencing the management of coastal instability, flooding and erosion at an international level are illustrated below.

International environmental law often takes the form of treaties or conventions, which may be either bilateral (between two states) or multilateral (between more than two states). Multilateral Environmental Agreements (MEAs) may be either global or regional. Although such treaties and Conventions are legally binding, they can only bind those states that agree to join them and, therefore, their effectiveness depends on the principle of consent. Some other international agreements affecting the environment take the form of a declaration, in which States declare their intention to achieve specified objectives, but do not make legally binding commitments. Such policies depict the intentions of the State.

The main international legal instruments specifically relating to the marine and coastal areas are the United Nations Convention on Law of the Sea (UNCLOS), Agenda 21, International Maritime Organisation (IMO) Conventions and the Ramsar Convention on Wetlands.

2.2 United Nations Convention on Law of the Sea (UNCLOS)

The United Nations Convention on Law of the Sea (UNCLOS) was adopted in 1982 and came into force in 1994. UNCLOS establishes the general principles of jurisdiction and responsibility in the marine environment to which other international, regional and national laws must conform. The UNCLOS treaty provides universal legal controls for the management of marine natural resources and the control of pollution. Its secretariat lies within the UN Division for Ocean Affairs and the Law of the Sea. Following its signing, the UN Secretary-General described the treaty as “Possibly the most important legal instrument of this century” (United Nations website).

UNCLOS defines the maximum extent and delimitation methods of maritime zones together with the powers of the States. The Convention set the limit of territorial waters to twelve nautical miles, within which area the coastal state is free to set laws, regulate use and utilise resources. Coastal states are also entitled to claim a contiguous zone of up to 24 nautical miles and an Exclusive Economic Zone (EEZ) of up to 200 nautical miles from shore.

The current aims of the UN include strengthening the cooperation that has developed over the last two decades among the organisations in the UN system involved in marine affairs. Such close cooperation would be of great benefit to states, since it would avoid duplication and overlapping of activities. It would also help to coordinate multidisciplinary activities related to the management of marine affairs (United Nations website).

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2.3 Agenda 21

The United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992 (otherwise known as the Earth Summit), provided the fundamental principles of sustainability and developed the programme of action for achieving sustainable development. At this global conference, Agenda 21 was adopted by more than 178 Governments. Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organisations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment. Chapter 17 aims at "*the Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources*" (UN 2003).

Coastal States commit themselves to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction. The objectives of Agenda 21 (Chapter 17) are as follows:

a) Provide for an integrated policy and decision-making process, including all involved sectors, to promote compatibility and a balance of uses;
b) Identify existing and projected uses of coastal areas and their interactions;
c) Concentrate on well-defined issues concerning coastal management;
d) Apply preventive and precautionary approaches in project planning and implementation, including prior assessment and systematic observation of the impacts of major projects;
e) Promote the development and application of methods, such as national resource and environmental accounting, that reflect changes in value resulting from uses of coastal and marine areas, including pollution, marine erosion, loss of resources and habitat destruction;
f) Provide access, as far as possible, for concerned individuals, groups and organizations to relevant information and opportunities for consultation and participation in planning and decision-making at appropriate levels (UN 2003).

Section C of Chapter 17 emphasises the importance of international and regional cooperation and coordination in Integrated Coastal Zone Management (ICZM) and states: "*The role of international cooperation and coordination on a bilateral basis and, where applicable, within a subregional, interregional, regional or global framework, is to support and supplement national efforts of coastal States to promote integrated management and sustainable development of coastal and marine areas*" and "*States should cooperate, as appropriate, in the preparation of national guidelines for integrated coastal zone management and development, drawing on existing experience*" (UN 2003).

The full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the commitments to the Rio principles, were strongly reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa in 2002 (United Nations website).

2.4 International Maritime Organisation

The International Maritime Organisation (IMO) was established as a result of a convention held in Geneva in 1948, and met for the first time in 1959. IMO is the UN agency responsible for improving maritime safety and navigation and preventing pollution.

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When IMO first began operations its chief concern was to develop international treaties and other legislation concerning safety and marine pollution prevention. Since 1959 IMO has promoted a series of global conventions to regulate such issues. By the late 1970s however, this work had been largely completed. IMO is now concentrating on keeping legislation up-to-date and ensuring that it is ratified by as many countries as possible. Currently, the emphasis is on trying to ensure that these conventions and other treaties are properly implemented by the countries that have accepted them (International Maritime Organisation website).

2.5 Ramsar Convention on Wetlands

The Ramsar Convention on Wetlands of International Importance was agreed in 1971 and came into force in 1975. It was the first global treaty on nature conservation with contracting parties throughout the World. The text has since been amended in 1982 and 1987. There are currently 152 contracting parties to the convention, with 1610 wetland sites, totalling 145.2 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance (Ramsar website).

The Ramsar Convention contracting parties agree to a number of commitments by signing up to the treaty, including designating wetland sites and establishing wetland nature reserves. Contracting parties report on implementation progress to the Conference of the Contracting Parties (COP), which meets every three years. The COP aims to encourage international cooperation in the delivery of wetland conservation, through the management of trans-boundary water resources and wetlands, collaboration with other international conventions and organisations, information sharing and by aiding developing countries through financial and technological assistance.

2.6 Integrated Management and Sustainable Development of Coastal Areas

The sustainable development of coastal areas and the management of coastal resources in an integrated manner are two major policies that are of high priority on international agendas. These policies are key concepts when considering the management of natural hazards in coastal zones.

The World Coast Conference, which was held from 1-5 November 1993 in the Netherlands, examined actions to strengthen capabilities for progressive sustainable development and integrated coastal zone management (ICZM). Participants at the Conference from more than 90 nations, 19 international organizations and 23 NGOs discussed actions for coastal States to undertake ICZM toward the year 2000. The Conference Statement and the Conference Report noted the following:

- There is an urgent need for coastal States to strengthen their capabilities for ICZM, working towards the development of appropriate strategies and programmes by the year 2000.
- ICZM is the most appropriate process to anticipate and respond to long-term concerns and needs while addressing present day challenges and opportunities.
- ICZM involves the comprehensive assessment, setting of objectives, planning and management of coastal systems and resources, taking into account traditional, cultural and historical perspectives

and conflicting interests and uses; it is a continuous and evolutionary process for achieving sustainable development.

- Coastal States that are in the process of defining and implementing a national programme for ICZM have encountered obstacles that constrain the effective development of national programmes. These include: limited understanding and experience in ICZM; limited understanding of coastal and marine resources; fragmented institutional arrangements; single-sector oriented bureaucracies; competing interests and lack of priorities; inadequate legislation and/or lack of enforcement; land-tenure regimes and other social factors; and lack of information and resources.
- Coastal States are urged to identify their priorities for ICZM, to identify their most pressing needs to improve their capabilities for ICZM, to undertake national measures to increase their capabilities, and to identify their special needs for assistance.
- Effective ICZM can be achieved by coordination between national, regional and international organizations and institutions. This will help to avoid unnecessary duplication and to develop the concepts, tools and networks needed to facilitate the development and implementation of national programmes. Support for ICZM capacity building could be in the following areas: information; education and training; concepts and tools; research, monitoring and evaluation; and funding.

(Global Development Research Centre website)

The global guidelines on ICZM have been translated into regional and national guidelines around the world. For example the European Parliament and Council Recommendation Concerning the Implementation of Integrated Coastal Zone Management in Europe (COM/00/545 of 8 Sept. 2000) was adopted in 2002. Whilst the concept of ICZM is rapidly developing in Europe, innovative progress is being made in other continents. For example, the USA has over thirty years of history of coastal management initiatives; the main foundation for this is the 1972 Coastal Zone Management Act. Coastal management practises are encouraged through incentives from the central government by provision of funding for the development of coastal planning policies. New Zealand introduced the Resource Management Act 1991 which provided for the framework for establishment of a new organisational and administrative structure for addressing coastal hazard planning and policy development. Australia has also recognised the importance of ICZM. The principal ICZM initiatives have comprised a series of State reviews and Coastal Policy Bills. Elsewhere the need for coastal management has been reinforced in the case of many low lying Pacific Islands, for example Micronesia (McInnes 2004).

A recent report produced by the European Environment Agency states, “Integrated coastal zone management has been widely recognised and promoted as the most appropriate process for dealing with current and long-term coastal challenges including climate change and sea level rise” (European Environment Agency, 2006). ICZM is discussed further in Chapter 3: European Legislation and Guidance

2.7 Climate Change

International Policies on Climate Change have been difficult to achieve and acquire global agreement. In 1988 the Intergovernmental Panel on Climate Change (IPCC) was created by the United Nations, bringing together scientists from the world's governments. During the 1980s, discussion about climate change focused on whether the world was warming or cooling and the formation of the IPCC marked an important step

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towards finding scientific answers. Former Prime Minister Brian Mulroney and former Norwegian Prime Minister Gro Harlem Bruntland hosted one of the world's first major scientific conferences on climate change, the Toronto Conference on the Changing Atmosphere (1988). It called for a 20% cut greenhouse gas emissions by 2005. Two years after its formation, the IPCC released its first report stating that the planet was warming and that human activity was causing it.

The IPCC 1992 report was fundamental to development of the UN Framework Convention on Climate Change (UNFCCC), which was agreed at the Earth Summit in Rio de Janeiro in 1992 and has been ratified by over 170 countries. The UNFCCC sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognises that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases (UNFCCC website). The convention began to consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable.

With gathering information and the results of Global Climate Models (GCMs), the UNFCCC recognised that further cuts in global emissions were needed to prevent serious climatic impacts in future. Each year, the countries that ratified the Rio Convention held a Conference of Parties (COP). In 1997 the 3rd COP meeting was held in Kyoto, Japan. After reviewing the original targets of the Rio Convention and finding them to be too weak, the countries came up with new targets. After intensive negotiations, a substantial extension to the Convention that outlined legally binding commitments to emissions cuts was adopted in Kyoto on 11 December 1997. The Kyoto Protocol sets out to reduce climate emissions of developed countries by some 5.2% below 1990 levels over the period 2008-2012. Additionally, the Kyoto Protocol introduced mechanisms to allow developed countries to buy emission reductions that have taken place in other countries and count them as their own. These mechanisms are Joint Implementation, Clean Development and Emissions Trading. Carbon sinks for the sequestering of CO^2, for example the proposed 'Kyoto Forests' are also allowed under the protocol.

The protocol was first agreed in 1997, but required the agreement of countries responsible for at least 55% of global emissions measured in 1990. The US, the world's largest emitter of greenhouse gases, withdrew from the protocol in 2001, saying that the changes would be too costly to introduce and that it would gravely damage the US economy. The Bush administration also criticised the protocol for not forcing developing nations including India and China to cut emissions immediately. Australia, which has a large coal industry, has also refused to ratify Kyoto.

After the United States refused to ratify the Protocol, only the Russian Federation, responsible for 17% of emissions, could enable this threshold to be passed. On 18 November 2004 Russian President Vladimir Putin signed the Kyoto protocol, finally allowing the protocol to be formally sanctioned. The Kyoto Protocol became a legally binding treaty on 16 February 2005. The European Environment Agency (2005) wrote, "By ratifying the UNFCCC and its Kyoto Protocol, the EU committed itself to the ultimate goal of the Convention. The objective is to stabilise greenhouse gases at levels sufficient to prevent dangerous anthropogenic climate change". Countries that fail to meet the targets will face penalties and the prospect of having to make deeper cuts in future. "The entry into force of Kyoto is the biggest step forward in environmental politics and law we have ever seen," said Jennifer Morgan, director of the World Wide Fund for Nature (WWF) conservation group's climate change programme.

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For the countries that have signed up to Kyoto, meeting the goals could be difficult. Canada, one of the treaty's first signatories, has no clear plan for reaching its target emission cuts. Emissions in Canada have actually increased by 20% since 1990. Japan is also unsure it will be able to meet its legal requirements to reduce emissions by 6% by 2012 (BBC News, February 2005).

Climate change and global warming are of increasingly political concern. At the recent G8 Summit in July 2005 in Gleneagles, Scotland, the world's most powerful leaders successfully agreed a statement about climate change and a series of actions. The G8 communiqué on climate change at the end of the Summit was a significant and long awaited expression of political agreement that human activity is contributing to climate change and of the consequent need to reduce greenhouse gas emissions. The climate change parts of the communiqué included:

- A political statement on the importance of climate change and an agreement to "act with resolve and urgency now".
- Agreement that greenhouse gas emissions need to slow, peak and reverse and that G8 countries need to make substantial cuts in emissions.
- A package of measure to combat climate change, building on existing work in order to increase the speed with which we reduce greenhouse gas emissions. This package includes improvements to energy efficiency in appliances and buildings, cleaner vehicles, aviation, work on developing cleaner fuels, renewable energy and promoting research and development and the financing of future projects. In order to assist with this the G8 has engaged with the International Energy Agency (IEA) and asked them to undertake further work on actions to reduce emissions.
- Agreement for the G8 to engage with the World Bank and other multilateral development.
- Agreement to a new dialogue on climate change, clean energy and sustainable development between G8 countries and other interested countries with significant energy needs. The dialogue will allow continued, more informal, discussion of the issues around climate change and measures to tackle it, such as those agreed at Gleneagles. This dialogue will also help create the condition for more constructive negotiations within the United Nations framework.
- Agreement to improve climate observation networks in Africa and to build capacity in African research institutions. This will be achieved by building on the existing Global Climate Observing System (GCOS).
- Agreement to support the work of international donor organisations and multilateral development banks as they develop and implement 'best practice' guidelines for screening the extent to which new infrastructure investments could be affected by climate risks and how these risks can best be managed.

  (G8 Gleneagles 2005 website)

Also welcome was the explicit acknowledgement of the UN as the body that must ultimately take the lead on negotiations around the creation of an international framework to ensure that climate change is tackled globally and fairly (The Independent, 2005). The Summit also agreed to develop an action plan with regard to accelerating the deployment of clean energy technologies and the adoption of energy efficient measures. The

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Tyndall Centre report 'Key 8 for G8' (2005) states, "The Gleneagles Action Plan is a welcome landmark on the long road to effective global climate management".

2.8 Disaster Reduction Strategies

The United Nations International Strategy for Disaster Reduction (UNISDR) revolves around three major concepts, namely natural hazards, vulnerability and risk. The UNISDR promotes links and synergies between, and the coordination of, disaster reduction activities in the socio-economic, humanitarian and development fields, as well as to support policy integration. It serves as an international information clearinghouse on disaster reduction, developing awareness campaigns and producing articles, journals, and other publications and promotional materials related to disaster reduction.

The UNISDR aims at building disaster resilient communities by promoting increased awareness of the importance of disaster reduction as an integral component of sustainable development, with the goal of reducing human, social, economic and environmental losses due to natural hazards and related technological and environmental disasters (International Strategy for Disaster Reduction website).

Priority goals for development planning were laid out in the Millennium Declaration in 2000 and agreed by 191 nations. Eight Millennium Development Goals have been broken down into 18 targets and 48 indicators for progress. Most of the goals are set for achievement by 2015. Each of these goals interacts with disaster risk and potentially contributes towards a reduction in human vulnerability to natural hazard. However, it is the processes undertaken in meeting each goal that will determine the extent to which disaster risk is reduced.

The UNDP report *Reducing Disaster Risk: A Challenge for Development* highlighted six key recommendations: governance for risk management; mainstreaming disaster risk into development planning; integrated climate risk management; managing the multifaceted nature of risk; compensatory risk management; and acquiring the knowledge for disaster risk assessment. UNDP states that '*appropriate governance for disaster risk management is a fundamental requirement if risk considerations are to be factored into developing and if existing risks are to be successfully mitigated*' (UNDP 2004).

The report differentiates between two types of disaster risk management: *prospective disaster risk management* should be integrated into sustainable development planning. Development programmes need to be reviewed for their potential to reduce vulnerability and hazard, the *compensatory disaster risk management* focuses on the amelioration of existing vulnerability through past development pathways. Compensatory policy is required for medium to long term disaster risk reduction. A developmentally informed perspective on disasters lies at the intersection of work normally undertaken by the development planners and disaster risk reduction practitioners. The report highlights the need to bring together development and disasters (UNDP 2004).

In addition UNDP emphasises the need to '*build on capacities that deal with existing disaster risk is an effective way to generate capacity to deal with future climate change risk*'. Natural disaster risk reduction can provide a useful basis for adapting to climate change. Bringing the disaster and climate change risk agendas

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and communities together should be a priority, facilitated by a proactive, adaptive mode of risk reduction championed in the UNDP report, which has much in common with the orientation of policy work on adapt ion to climate change (UNDP 2004).

Previous initiatives the Declaration of the UN International Decade for Natural Disaster Reduction (IDNDR) 1990-1999 helped to raise the profile of discussions surrounding the social and economic causes of disaster risk. In 1999 the countries participating in the IDNDR's International Programme Forum signed a Declaration of Intent, recognising that the world is increasingly being threatened by large-scale disasters and agreeing to act to guarantee a safer world for future generations. As the successor to IDNDR in 2000, the UN International Strategy for Disaster Reduction (ISDR) was initiated to foster this agenda by focussing on the processes involved in the awareness, assessment and management of disaster risks. A framework to organise and describe disaster risk reduction was the outcome of the information collection and processing for *Living with Risk: A global review of disaster reduction 2002*. In addition, the work conducted by UNDP to develop a risk and vulnerability index, took into account the positive impact of disaster risk reduction measures, organized around basic components. Based on these experiences, ISDR and UNDP worked during the first half of 2003 to develop a framework aimed at developing a "backbone" to guide the review of the Yokohama strategy, as well as future action in the *Framework for disaster risk reduction for guidance and monitoring 2003*.

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3. EUROPEAN LEGISLATION AND GUIDANCE

3.1 Introduction

European legislation and policy provides a strategic framework for all aspects of land use and development within the EU, including natural hazards. Legislation from the European Parliament is implemented in member states and covers major issues such as protection of the environment and the need for proper assessment of environmental conditions in association with major developments. National legislation provides the planning framework, requirements with respect to coast protection and protection of archaeological sites. In addition a number of member states produce informal advice or policy guidance which forms the basis for development planning.

The European Spatial Planning: Adapting to Climate Events (ESPACE) project states that '*robust spatial planning has a crucial part to play in minimising the risk of climate change, however, current frameworks are poorly developed and are unable to deal adequately with the risk*' (ESPACE 2004). The objective of the RESPONSE Project is to develop sustainable strategies for local authorities (LAs) and stakeholders to manage natural risks on the coastal zone, by demonstrating an innovative regional scale methodology for coastal evolution studies and risk mapping, taking account of the impacts of climate change. There is a strong need to adopt a more proactive approach based on planning, monitoring, evaluation, and ICZM principles with respect to the management of coastal hazards in response to climate change. It is important to take into account climate change and incorporate it within spatial planning strategies at local, regional, national and international levels.

The Amsterdam Treaty made Sustainable Development a core task of the European Community. In December 1999 at the European Council meeting in Helsinki, Member States asked the Commission to "*prepare a proposal for a long-term strategy dovetailing policies for economically, socially and ecologically sustainable development*" in time for the Gothenburg European Council in June 2001. The ECs proposal for an EU Sustainable Development Strategy was adopted by the Commission on the 15th May 2001. It contains a number of proposals for how the EU can improve its policy making to make it more coherent and focussed on the long term, as well as a number of specific headline objectives and the measures needed to achieve them.

The Commission's proposal for a sustainable development strategy builds on the analysis in a consultation paper released at the end of March, and on the responses to that paper. The consultation paper identified a number of unsustainable trends that need to be urgently tackled, and provided an analysis of the key drivers behind these trends.

In addition to ICZM and the Sustainable Development Strategy, coastal zones are also addressed in other legislation, such as the environmental impact assessment directive (2001), the water framework directive (2000), the quality of bathing water directive (1976, 2005) and the directive on quality required of shellfish waters (1979). In addition, coastal zones are highlighted by the European spatial development perspective (1999). Most recently, the Commission's communication on the European Marine Strategy (COM (2005) 504), the related Marine Strategy Directive proposal (COM (2005) 505) and the future Maritime Policy (Green Paper) are also very relevant to coastal zones (European Environment Agency, 2006). The Commission's

communication on the European Marine Strategy and the related Marine Strategy Directive proposal follows the overall objective of protecting and restoring Europe's oceans and seas, and ensuring that human activities are carried out in a sustainable way (European Environment Agency, 2006).

3.2 Spatial Planning

The European Council of Town Planners (ECTP), founded in 1985, brings together 22 professional town planning associations and institutes from 20 European countries. It is an umbrella association providing its members with a common framework for planning practice and sets standards of conduct for the planning profession, and engages in dialogue with local, national and European government.

In the EU most land use and development planning issues have to be considered strategically before they are examined in more detail on a site specific basis. Increasingly a strategic perspective is being applied especially with respect to the concept of sustainable development, which is increasingly becoming the major influence on all aspects of planning policy. This commitment is likely to be increasingly reflected in planning policies and decisions and development proposals as awareness of instability and other environmental issues continues to grow. Many member states are now publishing sustainable development strategies which will allow strategic objectives to be set and policies to be outlined to achieve sustainable development.

Land use planning and management decisions within the EU are usually made at local or regional level. However, the EC has a role to play in ensuring that Member States take environmental concerns into account when putting together their land use development plans.

The European Spatial Development Perspective (ESDP) 1999, places increased emphasis on the need for sustainability and environmental protection. As a direct consequence, detailed consideration must be given to geological factors in relation to economic development and regeneration.

The European Code of Conduct for Coastal Areas (ECCCZ) states that natural processes should only be disrupted by coastal defence works when life or important assets are at risk. Development in areas at risk should take place only if it is accompanied by coastal defence programmes ensuring acceptable standards of safety. The development of coastal defence systems should be subject to EIA and should be proven to be in the long term public interest (ECCCZ 1999).

The Directive on Environment Impact Assessment (EIA) and the Directive on Strategic Environmental Assessment (SEA) ensure that significant environmental impacts are identified, assessed and taken into account throughout the decision-making process.

Recent proposals for SEA have been put forward in a proposed European Directive on "Assessment of the effects of certain plans and programmes on the environment". Geological factors relate directly to many of the issues concerned including instability and, therefore, there is a need to take appropriate account of factors such as instability in land use planning. Further European legislation covering Ground Water Protection (80/68/EC), Waste Disposal (75/442, as amended) and Health and Safety (89/391, 89/654 and 92/57) have all impacted on development and planning issues in relation to instability (Thompson 1998). In 2001 the Council formally adopted the SEA Directive 2001/42/EC to ensure that environmental consequences of

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certain plans and programmes are identified and assessed during their preparation and before their adoption. The public and environmental authorities can give their opinion and all results are integrated and taken into account in the course of the planning procedure. After the adoption of the plan or programme the public is informed about the decision and the way in which it was made.

Promoting public awareness about coasts has been a long standing and complex issue. Early policy affecting the coastal zone was predominantly issue oriented (e.g. water quality) and reactive in nature. Furthermore, the governance of coastal and marine areas has remained fragmented between countries and thematic areas (e.g. sectors) at both national and European level (European Environment Agency, 2006). Two Commission initiatives – INSPIRE (Infrastructure for Spatial Information in Europe) and GMES (Global Monitoring for Environment and Security) – aim to make environmental information more accessible to citizens.

On 23 July 2004, the Commission adopted a Proposal for a Directive on INSPIRE. According to this Proposal, Member States would make accessible their existing public sector geographical information over the internet. This is a major milestone for the use of Geographical Information in Europe as a contribution to environmental policy and sustainable development. This is a first step in a co-decision procedure that should lead to the formal adoption of the INSPIRE Directive, which would then be implemented in every EU Member State. The INSPIRE Proposal will also be used as a starting point for the practical preparations of the future implementation of the INSPIRE Directive. For these preparations, a working programme is now being put together in order to make progress at the technical level in parallel with the negotiation of the Directive.

Over 80% of the EU's 377 million citizens live in cities and towns (Eurosion, 2004). The challenge for policy-makers is to come up with a sustainable and integrated approach to urban development and management that works in harmony with natural systems rather than against them. To assist in meeting this challenge the Community's Sixth Environmental Action Programme called the Commission to develop a new Thematic Strategy on the Urban Environment to help promote a more integrated approach and support action at local level. On 11 January 2006, the Commission adopted the Communication "Thematic Strategy on the Urban Environment". The strategy aims to help Member States and regional and local authorities to improve the environmental performance of Europe's cities.

Environmental designation is also an important aspect of European planning guidance. The EC Habitats and Species Directive (the Council Directive 92/43/EEC) requires member states to designate areas of importance for particular habitats and species as Special Areas of Conservation (SACs). Together with Special Protection Areas (SPAs) designated under the Conservation of Birds Directive (the Council Directive 79/409/EEC), these areas will form a Europe-wide series of sites known as "Natura 2000". Member states are required to take appropriate steps to avoid the deterioration of natural habitats and the habitats of species, as well as the significant disturbance of species, in SAC/SPA sites. If a plan or project is approved that could adversely affect a designated site, the member states have a duty to ensure compensatory measures are taken to preserve the overall coherence of the "Natura 2000" network.

3.3 Water Framework Directive

The Water Framework Directive 2000/60/EC (WFD), which came into force on 22 December 2000, established a new, integrated approach to the protection, improvement and sustainable use of Europe's

rivers, lakes, estuaries, coastal waters and groundwater. The Directive contributes to the main principles and objectives of the ESDP. Potentially the WFD provides a comprehensive legal and management framework for an integrated and co-ordinated approach to sustainable water management across Europe and the UK. It is likely to prove the most significant piece of legislation governing environmental management for many years to come (Potts, 2004).

The Directive introduced a river basin management planning system that will be the key mechanism for ensuring the integrated management of: groundwaters and coastal waters. River Basin Districts (RBD) will be established, characterised by ecology, geology, hydromorphology, demography, land use etc. Coastal waters will be assigned to the nearest and most appropriate RBD. The administrative division of a RBDs can also be divided into sub-basins.

Each RBD is to produce a River Basin Management Plan (RBMP), providing a range of information on: ecology, geology, hydromorphology, demography, land use and economic activity, point source and diffuse source pollution, protected areas etc. A competent authority will be responsible for the RBMP. The planning system will provide the decision-making framework within which costs and benefits can be properly taken into account when setting environmental objectives and proportionate and cost-effective combinations of measures to achieve the objectives can be designed and implemented.

A future obstacle that will need to be overcome is the effective management of coastal waters through the integration of Shoreline Management Plans (SMPs) and RBDs. Under the new Directive coastal waters will be assigned to the nearest RBD, however, coastal waters are divided into sediment cells and managed as such by SMPs. The sediment cells may not necessarily correspond with the River Basin Districts. This may prove a future complication unless SMPs continue to provide the management tool for the coastal zone and compliment the RBMPs.

The WFD will fill an important legislative gap – The Directive should facilitate more integrated management, especially at the land–sea (fresh and marine water) interface. It will provide an additional tool to address many of the marine aquatic issues that are currently difficult to cover effectively within the existing coastal management process (Potts, 2004).

3.4 Bathing Water Directive

The 1976 Bathing Water Directive (76/160/EEC) was one of the first pieces of European environmental legislation. Its object is to protect public health and the environment from faecal pollution at bathing waters. It places an obligation on Member States to identify popular bathing waters/areas and monitor against standards laid down in the Directive.

Now thirty years old, the 1976 Bathing Water Directive is a reflection of the state of knowledge and experience of the early 1970s. Since that time changes in science, technology and managerial experience have prompted the Commission to update the Directive. On 24 October 2002, the Commission adopted the proposal for a revised directive of the European Parliament and of the Council concerning the Quality of Bathing Water COM(2002)581. In October 2005, an agreement was reached between the European Parliament and Council on the content of the revision the final text was made public in January 2006.

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The new Directive lays down provisions for more sophisticated monitoring and classification of bathing water. The revision also adds the option of active management of bathing activity to the current practice of passive monitoring and retrospective compliance. It also requires compliance with more stringent water quality standards, action when these standards are breached and provision of sufficient and timely information so that the public are able to make an informed choice of whether to bathe or not.

3.5 Integrated Coastal Zone Management

Many of Europe's coastal zones face problems of deterioration of their environmental, socio-economic and cultural resources. Since 1993, the EC has been working to identify and promote measures to remedy this deterioration and to improve the overall situation in our coastal zones. The Fifth Community Programme of Policy and Action in Relation to the Environment and Sustainable Development was the initiative in response to the Council's request for an overall Community strategy on Integrated Coastal Zone Management (ICZM).

The EC defines ICZM as "a continuous process of administration the general aim of which is to put into practice sustainable development and conservation in coastal zones and to maintain their biodiversity. To this end, ICZM seeks, through more efficient management, to establish and maintain the best use and sustainable levels of development and activity in the coastal zone, and, over time, to improve the physical status of the coastal environment in accordance with certain commonly held and agreed norms." The Fifth Environmental Action Programme (5EAP) was approved by the Council and the Representatives of the Governments of the Member States in 1993 and focused on a more global approach. The main goals were: to maintain the overall quality of life; to maintain continuing access to natural resources; to avoid lasting environmental damage; and to consider as sustainable a development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

A progress report on implementation of the 5EAP noted that progress had been made in integration of environmental considerations into other policy areas. Based on the conclusions of the Progress Report, and on the updated State of the Environment Report published by the European Environment Agency (EEA) in November 1995, the Commission adopted, on 24 January 1996, a draft Decision of the European Parliament and the Council on the Review of the Programme aimed at speeding the process of improving the environment of the Union and of moving towards sustainable economic and social development in the EU.

The draft Decision identified five priority areas in which Community action needed to be stepped up. These priority areas included: improved integration of the environment into other policies like agriculture, transport, energy, industry and tourism; use of a wider range of policy instruments like market-based instruments or horizontal instruments; increased implementation and enforcement measures by improved and simplified legislation; additional action in the field of communication and information to raise the public awareness; reinforcement of the Union's role in international action. In July 1998, 30 months after the proposal was presented by the Commission, the Parliament and the Council finally agreed in conciliation the text of the Co-Decision on the Review of the 5EAP. The Co-Decision required the Commission to submit a global assessment of the implementation of the Programme, to the European Parliament and the Council at the end of the Programme. This global assessment and the discussion with Member States, target groups etc. was a major building block for the Sixth Community Environment Action Programme (6th EAP), in 2002 (Decision

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No 1600/2002/EC of the European Parliament and of the Council). The 6th EAP stresses the '*need to identify and implement measures aimed at adapting to the effects of climate change*.'

The role of the Strategic Environmental Assessment Directive is essential for addressing conflicts in the long-term development of coastal zones, and for backing the ICZM (European Environment Agency, 2006).

European Code of Conduct for Coastal Zones

The European Code of Conduct for Coastal Zones (ECCCZ) is an initiative of the EU for Coastal Conservation (EUCC), which launched the idea in 1993. It was included as a priority action in the Pan-European Biological and Landscape Diversity Strategy 'Coastal and Marine ecosystems' and drafted in 1996 by EUCC staff under the auspices of the Council of Europe and UNEP. The European Code of Conduct for Coastal Zones was officially adopted by the Council of Europe Ministers in April 1999. Chapter V of this initiative covers coastal protection, in which it outlines the status and trends; the impacts of coastal defences and the guidelines for coastal defence (see section 3.5). Chapter XV of this initiative covers sustainable management of coastal zones. Within this chapter the document highlights the need for EIA, the need for ICZM and gives guidelines on implementing ICZM. The ECCCZ states that the general prerequisites for the establishment of an ICZM system includes the political will to solve conflicts in the coastal zone; a legislative, administrative, and regulatory basis for making and implementing decisions must be in place; and enforcement mechanisms must be available to ensure compliance. The ECCCZ gives a series of steps generally considered to be essential in developing Integrated Coastal Management (ICM) plans, all of which require extensive consultation and co-operation amongst government agencies, Local Authorities, sectoral planners, NGOs, and others (ECCCZ 1999).

ECCCZ guidelines state that ICZM Plans should attempt to establish the carrying capacity of the coastal and marine environment, taking into account the vulnerability of coastal landscape types and habitats, and ensure that development is not allowed to exceed this capacity. Techniques for assessing carrying capacity have been developed in recent years by UNEP in the Mediterranean. These techniques should be considered for use in other regions of Europe. ICZM plans should specifically recognise the need to conserve nature as a precondition for all development, as this is the only way to ensure that development is truly sustainable. The principles for coastal development as described in the Chapter "Strategic Principles" of the ECCCZ document and should provide a fundamental basis for all ICZM plans (ECCCZ 1999).

The European report for the Ramsar convention COP9 meeting (Uganda, 2005) prioritised the need to integrate wetland policies fully into other strategic and planning processes, including ICZM between 2006 and 2008. The report pointed out that for many European countries this goal would remain a major challenge (European Environment Agency, 2006).

From 1996 to 1999, the EC implemented a Demonstration Programme for ICZM designed around 35 demonstration projects and 6 thematic studies. The programme was a collaborative action launched in 1996 by Directorate Generals Environment, Fisheries and Regional Policies & Cohesion, was developed as a partnership between the Commission and thirty-five regional study area projects as well as involving EC and external national expert teams. This programme was aimed to: Provide technical information about sustainable coastal zone management, and stimulate a broad debate among the various actors involved in the planning, management or use of European coastal zones. The programme was intended to lead to a

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consensus regarding the measures necessary in order to stimulate ICZM in Europe in 2000. In 1999 the Commission summarised the findings from these important studies in their document "*Towards a European Integrated Coastal Zone Management Strategy: General Principles and Policy Options - A Reflection Paper*". Two further publications entitled '*Better management of coastal resources*' and '*Lessons learnt from the EU demonstration programme'* followed on from this.

The Demonstration Programme was designed to enable the Commission to identify the necessary actions. It has to provide arguments to justify these actions and sustain a dialogue with the main parties involved in the development of coastal zones. These conditions were met by the three complementary components of this Demonstration Programme: A series of demonstration projects representing the experience and practice of development in the various parts of the EU (e.g. the Isle of Wight); thematic analysis that guarantees strict and systematic use of individual experiences; and a wide-ranging debate on the results of the Programme and the conclusions drawn from it.

The Demonstration Programme identified four principal causes of problems within the coastal zone, namely unplanned development, the decline of traditional environmentally compatible sectors, coastal erosion and lack of appropriate communications and transport networks. The need to resolve coastal zone management issues is therefore regarded as urgent as a result of the history of mismanagement in many coastal areas and the limited resilience of the coastal zone to recover from serious mismanagement.

Based on the experiences and outputs of the Demonstration Programme, the Commission adopted two documents: A Communication from the Commission to the Council and the European Parliament on "Integrated Coastal Zone Management: A Strategy for Europe" (COM/00/547 of 17 Sept. 2000); and a proposal for a European Parliament and Council Recommendation Concerning the Implementation of Integrated Coastal Zone Management in Europe (COM/00/545 of 8 Sept. 2000). This Recommendation was adopted by Council and Parliament on 30 May 2002. The Communication explains how the Commission will be working to promote ICZM through the use of Community instruments and programmes. The Recommendation outlines steps which the Member States should take to develop national strategies for ICZM.

Coastal issues have been recognised to be of high importance for Europe, and the issues involved cannot be solved by Member States separately. Problems related to the state of the coast in Europe are specifically addressed by the EU Recommendation on ICZM. In combination with policy frameworks, such as ESDP, SDS, 6th EAP and funds for regional development and cohesion, the EU's ICZM Recommendation provides the policy integration platform on which to base other directives relevant to the coast, in particular the Water Framework Directive, the Birds and Habitats Directives and Environmental Impact Assessment Directive (European Environment Agency, 2006). One of the difficulties for coastal management has typically been the fact that few policy elements relate to the land/sea interface. The EU ICZM Recommendation provides a unique policy opportunity to address this issue.

The central objective of ICZM is to achieve a degree of balance and conformity between the many diverse stakeholders with an interest in the coastal zone. Intensely developed coasts, particularly in the southeast and in the vicinity of major urbanised and industrialised estuaries, present immense pressures on the coastal environment. However, equally important challenges for ICZM include the need to maintain the extensive

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conservation importance of habitats, ranging from low-lying salt marshes and mudflats to steep, cliffed coastlines (Ballinger, 2002). ICZM promotes a multi-disciplinary approach to coastal management and encourages long-term sustainability of policies and actions.

The "Integrated" in ICZM refers both to the integration of objectives and to the integration of the multiple instruments needed to meet these objectives. It means integration of all relevant policy areas, sectors, and levels of administration and also integration at the land-sea interface. Although ICZM refers to "management", the ICZM process covers the full cycle of information collection, planning, decision making, management and monitoring of implementation. "Planning" is intended in its broadest sense, to mean strategic policy development, rather than only land use planning or other sectoral planning (European Commission, 1999).

The European Union is working to introduce a coordinated policy for the Union's coastal regions. As well as taking steps to improve the EU policies that influence coastal zones, the European Commission is calling on Member States to put in place national strategies for ICZM. Such national ICZM strategies would allow all the different policy-makers who have a say in the management of coastal regions within a country to coordinate their actions far more effectively. These national strategies would also aim to improve the compatibility of the many national sectoral laws and policies that affect the coastal zone, and would facilitate actions by local and regional authorities (European Commission, 2001).

The main principles of ICZM are as follows:

- Take a wide-ranging view of inter-related problems
- Base decisions on good data and information
- Try to work with natural forces
- Allow for unforeseen future developments
- Involve all stakeholders and all relevant parts of the administration
- Make use of a range of instruments (laws, plans, economic instruments, information campaigns, Local Agenda 21s, voluntary agreements, promotion of good practices, etc.)

(European Commission, 2001).

When developing national strategies it is crucial that Member States take a long-term perspective of coastal zone management to ensure the sustainable management of coastal resources. National Governments are requested to appreciate the increasing threat to coastal zones posed by climate change. Though there will be geographical disparities, there now exists overwhelming scientific evidence to confirm that global climates are changing and that sea levels are rising. When developing national strategies for the integrated management of the coastal zone, the possible impacts of future climate change should be taken into account. National Governments should endeavour to provide sufficient assistance and financial aid to operating authorities in order to implement effective coastal zone management in a changing climate.

The geographical scope of ICZM plans should be large enough to encompass the ecosystem as a whole since one or a few municipal units is clearly not enough. Involvement and co-operation between neighbouring communities and countries should be encouraged, recognising the transboundary nature of most

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environmental issues. Co-operation and information exchange between coastal areas facing comparable threats should also be encouraged.

The ECCCZ guidelines state that sustainable development and management of a coastal region requires a combination of top-down and bottom-up approaches; public participation in the process is essential. In order to ensure adequate public participation in coastal planning, decision-making and management, authorities should:

- Make sure that the decision-making process is consultative and open to all parties who want to or should be involved, and encourage such parties to do so;
- Make funds available to those who would otherwise be unable to take part;
- Establish along the coast coastal forums for ongoing discussions;
- Ensure that all opportunities for public involvement are well publicised;
- Support education and mobilisation programmes in schools and universities and other community programmes;
- Hold community workshops and/or public meetings;
- Involve the public in solution-oriented activities and events;
- Involve the public in monitoring human activities along the coast, impacts on the coastline, and implementation of laws, agreements, or other decisions;
- Involve local businesses in programmes, and work with them to advertise the issues in their outlets;
- Using public service advertisements and other media outreach;
- Use innovative techniques for reaching different audiences and age groups (ECCCZ 1999).

3.6 Future European Policy

Sustainable management of coastal areas strives for the maximum long term social benefit, including environmental, economic, social and cultural considerations. Whilst long term economic, environmental and social considerations are always inseparable, short term trade-offs between these goals may be unavoidable, due to the finite nature of coastal resources.

One of the goals of sustainable development must be to ensure that present decisions do not foreclose future options. However, the concept of "sustainability" also needs to embrace the idea that many of the negative situations created by human intervention are capable of being reversed or radically altered, albeit at a cost and over very long periods of time.

The ECCCZ coastal defence guidelines advise that when employing the techniques available for coastal defence the managed retreat option should be considered in order to preserve coastal ecosystems, such as saltmarshes. Where coastal defences are necessary the use of natural materials such as stones, sand, soil, or wood is preferable to artificial materials such as concrete, asphalt, or plastic as these are foreign to the coastal landscape and may cause pollution upon disintegration. Soft engineering methods using natural materials are generally preferred over hard engineering methods as they typically have a lesser impact on the environment and better maintain the natural character of the coast. If hard measures are necessary, they should be located as far inland as possible (ECCCZ 1999).

A recent report by the European Environment Agency states that in terms of a management strategy, the main objective should be to shift from coastal defence and beach management to sediment management. Modern methods of 'soft' coastal engineering that reinforce natural buffers against the rising tides, such as dunes and salt marshes and the protection of key sources of sediment, will help maintain coastal sediment balance and the stability of coastal systems (European Environment Agency, 2006).

In recent years, the EU has been continuously developing the frameworks and legislative base for facilitating an integrated, cross-cutting approach in policy. Such integration of objectives is yet to make their mark on coastal zone management, especially in the context of the territorial cohesion objectives of the EU (European Environment Agency, 2006).

The European Marine Strategy foresees a separate action plan for each European Sea with a view to implementing the EU Marine Policy. In summer 2005, the Helcom Member States and the EU agreed to develop a strategic Baltic Sea action plan by 2007. This should ensure that all positive measures are taken to reduce pollution in the Baltic Sea and ensure that damage done to the marine environment is repaired. The plan is based on ecological objectives, which reflect a common vision of a healthy Baltic Sea (European Environment Agency, 2006).

Regional Case Study – Eastern Europe

South East Europe is prone to natural disasters (landslides and flooding) that transcend borders or overwhelm the capacity of a single country to cope. The level of preparedness and prevention in case of the disasters varies from country to country and regional co-operation does not exist to the extent necessary. The Disaster Preparedness and Prevention Initiative (DPPI) was initiated in March, 2000 with the aim of pulling together ongoing activities and identifying unmet needs in order to improve the efficiency of the national disaster management systems and to endorse a framework for regional cooperation. DPPI has been a primary example of regional ownership, with full involvement of regional countries cooperating under the SP auspices, supported by interested countries, international organizations and agencies (UNDP, IFRC, NATO, SRSA Sweden). It brings together 12 countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Hungary, FYROM (Former Yugoslav Republic of Macedonia), Moldova, Romania, Slovenia, Turkey, FR Yugoslavia). As a first stage in developing a strategy, the DPPI undertook an assessment in each country of the region to review natural disaster and existing management and preparedness response. The assessments were based upon methodology developed by UNDP (discussed in section 1.5).

On 5 June 2002, the Declaration on Cooperation in Disaster Preparedness and Prevention in South East Europe was signed by 11 countries and International Federation for Red Cross and Red Crescent Societies. The Former Yugoslav Republic of Macedonia associated itself with the Declaration. At the Regional DPPI Meeting in Sofia, Bulgaria, September 2002, a new DPPI structure was adopted and the DPPI Action Plan (2002-2006) with Terms of Reference for Advisory Board to DPPI endorsed by participants.

Case Study – EUROSION

Since the early 1990s a new approach to address coastal erosion has been developed in Europe – managed realignment. The abandoning of land at risk and relocating the assets further inland is becoming more popular as an alternative solution in UK (Essex and Sussex) and France (Criel sur Mer). Cost benefit analysis has demonstrated that the cost of traditional protection may often accede the value of assets to be protected in the long term (over the life expectancy of the assets), making managed realignment a more economically reasonable option. Managed realignment also proves to be a more environmentally sound option through not altering the natural coastal sediment system. Experience has shown that the financial basis and timing of 'compensation' are key to ensure a board acceptance of managed realignment in some areas (Eurosion 2004).

Regional Case Study – Baltic Sea States

In 1974 the Baltic Sea States (Denmark, Estonia, European Union, Finland, Germany, Latvia, Lithuania, Poland, Russian Federation and Sweden) signed the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention). This was the first regional agreement ever to cover all sources of pollution, whether from land, sea or air. In its first two decades, the Convention oversaw considerable progress with significant reductions in discharges of organochlorine compounds from industry and of lead emissions from land-transport, and rehabilitation of some formerly endangered living species.

The Helsinki Convention has since been replaced by the new Convention, signed in 1992 and entered into force 17 January 2000. In the same year the Baltic Sea Joint Comprehensive Environmental Action Programme (JCP) was established. HELCOM is the coordinating body for the Helsinki Convention and the Action Plan. For the foreseeable future, the focus of HELCOM's work will be to limit discharges of nutrients and hazardous substances from land-based activities, prevent pollution by shipping, ensure response to accidents at sea, conserve natural habitats and biological diversity, and bring about the long-term restoration of the ecological balance of the Baltic Sea in keeping with the overall goal of the Helsinki Convention to bring about sustainable development and use of natural resources in the Baltic Sea Area.

Regarding the coastal strip HELCOM Recommendation 15/1 states that '*the Contracting Parties take all appropriate measures to ensure the protection of the coastal strip*' and '*that a protected coastal strip be established outside urban areas, the width of which shall be determined by the nature and landscape values of the coast, extending at least 100 to 300 m from the mean water line landwards and seawards*' (Gibson 1999).

In the protected coastal strip activities that would permanently change the nature and landscape such as the construction of buildings are not allowed unless it is proved that they are overwhelmingly in the public interest and that no less sensitive site can be found. In addition intensive farming, forestry and drainage can be restricted. Exceptions can be made from the provisions by a land use plan approved by the appropriate authority (Gibson 1999).

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The Commission also recommends that a '*zone of at least 3 km landwards from the mean water line be established as a coastal planning zone where major building development and other major permanent changes in nature and landscape be proceeded by an appropriate land use plan, including EIA, approved at least on regional level*' (Gibson 1999).

Case Study - KASPNET Project

The project *KASPNET (Karelia Atlantic Spatial Development Network)* is focused on cooperation in a wide area in Northern Europe. The project will establish and support a long lasting networking on spatial planning in this Development Zone, engaging a very large number of partners which to some extent already are cooperating in the region. One of the participants in Finland is Ostrobothnia. Subjects that are being covered are, for example, analysis of the conditions and development potential in the area, thematic studies, and development of a spatial planning strategy for the area. One of the priority areas is environmental dimensions, tourism and coastal zones. By treating the coastal and island areas in Norway, Sweden, Finland and the Republic of Karelia in parallel studies, there are chances to achieve a common knowledge based on both the differences and the similarities (Wormgoor *et al* 2002).

4. NATIONAL LEGISLATION AND POLICIES FOR THE MANGEMENT OF COASTAL HAZARDS

4.1 The United Kingdom

4.1.1 Administrative Structure

The main central Government departments that have a strong interest in UK coastal issues are: the Department for Environment, Food and Rural Affairs (DEFRA), Department for Transport (DfT), Department for Communities and Local Government (DCLG) (formerly Office of the Deputy Prime Minister), Department for Trade and Industry (DTI), and Ministry of Defence (MOD). Those with policy functions of particular importance to coastal management include DEFRA (in sustainable development, environment protection, coastal defence, fisheries, water quality and nature conservation); DCLG (land use planning); DTI (offshore oil and gas renewable energy); and MOD (defence estates).

The devolved government for Scotland is represented by the Scottish Parliament and the Scottish Executive both established under the Scotland Act 1998. The Northern Ireland Act 1988 set up the Northern Ireland Assembly and Executive. The National Assembly for Wales (MAW) was created through the Government of the Wales Act 1998. The Assembly's duty is towards sustainable development under section 121 of the Act and is also an important guiding policy for management of the coast.

The UK Government has sponsored specific approaches to coastal management notably through the development of Estuary Management Plans (EMPs) (administered through English Nature) and the combination of Shoreline Management Plans (SMPs) (funded by DEFRA) and Local Environmental Action Plan (administered by the EA).

Shoreline Management Plan

The Shoreline Management Plan (SMP) is an initiative led by the Department of Environment, Food and Rural Affairs (DEFRA) and has provided the opportunity for a national strategic assessment of flood and coastal defence and the management of coastal risks. Government investment has allowed the preparation of SMPs for discreet lengths of coastline based upon "sediment cells" and "sub cells". Coastal Defence Strategies are produced for each “sub cell” of the coastline and incorporated into the SMP. An SMP provides a large-scale assessment of the risks associated with coastal processes and presents a long term policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner. In doing so, an SMP is a high level document that forms an important element of the strategy for flood and coastal defence. The generic options for such sections of coast, all of which include monitoring to assess their effectiveness and how appropriate they continue to be, are:

- Do nothing;
- Hold the existing defence line by maintaining or changing the standard of protection;
- Advance the existing defence line; and
- Retreat the existing defence line (managed retreat or realignment).

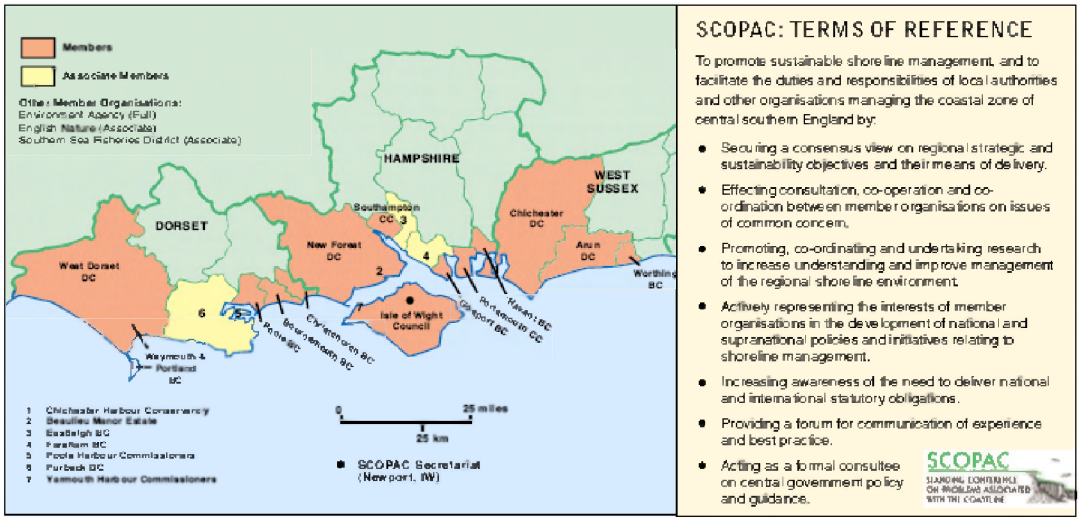

Figure 1: Standing Conference on the Problems Associated with the Coastline (Source: McInnes 2004)

First generation SMPs have been completed around the coastline of England and Wales. Many operating authorities have adopted the recommendations of their Plan as a basis for production of individual strategic plans, monitoring programmes and studies for all or parts of their coastline and, where proven by strategic plans, the implementation of appropriate schemes. A limitation of the first round of SMPs was the limited contribution made by planners (Taussik 2004). The second round of SMPs has now begun and will build on the first generation Plans, taking account of information subsequently collected or changing circumstances.

The preparation of the second round of SMPs is intended to be a more open process than was the first round of SMPs. As planning documents and SMPs are seen as the result of inclusive processes, there may be opportunities to integrate participation and consultation mechanisms for both if timing is appropriate. While

care will be needed in how this is done, it might be that on-going mechanisms for public involvement, like focus groups and forums, particularly successful at the local level, can be established through which a wide range of spatial planning matters can be subjected to participation, discussion or consultation on an ongoing basis. Additionally as planning documents are one of the few public policy statements subject to statutory regulation on public involvement, scrutiny of SMP policy in planning documents could improve its legitimacy (Taussik 2004).

Coastal Habitat Management Plans

Coastal Habitat Management Plans (CHaMPs) provide a framework for managing European and Ramsar sites that are located on or adjacent to dynamic coastlines, fulfilling the obligations under the Habitats and Birds Directives and Ramsar Convention. CHaMPs quantify habitat change (loss and gain), and recommended measures to prevent future losses. These include modifying flood and coastal defence options to avoid damage, or identifying the necessary habitat restoration or recreation works to compensate for unavoidable losses. CHaMPs look at the cumulative impact on these features over a 30-100 year timescale. They also include strategic habitat monitoring programmes to map future changes. The actions will be delivered through SMP's and flood and coastal defence strategies and schemes.

Estuary Management Plans

Arising from an initiative by English Nature, Estuary Management Plans (EMPs) are prepared by a project team which aims to bring together all those with an interest in an estuary to reach a consensus on the sustainable use of that estuary. The triggering factor in their development was the importance of nature conservation in estuaries and their initial development has been funded by English Nature, together with local authorities and other interested parties. Harbour management plans are similar in co-ordinating different interests within harbours and seeking to agree and implement management policies to promote sustainable use for conservation, recreation and economic activity.

The Water Framework Directive 2000/60/EC (WFD). which came into force on 22 December 2000, establishes a new, integrated approach to the protection, improvement and sustainable use of Europe's rivers, lakes, estuaries, coastal waters and groundwater. The Directive introduces a River Basin Management Plans (RBMPs) that will be the key mechanism for ensuring the integrated management of: groundwater; rivers; canals; lakes; reservoirs; estuaries and other brackish waters; coastal waters; and the water needs of terrestrial ecosystems that depend on groundwater, such as wetlands. The planning system will provide the decision-making framework within which costs and benefits can be properly taken into account when setting environmental objectives and cost-effective combinations of measures to achieve the objectives can be designed and implemented. It will also provide new opportunities for anyone to become actively involved in shaping the management of river basin districts – neighbouring river catchments, together with their associated stretches of coastal waters. Catchment Flood Management Plans (CFMPs) are being developed by the Agency for the whole of England and Wales and should form part of the wider RBMPs.

The Environment Agency (EA) produces a range of technical plans for managing different aspects of the water environment. Catchment abstraction management strategies set out EA policies for the licensing of water abstraction. Salmon action plans and Fisheries action plans relate to the management of salmonid and

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other fisheries. The Agency has also published 130 general Local Environment Agency Plans (LEAPS) on a catchment basis to integrate the range of its functions and present issues to a more general audience. In respect of the water environment, this includes water quality, flood defence, fisheries, recreation, conservation and navigation. The plans consider the various interests of users and develop a long-term vision and medium-term strategies and actions through consultations with local communities and organisations, highlighting key issues and developing practical solutions. The main aim is to assess the problems and opportunities resulting from catchment pressures, activities and users and to propose action to optimise the overall future well-being of the environment. The EA is currently reconsidering the role of general LEAPS, in recognition of the new role of Community strategies to promote local sustainable development (ODPM 2001). SEEPA established under the Environment Act 1995 has a similar responsibility to the EA except that SEEPA is responsible for issuing flood warnings but not other elements of flood protection works. In Northern Ireland the Rivers Agency (RA) within the Department Agriculture and Rural Development acts as the statutory drainage and flood defence authority. The RA does not have the powers to prevent flooding and its powers are limited to providing free flowing water course to alleviate flooding (Atkins 2004).

LAs have a statutory duty to prepare Community strategies to promote the economic, environmental and social well-being of their area, taking into account guidance issued by the Secretary of State. Community strategies are intended to provide an over-arching framework, integrating the plans and programmes of local authorities and other local bodies working towards an agreed vision and establishing clarity of roles and responsibilities. Many community planning partnerships will recognise flood risk as a local public safety issue, to be addressed sustainably and on a whole-catchment basis, through the management of land drainage and land use. High-level sustainable development messages in Community strategies should support the development of appropriate flood-risk management policies in development plans (ODPM 2001).

Heritage Coast Management Plans

Other plans that may be relevant to the consideration of development and flood risk include: Heritage Coast Management Plans prepared by local authorities together with the Countryside Agency and the involvement of interested bodies. Their aim is to guide management to achieve the heritage coast objectives of conservation, recreation, rural economic development and environmental health. Only a limited number of the 45 areas of heritage coast in England include areas at risk of flooding.

Conservation Regulations

The EU Habitats Directive is implemented through the Conservation (Natural Habitats &c) Regulations 1994 (SI 2716). The Regulations came into force on 30 October 1994, and have been subsequently amended in 1997 (SI 3055) and (in England only) 2000 (SI 192). Containing five Parts and four Schedules, the Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites. The term "European Site" encompasses Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The UK Government signed the 1971 Convention on Wetlands of International Importance Especially as Waterfowl Habitat (the Ramsar Convention) in 1973 and is obliged to protect wetlands of international importance (Ramsar sites).

In Great Britain, the Conservation Regulations require that the environmental implications be considered for any "plan or project" that is likely to have a significant effect on a SPA or SAC. Any scheme to implement the

preferred flood and coastal defence policy is a plan or project, and must comply with the requirements of the Regulations. This legal requirement will be an important factor in determining the policy for future coast protection.

English Nature (EN) is the Government funded body whose purpose is to promote the conservation of England's wildlife and natural features. Countryside Council for Wales (CCW) is the Government funded body promoting conservation in Wales. The Scottish Natural Heritage (SNH) has a similar role to EN. The main duties and powers are given by the following Acts of Parliament: National Parks and Access to the Countryside Act 1949; Countryside Act 1968; Nature Conservancy Council Act 1973; Wildlife and Countryside Act 1981 (amended 1985); Environmental Protection Act 1990 and Rights of Way Act 2000. EN is responsible for a number of statutory designations and managing habitats and sites in England, including coastal areas. EN is also responsible for contributing to the identification of sites designated under international conventions and directives such as the EU Habitats and Species Directive.

The Wildlife and Countryside Act 1981 consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain (equivalent provisions for Northern Ireland are contained within the Wildlife Order 1985 and the Nature Conservation and Amenity Lands Order 1985). It is complimented by the Wildlife and Countryside (Service of Notices) Act 1985, which relates to notices served under the 1981 Act, and the Conservation Regulations 1994 (equivalent provisions for Northern Ireland are contained within the Conservation Regulations 1995), which implement Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). The Act received royal assent on 30 October 1981 and was brought into force in incremental steps.

Amendments to the Act have occurred, the most recent being the Countryside and Rights of Way (CRoW) Act 2000 (in England and Wales only). There is also a statutory five-yearly review of Schedules 5 and 8 (protected wild animals and plant respectively), undertaken by the country agencies and co-ordinated by the Joint Nature Conservation Committee. Containing four Parts and 17 Schedules, the Act covers protection of wildlife (birds, and some animals and plants), the countryside, National Parks, and the designation of protected areas, and public rights of way.

The Habitats Regulations 1994 apply only as far as the limit of territorial waters (12 nautical miles from baseline). The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (SI 1754) apply the Habitats Directive and the Birds Directive in relation to oil and gas plans or projects wholly or partly on the United Kingdom's Continental Shelf (UKCS) and adjacent waters outside territorial waters. The Department for Environment, Food and Rural Affairs (DEFRA) will present separate regulations to deal with the overall management of sites and species to be protected in offshore areas. An initial consultation on these was carried out in 2003.

Biodiversity Action Plans (BAP) are published by EN on behalf of the UK Biodiversity Group to implement the UK BAP, to which the Government is committed. They briefly outline the current status of particular habitats or species and the pressures on them, propose action and targets to maintain or increase biodiversity and

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identify research needs. A number of the habitats and species covered by such plans affect river and coastal flood plains.

4.1.2 The UK Planning System

4.1.2.1 Current Planning System

The current planning system in England has two main parts: a framework of plans and development control. A third element is the role of the Secretary of State in determining planning policy, deciding planning appeals and some important applications. The current planning system is plan-led. If planning applications are in accordance with the development plan, they are likely to be approved unless there are 'material considerations' that suggest otherwise such as national policy statements that may override the plan or changes in local circumstance.

The statutory spatial planning system only covers terrestrial areas above the mean low water mark (there is no statutory planning offshore). The main instrument is the Town & Country Planning Act 1990, which covers much, but not all, of the inter-tidal zone. Some maritime legislation, for example, the Sea Fisheries & Wildlife Conservation Act 1992 includes powers covering the inter-tidal as well as the sub-tidal zones.

Town & Country Planning Act

The Town and Country Planning system in England, Wales and Scotland is designed to regulate the development and use of land in the public interest. The system is intended to provide: Guidance - which will assist in planning the use of land in a sensible way and enabling planning authorities to interpret the public interest wisely and consistently. An incentive with LAs stimulating development by the allocation of land in Statutory Plans. Development control to ensure that development does not take place against the public interest and to allow people affected by development to have their views considered. The planning system also has a vital role to play in promoting the principles of sustainable development. The primary legislation which forms the basis of the planning system is the Town and Country Planning Act 1990 (1997 Act in Scotland). With the exception of the Act, in Scotland this legislation has been amended by the Planning and Compensation Act 1991. The primary legislation which forms the basis of the planning system is supported by statutory Regulations and by non-statutory Circulars, Planning Policy Guidance and Advice issued in various forms by the DETR, the National Assembly for Wales and the Scottish Parliament. The Guidance and Advice is aimed primarily at LAs, to assist with the implementation of the legislation through the preparation of development plans and for the determination of planning applications (McInnes *et al* 2000).

The system is designed to regulate development, i.e. "*the carrying out of buildings, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any building on other land*" (The Town and Country Planning (Scotland) Act 1972 S.19; The Town and Country Planning Act 1990 S.55). Under the 1990 Act a number of activities are defined as not to constitute "development" of land and, therefore do not require planning permission (S.55). These include: maintenance, improvement or alteration of a building which does not materially affect its external appearance; the carrying out of road improvements or maintenance works on land within the boundary of the road; the carrying out of inspection, repair or renewal works (eg. for sewers or water mains) by LAs or statutory undertakers; the use of a building

or land within its curtilage for any purpose incidental to the enjoyment of the dwelling; the use of land and existing building for agriculture and forestry.

Not all development requires specific planning permission. In England and Wales, the General Development Order 1988 (GDO) gives general planning permission in advance for certain defined classes or development set out in Schedule 2 to the Order, i.e. permitted development. Planning powers are exercised by local planning authorities whose most important functions are: The preparation of development plans; and the control of development, through the determination of planning applications.

Regional Planning Guidance (RPG) provides a strategic planning framework in each of the eight English regions and in London, the Mayor prepares a Spatial Development Strategy. Development plans are produced by county authorities (structure plans), district councils (local plans) and for unitary authorities a Unitary Development Plan (UDP) combines elements of both. The system by which planning applications are determined is known as development control.

Development Plans

Development plans, (including Structure Plans, Local Plans, Minerals and Waste Local Plans and UDPs) set out policies on a wide range of factors which may influence land use and provide the framework for strategic planning. Structure Plans and Part 1 of UDPs provide strategic policies and make provision for development consistent with national policy and secure consistency between neighbouring LAs (McInnes *et al* 2000).

An important aspect of the planning system is that it should not duplicate or contradict the controls provided by other legislation. With respect to the consideration of instability matters there are a number of other relevant controls, which lie outside the scope of planning legislation, there being no legislation particularly addressing instability issues. In particular various aspects of environmental legislation provide mechanisms to restrict the extent to which development is permitted to affect the natural environment. Also relevant in respect of liabilities in association with land instability is a range of health and safety legislation and, of course, the influential European legislation described above.

In both the preparation of development plans and handling planning applications, local planning authorities are required to consult with a wide range of interested bodies and are advised to take account of the Government's advice. Regional Planning Guidance (RPG) notes set out broad strategic policies and guidance for land use and development within each of the English Regions. RPG concentrates upon those issues which though not of national scope, apply across regions or parts of regions and, therefore, need to be considered on a scale wider than that of a single LA (LA). There is scope within RPG for the incorporation of general advice on geological matters which are of regional rather than local extent. Examples include slope instability problems on clay soils as referred to in RPG9 (South East England).

In England, national planning policy guidance on a wide range of individual planning topics was published by the DETR in the form of Planning Policy Guidance (PPGs), and also Government Circulars and White Papers. PPG12 Development Plans and Regional Guidance. 1992 states that the principal aim of national planning guidance is to "*secure consistency of approach to decisions by setting out clearly the Government's policy priorities to be applied in each case*" other PPGNs address more specific topics.

PPG20 Coastal Planning. 1992 states that "*Due to the nature of coastal geology and landforms, there are risks, particularly from flooding; erosion by the sea; and land slips and falls of rock. The policy in these areas should be to avoid putting further development at risk. In particular, new development should not generally be permitted in areas which would need expensive engineering works, either to protect developments on land subject to erosion by the sea or to defend land which might be inundated by the sea. There is also the need to consider the possibility of such works causing a transfer of risk to other areas*" (ODPM 2000).

PPG25 Development and Flood Risk. 2001 aims to strengthen the co-ordination between land-use and development planning and the operational delivery of flood and coastal defence strategy. It also aims to strengthen the links between land-use planning, land management and the Building Regulations. Local planning authorities are expected to use their existing powers to guide, regulate and control development in accordance with the guidance set out in PPG 25. They should consider the issues raised by flooding on the wider scale (of the river catchment and the coastal cell) and the need to work with natural processes in planning future development.

In Wales, PPG's and Circulars, which previously existed, have now generally been cancelled and have been replaced by a single guidance document "Planning Guidance (Wales): Planning Policy". This is supported by a series of Technical Advisory Notes (TANs). which address most of the theme covered by the English PPG's. A consultation document '*People, places, futures- The Wales Spatial Plan'* was published by the Welsh Assembly Government in 2003 to give guidance on planning issues. While this is limited to the land areas, there is interest for it to be extended to include the territorial waters off the coast of Wales (Atkins 2004).

In Scotland National Planning Policy Guidelines (NPPG's) provide statements of Government policy; Circulars provide policy statements, together with the guidance on policy implementation; and Planning Advice Notes (PANs) provides advice on good practice and other relevant information. These cover similar topics to those in England and Wales, although not all have yet been published. In 2002 a seminar discussing the potential of extending LA jurisdiction offshore and the issue of marine spatial planning was held. Support for the extension of planning control to the marine environment was given and it was recognised that that there was a need for marine spatial planning as an important tool, however, much of the detail remains to be developed (Atkins 2004).

The Scottish Coastal Forum (SCF) has set out to create a national strategy for the sustainable use of Scotland's coast and inshore waters '*Coastal Strategy 2004'*. The aims are to take stock of the resources and key management issues and then look beyond the short term to develop an influential vision based on a 25-year forward view. The process of developing the strategy in an inclusive manner has been seen as valuable in itself to build coherence and synergy in coastal policy and management, whilst taking into account the needs of all sectors and the EU's encouragement for the development of ICZM.

Northern Ireland was the first part of the UK to go through the process of preparing and adopting a regional plan. The *Regional Development Strategy for Northern Ireland 2025* (RDS) was prepared by the Department of Regional Development between 1997 and 2001 and was finally approved by the Northern Ireland Assembly in September 2002 after extensive public consultation, scrutiny by Assembly Committees and an Examination in Public. In Northern Ireland, the RDS, incorporates the *Northern Ireland Spatial Development Strategy* (SDS). The SDS provides a framework for strategic choices in relation to development and

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infrastructural investment. It provides for a degree of continuity with existing policy, but sets new directions to achieve a more sustainable pattern of development in the interests of future generations.

With respect to guidance and advice in relation to instability hazards in England the following guidance notes are relevant: PPG14 Development on Unstable Land (together with Annex 1: Landslides and Planning), which states "*It is important that the stability of the ground is considered at all stages of the planning process. It therefore needs to be given due consideration in development plans as well as in decisions on individual planning applications*" (DoE, 1990). PPG14 confirms that the ultimate responsibility for the safe development and secure occupancy of individual sites rests, not with the Local Planning Authorities (LPA), but with landowners and developers. By extension, this responsibility might also extend to technical advisors appointed by landowners or developers and applies equally to any other form of hazard such as flooding or erosion.

The DoE intends to publish a new Annex 2: Subsidence and Planning to supplement the existing guidance contained in PPG 14 Annex 1: Landslides and planning. The new Annex will replace and extend the existing Minerals Planning Guidance Note; MPGN 12 Treatment of disused mine openings and availability of information on mined ground. The guidance will apply in England. This forms part of a package of measures, which aim to support LAs in assessing previously developed land for suitable new uses. Consultations have already taken place on the new PPG 25: Development and flood risk and consultations will take pace on revisions of part of PPG 23 Planning and pollution control on Land affected by contamination (Brook 2000).
The draft guidance aims to take forward the broad guidance contained in PPG 14 with specific reference to subsidence from various causes, including mining, natural cavities and adverse foundation conditions. It emphasises the importance of identifying areas where subsidence is likely to be a material planning consideration. It is generally much more expensive to deal with subsidence problems after development has taken place than to investigate the potential and deal with it in advance. The guidance recognises the importance of subsidence in influencing the feasibility and sustainability of land use and development proposals and advises that local plans should take account of the potential for subsidence in making such proposals. It recommends that applications for planning permission should be accompanied, when appropriate, by a stability report, which demonstrates that the ground will not be affected by subsidence or proposes suitable mitigation measures. An appendix outlines good practice on the content of stability reports (Brook 2000).

Subsidence is a relatively technical subject, with which many planners and developers are not familiar. The guidance is written as far as possible in non-technical language in order to increase awareness of the significance of the subject, of when professional advice is needed and whether that advice covers the relevant issues (Brook 2000).

To assist in the consideration of subsidence in planning and development, the Department has carried out a number of research projects aimed to establish the broad national picture and to go on from that to develop techniques that are useable in considering subsidence within the planning system. These have formed the basis of the guidance and they are described briefly in an appendix. Other appendices describe the causes and distribution of subsidence, the mitigation of subsidence and treatment of disused mine openings and appropriate data systems for information on mined ground.

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The draft guidance does not add to the requirements on developers or local planning authorities that are already in place through existing planning guidance or the general common law duty of care. The good practice advice is consistent with existing practice in the construction industry eg through British Standards and advocated by NHBC, the Institution of Civil Engineers and the Geological Society. Though this cannot be quantified, the adoption of the good practice it seeks to secure should reduce avoidable cases of future subsidence and the costs to private owners and LAs of damage to property (even lives on rare occasions) and of subsequent litigation.

PPG16 Archaeology and Planning relates to the utilisation of archaeological information when considering development in certain areas. The following statement from PPG16 is particularly relevant: "*Archaeological remains should be seen as a finite and non-renewable resource, in many cases highly fragile and vulnerable to damage and destruction. Appropriate management is therefore essential to ensure that they survive in good condition. In particular, care must be taken to ensure that archaeological remains are not needlessly or thoughtlessly destroyed. They can contain irreplaceable information about our past and the potential for an increase in future knowledge. They are part of our sense of national identity and are valuable both for their own sake and for their role in education, leisure and tourism*" (McInnes *et al* 2000).

In Wales TAN(W)13 Coastal Planning and TAN(W)19 Development on Unstable Land covers major hazards, whereas in Scotland the overall policy as set out in NPPG1 'The Planning System' is that development plans should take account of public safety, avoiding risks such as subsidence. More specific guidance on individual hazards is contained in other documents including: draft NPPG13 Coastal Planning and PAN51 Planning and Environmental Protection.

4.1.2.2 The New Strategic Planning System

In 2001 the planning system in England was reviewed and the Government produced a Green Paper '*Planning: Delivering a Fundamental Change* and identified the coast as a planning issue requiring a regional approach. The Town and Country Planning Act 1990 has now been replaced by the Planning and Compulsory Purchase Act (PCPA) 2004. Amendments to the General Development Procedure Order (GDPO), 2003 have been made and proposed changes to the GDPO have been put forward. In addition a Planning Delivery Grant has been established to enhance the resource level of planning and nearly 150 planning bursaries have been set up to encourage take up of places in planning schools (ODPM 2004).

In addition to the provisions of PCPA, the Government is committed to reviewing all planning policy guidance (PPG) and to separate out policy from guidance, and to issue it as Planning Policy Statements (PPSs). Draft PPS exist on various topics for example regional planning, forward planning, sustainable communities. Draft PPS1, Creating Sustainable Communities, establishes overarching Government policy for achieving sustainable development and although safe communities and protection of the environment are cited (ODPM 2004).

In commencement of the PCPA current regional planning guidance that is prescribed by the Secretary of State becomes Regional Spatial Strategy (RSS). RSS will be statutory and a strategic part of the development plan. Regional Policy Bodies (RPBs) will review the RSSs. At least 60% of RPBs must be members of county councils or Local Planning Authority (LPAs) and seek their assistance. RSSs are to

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include spatial elements of policies wider than just land use/planning. In the preparation RPBs must publish their strategy for community involvement in RSS review. Pre-submission consultation statements are required (ODPM 2004).

RSS will provide strategy on regional matters for a period of at least 15 years and will replace Structure Plans and Part1s of UDPs. Sub-regional policies will be prepared by a strategic planning authority where strategic policy deficit exists (ODPM 2004).

Planning and Compulsory Purchase Act

The PCPA, 2004 establishes some overarching principles for the planning system. The intention of the amendments to forward planning and development control is that both will be much faster. This has implications for those like shoreline managers who interface with it through consultation on planning applications and on planning policy. The implications are discussed below:

Section 39(1) makes sustainable development the explicit objective of the planning system. Regional Spatial Strategies (RSSs) and Local Development Documents (LDDs) must be prepared '*with the objective of contributing to the achievement of sustainable development*'. By implication, as determination of planning applications is made on the basis of development control. The consultation, *Planning Policy Statement 1, Creating Sustainable Communities*, identifies 4 aims which have to be integrated to deliver sustainable development. Of particular relevance is the need to address, through sound science, causes and impacts of climate change. This objective is shared by planners and shoreline managers.

The PCPA indicates the Governments objective that town and country planning should be incorporated in the wider activity of spatial planning. Unlike current land use planning, spatial planning is not so limited in that it includes the locational and geographic elements of all public policy. Spatial planning could also be related to other areas of forward planning with a spatial dimension for example recreation management. The Wales Spatial Plan appears to provide an exemplar with its statements on coast protection and other spatial material.

The PCPA stresses public input into the spatial planning process. It seeks wider involvement in the early stages of plan preparation, reducing the scope for amendment after documents are submitted for Examination (both regional spatial strategies and development plan documents) (Taussik 2004).

Local Development Frameworks

The Green Paper of 2001 highlighted the significance of Local Development Frameworks (LDFs), followed shortly afterwards in the draft PPS12 '*Local Development Frameworks'*. They are portfolios of LDDs and set out the authorities policies relating to the development and use of land in there area (PCPA: S17 (3)). LDDs not selected for development plan document status become Supplementary Planning Documents (SPDs) (ODPM 2004).

The LAs are expected to develop an LDF for the island. A Statement of Core Policies (SCP) forms the bulk of the LDF and delivers a long-term vision for the island. The statement gives clear objectives for what the LAs are seeking to achieve in terms of the development and improvement of the physical environment of its area, together with a proposed timetable and a strategy for delivering the objectives. The vision, objectives and the

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strategy are endorsed buy the local community. A Statement of Community Involvement (SCI) setting out arrangements for involving the community in the continuing review of the LDF and in significant development control decisions; and criteria-based policies to shape development and deliver the strategy (ODPM 2004).

The SCP will be concerned only with policies affecting the development and use of land and cover key issues, such as housing, business development, planning obligations, transport, waste disposal and recycling, and the historic environment. It may also include policies that are not solely reliant upon the grant of planning permission for their delivery, for example, infrastructure investment, management of land and traffic management issues. In Areas of Outstanding Natural Beauty (AONB) the statutory management plan is relevant (ODPM 2004).

The SCP will also need to take full account of the land-use consequences of other policies and programmes relevant to the Community Strategy, including education, health, waste, recycling and environmental protection and consider how it can assist in the delivery of these and other economic, environmental and social objectives i.e. a spatial strategy. This approach will reduce the complexity of the system and ensure that the LDFs provide much more clarity about the acceptability of development in an area (ODPM 2004).

There will also need to be an integrated and comprehensive appraisal covering economic, environmental and social impacts of the LDF. The Government will issue appraisal guidance, taking full account of the requirements of the EU Directive on Strategic Environmental Assessment (SEA). In addition the statement of core policies set out in the LDF needs to be continuously updated, as they are likely to change with time (ODPM 2004).

To summarise, LDFs are the key components in the delivery of community strategies and will have regard for the national and regional policy; other local development documents; SEA; and contribute towards sustainable development (PCPA: S 39(2)).

Community Strategies

The LAs have a new duty to prepare Community Strategies, developed in conjunction with other public, private and community sector organisations. Community Strategies should promote the economic, social and environmental well-being of their areas and contribute to the achievement of sustainable development and play a key role in informing the preparation of LDFs. They must have four key components:

- a long-term vision for the area which focuses on the outcomes that are to be achieved;
- an action plan identifying shorter-term priorities and activities that will contribute to the achievement of long-term outcomes;
- a shared commitment to implement the action plan and proposals for doing so; and
- arrangements for monitoring the implementation of the action plan, for periodically reviewing the community strategy, and for reporting progress to local communities (ODPM 2004).

The LAs should work with Local Strategic Partnerships to establish effective mechanisms for community involvement, building on their work preparing Community Strategies. The Council needs to involve all sectors within the local community, including local business, residents, tenants and voluntary groups (ODPM 2004).

Area Action Plans

In the LAs Statement of Core Policies, the Council should identify Area Action Plans (AAPs) for areas of significant change where site-specific policies are needed to guide development. An AAP can be new and free-standing or based on existing plans or strategies. This flexibility enables AAPs to effectively reflect local circumstances. Examples of the types of plans that might be prepared are shown below (ODPM 2004).

Area master plans - comprehensive plans for a major area of renewal or development covering design, layout and location of new houses and commercial development supported by a detailed implementation programme.
Neighbourhood and village plans - setting out how the distinctive character of a neighbourhood, village or parish is to be preserved, the location of any new development and the design standards to be applied, and identifying the key services and facilities.
Design statements - setting out the design standards and related performance criteria for an area or type of development.
Site development briefs - setting out detailed guidance on how a particular site is to be developed.

Depending on local circumstance some AAPs may need to be prepared on a topic basis which cover a wider area to show Green Belt boundaries or other area-based designations; housing allocations where issues of timing of land release might need to be addressed; specific proposals for major developments which may have LA-wide implications; and the safeguarding of land for transport and other purposes.

AAPs should form a new focus for community involvement in developments affecting neighbourhoods or other local areas. The LAs will have the opportunity to seek direct participation from local people in shaping the future of their communities, taking their view on the type of development they would like to see and how it is to be laid out (ODPM 2004).

4.1.3 Integrated Coastal Zone Management

The Recommendation of the European Parliament concerning the implementation of ICZM in Europe has created a new momentum for coastal management in the UK. The UK Government confirmed its commitment to ICZM in the Marine Stewardship Report, "Safeguarding Our Seas" (2002), led by a steering group of officials from central government and the devolved administrations. The overall objective of the programme is to develop a national framework for ICZM at regional and local levels.

Defra is the lead government department responsible for the implementation of Integrated Coastal Zone Management in the UK. In line with the EU Recommendation on ICZM, Defra commissioned Atkins consultants to carry out a national Stocktake of activities relating to coastal management in the UK, which was completed in 2004.

The Stocktake revealed that the implementation of ICZM across the country is not consistent. There are 'Centres of Excellence' within certain coastal fora but in other areas there is very little activity. Though there is a lack of coordination of ICZM initiatives at the national level, a number of local partnerships and coastal groups have developed to promote an integrated approach to coastal management. However, the approach

is currently sectoral and the lack of a national strategy and sufficient long-term funding prevents the current level of activity from fulfilling the true principles of ICZM.

Coastal management in the UK is in a current state of change, with new legislation being imminent. The Local Government Association's Special Interest Group (LGA SIG) on coastal issues must endeavour to ensure that future policy relating to coastal management is well thought out and incorporates the principles of ICZM.

Many coastal issues have a strong local and regional component that cannot be adequately reflected in a single national approach. Local and regional policies should be complimentary to the national coastal strategy whilst enabling local and regional initiatives to work towards a common national aim. The local and regional policies should provide the interface between local coastal initiatives and national and European policy.

The Stocktake findings present a mixed picture of how the principles of ICZM (as set out by the European Commission) are being implemented in the UK. The study found that whilst there are examples of good practice, the current framework reflects the sectoral approach to managing coastal issues in the UK and, like many other European nations, the framework is not representative of true ICZM principles (Atkins, 2004).

The findings of the stocktaking exercise observed that there is a lack of ICZM action and policy at the national level and that even without an integrated national framework, local ICZM initiatives have developed around the UK to address specific issues. This local commitment has been driven by the need to find a practical way of resolving conflicts in the coastal zone. However, this process has been uncoordinated and many initiatives have been constrained by the lack of long term resources and commitment by some stakeholders. Results demonstrated that local, voluntary actions tend to relate more closely to the principles of ICZM. Many examples were cited of local action taken to address local issues. Considerable effort was also being put into facilitating and encouraging the involvement of stakeholders in coastal planning and management. This principle is central to the concept of ICZM and is referred to in the EU Recommendation.

The Stocktake results highlight the significance of coastal forums, which have been established to promote, develop and deliver ICZM on the ground. The precise role of these forums varies depending on the level at which they operate. For example, at a local level, much of this partnership work is directed at resolving conflicts and preparing local management strategies. At a national level discussions are of a more strategic nature and concerned with policy direction. The strength of partnership working is that the membership of such partnerships represents a broad group of stakeholders including local authorities, marine industries (ports, oil companies, sea fisheries committees), and local residents.

The Stocktake endorsed the work of coastal forums as a way of involving stakeholders, facilitating exchange of information, breaking down sectoral barriers and moving ICZM forward at a local level. It also observed that the ability of these partnerships to deliver action and change is under threat due to the absence of long-term core funding, as opposed to project funding to support their work and support staff. The Stocktake recommended that a central funding stream and guidance on what is available is essential for the long-term survival of these forums (Atkins, 2004).

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Partnerships can be an effective means of promoting the principles of ICZM at all levels of Government and of engaging the public and stakeholders. They provide a forum where partners with conflicting interests can discuss controversial issues of common interest.

In the UK integrated coastal management initiatives to date typically involve a partnership of local authorities, statutory agencies, local conservation bodies, businesses and recreational groups who, together, produce a joint action plan for a particular stretch of coast. These local coastal forums, groups and partnerships have developed to resolve specific issues of concern. Their exact remits vary but almost all these initiatives possess a common purpose of promoting a more integrated approach to local coastal management by facilitating cooperation and resolving conflicts, raising awareness and understanding, and collecting and distributing information. (Atkins, 2004)

The collaborative working arrangements within coastal partnerships help bridge divides and build relationships amongst sectors, management groupings and relevant parties as well as helping cut down on the duplication of work, time and resources. The establishment of coastal groups and Shoreline Management Plans (SMPs) has been important to the delivery of a more sustainable and coordinated approach to coastal defence at regional and local levels (Ballinger *et al*, 2005).

In 2002 the Government produced its marine strategy, *Safeguarding our seas, the Government's strategy for the conservation and sustainable development of our marine environment* (Defra, 2002). The strategy encourages local partnerships, suggesting they help deliver local solutions and develop opportunities within the national policy framework. The strategy notes, *"A number of well-regarded local and regional partnerships have evolved across the UK to establish practical management arrangements for protecting estuaries and the coastal environment"* (Defra, 2002).

Most coastal partnerships include Local Authorities as key active, and often funding, partners. Some partnerships, such as the Solent Forum and the Severn Estuary Partnership, involve many Local Authorities and various tiers of authorities, partly as a result of their extensiveness geographical remit. Not only are there benefits of Local Authorities working with other non-Local Authority partners but there are also significant advantages of working with neighbouring authorities to foster a more strategic view of coastal processes (Ballinger & Dodds 2004).

The LGA SIG recognise the benefits of partnership working, noting in their strategy 'On The Edge', *"Local authorities working in partnership with other agencies such as English Nature, the Environment Agency and the private sector have pioneered voluntary initiatives in many key areas of the coastal zone. As a result, there have been significant advances in promoting more integrated management of coastal and nearshore marine areas in the UK"* (LGA SIG, 2001).

Examples of a few successful coastal partnerships are provided below. For more information on these partnerships, see the relevant websites.

Defra affirm that the UK Government is committed to the principles of ICZM and in their report to the Commission confirm that the UK Government and the devolved administrations have been preparing separate draft national strategies on either ICZM or more generally on marine and coastal management,

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which will be published throughout 2006. It is likely that the national strategy for ICZM will be incorporated into a new piece of piece of legislation, the Marine Bill.

The new Marine Bill will introduce within its area of responsibility a new framework for the seas, based on marine spatial planning, that balances, energy and resource needs. Defra state that the Bill is about modernising and streamlining. It will simplify legislation, streamline administration and strengthen partnership working. The UK Government's objective is to establish modern and flexible new arrangements and structures that will stand the test of time. Its purpose will be to improve the delivery of policies relating to marine activities operating in coastal and offshore waters and to marine natural resource protection, in particular, by providing an integrated approach to sustainable management, enhancement and use of the marine natural environment for the benefit of current and future generations (Defra, 2006).

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Case Study - The Thames Estuary Partnership

The Thames Estuary Partnership (TEP) provides a neutral forum for local authorities, government agencies, industry, voluntary bodies and local communities to work together for the Thames Estuary.

The TEP approaches the challenge of managing the Thames Estuary from a viewpoint that values the contribution of all the estuaries' users and seeks to learn from, and work with, this expertise. To achieve this approach the partnership has established a series of Action Groups to facilitate joint working. The Chairs of the Action Groups, along with other key representatives sit on a Steering Group, which provides advice and guidance to the Partnership. The work of the partnership is overseen by the Management Group, which is made up of Directors of the Company and Trustees of the Charity.

The work of the partnership is coordinated through the implementation of Management Guidance for the Thames Estuary. This framework brings together the wide range of issues, providing a common blueprint for the Thames estuary. In addition the Thames Estuary Partnership facilitates action and takes the lead with projects that require a neutral lead.

www.thamesweb.com/tep.php

Case Study - Welsh Coastal & Maritime Partnership

The Wales Coastal and Maritime Partnership (WCMP), established in 2002, is formed of representatives of maritime and coastal interests in Wales including Local Authorities, the National Trust, Welsh Assembly Government and its sponsored bodies and regional coastal partnerships, amongst others. It helps inform policy development in Wales on the sustainable development and management of Welsh coastal areas and maritime waters. WCMP is assisting the Assembly in developing an ICZM strategy for Wales.

The Partnership has been developing a national strategy for ICZM in Wales. The partnership has identified the management principles necessary for effective integrated management of our coasts as follows:

- Think ahead, taking a long-term view beyond immediate short-term needs - address longer-term issues, including those associated with climate change.
- Try to see the big picture, viewing inter-related coastal problems in the widest possible context, including consideration of all coastal activities and uses both on land and within coastal waters.
- Be flexible and adaptable, trying to anticipate potential problems and err on the side of caution where there are potential, but unknown damaging effects of a particular action or policy.
- Work with nature rather than battling against it, realising the limitations of the natural environment in assimilating pollution and other negative impacts of development.
- Use a combination of instruments, such as legal, economic and other methods to tackle coastal problems rather than relying on one instrument in isolation, such as a law or a tax.
- Get everyone involved, including relevant administrative bodies and the local communities. The involvement of local businesses and people can help identify real issues, harness local knowledge and build and strengthen commitment and shared responsibility.
- Develop local solutions to local problems, rather than a 'one size fits all' management approach. (Welsh Coastal & Maritime Partnership, 2005)

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4.1.4 Coastal Erosion, Flooding and Instability

A basic and long-standing principle of British law is that individuals have the right to protect their own property, under common law (Lee 2000). Hence, the primary responsibility rests with the landowner, not with the State. However, common law rights have been altered and reduced over time by statute law to allow State intervention in the interests of the common good. Individuals do not have to exercise their rights, although case law has indicated that landowners or occupiers have a general duty to their neighbours to take reasonable steps to remove or reduce hazards if they know of the hazard and of the consequences of not reducing or removing it.

In the past, individuals or private businesses have either avoided high risk areas, accepted the losses as the price to pay for living and working in such areas, or have sought to "improve" the conditions through engineering works. Maintenance, repair and clean-up are often a central element of most strategies for dealing with natural hazards. Insurance has become available for mitigating the losses associated with landslip (but excluding landslide losses caused by marine or river erosion). Occasionally compensation has been sought through litigation (McInnes *et al* 2000).

ABI guidance '*Development Planning and Flood Risk*' sets out the insurance industry perspective on development in flood risk areas. This has been sent to over 400 planning authorities in response to advice contained in paragraph 32 of PPG25 that planning authorities should consult with their insurers about the availability of insurance for new developments. The insurance industry in the UK fully endorses the sequential and risk based approach to development planning. The sustainability and affordability of insurance cover for flood risk will only be insured by the avoidance of development in high risk areas, and the proper provision and maintenance of drainage systems in areas outside the floodplain. Whilst insurance may still be available in areas of higher risk, the vulnerability of properties to damage and the level of risk may put the price out of reach for many property owners. The impact of new developments on flood risk elsewhere on the floodplain will be a material factor for insurance decisions on existing properties (Atkins 2004).

Over the last few centuries, the Government has gradually acquired a key role in addressing a number of specific problems associated with coastal instability (Lee 2000). These include: controlling development in areas at risk and minimising the impact of new development on risks experienced elsewhere, through the land use planning system; the provision of publicly funded coast protection works to prevent erosion or encroachment by the sea; and funding and co-ordinating the response to major events. There are, however, no provisions for compensating property owners if protection works are considered too expensive, or not in the national interest.

There are a number of reasons as to why Government intervention has become increasingly significant over the last millennium. The scope for individuals to reduce their own exposure is generally limited to pragmatic measures such as "flood proofing" or insurance. The cost and complexity of coastal defence works is generally beyond most property owners, with the exception of major companies or landowners. Indeed, it is often neither feasible nor desirable to attempt to protect a single property. To do so would inevitably lead to a patchwork of defence structures of different condition, standards and performance. State involvement also has a social welfare element. For example, reduced landslide losses should help promote greater prosperity by ensuring the security of property, a healthy workforce and efficient business.

There is also a need to balance the pressures for reducing the risks faced by communities and obligations to take into account the interests of other groups such as conservation bodies and fisheries interests. The evolution of Statute law has, therefore, introduced: consenting arrangements which ensure that management measures do not affect other interests or increase the level of risk elsewhere; provisions to ensure the conservation and enhancement of landscape and nature conservation features, involving the protection of designated sites and areas of national and international importance; and consultation arrangements between key interest groups whose interests may be affected by risk management measures.

The Land Drainage Act 1991 provides the legislative framework for addressing flooding from the sea. This Act gives power to LAs to undertake flood prevention works. In situations where landowners do not undertake necessary flood defence works it is possible for LAs to undertake the work and recharge the costs. There are 250 Internal Drainage Boards in Great Britain with the responsibility of undertaking flood defence works within Internal Drainage Districts under the provisions of the Act. These boards are generally established in areas susceptible to flooding and land drainage problems (McInnes 2003).

The allocation of land for specific types of development can be made with the need to avoid certain vulnerable areas in mind. The development control process can ensure that planning permission is refused in vulnerable areas. Typical approaches that have been used include identification of areas of pre-existing landslides and defining a 'set-back line' within which development could be affected by coastal erosion over a particular time period (McInnes *et al* 2000).

When considering applications for new development or changes of use LPAs (usually District/Borough Councils or Unitary Authorities) must have regard to the Development Plan and to any other material considerations including those which relate to the nature and condition of the ground. In this respect the LA will need to consider the physical capability and suitability of individual sites for development and the possible adverse effects of ground conditions and natural processes upon development including the need for mitigation or precautionary measures to deal with such effects as well as the potential effects of development upon ground conditions, natural processes, physical resources or conservation features both within the site itself and on adjacent land. It is important, that consideration of these geological factors is given at each stage of the development control process from initial, pre-planning application discussions, to final liaison with the building control sections of the LA.

Whilst certain classes of development, which do not require planning permission are permitted, in some cases planning authorities may withdraw these rights if they believe serious harm may be caused by the permitted development by invoking a General Development Procedure Order. For example a small excavation in an unstable slope, to allow a minor house extension to be constructed, may cause land instability problems that would threaten other properties. Such measures are however subject to approval by the Secretary of State and may also involve giving compensation payments and are, therefore, used sparingly.

General Development Procedure Order

The GDPO was amended in 2003 so that consultees on planning applications could prepare for the operation of standing advice on planning issues. In response the EA is delegating responsibility for managing flood risks aspects of planning applications to LPAs where there is no flood risk or where the risk is low. For this

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the EA is preparing standing advice and expects the LPAs to consult them on higher risk applications. LPA officers will be required to check:

- The level of risk associated with the location of the application; and
- The nature of the proposed development (Taussik 2004).

Locations are classified as: within Main River bye-law distance; within the indicative flood plain i.e. falling into PPG25's zone 3, high flood risk; and outside the high flood risk area as represented by PPG25's zones 1 and 2, no/low risk and low/medium risk. An EA matrix indicates how LPAs should proceed with advice to evaluate whether any flood risk has been mitigated. The material, maps, the flood risk response matrix and four technical guidance notes on flood risk assessment for different types of development in different types of location are available on the web (Taussik 2004).

The GDPO stipulates that for the first time LPAs must state their reasons for permitting development and indicate what development plan policy was relevant to the decision. The PCPA also offers opportunities to third parties involved in managing coastal risk who depend on the planning system to regulate development to protect resources or to minimise risk. This relates particularly to consultations and obligations (Taussik 2004).

Whist the planning system in the UK is designed to regulate the development and use of land in the public interest, the building control system, which is enforced through building regulations is designed to secure "*the health, safety, welfare and convenience of persons in and about the building*", Building Act, 1984, S1(1). Building regulations, therefore, provide a complementary mechanism to the planning system for addressing instability issues during the course of development. The 1991 Building Regulations drew the building industry's attention to the problems that instability and subsidence may cause to a building and the surrounding areas: '*The buildings shall be constructed so that ground movement caused by swelling, shrinkage or freezing of the subsoil; or landslip or subsidence, in so far as the risk can be reasonably foreseen, will not impair the stability of any part of the building*' (McInnes *et al* 2000). The 1991 regulations also highlighted the availability of relevant information in the National Landslide Databank for Great Britain.

Building Regulations

The Building Regulations apply to building work in general, control of services and fittings and material change of use. However, there are exceptions such as greenhouses and agricultural buildings, temporary buildings, small detached buildings and extensions. The LA Building Control Department has to see that building work complies with the Regulations. If the work fails to comply the developer may be required to alter or move it. A person intending to carry out building work or make a material change of use may either: deposit full plans with the LA; use the private certification procedure; and give a building notice.

Plans drawn up for submission seeking Building Regulation approval must show all construction details. The application should be submitted to the LA who will thoroughly check the plans and, if they comply with the regulations, issue an Approval Notice. In other instances a conditional approval may be issued. A notice of rejection must specify the defects or grounds on which the plans have been rejected. The LA will normally inspect the work as it proceeds.

The private certification procedure is controlled by the (Approved Inspectors) Building Regulations 1985. The only Approved Inspector at present is the National House Building Council (NHBC). The system involves the developer and inspector jointly notifying the LA by the issue of an Initial Notice. Once that has been accepted by the LA, the Approved Inspector is responsible for the supervision of the building work and will issue a final certificate when the work is completed.

The LA Development Control process considers the development proposal in the context of planning policy and any other material considerations which might, for example, include ground movement. In this particular capacity, the LA will take account of the physical capability and suitability of individual sites for development as well as the possible adverse impacts of ground conditions and natural physical processes. It is also duty bound to take account of the effects of development upon ground conditions in the area, physical processes as well as the environmental impacts.

In order to resolve some of the ground instability issues at the planning stage, use is made of planning conditions. In the case of ground instability, such conditions might relate for example to the siting of a proposed dwelling, drainage arrangements and sequential working (e.g. retaining wall to be constructed before excavation and development of a site). On receipt of planning approval, Building Regulation approval may be sought, which is likely to cover structural aspects of the construction in much more detail. The consensus amongst planners, geotechnical engineers and building control officers is that key ground stability aspects should be resolved at the planning application stage and not be left to be addressed through the Building Control application. The Building Regulations should not be used as a substitute for proper planning procedures. All instability related issues should be addressed as far as possible before development takes place. Whilst the dual system of planning and building control may seem complex, the system works well and helps to ensure that development and the actual construction and completion of works is undertaken.

There were no general statutory powers to protect the coast against erosion and landsliding before 1949, although many authorities had provided defences under general LA powers or local Acts. The Coast Protection Act 1949 gave local authorities powers to carry out works, under general supervision by central Government (MAFF now DEFRA), to prevent erosion or encroachment by the sea (McInnes *et al* 2000).

Coast protection authorities (i.e. maritime district councils or unitary authorities) have two functions: *promoting* their own schemes under the 1949 Act and *regulating* protection works by landowners, or bodies with their own statutory powers (e.g. rail track, harbour authorities, highways authorities etc.). Figure 4 shows the interaction between coastal defence authorities/agencies and the planning system. Coast protection works also require the following consents:

- express planning permission from the local planning authority (above LWM);
- a licence to deposit anything in the sea from the DEFRA, under the Food and Environment Protection Act 1985 Part II;
- a lease for use of the sea bed from the Crown Estate Commissioners; and
- permission from the Secretary of State for Transport to ensure that works in tidal waters do not affect navigation, under the 1949 Act S.34. This includes permission for the construction, alteration or improvement of any works on, under, or over any part of the seashore below spring HWM, or the removal or deposit of any object or materials below the level of spring HWM.

Grant-aid is made available to operating authorities by DEFRA and The National Assembly for Wales for schemes that are technically sound, environmentally acceptable , economically viable and cost- effective. The current level of grant-aid for coast protection is around £20M per year.

A key feature of the powers is that they are permissive rather than mandatory; the operating authorities are not obliged to carry out works. This clearly limits the role of the State to only providing defences that are deemed to be in the national interest. However, the subtle distinction can cause considerable public misunderstanding and frustration. It also recognises that complete protection is impossible: "*a balance has to be struck between costs and benefits to the nation as a whole. For example, to attempt to protect every inch of coastline from change would not only be uneconomic but would work against the dynamic processes which determine the coastline and could have adverse effect on defences elsewhere and on the natural environment*" (MAFF 1993).

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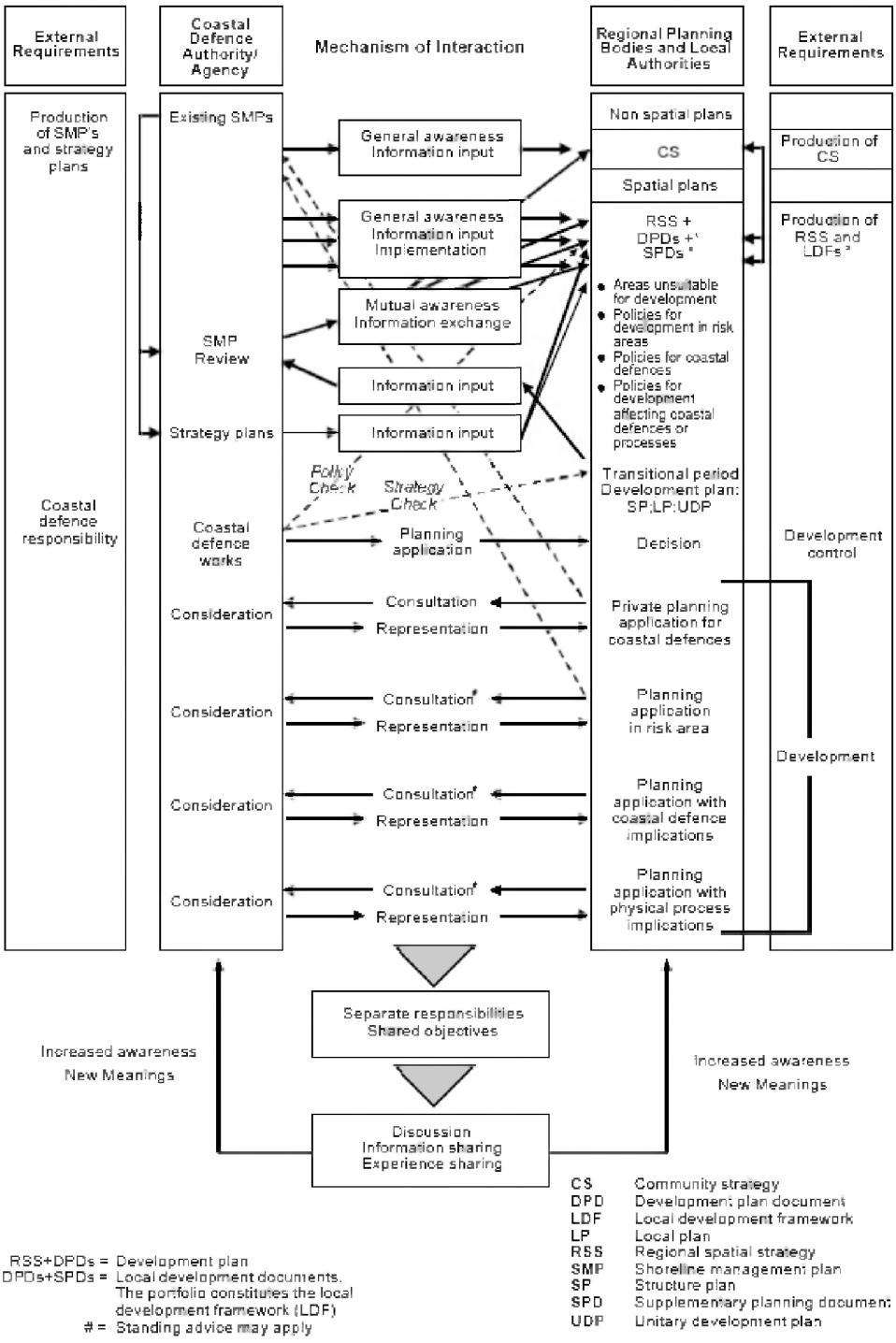

Figure 2: The interaction between coastal defence authorities/agencies and the planning system (Source: Taussik 2004)

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Protection of life is the primary focus of Government flood and coastal defence policy (MAFF 1993), the order of priority for grant-aid is as follows:

- flood warning systems;
- urban coastal defence;
- urban flood defence;
- rural coastal defence and existing rural flood defence; and
- new rural flood defence schemes.

These priorities are not prescriptive and grant-aid decisions are subject to rigorous appraisal procedures (MAFF 1993). In England and Wales, schemes (especially those that are grant-aided by MAFF or the National Assembly for Wales) must be technically sound, environmentally acceptable, economically viable and cost-effective.

The existing arrangements for flood and coastal defences have been very effective in protecting vulnerable communities. For example, over the last 100 years or so some 860km of coast protection works have been constructed in England, to prevent coastal erosion (MAFF 1994). The EA maintains a total of about 1,400km of sea defences around the coast. This is about two-thirds of the total, with the remainder being either the responsibility of local authorities or privately owned. The Agency maintains a further 3,300 km of tidal defences within estuaries and tidal rivers. The EA for England and Wales maintains a major data base of information on water quality and pollution in accordance with its statutory responsibility. Details are contained in the state of the coast report *State of the Environment of England and Wales: Coasts*, 1999.

A Strategy for Flood and Coastal Defence in England and Wales was published by the former MAFF and the Welsh Office in 1993. In summer 2003 DEFRA decided to review flood and coastal erosion risk management policy for England in the light of drivers for change, including the latest predictions on climate change. To this end, DEFRA's Flood Management Strategy Unit is currently co-ordinating a strategic longer term look across all Government policies as they affect flood risk. A new strategy that will set the direction for flood and coastal erosion risk management over the next 20 years.

Planning permission by LAs is not granted where the EA raise objections to planning applications. There are two stages to consideration of flood risk issues:

The sequential test established by PPG25, Development and Flood Risk establishes whether the proposed development is appropriate at the level of risk; and The Flood Risk Assessment (FRA) is evaluated to assess whether the mitigation measures/remedial works proposed to be incorporated in the proposal will bring the proposed development up to the required threshold of safety to be granted planning permission.

It has been suggested that only if the proposed development is 'permitable' under the sequential test does the FRA need to be evaluated. There is much support for the approach established by PPG25 and the sequential test is considered useful in establishing policy and reducing the numbers of speculative planning applications submitted in flood risk areas, however, it also creates considerable practical difficulties for those LPAs that lie exclusively or with the majority of land within flood risk areas for example the case study (Taussik 2004a).

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SMPs have been developed throughout England to help address the coastal problems supported by EMPs, CHaMPs, BAPs and Coastal Management Plans. Management of the shoreline involves assessing and implementing risk reduction measures for people as well as the developed and natural environment. Risk management includes the use of the planning system to avoid development in locations at risk as well as protection measures, provision of monitoring and warning systems and pro-active coastal management.
Cost benefit analysis, which takes account of environmental factors as well as property values, plays an important role in formulating the preferred policy options around the coast and are also required in order to gain funding from DEFRA/NAW towards the cost of new coastal defences. Local Planning Authorities have to balance the recommendations of non-statutory SMPs against other priorities, including the risk of failing to provide adequate protection to existing development.

LAs have a long tradition of undertaking works to benefit their residents, either to alleviate the suffering after a disaster or preventing problems. A LA has the permissive powers, under the Local Government Act 1972, to:

- incur expenditure which in their opinion is in the interests of their area or its inhabitants;
- incur such expenditure as they consider necessary in an emergency or disaster involving destruction of or danger to life or property or where there are reasonable grounds for preventing such an event; and
- make grants or loans to other people, bodies in an emergency or disaster.

The Local Government Acts of 1999 and 2000 enacted some of the key provisions of the 1998 White Paper, *Modern Local Government: in Touch with the People* setting out the Government strategy. Corporate Planning and Policy documents are a vital component of the corporate governance system of LAs. Figure 3 provides a summary of the typical range of corporate planning documents and strategies produced by LAs.

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	Stat. / Non-Stat.	Legislation	Purpose of plan
Asset Management Plan	NS		Reports on corporate asset management, setting out produced and planned future improvements.
(Local) Best Value Performance Plan	S	Local Government Act 1999	Process by which LAs are held to account for the efficiency and effectiveness of their services and proposed actions. (Section 3.3)
Capital Strategy	NS		Sets out LA's overarching, cross-service, corporate aims and objectives alongside details of its capital programme
Community Strategy	S	Local Government Act 2000	To provide a strategic planning framework, setting out the priorities and objectives at a community-wide level. (Section 3.2)
Corporate Plans	NS, but statutory requirement to produce a LA policy framework		To provide a framework for corporate working, including often the strategic objectives of the council and the desired outcomes and actions to achieve them; should be integrated with other LA plans, particularly Local Performance Plans and Community Strategies
Local Agenda 21 Strategy	NS		To identify local priorities for sustainability and act as a catalyst to delivering them as part of the wider LA21 process.
Local Public Service Agreement	NS		To improve performance in the delivery of local public services by focusing on targeted outcomes with support from government

*Figure 3: The main types of Corporate Plans produced by Local Authorities relevant to Coastal Risk Management (*source: Ballinger and Dodds 2004)

High Level Targets

In November 1999, DEFRA published a series of High Level Targets (HLTs) for Coastal Defence Operating Authorities, which took effect in April 2000. The existing aim of the HLTs is '*to reduce the risks to people and the developed and natural environment from flooding and coastal erosion by encouraging the provision of technically, environmentally and economically sound and sustainable flood defence measure*'(DEFRA 2005). The fourteen HLTs are listed in Figure 7. The targets of the HLTs aim to:

- encourage the use of adequate and cost effective warning system:
- encourage the provision of adequate, economically, technically and environmentally sound and sustainable flood and coastal defence measures;
- discourage inappropriate development in areas at risk from flooding and coastal erosion; and

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- encourage, share and build on best practice and achieve a greater consistency in approach by all authorities in their flood defence activities (Ballinger and Dodds 2004).

Taking into account the outcome of the *Flood and Coastal Defence Funding Review* and the introduction of agreed performance measures and targets with the EA as part of their cooperate plan, some of the HLTs have been streamlined in order to provide more focus on what still needs to be done by all operating authorities and to place greater emphasis on outcomes rather than processes.

DEFRA has been working with the DCLG in reviewing PPG25 to consider the experience of it implementation and effectiveness and to take account of any changes in knowledge on climate change. The aims of PPG25 are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk.

The DCLG consulted on the EA becoming a statutory consultee for all applications for development in areas of flood risk. Coast protection authorities are to report to DEFRA and DCLG on development plans identifying the extent to which they contain coastal erosion statements and reflect the assessed risk of coastal erosion as set out in *inter alia* SMPs.

In the autumn of 2004 Defra held a three-month consultation on a new cross-Government strategy for flood and coastal erosion risk management; '*Making space for water: Developing a New Government Strategy for Flood and Coastal Erosion Risk Management in England', which* addressed the issues raised in the '*Foresight Future Flooding Report 2004'* and aimed to seek views from all stakeholders with an interest in a broad range of flood and coastal erosion management issues. Defra published its first response to this consultation exercise in March 2005. The response sets out the aim of the new strategy:

To manage the risks from flooding and coastal erosion by employing an integrated portfolio of approaches which reflect both national and local priorities, so as:

- To reduce the threat to people and their property; and
- To deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.
- To secure efficient and reliable funding mechanisms that deliver the levels of investment required to achieve the vision of this strategy.

Over the 20-year lifetime of the new strategy, the aim is to implement a more holistic approach to managing flood and coastal erosion risks in England. The approach will involve taking account of all sources of flooding, embedding flood and coastal risk management across a range of government policies.

"The concept of sustainable development will be firmly rooted in all flood risk management and coastal erosion decisions and operations. Full account will be taken of the social, environmental and economic pillars of sustainable development, and our arrangements will be transparent enough to allow our customers and stakeholders to perceive that this is the case. Account will also continue to be taken of long-term drivers such as climate change" (Defra, 2005).

The planning system has an important role in cliff management by ensuring that development is suitable and takes full account of the potential instability problems that it may generate. A common approach is to require the developer to submit a *stability report* with a planning application which determines the site conditions and identifies any remedial measures which may be required to overcome any problems. Much can also be done by the local authorities and other coastal managers to reduce the likelihood of slope failure in developed areas by simple, pragmatic cliff management practices (McInnes *et al* 2000).

Provisions for an authority to ensure that disruption of sediment transport did not have significant effects are included within the Coast Protection Act 1949 S.16-17. However, these powers were not widely used and disruption of sediment transport around the coastline is believed to have led to increased cliff erosion, especially on parts of the south and east coasts of England. Nowadays the potential problems are widely recognised by the Government and coast protection authorities, with the formation of coastal defence groups helping to ensure that coastal engineering works by one authority do not have adverse effects on the neighbouring authority's coastline.

The *Government View Procedure* for determining the suitability of marine aggregate extraction licences is an important mechanism for ensuring that dredging operations do not affect coastal cliff erosion rates. Applicants are required to demonstrate that the proposed extraction will have no adverse effects on coastal defences or the environment generally. Although the procedure is not statutory, the Crown Estate Commissioners will not issue licences without a favourable Government view (the procedure is currently under review). Orders made under the Coast Protection Act 1949 S.18 can be used by local authorities to prevent the excavation or removal of materials on the sea bed or shoreline, although such powers have not been widely used in the past.

4.1.5 The Future Planning System in Coastal Risk Management

The legal framework governing the management and use of the UK coastal zone is inevitably complex, and comprises a wide variety of laws drawn from many different sources. In addition to the complexity of coastal risk management due to the large number of laws and policies governing the coastal zones of the UK, a further complication is the multitude of Government Departments and agencies concerned with the management of activities in the coastal zone and the wide range of stakeholders and resource users whose interests need to be accommodated in coastal risk management.

There are a number of issues that need to be looked at in the near future. How to move from an incremental approach to dealing with coastal risk, operating over relatively short term futures and emphasising 'business as usual', to a much longer term and more strategic approach. This is particularly important to consider for any settlements where vulnerability to coastal risk is increasing but raises important implementation issues. The idea that land once used for development should continue to be used, should be reassessed. This is not appropriate in areas of increasing coastal risk and approaches that link life of buildings life of defences need to be developed. In addition evaluation of EA standing advice on flood risk, especially as it does not deal with long term time frames, is not site specific and is prepared without site specific knowledge. There is also the problem that the incremental granting of small scale planning permissions may, cumulatively, create a

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substantial risk problem in the longer term in an area where the shoreline or its defence cannot be sustained (Taussik 2004).

The main constraint to investing in the marine environment is that the legal framework for planning in the marine environment does not exist and the legal and administrative framework is not sufficient to ensure that development in the marine environment is sustainable. In recent years there has been an increase in pressure on the UK Government to implement legislation to protect the marine environment from unsustainable development (Atkins, 2005).

The coast is a valuable resource and land use in the coastal zone is often a point of conflict. Developers may regard nature conservation legislation as a barrier to economic growth due to the inflexibility of regulations such as the habitats directive. It is hoped that the proposed Marine Bill may remedy some of the conflicting demands for energy, aggregates, shipping and fishing while ensuring that nature conservation objectives are achieved.

The Marine Bill, which is being developed by Defra, will be published in draft form by November 2006 and aims to introduce a better system for managing marine resources and ensuring sustainability. Defra regards the Marine Bill as an "opportunity to put in place a better system for delivering sustainable development of the marine and coastal environment, addressing both the use and protection of our marine resources" (Defra 2005).

4.1.6 Climate Change

Understanding the risk management framework and the broader social and political context provides a basis for speculating about how climate change and sea-level rise will impact upon the coastline over the next 100 years or so. It should be stressed that because of the nature of social systems, there is probably more uncertainty as to how society and politicians will respond to these changes than their impact on coastal processes.

Politically, climate change has received a great amount of recent attention and the predictions of climate change impacts are beginning to influence policy at the international, national and local level. The UK Government believes in the importance of taking domestic action to cut greenhouse gas emissions. Since Kyoto in 1997, the UK has been pressing ahead and introducing innovative policies which will have a significant impact (DEFRA 2005a).

In 1997 the UK Climate Impacts Programme (UKCIP) was set up and funded by DEFRA providing advice and guidance for public and private sector organisations in identifying their exposure to climate change risks and ways of responding to these. UKCIP was instrumental in producing a new set of climate change scenarios for the UK published in April 2002. The UKCIP is currently in the process of producing an updated set of climate change scenarios for the UK, which will be known as the 'UKCIP Next' scenarios.

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In 2000 DEFRA published '*The UK's Climate Change Programme.'* It details how the UK plans to deliver its Kyoto target to cut its greenhouse gas emissions by 12.5%, and move towards its domestic goal to cut carbon dioxide emissions by 20% below 1990 levels by 2010 (DEFRA 2005a).

Action taken in the UK throughout the 1990s has significantly reduced greenhouse gas emissions. The Government and the devolved administrations are continuing this positive approach with a substantial programme of integrated policies and measures to:

- improve business's use of energy, stimulate investment and cut costs;
- stimulate new, more efficient sources of power generation;
- cut emissions from the transport sector;
- promote better energy efficiency in the domestic sector;
- improve energy efficiency requirements of the Building Regulations;
- continue the fall in emissions form agriculture and forestry;
- ensure the public sector takes a leading role.

Many of the policies in the Climate Change Programme are implemented by other government departments, for example, polices on renewables are implemented by the DTI and the climate change levy by HM Customs and Excise (DEFRA 2005a). A review of the UK Climate Change Programme was launched in September 2004 with the publication of the Terms of Reference for the Review. As part of the review, a formal consultation exercise year was launched in December 2004, with the closing date for responses in March 2005. The intention is to publish a revised programme in the first half of 2005 and the intention is to publish a revised programme in the first half of next year (DEFRA 2005). UKCIP's Integration Report will be produced in Spring 2005 to integrate findings from studies and develop a national picture of the impacts of climate change and emerging adaptation options.

The Government recognises the need to adapt to some degree of climate change, however successful it is at cutting emissions of greenhouse gases. The Government and devolved administrations are taking a lead in preparing to adapt to climate change, and these steps are outlined in the UK Climate Change Programme (DEFRA 2005a).

The Government has begun to build climate change into many areas of mainstream policymaking. For example, following the widespread flooding in the UK in 2000, planning guidance on development in areas at risk of flooding has been strengthened to advise a precautionary and risk-based approach (PPG25). Many other areas of policy now incorporate a climate change perspective, including building regulations, flood and coastal defence, water resources, and health. The Government has recently started a comprehensive interdepartmental process to consider the implications of climate change across the full range of its policy and operational responsibilities - building on an initial report, "*Implications of Climate Change for DETR*" 2001.

The report suggests that the overall risk management framework should include clear statements of roles and responsibilities, particularly on the extent of DETR responsibility in relation to external organisations. It suggests also that the framework should highlight the need to give priority to those responsibilities where a

proactive precautionary approach is required. The report includes suggestions on how these responsibilities might be defined. The future roles and priorities of UKCIP are also explored.

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Case Study - UK Climate Change Programme

The UK Climate Change Programme (UKCIP) was set up in 1997 by DEFRA. Mounting evidence that the world's climate is changing is reported in the UKCIP 2000.

Globally 1998 was the hottest year ever recorded, and seven of the ten hottest years have fallen in the last decade.

In the UK, four of the five hottest years ever recorded over a 330 year period have occurred in the last ten years.

Winter rainfall in the UK is becoming heavier, with the most intense daily rainfalls now contributing about twice as much to winter rainfall as in the early 1960s.

The climate change scenarios produced by the UK Climate Impacts Programme are quoted in the Climate Change Programme as suggesting that, without deep cuts in greenhouse gas emissions:-

- average UK temperatures could increase by about 3° by 2100;
- rainfall could increase by as much as 10% over England and Wales and 20% over Scotland by the 2080s;
- sea-level rise by the 2050s could amount to 41cm in East Anglia and 21cm in the west of Scotland;
- winters and autumns are likely to get wetter;
- spring and summer rainfall patterns are likely to change, with the north west of England becoming wetter and the south east becoming drier;
- the frequency of extreme weather events such as severe floods is expected to increase (though there is less clarity about the likely frequency of storms and high winds);
- individual years and groups of years will continue to show considerable variation about the underlying trend.

The Building Regulations (BR) need to factor in the implications of changing climate and BR has put in hand arrangements to do this. BRE have produced reports on the implications of climate change for the built environment; the implications of climate change for Building Regulations; and a review of implications for Part A of the Regulations (structures). BR Division is committed to seeking advice on climate change as each Part of the Building Regulations comes up for review.

The biggest challenge is how to address issues arising on the existing building stock. BSIRA has studied the impact of climate change on the building services industry. There is a joint study underway with EA, ABI and NHBC regarding flood proofing. There is a joint study underway with EA regarding sustainable urban drainage. CRISP propose research on climate change and the construction industry. Sustainability North West is hosted a conference on climate change and the construction industry in 2001.

Climate change impacts vary from region to region. The implications need to be taken into account in regional plans including Sustainable Development Frameworks, RPG and RDA strategies, as well as EA regional objectives. At present coverage of climate impacts is patchy. Regional scoping studies carried out within UKCIP programme have exposed need for further exploration of the issues at regional level and development of practical guidance. There is a need to clarify the respective responsibilities of the various regional bodies in relation to planning for climate change, and to provide for effective leadership.

On a local scale the main issue is the implications for management of Bellwin fund of LA expenditure on flood protection and responses to flooding. A review of Bellwin Scheme was undertaken, with final revisions in

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2002/3. Research is in progress to examine the role of the planning system in adapting to climate change, aiming to develop good practice guidance for planners on how to take account of climate change. Consultation on revision of PPG25 on Development and Flood Risk represents a significant strengthening of previous guidance, incorporating material on predicted sea level rise and increased heavy rainfall as a result of climate change.

Case Study – North Yorkshire

The coastal zone of North Yorkshire is particularly vulnerable to rising sea levels, changing patterns of tidal flooding and coastal erosion and the warming of seawaters. At present in the North Yorkshire region sea levels and mean annual temperatures are rising. Mean sea levels along the coast have risen at rates of between 1.5mm and 3.6mm per year over the last 80 years. The average UK sea level is 10cm higher than in 1900. The scenario for sea level rise in North Yorkshire for 2080 gives a rise above the 1900 level of between 15-75cms.The DEFRA recommended planning guidance for sea level rise is 4mm/year, north of Flamborough. The rising sea levels will lead to: -

- Coastal Squeeze- intertidal habitats will be lost to the sea as they are trapped between rising seawaters and hard coastal defences.
- Increased risk of tidal flooding including the overtopping, bypassing and breaching of coastal defences due to sea level rise and increased storminess.
- Growing concern regarding tidal flood risks potentially leading to "insurance blight" for businesses and households.
- Changing sea temperatures that will affect the type and quality of fish stocks. The area has already seen a reduction in cod stocks and an increase in red mullet due to warming waters.

For more information about climate change please see the RESPONSE report "A Review of Climate Change Research and Probable Impacts at the Coast - with particular reference to the RESPONSE Coastal Study Areas"

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4.2 France

In terms of natural hazard management, the French regulatory and legislative framework is an example of good practice and reflects the complexity of the legislation. Based on a study of the regulation for the LIFE project; "Coastal change, climate and instability (1997-2000)" this information has been updated ~~in~~ with reference to ~~regards to~~ coastal risks and incorporated into this report.

Regarding French law, coastal management is referring to numerous laws for land use planning, nature and conservation, risk management and, integrated coastal management (more specifically the Loi littorale (littoral Act). The legal frame of these diverse objectives is described here after and in the last chapter, summarised in application to coastal risk management.

4.2.1 Legal framework for land use planning

France has a four-tired administrative system, namely the State, the Regions, the Departments, and the Communes. A share of the responsibility for planning matters rests within each level, particularly in the context of hazards. The most important legislation affecting coastal management is planning law which is supervised by the *Ministère de l'Equipement, des Transports et du Logement,* whose responsibilities also include the administration of navigable waters. The *Ministry for Environment (Ministère de l'Ecologie et du Développement Durable)* is responsible for environmental protection and nature conservation and the *Ministère de l'Agriculture et de la Pêche* is responsible for agriculture and fisheries. The *Ministère de l'Interieur* (Ministry for the Interior) is in charge of civil security, with departmental delegation to prefectures.

The main legislation governing the spatial planning system in France is the *Code de l'Urbanisme*, which is the Town and Country Planning Code. The *Loi de Décentralisation* (Decentralisation Act) of the 7th January 1983, and the following decrees, institute the different action levels for each administrative systems. Communes are responsible for preparing *Plan Local d'Urbanisme* (PLU ~ Local Town Plan), which replaces the *Plan d'Occupation des Sols* (POS,~ Use Land Plan) since the 13th December 2000 and the law *Solidarite et Renouvellement Urbain* (SRU ~ Town Solidarity and Replenishment). Groups of communes, called *Communautés,* may also collaborate in the production of *Schémas de Cohérence Territoriale* (SCOT ~ Territorial Coherence Scheme) which define planning objectives for a wider area. These schemes replace the *Schémas Directeurs* according to the SRU law of 2000.

The DIACT (Direction *i*nterministérielle à l'Aménagement et à la Compétitivité des Territoires ex DATAR – Direction de l'Aménagement des Territoires et des Actions Régionales) is in charge of national orientation on territorial land use. The role of its policy is strengthened by a 1995's law for providing a national *Schéma National d'Aménagement et de Développement du Territoire* (SNADT, ~ Territory Development and Planning National Scheme). The *Directives Territoriales de l'Aménagement* (DTA, Development Territorial acts) apply the orientations of the SNADT at a regional level.

The SCOT gives basic guidelines for development for the concerned area, taking into account the balance, which must be achieved between development of the area and the conservation of natural sites and resources. As town planning documents, the Land Use Master Plans define overall land use, major infrastructure, location of the most important amenities and activities as well as land to be protected from urbanisation. The principles thus adopted must be transposed into specific regulations through the PLU.

There are three types of urban planning documents: strategic plans and sectoral plans, the PLU and the *Zones d'Aménagement Concerté* (ZAC, ~ Concerted Planning Area).

Strategic plans/sectoral plans set the fundamental direction of the planning of affected territories, taking into account the balance that should be maintained between urban sprawl, the occurrence of agricultural activities and other economic activities and the preservation of natural and urban sites and landscapes. They take into consideration the practice of foreseeable natural hazards and technological hazards. They are established for the Communes, part or whole Communes composed in groups or geographical units presenting a community of economic and social interests and for whom the development, enhancement and protection perspectives require fundamental land use planning orientations to be defined.

PLU is an urban planning document at the scale of the Commune. It should take into account the documents for the prevention of major natural hazards and the possible *Plan de Prévention des Risques naturels* (PPR, ~ Natural Hazards Prevention Plan) for the Commune concerned should be annexed to the PLU. This is a document that can be challenged by third parties once it is published or approved. The planners or developers should undertake to apply the rules of the PLU.

ZAC is to be compatible with the aims of the strategic plan, if one exists. This plan takes into consideration the arrangements of the local programme of the environment where they exist. The public develops it by taking the initiative to create the zone.

PIG (*Projets d'intérêt Général*-General interest project) and SUP (*servitude d'utilité publique*-public use easement), prescribed by the Prefet are building or road works, protection project or land use reserve of a public utility nature and subject to certain conditions in content and form. It can be used for the prevention of major natural hazards, and its provisions have to be taken into account by the Communes within their urban planning documents. The PIG can be used to prevent major hazards, whether technological or natural: its development is simple and rapid. The PIG imposes upon all urban planning documents; even executory ones and it should be incorporated in the strategic plan.

Besides these planning tools, the decentralisation law has lead to common planning objectives, sustained by a shared financial tool declines as *Contrats de Plan Etat-Régions* (State-Region Planning Contracts). Environment has become one of the priority thrusts of recent generations of plans, concluded between the State and each of the 22 French regions and cover a five-year period (the 2000-2005 plans ending, and the 2007-2013 being currently settled). These instruments enable a decentralised approach to public policies centred on major planning and development objectives. The decree of the 5th July 2001 includes the environment in the territorial part of the State Region Planning Contracts.

Specific contract- based objectives concerning the environment are defined and active policies to protect the environment are encouraged. In many respects (protection of outstanding sites, management of sensitive areas, pollution control, etc.), these planning contracts contribute directly or indirectly to the conservation of wild flora and fauna. France has 100 sites and four of which are overseas.

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Case study : « Observatoire de la Côte Aquitaine »
In 1996, the French State, the Aquitaine Region, BRGM, IFREMER and ONF initiated a regional partnership for the monitoring of the Aquitaine coastline mobility.

The increasing economics and social pressure (growing population) of the Aquitaine coast make it important to consider coastal erosion in coastal management projects. Located at the South of the Bay of Biscaye, the Aquitaine coast is very exposed to natural (wave, wind, currents) and anthropic (urbanisation, pollution) hazards.

The Observatoire de la Côte Aquitaine partners are conscious of these issues: the attractive coast must propose adapted infrastructures and must be prepared to erosion risk.

Two programs have been prepared in order to increase the knowledge and the quantification of coastal movements and to anticipate it.

The first program, grouping together Aquitaine Region, BRGM and IFREMER was carried out between 1996 and 2000 and was concerned by the sandy coast only. The second program, grouping together the French State, the Aquitaine Region, the Pyrénées-Atlantiques Department, the BRGM and ONF was carried out between 2000 and 2004 and was interested by the sandy coast and the cliff and beaches littoral in the South. Since 2004, a new convention allows to incorporate the Arcachon lagoon into the main program. The pollution of the coast (beach cleaning operation) is also integrated. At the present time, a future program is in preparation in order to continue these operations, which should be integrated within the future 2007-2013 Contract Plan State-Region, and European programs. The main objective remains to propose to the stakeholders a tool (GIS oriented) to integrate erosion within decision processes of coastal management. Others subjects are taken into account such as pollution, and other partners should be associated: Gironde and Landes Departments. Information on the website: littoral.aquitaine.fr (French language).

Case Study. The P.L.A.G.E. in Nord Pas de Calais
Between the years 1999 and 2003, the Nord Pas de Calais Region and the state through the CPER, and with the help of European fundings (FEDER NPc, INTERREG2c) designed a planning document and mappinfg for managing the erosion phenomena.

The programme was developed in 3 stages:
-Define coastal management units
-Identify and quantify existing risks, and future risks, whose evaluation is based on past events.
-Giving guidelines for actions, within a objective of integrated and sustainable management

The deliverable was a map atlas, based on an updatable GIS.

4.2.2 Legal frame for Risk management

Regarding risk management, the French tiered organisation is shown.

In accordance with the provisions to the loi Barnier (13th July 1982 Environment Act) the State (Ministry of the Environment -MEDD) is responsible for giving information on risk: to such aim,
- The Ministry of the Environment is in charge of preparing methodologies to acquire knowledge of risks, which application is transferred to regions and departments and deconcentrated state services such as Direction régionales de l'Industrie for technological and industrial risk Direction départementale de l' Equipement and Direction regionale de l'E,nvironnement for natural risk, when existing, Services maritimes for coastal Risk).

-The Ministry of the Interior is in charge of recognising existence of natural disaster events, allowing affected population to be indemnised by insurances, following a increasing system of "franchise" in case of disaster reoccurrences, if no planning for risk management has been started by local authorities.

-The Ministry of the Interior and the civil security direction of the prefectures are responsible for urgency assistance in case of a disaster: The organisation of assistance follows the *Organisation des SECours* plans (ORSEC, ~ Organisation of Assistance) and /or the emergency plans. The aim of ORSEC plans is to list the measures likely to be implemented and to define their conditions of use. There are three types of ORSEC plans: national ORSEC plans; zonal ORSEC plans; and Departmental ORSEC plans (McInnes *et al* 2000). Emergency plans set-out the steps to take and the means of assistance to be implemented in the case of a disaster. There are three types of emergency plans in terms of natural hazards: Particular Intervention Plans (PPI), Red Plans, Specialised Assistance Plans (PSS)

The departmental prefecture, associated state services, the Departmental Council and any expert considered as qualified are in charge of publishing and updating a DDRM (Dossier départemental des risques majeurs), which aims to inform the local authorities for existing risks.
This document is also a guide for planning prescription of PPRs.

This document is then to be declined for each concerned in DICRIM (*Document d'Information Communale* sur les Risques Majeurs and DCS (*Document Communal Synthétique*) giving to the local authority information (DICRIM) and maps (DCS) on exiting risks (natural and/or technological) on its territory. The mayor is then responsible for giving the information to the population.

On the base of the DDRM and DCS, and occurring catastrophic events, local authorities associated with regional state services are qualified to ask for prescription of PPR (*Plan de Prévention des Risques*), regarding a specific hazard. Such plans are then prescribed by the prefet and are to be elaborated within 5 years

In addition, the latest loi Bachelot of the 30th July 2003, for natural and technological risk prevention and damage compensation was edicted following the technological catastrophy of AZF in Toulouse. Besides introducing the technological risks in the PPR regelmentation, it asks for any information on risk to be included in communal mapping for SCOT and PLU, so to be taken into account in land management planning. It also prescribe that any person having knowledge of a risk is to inform the mayor, who has to transfer the information to the prefect and to the president of the department council.

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4.2.3 Legal frame for nature conservation and planning

The Forest Code of 1827. 1930 Act on the Protection of Natural Monuments and Sites) induced for 150 years a natural area conservation policy taking into account the "scientific, historic or legendary" aspects were taken into account.

Since 1960, when the National Parks Act was passed, biotope protection has been put forward and France has developed an original policy based on an undertaking agreement jointly by landowners, local authorities and the State. This requires consultation and consensus of the various public and private actors involved. There fore biotope protection orders – *arrêté sur la protection des biotopes*) can only be imposed after an in-depth public enquiry. It entails delegating the management of protected natural areas to local bodies and adopting contract-based measures (voluntary nature reserves, regional nature parks, agri-environmental measures, charters, etc.). The environment must be taken into account when a public or private development scheme may have an impact on the environment, under the 1976 Nature Conservation Act.

Taking the environment into account in land use plans is now a legal requirement under four major Acts adopted between 1976 and 1985 (Town and Country Planning Code - *Code de l'urbanisme,* Art. L 121-1 and those following). Urban documents (PLU, …) can have considerable influence on the conservation of biological diversity. The draft land use plan is subject to public enquiry and once it has been approved, it remains applicable for an unlimited period of time.

In addition, since 1976, the natural area conservation agencies have established land acquisition and land use rights programmes with support from the government, local authorities and the general public.

The 1979 Development Protection and Enhancement of the Coast Act (helps to protect coastal areas and the coastal environment (including marine areas) within communes located along the coast. It provides for the protection of outstanding or typical features of the area concerned, particularly those of great biological importance such as deltas, dunes, nesting sites, feeding or roosting grounds for birds protected under the EC Directive on the Conservation of Wild Birds (no. 79/409/EEC), caves, coastal forests, artificial lakes of over 1 000 hectares in area, *Posidonia* beds or mangroves in the overseas. This Act, along with the National Coast and Lakeside Conservation Agency *(Conservatoire de l'Espace Littoral et des Rivages Lacustres* or CELRL*),* is an essential tool for maintaining biological diversity in coastal areas. Since it was set up in 1975, the Agency has acquired almost 45 000 hectares, i.e. 8 % of the French coastline.

The Mountain and Coast Acts (respectively no. of January 9 1985 and no. 86-2 of January 3 1986) also set targets and establish specific procedures that affect certain aspects of the natural environment. Areas mainly protected by the State for the purpose of nature conservation thus cover a small surface area because considerable precautions are taken so as not to arbitrarily infringe ownership rights (various forms of consultation, public enquiries, etc.). Two items of legislation have since been added to the aforementioned legislation the Landscape Protection and Enhancement Act no. 93-24 of January 8 1993 and Act no. of 2 February 1995 on the Reinforcement of Environmental Protection (French Republic 1997).

In 1990, France began a contractual policy encouraging local authorities (communes or groups of communes) to draw up municipal environment plans (*Plans Municipaux d'Environnement*). These instruments became Environment Charters (*Chartes pour l'Environnement*) in 1992. The latter are contracts concluded

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between a local authority and the State in order to implement an overall environment strategy for a given area. Priority action areas include protection of natural and outstanding areas and maintaining biological diversity.

A central role is played by the National Natural History Museum (*Muséum National d'Histoire Naturelle* or MNHN) and its Institute of Ecology and Biodiversity Management (*Institut d'Ecologie et de Gestion de la Biodiversité* or IEGB). to act as a "spearhead" for observing and monitoring natural heritage.

France is closely involved at several levels in the activities of the European Environment Agency (EEA) which began operating on October 30, 1993. One of the nine so-called European Topic Centres (ETCs) established by EEA since 1994 is based in France: the European Topic Centre for Nature Conservation (ETCMC). The Ministry of Environment provides further funding for the Centre in addition to that provided by EEA

4.2.4 Legal frame for Integrated Coastal zone Management

a) Loi littoral 1986 (Coastal Act)

In the coastal zone the ordinary principles of planning law are modified by the provisions of the *Loi Littoral* (Coastal Act, law of the 3rd January of 1986) and the *system of Schémas de Mise en Valeur de la Mer (SMVM ~ Sea Exploitation* Schemes, law of the 7th January of 1983) (Gibson 1999).

The *Loi Littoral* amends the *Code de l'Urbanisme* by inserting national provisions on coastal planning that must be observed by communes when preparing their plans. Urban expansion is restricted to the vicinity of existing developments and within urban areas, a coastal strip extending 100 m from the landward limit of the shore is declared *"la bande littorale non constructible",* in which most construction is prohibited. Other requirements are the interruption of urban development by natural spaces, the maintenance of public access to the shore and the protection of sensitive sites. In addition new transit routes must normally be located at least 2000 m from the shore. (Gibson 1999).

The *Loi Littoral* also contains provisions concerning public maritime property which was defined by legislation in 1963 to incorporate the bed and subsoil of the territorial sea, foreshores and future accretions and lands artificially reclaimed from the sea. Under the *Loi Littoral* the precise delimitation of the shore may be administratively determined by the State. Pedestrian access to the beach is generally guaranteed and motor vehicles are normally excluded; beach concessions may be issued subject to public inquiry, but must not impede free circulation along the shore (Gibson 1999).

SMVM is predominantly a marine planning mechanism, whereas the focus of *Loi Littoral* is primarily terrestrial. Together they provide a potential planning framework for the whole coastal zone. On 24 February 1999, the *Ministère de l'Equipement des Transport et du Logement* submitted to Parliament the fist report on the operation of *Loi Littoral*, which noted the need to simplify the procedure for the adoption of SMVM (Gibson 1999).

The *Domaine Public Maritime* (DPM) consists of: the natural public domain: the sea shore, areas left exposed by the tide and areas which were covered by the sea in the past, soils and subsoils of the territorial sea; and the artificial public domain: ports and dependencies, and artificial beaches. The DPM is a geographical and

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legal entity, but it is not clearly delimited. The Government owns the DPM and is alone responsible for all decisions regarding its use. Private temporary occupancy is allowed but, in return, the Government is in a position to obtain an income. The competent Authority to manage the DPM is the *Direction des Transports Maritimes, des Ports et du Littoral* (DTMPL).

The prefecture regulates the use of the DPM at the local level through the *Service Maritime et de la Navigation* and the *Service des Affaires Maritimes*. The management of the DPM can be limited due to restrictions in funding and legislation.

At the National level around 15 Ministries are concerned with the coastal zone. The most important are the Ministries of Ecology and sustainable development Equipment, Interior, Agriculture, Finance, Defence, Tourism, Culture, Health, Industry and Research. France is also involved in European initiatives towards development of integrated coastal zone management.

b) Other legal tools for Integrated Coastal Zone Management

Today, an increasing number of components of public policies and practices integrate the environment within their approach or policies based on partnerships between public authorities such as environment plans. In addition, as France is a partly decentralised State, today, instruments for policy consultation and a contract-based approach to policies as well as information and public participation play a major role. The Spatial Planning Act no. 95-115 of February 4 1995 contributed to strengthening these guidelines. In 1997, planning policies focusing on specific types of environment - mountain or coastal areas - enable implementation of the biological diversity conservation policy to be adapted accordingly.

Since the 1999 population national inventory, most of the coastal French regions underwent territory diagnosis by INSEE, focused on the coastal zone. These studies are a clue to recent development of the coastal zone, and allow to anticipate to a future increase in population, and is to be taken into account in future planning as well as PPR recently done or in progress, focused on coastal erosion (cliffs and low lying coasts) and marine flooding.

Tools such as the above quoted SCOT and PLU, by integrationg the PPR results will lead to an integrated management of the coastal zone.

Also, coastal zone is included in water management plans such as *Schéma Directeur d'Aménagement et de Gestion des Eaux,* (SDAGE or Leading Plan for Water Development and Management) applying to large basins (catchments) and their local application in *Schémas d'Aménagement et de Gestion des Eaux* (SAGE or Plan for Water Development and Management), declined for one to several sub-basins.

Finally, regional natural parks provide a good opportunity for the management of the coastal zone. Indeed, among the different processes shared by several French Communes, the Regional natural park process is one of the best suited to rural sites. The parks were first commissioned to preserve a threatened natural heritage.

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The SMVM (*Schéma de Mise en Valeur de la Mer*) were developed in the 80's to manage the preservation, exploitation and planning of a predetermined coastal zone, including the maritime and land areas of coastal towns. This organisation imposes their maritime and land arbitration on the different land use plans of the coastal towns. The setting up of SMVM was slowed down by the length of the elaboration process and the lack of any Government budget credits. Moreover, it was not specified which Authorities would have to set up the SMVM and to follow their development. Only few SMVM were successful, while about ten others have been prepared but have been blocked by local elected members.
More recently , SMVM were supersede by bay contracts which aim is to preserve the quality of the coastal ecosystem, harmonising activities within the area, managing water resources and setting up a permanent institutional organization for the management of embayments.

More recently France has made rapid advances with the implementation of the Eu recommendation on IMCZ firstly by providing legal and administrative framework for coastal zone management and secondly by encouraging active implementation: The ministry for environement (MEDD) and the DIADT (former DATAR) coordinate a program of ICZM applications lead by local authorities. This program is in progress.

c) Remarks on existing legal tools in France applied to coastal management

- Concepts of the Coastal Act relating to planning, preservation and management of the coastal zone are sometimes not clearly defined. The Government strategy suffers from the imprecision of the law. Indeed, the Coastal Act attempts to combine purposes that are difficult to conciliate. The Act can create negotiated mechanisms for decision-making and may benefit from stronger political intentions and give weight to jurisprudence cases.

- There are many authorities and Government services sharing responsibility within the coastal zone and its protection, and many approaches/rules, so coherence between them can be difficult, especially as the quantity of relevant legislation increases through time.

- It would appear that public bodies sometimes have contradictory objectives. For instance, the Ministry of Agriculture subsidises the draining of the wetlands, whilst the Ministry of the Environment does its best to preserve them. So, coordination between the different policies is fundamental.

Due to these points, French coastal policy suffers of a lack of national strategic vision of the coastal area regarding town and country planning, although steps are being taken towards integrated coastal zone management,

4.2.5 Legal frame for coastal risks management

Deduced of all above quoted law acts (land planning, risk assessments, nature preservation) this chapter points out their application to coastal risk management.

a) Responsibility of the different administrative levels

This section concerns specifically the legislatives tools to manage the risks due to natural coastal erosion hazards (cliff instability or sand lack on sandy coast system) and marine flooding hazard). These hazards may cause damage to people and property.

Decision powers are split between the Commune and the Government. The general statutory powers are defined under:

- the "Code des Communes" and the Code of Development and Town Planning
- the 13th July 1982 Environment Act
- the 3rd January 1986 Coastal Act or "loi littoral",
- the Public Safety Act, and the "loi Barnier" of the 2nd February 1995 ,
- the Loi Bachelot of the 30th July 2003 for natural and technological risk prevention and damage compensation.

Natural disaster classification

Such hazard occurrence can be classified as a "natural disaster" in accordance with the provisions of the 13th July 1982 Environment Act. This interpretation has implications in terms of administrative power and the obligations and liabilities incurred regarding public safety standards and the prevention of risks. Classification as a natural disaster relies on the Ministry for the Interior, based on an interministerial commission, under submission by the mayor.

The commune responsibility (information, prevention, protection)

The Mayor represents the Commune in relation to two different types of responsibilities, as outlined below, in reference to the 1983 Decentralization act, the 1982 code of town planning, and coastal act and the latest 2003 *Loi Bachelot*.

- A general obligation to ensure public safety standards in relation to coastal risks caused by natural phenomena; this obligation implies, on the one hand, an obligation of provision and notification and, on the other, an obligation of protection. However, the Local Authority has no obligation to carry out coastal defence civil engineering, nor to finance its maintenance or repair.
- A specific obligation in the case of major danger or impending risk. This obligation is generally met by use of non-structural safety measures, such as closing local roads or ordering the evacuation of a residence built on the edge of a cliff threatened by collapse.
- The latest law (loi Bachelot) of july 2003 gives obligation to the mayor to include in all communal documents and maps any knowledge of risks on his territory

In addition, the Commune may (in reference to the Code of Country and Town planning) refuse to grant planning permission for a development, subject to case by case conditions. The local authority may be held responsible in the case of an obvious error of judgement where it is found that a potential risk has been ignored at the time of the redrafting of the PLU or where a planning permission granted for the purpose of the use of land is found to have been delivered without due regard to the potential risks or of the incidental provisions of the 'Loi Littoral'. However the lawfulness of the aforementioned planning permission would be judged based upon the degree of public general knowledge as to the existence of a potential risk on issue of the planning permission.

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Other local authorities responsibilities (prevention)

Other local government authorities have limited responsibilities in connection with the protection of ecologically-sensitive areas where the Department (or, by substitution or delegation, the Conservatoire de l'Espace Littoral et de Rivages Lacustres) can initiate purchase proceedings.

Some communal obligations can be delegate to communauty of communes, transferring competence by statutory means.

Case Study – Local Government

The local authority has no obligation to carry out coastal defence civil engineering work nor to finance its maintenance or repair. In the test case Dame Louvet versus town of Biarritz, the 6th January 1971 State Council's decision confirmed that the Commune had not been found liable over failing to carry out works to protect a private seaside property against marine damage. This decision is consistent with the principle established in the 16th September 1807 Act relating to the drying out of marshes (Article 33) which confers on coastal landowners the option (not compulsory) of protecting their land against marine damage. Nevertheless in accordance with the 3rd January 1992 Act (Article 31) local authorities are empowered to initiate coastal civil engineering as long as such works are carried out in the public interest or in case of an emergency. If the local authority does carry out works they may be liable if they are not maintained adequately.

The obligation of protection in case of a major danger or an impending risk (Article L.131.7 of the Code des Communes) is generally met by use of non-structural safety measures such as controlling/diverting local traffic or parking, or ordering the evacuation of a dwelling located on the edge of a cliff threatening to collapse (M et Mme Gratti, February 3rd 1984 and February 23rd 1983 State Council Decision). However the Mayor must prescribe such emergency civil engineering measures as may be required by the circumstances. Such works carried out in the public general interest are financed by the Commune even though they may be carried out on private land (McInnes *et al* 2000).

National Governement responsibilties

The Government has powers to influence each level of the risk management process from prevention to repair.

-the government has a shared responsibility with the commune to plan inform and prevent coastal risk by the way of land use plans maps and other communication means

-In addition it has specific coastal defence management powers to prevent coastal damage by commenting on proposals before they can be permitted; it finally assesses the probability of any natural disaster (a prior condition on insurance guarantees). State reponsability for coastal defence has been traditionally assumed by maritime services or DDE (*Direction Départementale de l'Equipement*).

The owners of a house bordering the sea can protect their property against erosion but coastal defence works must be approved by the government; Nevertheless, public bodies have no obligation to carry out or finance them

-The Government has a general statutory power available for use wherever safety measures have not been implemented by the local authorities or where the risk extends to several Communes in a Department (ie. at a more strategic level). It may also intervene in one single Commune if the Mayor is negligent. The statutory power conferred on the government representative of the Department (in

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accordance with the Article L.131.13 of the Code des Communes) renders him/her liable and binds his/her responsibility separately or simultaneously with the responsibility of the Commune.
-The Government also has a specific statutory power regarding the removal of aggregates and other materials (according to the 19th July 1975 Act relating to artefacts covered by a Preservation Order for the Protection of the Environment and by the 'Loi Littoral'). It must ensure that removal of material is limited in its extent in accordance with the provisions of the 'Loi Littoral'. In this respect they may order the cessation of works when the natural balance of the coast is threatened (there are no equivalent powers at a local government level in Great Britain).
-In the field of urban development and land-use planning, the Government has a wide range of measures at its disposal to ensure that the probability of a risk is taken into consideration when drafting land use plans and issuing planning consents
-The Government has to specify statutory cartographic documents relating to the extent of land use (delineating the boundary of risks in accordance with Article R.111.3 of the Code of Urbanization) and giving rights of access in the public interest formerly in regards to the Environment act of 1982, and then to the *Loi Barnier*. It is to give a standard methodology for elaborating PPRs.
The state services, in regions and department, coordinate the definition of zones of risk [1]This definition and the provisions laid down in documents, which prevent or regulate construction, is fundamental to the drafting of Land Use Plans and must be taken into account in all current Development Plans and all relevant planning permissions in the area covered by the Plan (Article L.126.1 and L421.3 of the Code of Urbanization).
-The Law Barnier authorizes the expropriation and compensation by the Government of all property threatened by *natural* risks when the remedial works are too expensive to undertake. Compensation is funded from a State Surcharge of 12% which is added to all property insurance premiums.
-The procedure for State approved compulsory purchase can be implemented if the following three conditions are fulfilled: the risk should be linked to one of the following three hazards: ground movements, avalanches or torrential floods; the threat should be serious; and the other possible methods for safeguarding and protecting the public are more expensive than the cost of compulsory purchase. This procedure can be applied to cliff instability

[1] the DIREN -Regional Management for the ENvironment within the Ministry of the Environment; the DDE -Departmental Management for Equipment-, DRE -Regional Management for Equipment) for natural risks, DRIRE -Regional Management for Industry, Research and the Environment within the Ministry of Industry-; for technological, industrial and after-mining risks

Case Study - National Government

These obligations of avoidance of risks were confirmed in the recent test case of the State Council in its decision on the enforcement of Article R.111.3 of the 'Code de L'Urbanisme' (9th April 1993, Mentzler). The High Court considered that 'whenever a Commune is drafting a land use planning document, and the Prefect has already designated the land which is exposed to high risks by preventing construction, the 'Conseil Municipal' is assigned to constrain the use of that land to an appropriate level.

The Government may intervene if this power is not exercised. Oversight or unexplained delay in designating high risk zones may also be penalised in court (State Council's decision: 27th July 1979, Blanc and Minister of Equipment). The designation by the representative of the State in a Risk Exposure Plan, however, assumes that the risks are sufficiently likely and prejudicial (administrative tribunal of Montpellier, 3rd December 1992, Guitart versus Pyrennées Orientales Prefect and Commune of Argelés-sur-Mer).

Public bodies (ie State and local authorities) have permissive powers (but not a duty) to carry out or finance coastal defence works. Apart from some particular cases where a specific text makes provision it has no duty to ensure the maintenance of defence work even when it has financed the construction. Nevertheless it may be responsible if it has not maintained works adequately, or carried out public works, which have caused or worsened damage (27th April 1966 State Council's decision, Commune of Hossegor and 24th February 1984 decision, town of Hyères versus Osellane).

When projects are proposed by the local communities, they are subjected to a simple notification proceedings or authorization proceedings according to their importance or their cost (29th March 1993 Statutory Order, in accordance with Article 10 of the Law on Water) except in the case of emergency works to be carried out in the event of grave danger, where only a justification report is required. The authorisation proceedings consist of a preliminary public inquiry and a study, or an impact study according to the size of the area concerned (the limit is 2000m² in accordance with the Statutory Order dated 25th February 1993) as instructed by the Prefect. If a national or Regional State administered property title is involved an inquiry is also necessary particularly if there is any impact on territorial waters. The State has a duty to implement and control the legislative provisions and statutory proceedings provided for within the framework of project inquiry proceedings (the 16th September 1987 Act and 10th July 1973 Act repealed by the 3rd January 1992 Act on Water) (McInnes *et al* 2000).

Case Study - Criel sur Mer

Criel sur Mer located in the North-eastern part of the Cote d'Albatre in Haute Normandie has become one of the first examples of application of the Barnier law expropriation system, in France. From 1995 to 2003, a total of 14 houses were abandoned and their inhabitants relocated with the assistance of compensation (Eurosion 2004).

b) Coastal risk prevention planning

PPR

A PPR according to Law Barnier, determines the areas where a natural risk is foreseeable. The PPR is intended to allow action to be taken in advance by the proprietor and the local authority.

The PPR addresses natural It can prohibit construction and other activities or draw specific requirements within a particular zone because it will be exposed to a risk or could aggravate it. Some remedial measures may be undertaken within such zones as long as the cost of the work does not exceed 10% of the total value of the asset. The PPR normally forms an appendix to the town planning document for the area concerned.

The PPR is a document "opposable to a third part" in case of arguments.

The application of the loi Barnier lead to the elaboration of methodological guide for the elaboration of coastal risk prevention plans.

3 natural phenomena are taken into account (shoreline retreat-cliffs and low coasts), marine flooding and landward dune migrations). The hazard definition is done on qualitative bases, referring to historical data, on a range of time depending on hazard (100 yearsfor shoreline retreat and dune migration), 100 years or more for marine flooding. The resulting maps are drawn at 1/250000 but can be used at 1/10000 in landuse communal plans (PLU, SCOT). This definition is to be validated by local stakeholders..

Existing defences are taken into account in the hazard definition with reserves on their long term efficiency, depending on their function and the assets at risks.
This hazard zonation lead to provisions to prevent or regulate construction : In case of high level hazard, no construction are allowed, in case of average to low level of flooding hazard, construction is not allowed or allowed with conditions.

Case studies : Littoral Risk preventions plans in Aquitaine

In Aquitaine a *PPR « Littoral »* (Littoral Risk Prevention Plan) has been prescribed for the entire Gironde Department Atlantic coast (North of Aquitaine), and a PPR "Mouvements de Terrain" (Ground Movements Risk Prevention Plan) is in preparation for the three communes of Anglet, Biarritz and Bidart in the Pyrénées-Atlantiques Department.

Insertion of PPR provisions in urbanistic documents

The provisions drawn by the PPR are then to be included in PLU, strategic/sectoral plans and SCOT ; in some cases it can lead to specific land use restrictions on an area (PIG -Projet d'intérêt general and/or SUP (servitude d'utilité publique)

Strategic plans, developed through publicly established inter-Communal co- operation, should allow the organisation of land use according to the existence of natural hazards. The State has a duty to communicate to the authority responsible for urban planning issues, all information concerning natural hazards, and request this to be taken into account in the Strategic Plans. In particular, the strategic plan should take into account the particular requirements imposed by a PIG.

The PLU, which is under the responsibility of the mayor, is prescribed after the deliberation of the Municipal Council. It comprises maps, a regulation and appendices. As with the strategic plans and sectoral plans, the State has a duty to provide all information about major natural hazards and to ensure that these hazards are taken into account within the PLU. If a PPR exists for a Commune, the PLU must take it into account: and the PPR will be placed as an appendix to the PLU, or better still, the PLU will be revised with a list of the zones at risk. A PLU can be opposable to third parties, it is a constraint on State approval as soon as it is made public or approved

Besides, the prefecture direction in charge of civil security, will be in charge of researching and collecting existing information relating to natural hazards; communicating this information, by prefectorial order, through DDRM, DICRIM and DCS, and existing PIG verifying that natural hazards are taken into account in urban planning documents.

Preventative information measures are disseminated in the Communes which include inhabited areas subject to risk. They correspond to areas where one of the following plans are in place: PPR, Hazard Exposure Plan (PER) or an R111-3 border, Submersible Surface Plan (PSS), Particular Intervention Plan (PPI), General Interest Project (PIG). It also includes Communes itemised on national or Departmental lists as exposed to hazards, and designated by a Prefectorial order because of their exposure to a particular major hazard (Communes at risk of flood without PPR for example).

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Compensation

Insurance companies insert a clause in the contracts envisaged by article L. 125-1 of the insurance code - called "base contracts" - extending their cover against the effects of natural disasters. This cover is open to all physical or mental individuals other than the State, which is covered by an additional premium or contribution. The obligation of cover does not apply to insurance companies with regard to constructed landed property and to activities exercised in violation of current administrative rules when they were put in place and aimed at preventing natural disasters.

The compensation procedure can only start once a state of natural disaster has been declared by an inter-ministerial order. Once declared, the policy holders have 5 days after the publication of an official journal to make their claim for direct material damages to their insurance company, at the latest within 30 days for loss

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of use. The insurance company must pay out the compensation, the amount of which is established by a damage expert, within three months counting either from when the policyholder submitted an estimate of the state of damages, or from the publication in the official journal of the state of natural disaster, if the latter is after the production of an estimate of the state of the damages by the policyholder. If a PPR has been prescribed, proof must be made that PPR provisions have been followed.

An inter-ministerial commission issues an advisory warning on the abnormal intensity of the natural agent prior to the declaration of a state of natural disaster, declares the state of natural disaster by inter-ministerial order. The Department warns the civil safety department (DSC) of the natural disaster, and puts together a file on the threat which he sends to the DSC. The Mayor informs the population of the state of natural disaster, and informs the disaster victims of the compensation procedures. The BCT intervenes at the request of an insurance company when it wishes to go against the obligation of cover provided for in article L. 125-1 and L.125-4 of the insurance code, it imposes the obligation of cover on the insurance company chosen by the policyholder when the latter finds itself refused three insurance policies (McInnes *et al* 2000).

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4.3 Italy

4.3.1 Integrated Coastal Zone Management

The two national government departments most concerned with coastal management are the Ministry of Environment (*Ministero dell'Ambiente*) and the Ministery of Transport and Navigation (*Ministero dei Transporti e della Navigazione*). However many administrative functions are currently in the process of being transformed to the regions under the Bassanini Laws:

- Law 15 March 1997, n59, Delegates to the Government for the awarding of functions and tasks to the regions and local authorities, for the reform of the Public Administration and for the *semplificaione amministriva* (Official Gazette n 63, Suppl Ord n 56/L, 17.31997); and
- Law 15 May 1997, n127, Measures be urgent for the streamlining *dell'administrative* profit and of the procedures of decision and control (Official Gazetta n 113, Suppl Ord n 98/L, 17.5.1997). At present governmental bodies involved in this field include the General Direction of Maritime Works (Gibson 1999).

Water Basin Management is an important aspect of ICZM in Italy. Law 183 of 1989, supplemented by Law 36 of 1994 deals with the management of water resources and requires the establishment of basin authorities for catchments of national ad regional importance. These authorities must prepare basin plans for the conservation of water and the protection of the environment within their areas. Specific legislation has recently been introduced by the *Regione Abruzzo* to constitute a basin authority of regional importance, whose objectives include the integrated management of coastal zones in order to prevent erosion (Gibson 1999).

The Minister of Environment is responsible for implementing policies on marine environmental protection under Law 979 of 1982. This involves a national plan to prevent pollution of the sea and coasts and the designation of marine reserves. Law 394 of 1991 is a framework on protected areas, which provides for the designation and management of national parks, regional nature parks and nature reserves. Protected areas also apply to the marine environment under Article 2. This Law creates a general framework for nature conservation and further legislation by the regional governments will be needed to implement many of its provisions (Gibson 1999). The yearly law decree "*Legge Comunitaria*" contains the transposition of Strategic Environmental Assessment (SEA) Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment.

Article 1 of the recent Reg. law No. 15/2004 approved by the Regional Council called "Regulations concerning duties dealing with the defence of the coastline" states:

In carrying out its duties as indicated in article 51 of the Regional Law No. 10 dated 17 May 1999 and article 14 of the Regional Law No. 13 dated 25 May 1999, the Region adopts a Plan for the integrated management of coastal areas, hereafter referred to as the Plan, in order to promote the safeguarding and rational use of the coastal areas and their resources.

Regione Marche has prepared an 'Integrated Coastal Zone Management Plan'. The full report is annexed to this report and a summary is provided below.

This sectorial Regional Plan is the planning document with which the Marche Region, without solutions of continuity along its 170 km of shoreline, intends to address the environmental imbalances caused by marine erosion whilst respecting the tourist activities and the environmental value of the Marche Region.
Consultation and its related activities have allowed the Plan to be drawn up in a participatory manner as stipulated by EU regulations (Directive 2001/42/EC).
The Plan is made up of the following documents:

- General Report
- Economic-financial Report
- Technical Implementation Standards,
- Technical Documents.

STRATEGIES

In the Report, the principles of Sustainable Development[2], Physiographical Unit[3], Dynamic Balance[4] and Integrated Management can be considered the key factors with which the proposed long-term planning was addressed which commits the Regional Administration and the Local Authorities in the management of the available resources.
Therefore the challenge is to reconcile:

- the economic pressures linked to tourism,
- the protection of the land,
- the environmental quality of the shoreline.

In short, in this instance too, the planning document represents the mediation among the three needs.

COSTS

The Economic-Financial Report envisages considerable investments that may be summarised as follows:

TYPE OF WORK	COSTS million €
Improvement to the imbalances	89.00
Re-nourishment using sand	78.50
TOTAL	167.50

The expenditure will be met by the following parties:

PARTIES	TYPE OF WORK				TOTAL million €
	IMPROVEMENT TO THE IMBALANCES		RE-NOURISHMENT USING SAND		
	%	milion €	%	milion €	
Region	35	31.15	52	40.82	71.97

[2] Groo Harlem Brundtland (President, World Commission on Environment and Development - Tokyo Conference of United Nations 1987) theorises the concept of "Sustainable Development" as that "*…development capable of meeting the needs of current generations without jeopardising the capability of future generations to meet their needs".*

[3] A Physiographical Unit is defined as the coastal strip where the movements of material forming or contributing to the formation of the coast are confined internally or have exchanges with the exterior that are not influenced by what happens to the rest of the coast.

[4] Condition that can be modified in the continuous search for the optimum order of spaces and resources. The balance takes shape in the search of relations and exchanges amongst the environmental components capable of keeping the system active and controlled. Therefore by taking into consideration not only the necessity of primary meeting of human needs, but also of production and reproduction of natural resources.

Grants under Law 183/89	30	26.70	-	-	26.70
Local Authorities	10	8.90	48	37.68	46.58
Private parties	10	8.90	-	-	8.90
State property licences	15	13.35	-	-	13.35
TOTALS	100	89.00	100	78.50	167.50

The financial commitments are envisaged for the first seven years, whereas the construction work will be over 10 years.

From the environmental analysis it emerges that every effort has been made to see that the construction work envisaged under the Plan will be able to guarantee the safeguard of the environment.
The incidence of the costs of the Plan on revenues from tourism stands at about 0.93% which is a reasonable level of costs compared to the overall budget of the Marche Region.

DECISION SUPPORT SYSTEMS (D.S.S.)
It has been necessary to construct a simple Decision Support System which has identified some environmental and economic macro-indicators which have been given differentiated weighting; using this matrix it will be possible to create a list of priorities on the basis of the Physiographical Units or of the Administrative Units.

The Plan does not indicate the priorities but only the method; the aforesaid matrix will be filled in year by year on the basis of the indicators relating to the year in progress and on the availability as certified by the financial participation.

During the participation phase on the part of all public and private parties (including that between the 1st and 2nd adoption), the system was modified in those areas regarding the weight of the direct and indirect economy, of the quality of the bathing waters, the financial participation and the stretches of shoreline the railway goes along.

In short, these four indicators were modified, following the comments received and on the basis of the current conditions of the well-established and consolidated seaside tourism along the existing coastal state property which the recent sea-storms have shown to be extremely vulnerable from a physical point of view, so much so as make the 2005 summer holiday season appear rather difficult to manage.

INDICATOR	1st ADOPTION Resolution of Regional Executive No. 1013 dated 07.09.2004	2nd ADOPTION Resolution of Regional Executive No. 1621 dated 21.12.04
Direct and indirect economy	14	22
Quality of water	14	20
Financial participation	24	20
Stretch of shoreline affected by railway infrastructures	20	10

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PARTIAL TOTAL	*72*	*72*

The indicator relating to financial participation averages out this last figure on the cost of the work and on the cost of the whole Plan (in order to avoid excessive weight given to small works).

PROCEDURES AND REGULATIONS

In accordance with the provisions of Regional Law no. 46/92, the Plan was adopted by the Regional Executive Committee with Resolution No. 1013 dated 07 September 2004 for the subsequent phases of consultation and comment. The same act also established that any comments on the Plan made by public and private parties should be sent within 60 days from its publication in the Official Regional Bulletin.

All the Communes along the coast received a copy of the Plan in computerised form for consultation and a hard copy of all the documentation was left for consultation in the offices of "Public Works, Environmental Impact Assessment and Integrated Management of Coastal Areas".

Having acquired the opinions of the Regional Conference of Autonomies and the Economic and Social Committee and listened to the comments of the stakeholders, the Plan was adopted definitively by the Regional Executive Committee with its Resolution No. 1621 dated 21 December 2004, subsequently transferred to the Regional Council for its approval.

With Administrative Resolution of the Regional Council No. 169 dated 02 February 2005 the INTEGRATED COASTAL ZONE MANAGEMENT PLAN was approved.

The Technical Implementation Standards make up the prescriptive part of the Plan; from a contents point of view they can be divided up into two parts:

- provisions and general principles for planning
- use of areas that are part of the coastal state property.

On this basis, in fact, the Technical Implementation Standards also include the regulations relating to the Plan for the Use of Coastal State Property as stipulated by Law No. 494/1993; from a technical-judicial point of view they are prescriptive inasmuch as they aim to outline the guidelines and directives concerning planning and management of coastal State property.

Rearrangement of sea structures and re-nourishment are the key words in order to have greater certainty regarding the environmental quality of the waters and the use of the beaches for bathing.
The final objectives are the elimination of conflicts between "environmental capital" and "artificial capital", as well as favouring and harmonising the financial participation between State, Region, Communes, specifically allocated State property licence fees and private parties.

Pursuing sustainable development does not mean blocking economic growth in a country but promoting business, which is compatible with the environment surrounding it.

4.3.2 Planning System

Under Article 822 of the Civil Code (*Codice Civile*) of 1942, the sea shore, beaches, roadsteads, ports and rivers belong to the State as part of the public domain. This is repeated in Article 28 of the Navigation Code 1942 (*Codice della Navigazione*) which regulates the grant of concessions for the occupation and use the public maritime domain. The extent of this area is not precisely defined, although there is a procedure for its administrative determination in particular places. Article 55 of the Navigation Code declares a 30 metre zone behind the public maritime domain, in which the consent of the maritime authority must be obtained for the execution of new works. In 1977, a Presidential Decree 24 July 1977 required that any development on coastal land within 300 metres of the waters edge must be authorised by the regional authorities and the agencies responsible for natural property belonging to the State. This was reinforced in 1985 by the Galasso Decree and confirmed by the Galasso Law, which requires the regions to prepare territorial and landscape plans limiting or prohibiting building in this zone, although a few have actually been produced (Gibson 1999). Common Agricultural Policy (CAP), launched the 1999 reform of community structural and rural development policy.

The following summary describes the organisation and function of government departments with relevance to coastal management and natural hazards in Italy. The Italian central Government is the legislative body in charge of laws of national and general nature. The Ministry of Public Works is in charge of planning, approving, and executing Public Works' projects. These include major infrastructure projects such as highways, water works, ports, and public housing. It determines policies regarding public works and coordinates activities of other Ministries and the Regions in this field excluding those of a purely local nature.

The Central Administration is divided into five central directorates and the High Council for Public Works *(Consiglio Superiore dei Lavori Pubblici).* The decentralised administration is constituted by the Regional Departments of Public Works *(Provveditorati alle Opere Pubbliche)* and the authorities for the waters of Venice, the Po river and the Tiber river.

The High Council for Public Works is the highest technical consultive body on issues of Public Works. The Council, through its General Assembly (composed of 54 members nominated by Ministerial Decree and chosen amongst the General Directors of the Public Works and other Ministries, as well as from State and other locations) advises on legislation relating to Public Works, prepares a general plan that includes the needs of the Regions and provides advice on projects involving major works that involve more than one Region and expresses itself on all matters concerning Public Works (Regulation schemes, Construction Costs etc). The Council is chaired by a President and is composed, beyond the Presidency, of the General Secretariat and Assembly, of six sections that advise on policy and planning matters and of a Central Technical Service depending functionally from the High Council's President. The sections are divided according to the types of Public Works and deal with building standards, maritime works, public water supplies, public transport and urban development. Each Section has its own President and Assembly.

Each Section's Assembly varies as far as the number of its members and its composition is concerned. Members are nominated by Ministerial Decree and chosen amongst the Managers/Directors of various

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ministries, Public Institutions and University Professors. Of particular relevance to this study are the following sections of activity:

Section I: Construction Works

- Technical norms on seismic zone constructions;
- Classification of seismic zones;
- Structures' and materials' testing laboratories;
- Legislation concerning this section's specific competence.

Section II: Hydro-geological Aspects

- Geotechnical problems associated with the soil defence;
- Consolidation works and relocation of inhabited (urbanized) areas;
- Land improvement and reclamation, irrigation and land;
- Hydraulic and forest settlement works;
- Safeguarding of Water quality;
- Aqueducts and sewage systems;
- Norms concerning this section's specific competences.

Section III: Maritime Works

- Coast defence Works;
- Ports and harbour plants and installations;

Section IV: Energy Production plants - Hydraulic Works

- Water retention plants - dams;
- Utilisation of public and underground water supplies;
- Norms concerning this section's specific competences.
- Central Technical Service

The Central Technical Service is composed by a General Secretary, a Secretariat and the Divisions: Structures and Geo-Technical Division; Urban Development and Buildings construction Technical Division; Aqueducts and sewage Technical Division; Environmental protection Technical Division; Maritime works and ports Technical Division; and Hydrogeological adjustments and Basin plans. These Divisions, however, aren't actual technical offices with numerous staff but consultive bodies in which officers (for a total of 17 officers) are examining the technical and legislative aspects to be discussed in the various High Council Section Commissions and in reply to questions raised by Public and Private Institutions.

The General Direction for Maritime Works is in charge of a number of functions including: construction and maintenance of port facilities; the dredging of waterways; and the prevention of coastal erosion (with the assistance of the Ministry of Environment).

The General Direction for Public Buildings and Special Services is in charge of building facilities for general public. Division III deals with: the reconstruction of public and religious buildings damaged by the war; works in calamity stricken areas; anti-seismic buildings; and improvement and maintenance of provincial roads. Division IV deals with: State owned buildings: maintenance, enlargements, completion of existing buildings and new construction; and preservation of buildings of historical interest. Division VI deals with the administrative activities concerning the completion of the Public Works in the economically depressed areas.

General Direction for Territorial Coordination provides direction and coordination for the central (State) and local (Regional) administrations in matters of territorial matters. It has powers over urban planning and anything that concerns territorial utilisation and transformation. It also examines any disputes in urban matters and the State and Regional legislation. It has five divisions concerned with:

- Disputes over urbanisation issues;
- Coordination of State and Regional legislation/certification of planning experts;
- Studies, research and surveillance on Territorial Planning and Urban Requalification programmes;
- Control of mobility and supervision of ANAS (State-road network Department); and
- Town-planning reform; Expropriation studies and legislation; Research and implementation of works concerning the recovery of building heritage.

General Direction for the Protection of the Land acts to protect the environment, to provide for the public utilisation of water, and to prevent water pollution. Regarding water works, the Department has responsibility for matters involving river basins that extend across Regions (including some Hydraulic works), the declarations and lists of public water use (including groundwater), the use of water for public, industrial, irrigation and hydro-electric purposes; the canalisation of waters to reduce flood damage. The Plans and Programmes office is concerned with measures for soil protection and for water resource management on a national scale. The Water Resources and Provision Services Observatory was formally established in August 1997 to gather, elaborates and publish statistics and other research data. Five Territorial Areas Offices deal with Land protection and water resource management. Specifically, each Territorial Office promotes and coordinates activity with each area's competent bodies and administrations concerning implementation of Law n.183/89 (Fundamental Law on the functional reorganisation of the Land Protection) including public water supply and storage. They are responsible for authorisations concerning the construction and running of electricity supply networks and they also commission research studies and projects.

The key functions of the Regional Government are:

- Administrative organisation;
- Public services: social assistance; local museums and libraries; transport of Regional importance.
- Economic development: tourism; road maintenance and construction; public works of Regional importance; quarries, peat-bogs, agriculture; crafts; mineral waters and spas.
- Environment: urban planning; protection of fauna, hunting and fishing, forests and flora; defence of the soil; measures against pollution.

The Regions' administrative activities are implemented by way of decisions made in the Regional Government and Regional Council or through presidential decrees. In some of the latter cases signature is

delegated to the relevant councillor. The Regions' administrative acts cannot be executed until they have been checked by the State Commission of Control.

Italy is divided administratively into 20 Regions, 15 of which have an ordinary statute (a statute approved by Parliament) and the other 5 (Valle d'Aosta, Trentino-Alto Adige, Friuli-Venezia Giulia, Sicily, Sardinia) have a special statute approved by a Constitutional Law. There are 103 Provinces, each with its administrative centre. Italy also has 8.104 comunes (municipalities). Regions, Provinces and Municipalities are the layers of local government, each of which is responsible for certain administrative, judicial, legislative and social functions as well as general services.

The National Institute of Town Planning (INU) has undertaken the promotion and organization of the Fifth National Review of Town Planning, to take place in Venice from 10th to 20th November 2004. This event, held every five years, has taken on the character of a debate, reflection and exchange of experiences among operators, designers and other experts engaged in territorial governance. The theme of the Fifth National Review of Town Planning consists in the Agenda for territorial governance by the local institutions wishing to set forth their plans, projects, designs, programmes and policies.

PROVISIONAL HYDROGEOLOGICAL SYSTEM PLAN (PAI)
Regione Marche has produced a PAI. The full report is annexed to this report and a summary is provided below.

This report illustrates the Basin Summary Plan for the Hydro-geological Arrangement (PAI), as stipulated by Laws 267/98 and 265/00, configured as a functional summary of the part of the general basin Plan in accordance with Law no. 183/89 and Regional Law no. 13/99 relating to water and hydro-geological levels of hazard.

The areas of water hazard were divided up into homogeneous river sections, using criteria including river-bed morphology, the presence of construction work across the river and risk elements; each single homogeneous river section, identified in this way, was assigned a level of risk, according to four different classes, referring to elements contained in an analysis matrix. The definitions contained in the aforesaid D.P.C.M. dated 29 September 1998 can be associated with the identified classes of risk (from R4 to R1).

Areas subject to hazard and gravitational hydro-geological risk due to landslides as identified on the basis of research of the specific information contained in Commune town-planning documentation, provincial Territorial Coordination Plan and in other specific sectorial studies, that have already been completed (CARG, S.C.A.I., RIM, GNDCI studies); the registered phenomena were assigned a level of hazard on a scale of four levels based on the type of phenomenon and the relative state of activity as can be gleaned from the homogenization and classification of the documentation acquired.

The areas of hydro-geological hazard as described above were assigned a level of risk, on a scale of four classes, referring to the elements contained in an analysis matrix, which takes into consideration the data relating to the level of hazard and on the basis of the elements as inferred from viewing “videos” of aerial

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photography mapping (AIMA 97 flight). The definitions contained in the aforesaid D.P.C.M. dated 29 September 1998 can be associated with the identified classes of risk (from R4 to R1).

Risks of avalanches that might occur in areas identified by the Region's Civil Defence Service are also included in this type of unstable occurrences.

A series of regulations on land use is applied to the above-described areas based on the different levels of hazard and risks; the regulations also contain two guideline documents:

Annexe "A" to the Technical Implementation Standards: a guideline document for the correct use of the territory in order to safeguard against flooding;

Annexe "B" to the Technical Implementation Standards: a guideline document for the correct use of the land with particular reference to farming and forestry;
In general, this detailed series of regulations proposes, for those areas in which current knowledge highlights a high or extremely high level of hazard, the maintenance of current building levels and a considerable limitation in future building levels in the town-planning and territorial documentation, stipulating in the meantime, for certain urban areas, an agreed procedure for assessing their compatibility with the level of hazard in the area.

It should be noted that the boundaries to areas at risk of flooding were established using just one level of hazard referring to "high" and/or "extremely high" risk levels which is comparable to a type of flooding that occurs once every 200 years; the areas with "moderate" and "average" levels of hazard have no established boundaries and are not, therefore, subject to any particular series of regulations.

All levels of hazard were taken into consideration with regard to gravitational unstable occurrences (landslides and avalanches), which required less discretional interpretation on the part of the Authority (since they are public and official sources); for those areas included in this category with boundaries indicating levels of "moderate" and "average" hazard, it is possible to put the provisions of the town-planning and territorial instruments into effect in compliance with the ordinary technical regulations relating to geological surveys in the planning and execution phase of the work.

Financial requirements for the work
During the phase of definitive drafting, the PAI documents, quantifying the "*Preliminary table for the financial requirements for the work*" were updated with additional cost items, whose estimates were calculated on the basis of parameters described in document e) of the Plan.

This revision became necessary following further study of the specific provisions contained in the Implementation Standards as defined (also following the comments made regarding the 1st adopted Plan) at the joint meeting between ANCI (National Association of Italian Communes) and the Technical-Operative Secretarial Offices of the Authority and as positively assessed by the Planning Conference, as well as following certain indications supplied in the meantime by the competent Regional Council Commission in a hearing called by the Commission itself.

The following in particular were taken into consideration in updating the estimates:

- the provision relating to drafting detailed three-yearly work plans that should take into consideration changing circumstances (article 15 of the Implementation Standards);
- the provision to identify the manufactured products to be subjected to delocalization through the use of incentive measures (article 17 of the Implementation Standards);
- the provision to issue directives relating to the use of land for farming and forestry (article 21 of Implementation Standards) with drafting at the same time of the Summary Plan for the Minor Hydrographical Network (Annexe A to this Report);
- the need to set up a process that will favour ordinary scheduled maintenance of the water courses, as is stipulated, however, by state and regional regulations regarding land defence;
- the possible need to proceed with acquiring areas required for getting the project organisation under way (article 6 (1), letter c) of the Implementation Standards).

As regards work aimed at reducing WATER RISK, estimates were calculated for each hydrographical basin on the basis of the principal types of work, assessing the costs needed to make the areas subject to R3 and R4 risks safe and, for every indicator category (work on the minor hydrographical network, monitoring, maintenance, incentives for delocalization and the acquisition of areas needed for the organisation of the project), parameters were identified ascribable to the dimensions of the hydrographical basin in question (surface area - length of the principal course). On the basis of all these elements the preliminary financial requirements were estimated.

As regards work aimed at reducing GRAVITATIONAL RISK, the sums were calculated on the basis of preliminary estimates compared to similar recently performed work using other financial instruments; also for this type of unstable occurrence the financial requirements were calculated for widespread work on the slopes, monitoring, maintenance, incentives for delocalization and the acquisition of areas; for each category of indicators, parameters were identified ascribable to the surface area of the hydrographical basin in question and the number of recorded occurrences, on the basis of which the preliminary financial requirements were estimated.

In any case, in general, as regards the estimation of the "*Preliminary table for the financial requirements for the work"* it is important to highlight a certain provisional nature linked :
as regards water risk, to the completion in the near future of topographical surveys and the consequent further study relating to the outlined areas, as well as the outcome of the study for the definition of the "Project Organisation", which will immediately be set under way, even on a sample basis, at a level of hydrographical basin. As a consequence of this further study, in compliance with the process logic in acquiring "knowledge" as described in the Presidential Decree dated 18 July 1995 and in Annexe A to the Regional Law No. 13/99, the boundaries could be modified and the identification of the area in question and of the type of work involved could also be very different from what was contained in the documents annexed to the PAI and, therefore, the current preliminary financial table would have to undergo some necessary modifications, which could turn out to be quite extensive;
- *as regards gravitational risk due to landslide*, to the technical difficulty, on the one hand, of quantifying the costs for the work involved in the absence of detailed surveys and specific monitoring, and on the other, to the difficulty in this phase of assessing the level of effectiveness of the partial work already carried out on many occurrences, also because much of this work was carried out using funds not under the

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control of the Regional Administration or for purposes and priorities different from those stipulated in Law No. 183/89; furthermore there are administrative and/or technical procedures in progress enacting programmes financing various other kinds of work (post-earthquake reconstruction and ministerial programmes), the results of which cannot at the moment be definitively assessed.

In conclusion, for both types of unstable occurrence, it is stipulated that reference procedural criteria must be defined before any financial grants are assigned, in order to check on the admissibility of any safety work or hydro-geological re-organisation work. In fact the causes behind the risk will be assessed (through the analysis of the available technical-administrative factors, including the original period the work was authorised and carried out in relation to the legislation valid at the time and the provisions that may have been established by the competent authorities) with regard to construction work that is currently regarded as potentially dangerous or exposed to hazard.

Therefore, considering that the Technical Implementation Standards stipulate, pursuant to articles 21 and following of Law No. 183/1989 and article 13 of the Regional law No.13/1999, that the Plan itself must be implemented through "Three-yearly Programmes of Work", these Programmes will be drawn up when the results of specific reconnaissance work (currently in progress) have been received, and be finally defined when informing the recipient of the grant assignment (state funds or funds from within the Local Authorities system of the Marche Region), if any are provided.

4.3.3 Planning for Coastal Instability

'Hundreds of people were left homeless in southern Italy after the village of Cavallerizzo was hit by landslides and 40 houses were destroyed. Landslides continued to threaten other houses in the Calabrian village after severe winter storms' (AFP 2005). With respect to landslide management, planning policies in Italy are shared by various bodies: Municipalities, Provinces, Regions and Central Government. The Municipalities' activities in this field concern the layout out of development projects in general (buildings, infrastructure, land use, etc). Nevertheless, these plans must be revised and approval by the Provinces or Regions, according to Regional laws which are fixed by the single Regions, sometimes in very different ways. For example the landslides investigated along the Adriatic coastline fall within three different Regions of central-southern Italy: Marches, Abruzzo and Molise.

Geological reports, which as a rule are produced for planning purposes, are usually too generic and very often unsatisfactory since they are produced in a merely qualitative, descriptive way: e.g., experimental investigations and slope stability analyses are often neglected when dealing with instability processes. Unfortunately, the serious Ancona landslide of 1982 is not an isolated example of this situation. A number of mudflows occurred in the Campania Region in 1998.

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Case Study – Mudflows in Campania Region

In 1998 a large number of mudflows occurred in the area of Pizzo d'Alvano in the southern Apennines (Campania Region). Intense and long lasting rainfalls triggered about 150 mudflows in 10 hours between 14.00 and 24.00 hours on 5 May affecting 75km². The event caused 160 fatalities; 115 people were injured and 1210 became homeless (figure 11). The event caused heavy damages to public and private buildings (figure 12). The hazard from mudflows was known therefore the areas at risk could have been defined well before the event had happened (Brondi and Salvatori 2003).

Figure 11 Residents and fatalities to buildings in the affected municipalities

Municipality	Resident	Fatalities
Sarno (SA)	31,509	137
Siano (SA)	9,265	5
Bracigliano (SA)	5,105	6
Quindici (VA)	3,023	11
S. Felice a Cancello (CE)	16,771	1
TOTAL	65,673	160

Source: Brondi and Salvatori (2003)

Figure 12 Damages to buildings in the affected municipalities

Municipality	Damages to houses (million Euros)	Destroyed Buildings	In-Accessible	Partially Accessible	Accessible
Sarno (SA)	0.28	2	7	2	2
Siano (SA)	3.41	19	154	46	105
Bracigliano (SA)	0.28	2	7	2	2
Quindici (VA)	19.32	126	195	66	549
S. Felice a Cancello (CE)	2.27	5	34	10	170
TOTAL	25.56	154	397	126	828

Source: Adapted from Brondi and Salvatori (2003)

The aftermath of the event led to enforcement of evacuation plans and the Department for Civil Protection installed five tele-metered rain gauges run by the Naples Division of the National Hydrographic Survey (*Servizo Idrografico e Mareografico Nazionale – Compartimento di Napoli*). This helped to define a rainfall alert system. The Department of Civil Protection set up the Operational Unit 2.38, a component of the *Gruppo Nazionale per la Difesa dale Catastrofi Idrogeologiche* (GNDCI ~ National Group for the Prevention of Hydrogeological Catastrophes) at the Italian National Research Council (*Consiglio Nazionale delle Ricerche* ~ CNR), which in ten days after the mudflows in Campania, drafted a 'Preliminary Map of the Areas at Residual Risk', at 1:5,000 scale (Brondi and Salvatori 2003).

Information systems have now been set up at national and local levels through the media and operational centres. The information systems used to evacuate people inj case of such events includes:

- Leaflets with rules to follow during warning and alarm phases;
- Broadcast of brief messages by local radio and TV;
- Loudspeakers to disseminate standard message; and
- Door to door warning at the beginning of the alarm phase by local bodies involved in civil protection (Brondi and Salvatori 2003).

Geological engineering investigations are required by some Regions when building permission is to be granted, following national legislation in 1988. The *Provinces* fulfil a co-ordinating role for soil defence activities proposed by single Municipalities or other Boards. They may intervene directly on landslide consolidation only when transport and service infrastructure falling within their jurisdiction are involved or if they may be threatened by a mass movement. Since 1992 Urban Development Plans have been produced by the Provinces since they may comprise projects spanning the territory of more than one Municipality. Furthermore, Provinces have another competence, although indirect, on landslide management: they have to organise, together with the Prefecture authority, civil defence plans which include, obviously, also landslide risks.

By contrast the *Regions* have the most important responsibilities for soil defence and mitigation measures on landslides. They are provided with special funds for the management of landslides affecting inhabited areas and particularly important transport infrastructure, according to schemes which are produced annually. As a norm, these funds are completely inadequate with respect to the practical needs for implementation. The intervention projects are set out by their own offices which are situated at various locations in the various Provinces of a particular Region, often with the help of private consultants such as geologists and engineers since their own technical staff do not usually have the necessary technical skills. Moreover, the Regions are largely responsible for civil defence activities. These are: coordination between different Provinces, liaison with central Government and direct interventions in case of emergency.

Land-reclamation Syndicates also operate in some catchment basins. They deal with soil defence problems and carry out interventions on landslides: their activities often overlap (sometimes in an un-coordinated way) those pertaining to the Regions. A law was recently proposed in the Italian Parliament which recommended the abolition of these syndicates with the transfer of their areas of responsibilities to the Regions themselves.

Central Government does not usually intervene apart from in specific cases: National-interest emergencies, such as large landslides affecting inhabited centres. The way these direct interventions are decided may depend on some discriminating criteria, such as political pressures which may overwhelm the actual emergency situation, since large sums of money are concerned when a national-interest emergency is officially declared.

By means of the Forest Rangers Corps, which also has soil defence responsibilities. Also in this case a law has been recently proposed recommending the abolition of the Forest Rangers as a State corps and its incorporation within the relevant Regions.

The Italian central *Government* is the legislative body in charge the law on soil defence, catchment basin authorities, seismic zonation of the territory, technical norms for the drawing up of geological and geotechnical reports, etc. With respect to the problems induced by landslides, when emergency situations due to natural disasters occur, the Government intervenes directly on a financial level through the Department for Civil Defence (which was formerly an autonomous Ministry whereas it depends now on the President of the Council of Ministries). Furthermore, special interventions can also come under the responsibility of the catchment basin authorities which at present have not been activated in several Italian Regions, among which those considered as study areas for this project (Marches, Abruzzo, Molise).

The Region*s* play the dominant role in the distribution of funds in areas affected by natural disasters as well as in drawing up and implementing rehabilitation projects. Operative Offices are usually decentralised in the individual Provinces, whether they are Civil Engineers Boards or Provincial Offices for Soil Defence Policies. The inadequacy of the funds granted for the innumerable cases of landslide consolidation projects is made worse by the fact that, owing also to local political pressures, a uniform distribution of the financial resources is preferred rather than concentrating them on the most serious cases. This arrangement frustrates efforts to improve the situation.

Case Study –Veneto and Emilia Romagna Regions

The Goro mouth – Po delta within the Veneto and Emilia Romagna Regions is mainly characterized by bars sometimes related to wide spits evolution, that edge large inner land lagoons with high anthropic pressure. Nowadays, in Goro Po area, a sandy beach edged by coastal dunes ridges and submerged bars on the bottom are present. Land subsidence is another characteristic of this area.

The physical processes induce a longshore transport connected to Sirocco and Levanter winds; the other winds have less importance for the protection offered by Po Delta apparatus prominence. The sedimentary supply for the Goro spit are mainly due to Goro Po river contribute and, partially, comes from reworked sediments coming from northern beaches. A small amount of this sediment supplies the Goro spit growth and the rest is dispersed on the bottom and trapped, by mouths, in the backward lagoon. In the last tens years 8 million m3 of sediments have nourished the sea bottom in front of Goro spit, but great part of these counterbalance the local natural and human induced subsidence. Research shows that from 1900 to 1957, the Goro area lowers in a differentiate way about 8mm/yr. To the natural subsidence, after 1938, the human induced subsidence adds up. The lowering rate, after this time, in fact highly raises, mainly in the period 1951-1962. The Goro Po mouth shows a highly asymmetric morphology: an erosional trend of the mouth right side and an advancing trend or steadiness of left side, that also presents, in the in front sea bottom, a well developed submerged bar system.

Fisheries is the most important activity of this area. Many policies concur to sustain the maintenance of this area: the regional policy (Environment Councillorship- Soil and coasts Defence) aims to safe the areas, when populated or industrial activities could be damaged by natural hazards. Po Delta Natural Regional Park policy is to keep relevant natural areas and, when possible, to restore the natural value of damaged areas, mainly trough eco-compatible actions. The Goro Municipality and the Ferrara Province policies aim to safe the economic activities and the natural value of this land (Simeoni 2004).

Usually an Intervention Project is developed according to the following bureaucratic course: Every year each provincial office indicates to its own Region the most urgent cases and the relative funds requested. On the basis of its own budget the Region grants annual funding, which is subdivided among the various subsidiary local offices in proportion to the requests previously submitted (although sometimes other non-technical criteria may prevail). Nevertheless, in most cases the real needs of a stricken area are only partially satisfied (20% ca. of the original amount requested).

Each local office carries out remedial projects either on its own or with the help of private companies and consultants. These projects receive funds exclusively on the basis of those assigned by the Region. Also in this case, very often the works preferred are the most visible ones (such as interventions on the slope's geometry) which are not necessarily the most adequate.

Once the project has been drawn up, public contracts are put out for tender and are assigned according to price effectiveness. A technical executive from the Soil Defence Office supervises the works as they are carried out. A final inspection is carried out by officers from the Region or other administrative and technical agencies (State, Universities, etc).Unfortunately, once this procedure has been fully accomplished no other

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funds are assigned for the same landslide; therefore ordinary maintenance works, which would be vital for keeping slope stability under control, are in most cases neglected.

Case Study - Sicily

The bay of Giardini Naxos is situated in the Northern sector of the Ionian coast of Sicily (Italy), between the towns of Messina and Catania. The town of Giardini Naxos has about 10,000 inhabitants and it is characterized by a strong tourism with plus than 1 million tourists per year. Over recent years several stretches of the coast of Giardini have been victims of an intense erosive activity, caused and aggravated by a series of man-made constructions: within the hydrographic basin; along the coast; or directly at sea.

Previously, the only projects for erosion prevention were for a rigid type of barrier, consisting of structures oriented in various directions with respect to the shoreline. These structures were always emergent and were rarely placed at a sufficient distance from the shore to be effective, in consequence of that they had a limited efficacy causing further erosion problems downdrift. On the basis of these observations the Regional Department of the Environment (ARTA) under the pressing of the EU, published a public announcement, within the project for public works from 2000 to 2006, which contained the guidelines for the definition of priority areas to be protected and the type of projects to be adopted, as well as the various stages, of which this study is a part.

The policy aim was the removal of the causes of deterioration and/or erosion in the coastal areas, by means of the restoration of the natural conditions which led originally to the formation of the shoreline, with particular reference also to building activities inland, to the recovery and restitution to their natural state of the wet and dry river courses and the restoration of the solid littoral transport; particular attention is to be paid also to the effects on an increase in tourist potential, the recovery of state property and the protection of private and public goods from sea storms (Randazzo 2004).

In the last years many governments as well as national and international agencies have recognised that land use planning plays a key role in risk reduction. The paper '*NA-Tech Risks from a Planner's Perspective*' for the 1996 Annual Meeting of the Society for Risk Analysis-Europe gave an attempt to enlighten how planning and risk assessment procedures can be intertwined to improve existing prevention strategies. From a planner's perspective some assumptions that had been explicitly or implicitly accepted in the past should be changed, especially the belief that risk can be isolated from its geographical context and treated like a point in the space which can be made safer by adopting only technical solutions. There are a number of reasons why this assumption does not work well for land use planning purposes (Menoni 1996).

The first is that some hazards, natural as well as technological are not punctual, they rather cover a surface, in the sense that the same source of potential damage cannot be confined to one place. Secondly risks are connected one to the other. Researchers and decision makers usually do not consider multiple risks, as it is already very difficult to deal with one at a time; however it should be kept in mind that most inhabited areas are exposed to various risks, some of which might interact in a single event giving rise to disastrous chains. Examples of those interlaced risks are provided by induced hazards triggered by earthquake (Menoni 1996).

The third reason is that when information concerning lifelines (for example the exact location of pipes) is not available or is simply ignored by people producing town master plans, it usually happens that owners receive building permits in areas where those infrastructures already exist. This kind of problems is very common in Italy (Menoni 1996).

- settlements complexity;
- public administrations complexity, with the large number of agencies and offices dealing with the same type of lifeline;
- number of public, semi-public and private firms distributing gas, electricity, telecommunication at the local level.

The same lack of information may prove itself catastrophic after a disaster or an accident, when urgent demands are made on emergency management agencies (Menoni 1996).

4.4 Poland

4.4.1 Integrated Coastal Zone Management

The main authorities are the Ministry of Infrastructure – at national level, and the Directors of Maritime Offices – at the regional level which are responsible for monitoring and measures against coastal erosion. With respect to land use planning, development, construction permits and water-use permits in the coastal strip a complex system of cross-sectoral approval and opinion gathering is operating; however no such decision/permit is possible without obtaining agreement of the maritime authority (Maritime Office 2004).

The Polish Constitution states that sustainable development shall be a basic principle of any policy which is at least a good general platform for the introduction of ICZM (Monod de Froideville *et al* 2002). A Sustainable Development Strategy for Poland was adopted on the 26th of July 2000 by the Council of Ministers. It has not been institutionalised by law, but the *legal basis* is provided by the Constitution from 1997. Article 5 lays down that "*the Republic of Poland provides for the protection of the environment, while pursuing the principle of sustainable development*" (GCSS/MoE 2000 cited by Zieschank 2004).

There is no separate national legislation for coastal zone planning and management. A number of legal instruments cover either the terrestrial or the marine part of the coastal zone. In the field of coastal protection, most important is the 1991 Act on the Sea Areas of Poland and Maritime Administration. Other important laws include: the Act on Protection of Environment (2001), Act on Spatial Planning and Management (2003), Water Law (2001), Construction Law (1994), Law on Protection of Environment (2001), Nature Conservation Act (1991), Act on Maintaining the National Status of Natural Resources (2001), Ordnance of the Board of Ministers on the minimum and maximum width of technical and protective belt and methods of determining their boundaries (2003) (Maritime Office 2004).

There is no national legislation that can be identified as ICZM regulations or decrees. Since no formal mechanism has been installed to facilitate or promote integration as regards ICZM and there is no national policy or legislation for ICZM, overall legislation concerning management and planning is applied. Poland has created a framework for the development of ICZM which could be perceived as an important international incentive for a more integrated approach by signing numerous conventions. Moreover, Poland has engaged in international discussions on the implementation of ICZM and accepted international obligations to meet certain criteria and pursue a strategy of sustainable development in numerous fields, including coastal areas (Monod de Froideville *et al* 2002).

Case Study – ICZM in Vistula Lagoon
ICZM in the Baltic States and Poland is a project that has been completed; other ongoing projects include ICZM plans for the Oder and Vistula Lagoons. These plans have been developed under the auspices of the HELCOM Working Group for Coastal Lagoons and Wetlands (HELCOM PITF MLW), being the subsidiary of HELCOM PITF. Provisions included in these plans have been incorporated into the development strategies for Poland's coastal provinces. Additionally, the Union of the Vistula Lagoon is to take responsibility for the implementation of ICZM plans for the Vistula Lagoon. A programme to support the participation of integrated management of the Vistula Lagoon was elaborated in 2000. The aim of the project is to provide the support for implementation of the ICZM plan for the Vistula Lagoon by dissemination of knowledge on ICZM among local authorities and the public, by organising public hearings on ICZM. A similar project is to be implemented for the Szczecin Lagoon.

The first Polish policy for coastal protection, named "*Long Term Programme for Coastal Protection and Maintenance of Beaches*", was developed in 1986 and revised in 1989. A new policy, the "*Strategy for Coastal Protection*", has been approved by the Minister of Infrastructure in 2001. The approach is selective managed realignment, which means that along about 35% of the coast the present position of the coastline will be dynamically preserved, and along the rest some retreat will be allowed. The Strategy has a 10, 25 and 50-year perspective (Maritime Office 2004).

4.4.2 Planning System in the Coastal Zone

The Act on Marine Areas of the Polish Republic and Maritime Administration 1991 established a protected coastal strip running the length of the Polish coastline, including internal marine areas, i.e. Vistula Lagoon, Szczecin Lagoon. This strip comprises the Technical Belt and the Protective Belt which must be marked on all Land Use Plans. The technical belt is used for ensuring adequate safety and state of the environment, whereas the protective belt is established in order to control the negative impact of human activity in areas directly adjoining the technical belt landward of the technical belt (Monod de Froideville *et al* 2002).

The Technical Belt has been established for the whole Polish coastline and extends up to 200m inland, according to the type of coast. In dune areas it is up to 200m landward of the dune ridge; for cliffs it is up to 100 m landward of the upper edge of the cliff; and for the lagoons it is up to 200 m landward of the shore. In some areas, it has been increased to as much as 1 km wide, but in urban areas and along the shores of lagoons it can be much narrower. According to the 1991 Act, it is "*an area designed for maintaining the coast in a state conforming with the requirements of safety and environmental protection*". The relevant Maritime Office must approve all uses of this strip. It is primarily intended for coastal and environmental protection (Monod de Froideville *et al* 2002).

The Protective Belt extends generally up to 2 km inland from the landward boundary of the Technical Belt but in some places it widens to 5 km. In urban areas it can be much narrower. The Belt is intended to limit the impact of human activities on the Technical Belt and consequently there are restrictions on land use and development to ensure they do not have a negative influence on the state of the Technical Belt. All

permissions for building within these zones must have the approval of the relevant Maritime Office. In essence, it is acting as a buffer zone (Monod de Froideville *et al* 2002).

The Housing and Urban Development Office is the governmental agency that is responsible for the general co-ordination and standardisation of physical planning. The Government Centre for Strategic Studies is responsible for the national physical development policy and other kinds of planning at this level. Furthermore, the Ministry of the Environment has guiding and control tasks in respect to environmental issues of spatial planning (Monod de Froideville *et al* 2002).

There are 16 provinces, or *voivodships*, in Poland, three of which are situated on the coast, being the West-Pomeranian, Pomeranian and Varmian-Masurian. The voivodships are self-governing authorities. The regional self-government, headed by the Marshal of the Vovoidship, has full responsibility for strategic and spatial planning. The regional body for planning is the Marshal's Office and the Department of Strategy and Development. Other institutions involved in the formulation and implementation of regional plans include regional development agencies, NGOs, foundations, etc (Monod de Froideville *et al* 2002).

The role of counties in public administration is an intermediary one, with no specific planning competencies. There are 1489 communes in Poland which have substantial planning responsibilities, however their enforcement potential is rather weak. All local communes are obliged to prepare and approve a 'local comprehensive planning document', which formulates the preconditions and directions for physical development. National and regional goals and directions are to be taken into account when elaborating these plans. The detailed spatial plans are prepared as a legal instrument for the development permits (Monod de Froideville *et al* 2002).

The Physical Development Act 1994 regulates the goals and principles of spatial development and planning, adopting sustainable development as a foundation. The most important changes, which have appeared since then are: private ownership has received protection; planning process has gone under public control; and public participation has become a part of planning procedures. It has also vested responsibility for local planning in the local councils. Nowadays in Poland there are: governmental planning - as an instrument of national spatial development policy and self-governmental one - letting independently by regional and local councils (Szulczewska 2001).

In general, the spatial planning system in Poland is similar to the existing planning systems in other EU countries. However it should be stressed that the present planning system is not stable. Currently there is a revision of legislation on spatial planning. Rapid transformation of political as well as economical system has given rise new problems and negative phenomena also in the field of physical development. The 1994 Act is not able to solve these new problems. The new legislation has been worked out and presented in the Parliament but the project has been abandoned due to lack of agreement on presented solutions. A new initiative is expected in the future (Szulczewska 2001).

A drawback of the Polish system is that planning, building and environmental protection issues are regulated by completely different acts. It also must be said that many communes have not yet enforced their local comprehensive plans. The Ministry of the Environment is responsible for the so-called "protection plans", prepared for the National and Landscape (regional) Parks. However, these plans do not belong to the

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category of spatial plans in the sense of the Physical Development Act and their provisions are binding for the regulations of the statutory local comprehensive and detailed spatial development plans (Monod de Froideville *et al* 2002).

The Ministry of Regional Development and Construction administers spatial planning at the national and regional level. The State Office for Housing and Urban Planning (the head of the Office reports to Minister of Regional Development and Construction) administers spatial planning at the regional and local level (Szulczewska 2001). There is a strong possibility that it will be changed in the near future. Figure 4 shows the organisation of spatial planning.

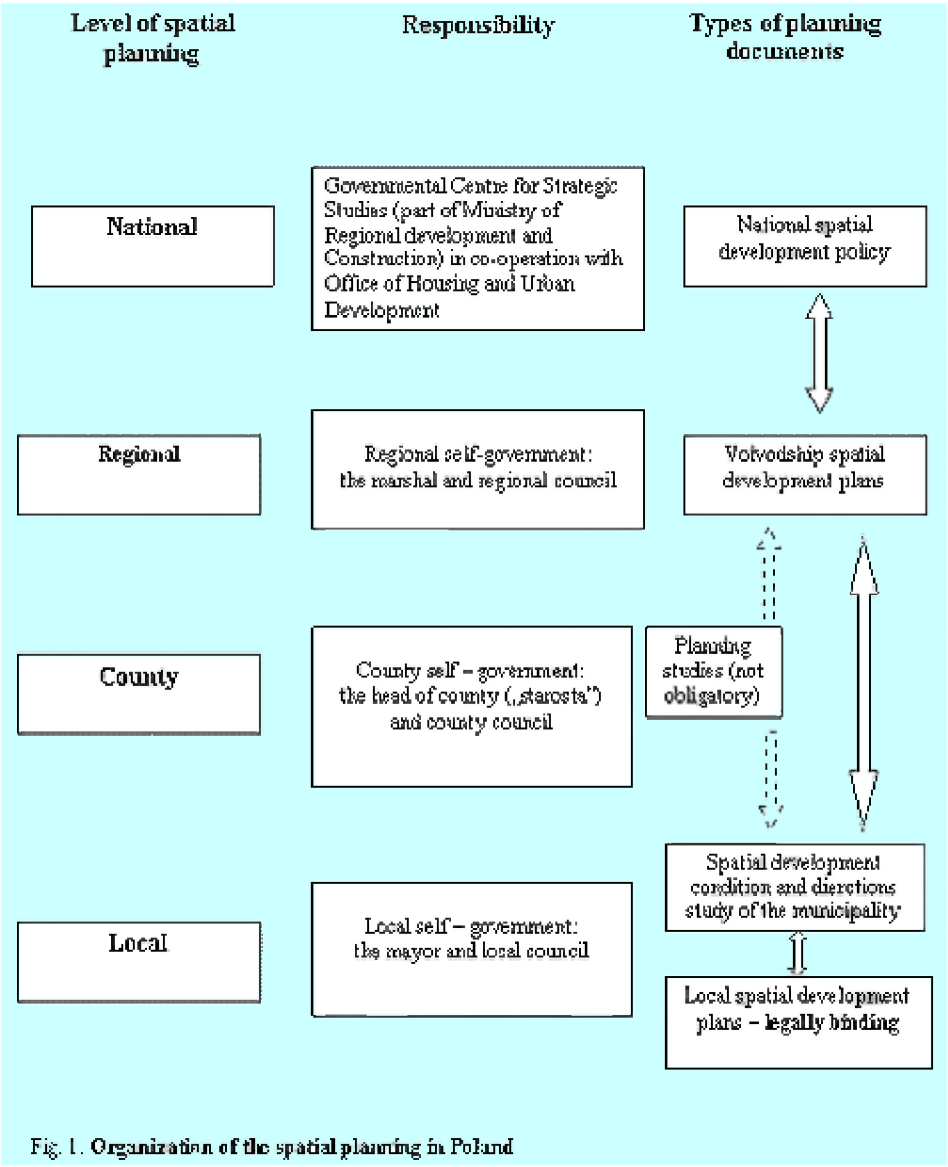

Figure 4: Organisational Spatial Planning in Poland (Source: Szulczewska 2001)

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At the national level, the Concept of *National Spatial Development Policy* is being elaborated as a strategic document (the present document is called "*Poland 2000 plus*"). One of the key components of the Concept is sustainability. Alongside the socio-economic and environmental policy documents (strategies), it is supposed to operate as a tool for indirect regulation of structural changes in Poland (especially the physical space, incl. environment), during the process of transition to a market driven economy. In this respect, it is co-ordinated with the umbrella document of the Polish government Sustainable Development Strategy for Poland till 2025. Drafts of substantial amendments to the Physical Development Act and the Environmental Protection Act have been submitted to the Parliamentary Commission. Regulations and legislation relevant to spatial planning include:

- The Act on Municipal Self-government, 1990,
- The Act on Marine Areas of the Polish Republic and Maritime Administration, 1991,
- Construction Law, 1995,
- General Building Regulations, 1997, and the
- Protected Belts Act, 1997

The scope of competence of maritime administration and other local and governmental administrative bodies can be divided into three areas: the territorial sea and marine internal waters, the technical belt and the protective belt (Monod de Froideville *et al* 2002).

In the territorial sea and marine internal waters the maritime administration enjoys full competence as regards the location and the substance of issues, with the exception of construction permits and water supply and sewage effluent disposal consents, i.e. the so-called water law permits. However, these require consultation with the competent head of the maritime office within the territory. Another exception is permits for the extraction of seabed resources which require consultation with the Ministry of Transport and Maritime Economy. Construction and water law permits are issued by provincial governors. Maritime Administration is competent to issue decisions in terms of land development and spatial management in this area (Monod de Froideville *et al* 2002).

In the technical belt the maritime administration is responsible for the preparation and execution of the protection of the shore and the environment, as well as for issuing permits for all kinds of use, with the exception of construction and water law permits and for the consultation of local spatial management plans and decisions. Construction and water law permits are issued by other administrative bodies on condition that they have received the approval of a competent maritime authority (Monod de Froideville *et al* 2002).

In the protective belt the Water law permits and decisions related to construction, changes in land use, as well as the elaboration of spatial management plans, are effected by competent 'land' bodies in consultation with the competent maritime authority (Monod de Froideville *et al* 2002).

Under Article 36 of the Act concerning the Maritime Areas of the Republic of Poland and the Maritime Administration, 21 March 1991 the coastal areas includes:

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1. The technical strip constituted by the area which directly separates the sea and the land from each other: it is an area maintain for keeping the coast in a condition consistent with the needs of safety and environment protection
2. The protective stripe, which comprise the areas in which human activity has a direct influence on the status of the technical strip.

Article 37 of the 1991 Act states that the "*technical strip may be utilized for purposes other than those referred to in article 36, paragraph 2, subparagraph (1), with the consent of the competent authority of marine administration.*" It also states that "*authorization under shore-water law and decision in matters relating to construction, as well as the formulation and execution of plans for bringing land into economic use in the protective strip, shall require coordination with the director of the competent maritime office.*" In addition "*all plans and projects related to the economic use of the technical stripe, the internal waters and the territorial sea shall be approved by the authorities of the maritime administration in agreement with the competent coastal communities.*"

The competent maritime authorities referred to are the Minister of Transport and Marine Economy; and the directors of the maritime offices, as the local authorities of the maritime administration (Article 38). The maritime authorities deal with matters relating to "*the construction, preservation and protection of coastal fortification, dunes and protections forestation in the technical strip*" (Article 42).

Over 100 km of the Polish shoreline is now protected in some form by means of groynes, seawalls, bulkheads, revetments and increasingly artificial beach nourishment. The Act on the Forests 1991 describes which forests in the coastal belt are understood as 'protective forests'. A strategy for coastal defence is under preparation which will mainly consist of technical guidelines.

The Act on Environmental Protection 2001 requires from planning documents (particularly on the local level) to solve problems of town and countryside development, taking into consideration greenstructure management. It allows for the establishment proportional spaces between built-up and open spaces necessary for nature balance preservation (local plans and decision on land use and building pattern).

The Act on Nature Protection 1991 (last amendment 2000) orders the protection of greenery in towns and villages, particularly trees and shrubs; and defines the term "green open spaces" as spaces within built-up areas (Szulczewska 2001). The Decree on Classification of Building and Grounds 1996 recognises green areas as recreational ones (the term green area is not used in the Act) and establishes these areas. The Act on Physical Development 1994 concentrates on procedures not on standards and requires the taking into consideration of specific conditions for land development in relation to natural and cultural environment protection. A local development plan is the only legally binding document that can establish conditions for development, including prohibition of building also for greenstructure protection and development (Szulczewska 2001). Figure 14 shows the Planning System and Greenstructure in Poland.

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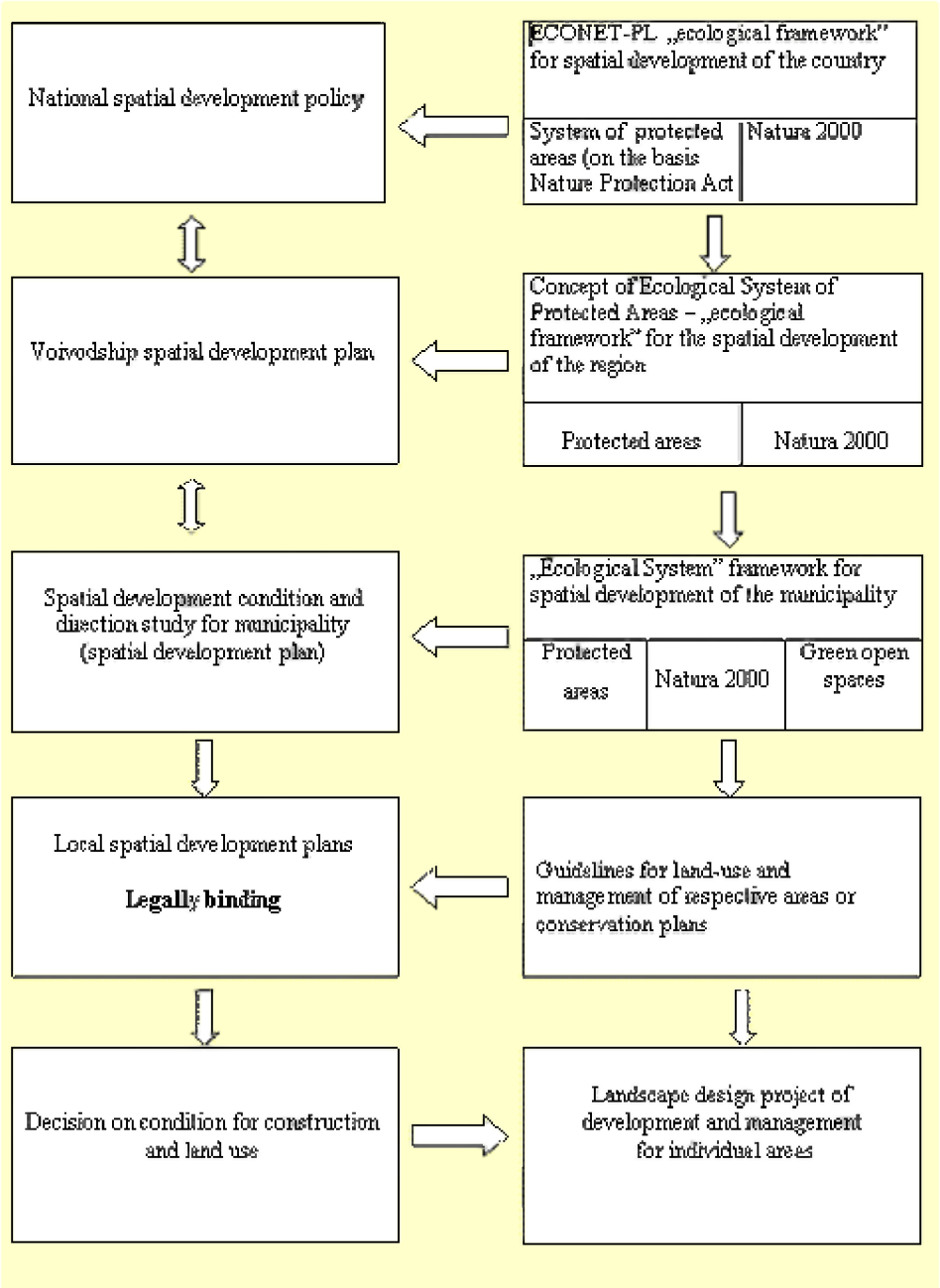

Figure 5: Planning System and Green Structure in Poland (Source: Szulczewska 2001)

A new example for policy formulation as well as participation of social actors is the Polish Biodiversity-Strategy. In this case the national strategy has been subject to discussions across government departments and to consultations with NGOs and other stakeholder representatives. Due to the overall aim of assuring acceptance and also responsibility by policy makers as well as by different actors in relevant policy fields, this process is more opened to participation. Concerning the policy integration between different levels, the government intends to strengthen the relationship between local spatial plans and national or conservation plans for protected areas (Zieschank 2004).

A National Wetland Strategy was developed in 1998 by the Ministry of Environmental Protection. The strategy is a development and aggregation of the Act on Nature Conservation (1991), the Act on the Protection of Agricultural and Forest Land, the State Ecological Policy and the National Biodiversity Strategy (draft). Several regulations are in place which considers wetland protection in planning and management activities, specifically the Act on Spatial Management of 1994, the Act on the Protection of Agricultural and Forest Land and the Act on Nature Conservation (Blincoe 1999).

At present, the New National Environment Policy to replace the one of 1991 is formulated by the government and being discussed in the Parliament. The document calls for actions in the field of environmental protection and sustainable development of Poland at the turn of the century. The principle of sustainable development has been adopted as a leading principle of the New National Environment Policy. The primary objective of the state environmental policy is to ensure ecological safety for the country, its inhabitants and natural resources by applying such measures as legal regulations and control in reference to the use of the environment. The transposition of the respective EU regulations into the Polish legal system is an important element necessary for the achievement of this objective (Monod de Froideville *et al* 2002).

The provincial governor has the basic competencies in terms of the introduction of certain forms of nature conservation and is authorised to establish reserves. Boards of communes are competent to implement different forms of individual protection, to establish protected landscape areas and to introduce species protection. Certain rights, related to management, organisation and supervision lie with the head of the county. The authority regarding protective forests is either the minister, in the case of forests that are the property of the State Treasury, or the provincial governor, for all other forests. A long-term programme for coastal protection was approved in 1986 and revised in 1989. A new long-term coastal policy is under preparation which will mainly consist of technical guidelines. Moreover, Poland has established several parks, reserves and protected areas (Monod de Froideville *et al* 2002).

Protected areas in the coastal zone cover a total of 154,512 ha. There are 2 national parks, 66 nature reserves, 5 landscape parks and 5 areas of protected landscapes. Two national parks protect two different types of dry coastal ecosystems in Poland. The Wolinski National Park in the north-western cliff zone was established in 1960, while the Slowinski National Park on the sandy coast, with large mobile dunes, was established in 1966. The latter was nominated as a 'Biosphere Reserve' in 1980. Many nature reserves of different character protect special forms of coastal landscapes, special types of soils (notably naspa soils and classical podzolized soils), rare plants, plant communities and animals (Monod de Froideville *et al* 2002).

4.4.3 Planning and Climate Change

During the last 15 years the average rate of retreat of the Polish open sea coastline was about 0.8 m/year, which, in Polish conditions, corresponds to a loss of about 10 cu.m. of soil per metre of coastline length. Taking into account the cost of replacing the eroded soil and of rebuilding the dune system, the cost of this consistent erosion amounts to about 20 mln Euro per year (Maritime Office, 2004).

Due to legislation and practice of coastal zone management (especially set-back lines), at present there are only a few developed sites, at which there is a risk of loss of assets due to erosion or flooding. However, the picture becomes quite different when sea level rise due to climate change is taken into account. Three sea level rise scenarios have been analysed: a rise of 30 cm, 60 cm and 100 cm between the years 2000 and 2100. The findings for the most probable 60 cm scenario, for the whole Polish coastline (including both lagoons) are given below (Maritime Office, 2004).

If no measures were to be taken, the total area in risk of periodical inundation is nearly 2,200 sq.km, and 120 sq.km could be lost due to marine erosion. In effect the value of lost assets would amount to about 90 billion Euro, and about 178 thousand people would have to be relocated. The relocations would result in next significant costs connected with e.g. generation of new work places (probably at least 50 billion Euro). Additionally, the value of assets at risk would amount to about 65 billion Euro and about 108 thousand people would be at risk of periodical difficulties. It should be also mentioned that effects of sea level rise would indirectly influence further 1.5 million inhabitants of coastal areas bordering with the risk areas (Maritime Office, 2004).

With respect to ecological values, it is assessed that within the risk area there are 436 sq.km of areas with outstanding natural value (unique in European or national scale), which would become destroyed or significantly transformed (Maritime Office, 2004).

In order to prevent these effects, a long-term (50 year) strategy of coastal protection has been developed, which includes not only technical, but also land management, legal and organisational measures. The strategy of selective retreat was adopted. In effect a proper level of safety will be ensured for all valuable areas. Nevertheless, about 2 thousand people may have to be relocated (Maritime Office, 2004).

The cost of realisation of this strategy is evaluated at 20 million Euro annually during the first 10 years, 25 million Euro annually during the next 15 years and 28-30 million Euro during the last 25 years. These costs include all coastal defence measures, monitoring and research, but not the cost of relocations and of possible measures taken up in the hinterland (Maritime Office, 2004).

4.5 Ireland

4.5.1 Integrated Coastal Zone Management

In Ireland, three national government departments have primary responsibility for the coastal zone and its resources and instability issues: Department of the Environment and Local Government (DOELG) - landward planning; Department of the Marine and Natural Resources (DOMNR) - seaward planning; and Department of Arts, Heritage, Gaeltacht and the Islands - nature conservation. The sectoral approach to the administration of the coastal zone does not assist with the development of integrated policy and there is an obvious division between terrestrial and marine measures. Another problem is the lack of adequate statutory provision for consultation.

The Green Network of Government Departments is a high level group of officials intended to promote the integration of environmental policies into Government policies and programmes generally, and to improve coordination across Government Departments in relation to environmental matters. The establishment of separate coordinating structures on ICZM are under consideration. A number of state agencies have responsibilities in relation to oceans and seas issues, including the Marine Institute and the Environmental Protection Agency (Gibson l999).

Major projects and activities underway or planned to address marine issues include the following: The development of national policy on Coastal Zone Management (draft policy published for consultation in 1997). This was followed by a public consultation seminar on CZM in 1998. The Marine Institute and the Environmental Protection Agency produce a range of publications related to oceans and seas issues generally.

Training courses for public authorities and private sector agencies are provided by the Marine Institute, the Institute of Public Administration and other bodies, e.g., the Institute of Engineers of Ireland, Universities and other third-level institutions. CZM demonstrations are organised under an EU funded programme. The Marine Institute regularly organises conferences on marine matters, including, in 1998, the Year of the Ocean Conference. The Environmental Information Service (ENFO) is a service of the DOELG and provides a range of services to facilitate public access to information.

4.5.2 Planning for Coastal Erosion and Instability

Landsliding is not a significant issue in Ireland with not many serious adverse effects on the economy or the population. The coastline is predominantly hard rock so landslides are rare with only occasional minor damage to roads and property. Instability in terms of bog-bursts is known, but is a reducing hazard as a result of peat digging and drainage works. It is not believed that any landslide hazard or risk assessment has been undertaken in Ireland. The extent of landsliding problems in Ireland resulting from coastal erosion and other causes is extremely limited and as a result these issues can be addressed within the existing legislative and policy frameworks (McInnes *et al* 2000).

There are however, coastal areas that are at risk from erosion. Two of these areas have been identified by the Eurosion Project (2004) as Rosslare Strand in Wexford County and Rossnowlagh in Donegal County.

Case Study - Wexford County

The erosion at Rosslare Strand in Wexford is mainly caused by human interference with the natural sediment movement patterns in Rosslare Bay, such as land reclamation and the construction of Rosslare harbour. The impact of erosion on socio-economic functions mainly consists of the impact on the available beach area and the infrastructure backing the beach. A breach in the coastal dunes can, in an extreme case, also cause the flooding of Wexford's town and harbour area.

The recommended strategy was the construction of rock groynes and the provision of additional beach nourishment as the best solution for preventing further erosion. Information on the effectiveness of the coastal protection scheme was only found for the first year after construction. In this short monitoring period, during the winter storm events a long shore bar was formed with sediment taken from the beach. Thus, the coastline receded. However, it was expected that during the summer the beach would be rebuilt again. The long-term effects of the nourishment and groyne construction cannot be determined from such a short monitoring period (Sistermans, and Nieuwenhuis 2004).

Case Study - Donegal County

Previous evidence suggests that a balanced system alternating between erosion and accretion has been replaced by a solely erosional system. Natural processes are trying to move the Rossnowlagh beach and dunes to a position further east. Another possible factor in the acceleration of dune erosion may be the progressive reduction of the substantial cobble storm beach that lies between the dunes and the beach. Furthermore, due to pressure from recreation, the variety of species is being reduced and thus the natural resilience of the dune and beach system is threatened.

Current measures for protecting the dune front of Belalt Strand have been effective locally, but, due to the ad hoc basis on which they were implemented, they are not really effective for overall beach development. Currently, the future sustainable development and protection of the area is being studied in a more integrated way. Several options for future development have been proposed and analysed, but no detailed actions have yet been implemented (Lynn 2004).

Mean High Water Mark (MHWM) is the jurisdictional boundary between landward and seaward planning, but there are some exceptions to this rule. They include for example Bantry Bay where, following the Betelgeuse disaster of 1979, Cork County Council's planning jurisdiction was extended into part of the bay from League Point to Shot Head. Other exceptions include: coastal counties bordering the Shannon estuary, which have jurisdiction over the estuary; and Dublin County Borough, with jurisdiction below the low water mark. Furthermore, the Local Government (Reorganisation) Act. 1985 allows the Minister for the Environment to extend the boundaries of any coastal county up to three miles beyond the MHWM; to date no such extension has been made.

In 1997 a Coastal Zone Administration Division was set up in the DOMNR. The principal functions of the division, detailed in the DOMNR Guide to the Functions of and Records held by the Department (1998) are to support the development of sustainable CZM through new policies, plans and legislation and through

effective licensing arrangements for management of activities on the foreshore and at sea. The principal legislation for dealing with development in coastal areas is primarily the Foreshore Acts (1933 to 1992) and the Harbours Act. 1946.

Under the Foreshore Acts, which deal with any development on the shore below the MHWM, public advertisement of applications for leases/licences is the norm for any sizeable project where an EIS is required of applicants. All responses are carefully considered before the Minister's decision is made; applicants are asked to comment on third party comments.

The Harbours Act endows certain supervisory and regulatory powers upon Harbour Masters in their respective harbour areas. However, development control remains with the Minister for the Marine, to whom the Harbour Master is directly responsible. Development may also be subject to Local Authority planning controls.

In addition, a foreshores licence is required to place objects or structures on the foreshores, to use or occupy the foreshore, or to remove or disturb beach material from it. However there are no time limits for deciding applications, there is little opportunity for public participation and the procedure is not integrated with the planning system. This is an example of the deficiencies in the existing legislation. The legislation is outdated and due to be reviewed. In contrast the law on aquaculture licensing which also suffered major defects has recently been reformed (Fisheries (Amendment) Act 1997; Fisheries and Foreshore (Amendment) Act 1998 (Gibson 1999).

The DOELG is the agency with responsibility for policy formation and legislation relating to all matters environmental on the landward side of the MHWM. The Department is primarily responsible for securing the implementation of EC environmental legislation, co-ordinating Irish policies on environmental matters, and presenting these policies at EC and international levels.

Implementing policy is the responsibility of government at local level. There are sixteen local authority county councils around the coast of Ireland, five county borough and borough councils, fourteen urban district councils and seven town commissioners. The functions of local authorities are mainly concerned with the physical environment, viz, planning and development, environmental management and control. Under the Local Government (Planning and Development) Acts. 1963 to 1993, local authorities must make a plan indicating the development objectives for their area. These plans deal with physical, economic and social development within their jurisdictional boundaries. The Act also allows the local authority to make Special Amenity Area Orders, Conservation Orders and Tree Protection Orders.

The Local Government Act, 1994 deals with bye-laws and the most relevant section is 5.37 (7). This states: *"The power of a local authority to make a bye-law in respect of its functional area shall include a power to make a bye-law in respect of the foreshore and of coastal waters adjoining that functional area and with the agreement of any other local authority, of the coastal waters adjoining the functional area of that other local authority"* (McInnes *et al* 2000).

Under the Local Government Acts, 1963-1993, each LA must prepare a county development plan for its area at least every five years. Development plans are subject to public consultation, with a right to appeal through

An Bórd Pleanála (the Planning Appeals Board), thus bringing the planning process on the landward side into the public domain. The existing planning system, administered at local level, is widely accepted and understood, and allows for public involvement. In addition, the following legislation applies to the area of oceans and seas:

- Dumping at Sea Act, 1996
- Coast Protection Act 1963
- Continental Shelf Act 1968
- Environmental Protection Agency Act 1992
- European Communities (EIA) Regulations 1989
- European Communities (Natural Habitats) Regulations 1997
- Fisheries Acts 1959-1998
- Local Government (Planning and Development) Acts 1963-1998
- Minerals development Acts 1940-1995
- Sea Pollution Act 1991
- Marine Institute Act, 1991
- Oil Pollution of the Sea Acts
- Waste Management Act, 1996
- Water Pollution Acts 1977-1990

Other policy instruments include the following: Code of Practice in relation to Agricultural Activities; Guidelines for the Environmental Regulation of Offshore Oil and Gas Activities (under preparation); and voluntary agreement with industry on the reduction of phosphates in detergents (under preparation).

Marine policy is generally addressed in *Making the Most of Ireland's Marine and Natural Resources* 1998. RTDI issues are addressed in *A Marine Research, Technology, Development and Innovation* Strategy *for Ireland* 1998. The following major programmes are in effect:

- Water Services Investment Programme to provide upgraded treatment facilities for effluents discharged to estuarine and coastal areas;
- Provision of port reception facilities for ships' waste;
- Monitoring programme in relation to bathing water quality;
- Blue Flag Scheme in relation to beaches;

Local authority programmes to combat coastal erosion

4.6 Denmark

4.6.1 Integrated Coastal Zone Management

Denmark has not formally adopted a clearly defined and coherent ICZM system, but ICZM principles have been brought into practice through the system of laws and regulations, inter-sectoral co-ordination and planning and the high degree of public participation which has been developed over several years (Van Barneveld *et al* 2002). In Denmark initiatives to promote ICZM have been few. It was stressed by the Wilhjelm Committee in their 2001 Report; the importance of coastal areas and the need for better co-operation among authorities. In 2002 a Regional Planning Committee was set up under the Ministry for the Environment with representatives from various authorities and organizations. The Committee was given the task to recommend changes in legislation as regards regional planning in general (Anker *et al* 2003).

On a national level, the Ministry of Environment is responsible for integrated management and sustainable development in coastal and marine areas, including the EEZ. The Danish EPA, together with the Ministry of Defence, are responsible for protecting the Danish coast against oil and chemical pollution. The Ministry of Environment and the Ministry of Trade and Industry are co-operating to develop sustainable tourism. In accordance with national legislation, the general public is involved in the planning process and the Danish Society for the Conservation of Nature has a statutory right to complain under the majority of Acts concerning nature and the environment (Van Barneveld *et al* 2002)

The Danish Coastal Authority (Kystdirektoratet), a technical institution under the Ministry of Transport, was established in 1973. Tasks of the Danish Coastal Authority include: monitoring and coastal protection; storm tides warning; supervising public bodies and individuals on compliance to coastal defence laws; and approving regional and private plans for coastal protection works. The Coastal Authority co-operates with the Ministry of Environment on several areas and is a member of various commissions; e.g. to assess the payments for damage by storm tides (Van Barneveld *et al* 2002)

The main incentive for coastal management policy in Denmark has been the control of coastal erosion, the need for a balanced utilisation of resources in the coastal zone and the wish to enhance the environmental quality of the coastal zone. In addition to this, rights of way, general setback lines, and governmental sovereignty over the sea territory are pillars in Danish coastal policy. During the past four decades the development in the Danish coastal zone has been characterised by a number of rational, technical and economic conditions (Van Barneveld *et al* 2002).

There is no legal basis for integrating planning across the intertidal shore – except for specific nature conservation purposes as stated in the Nature Protection Act 1992, which was amended in 1994 and 2002. Management of the marine area is the responsibility of the State and is subject to sectoral legislation (Van Barneveld *et al* 2002). The legal framework is also complicated and this complexity presents a potential obstacle to integrated management (Gibson 1999).

A quite clear split of powers with regards to land and sea respectively and the lack of comprehensive coastal planning, including both land and sea areas, have been major flaws in the present regulations. The present problems and need for new legislative and management practice initiatives as regards the coastal zone were

addressed in a small-scale Danish research project initiated by the Department of National Spatial Planning of the then Ministry for the Environment and Energy, in 1997. The research project had the aim of clarifying elements in the existing Danish regulatory framework, management practices and international experience that support or impede ICZM. The Danish Forest and Landscape Research Institute and the Institute for Fisheries Management and Coastal Community Development jointly undertook this research project during the period 1997-99 (Anker *et al* 2003).

Since 1874 Denmark has had a Dike Protection Law and a Coast Protection Law, defining the owners' responsibility for the physical coastal activities and their consequences. In 1988 the Danish Parliament passed a new law for Coastal Protection, opening up for improved co-ordination of coastal protection with other coastal activities and for the integration of environmental issues in a Coastal Erosion Management process (Van Barneveld *et al* 2002)

As early as 1917 the Nature Conservation Act formalised the right of public access to all Danish beaches. Considerable effort is devoted to securing general public access from the hinterland to the beaches. This Act prohibits the erection of new buildings or other constructions as well as fencing and placing of camping and similar facilities within the beach protection zone. In summerhouse areas, the protection zone is set at 100 m, but may be reduced. In rural areas it is set at 300 m. Constructions for military purposes and harbours are exempted. Existing farming is also allowed to continue. All natural coastal habitats are protected, including the Wadden Sea and dunes (Van Barneveld *et al* 2002)

Other legislation relevant to the management of coastal and marine resources includes the Fishery Act, Act No. 281/1999; the Water Supply Act, Consolidated Act No.753/1999; the Forest Act, Consolidated Act No. 958/1996; Agricultural Act, Consolidated Act No.598/1999; Raw Materials Act (Act no. 569, 30 June 1997), and the Harbour Act, Act No.326/1999 (Anker *et al* 2003).

Case Study – PROCOAST

Completed projects associated with ICZM include: Coastlink Storstrøm; Waterfront Urban Development; BEST project; SUSWAT; ARCHIBAL; Integrated Coastal Management Project K.E.R.N. PROCOAST is an on-going project in with the aim of bringing experts on coastal zone management issues from different regions in the Baltic Sea together in order to exchange experiences on how to incorporate environmental concerns into practical management solutions for the coastal zones in the Baltic Sea region. A handbook, a state of the art report, containing a background for coastal zone planning and management in the Baltic Sea Region, is one of the results of this 'harmonisation of uses and interests in the coastal zone' project. The Schleswig-Holstein State Ministry for the Rural Areas, Regional Planning, Agriculture, and Tourism is the lead partner of PROCOAST. Partners include, *inter alia* Sweden and Denmark (Van Barneveld *et al* 2002).

The highest environmental authority is the Ministry of Environment and Energy operating on the basis of legislation concerning environmental and nature protection specifically and involving, *i.e.* legislation on raw materials and hunting (Van Barneveld *et al* 2002). The environmental protection system has been developed in the last 20 – 30 years, regulating pollution from industry and agriculture by environmental permits and supervision. The regional authorities are responsible for the permits and supervision of large industries while municipal authorities are responsible for smaller companies and large farms. On the marine side of the mean water level, Denmark's first Environmental Protection Act from 1974 imposed the county councils to elaborate and implement water quality plans, based on the concept of "environmental quality objectives". The aim of the Environmental Protection Act. Consolidated Act No.753/2001 is to prevent and control pollution of air, water, land in order that social development will be on a sustainable basis and in respect for both human living conditions and the conservation of plant and animal life (Van Barneveld *et al* 2002).

Denmark is party to the Helsinki Convention on the Protection of the Marine Environment of the Baltic Seas Area and the coastal planning zone and protection zone are intended to implement HELCOM Recommendation 15/1 concerning the protection of the coastal strip (Gibson 1999). Denmark, together with Germany and the Netherlands, is a member of the Trilateral Co-operation on the protection of the Wadden Sea and has designated (in 1982, with further amendments) the whole of its part of the Wadden Sea (Vadehavet) as a nature and wildlife reserve. At the same time the local municipalities, landowners and Danish Coastal Administration (DCA) are involved (Gibson 1999).

Through the Coast Protection Act. Consolidated Act No.243/1994 there is a wide integration between the involved authorities and the landowners. The law empowers regional authorities, i.e. the county, to take their own initiatives or to respond to requests brought forward from local citizens or authorities. This ensures that co-ordination with physical planning is established at the appropriate administration level at an early stage of the project. At the same time the local municipalities and landowners are involved (Van Barneveld *et al* 2002)

To a certain extent the public is involved through its representatives in the political organs but, except for the landowners benefiting from the project, no citizen is asked during the process. This may seen a little old fashioned compared to the Nature Protection Act 1994 amendment where all decisions have to be made public or the sectored planning which have pre-proposal periods. Up until now the procedure stated in the Coastal Protection Act secures both public involvement (to a certain extent) and authority involvement in the

process of coastal protection (prioritisation and planning) and no immediate need for further integration seems obvious. The problems caused by migrating dunes, which were already serious in the 16th century, and continuing to modern times, led to the adoption of a Dune Preservation Law (Van Barneveld *et al* 2002)

ICZM in Denmark is mostly being established through gradual harmonisation and co-operation of the administrative and legislative framework, through the physical planning system and through environmental legislation. Coastal zone management objectives are incorporated into the planning system, and regional plans can provide guidelines for the rational use of coastal areas of a region, including planning of recreational activities and facilities. Involving the general public and a variety of NGOs and other organisations in the planning process underlines the integrated approach. Although integration is generally good, both between sectors and administrative levels, there are still some conflicts of interest and contradictions between legislation, particularly concerning the marine area (Van Barneveld *et al* 2002).

4.6.2 Planning in the Coastal Zone

The Ministry of Environment and Energy is responsible for planning policy. It is supported by specialist agencies including the Danish Environmental Protection Agency. Regional planning is undertaken by the counties and the municipalities carry out local planning (Gibson 1999). The Coast Protection Act (Act no. 243, 5 April 1994) empowers the counties (regional authorities) to protect the coastal areas against flooding and erosion. It also provides improved co-ordination of coastal protection and development schemes within a coastal environment perspective. In case the counties lack expertise, they can involve the Danish Coastal Authority at an early stage for assistance in further examination of a project. The integrated process, called coastal erosion management, leads to local plans with a few prerequisites: coherence with the planning system; set back and no building regulations.

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If appraisal by the Danish Coastal Authority is positive the regional authority may proceed with project preparation. The final regulatory procedures still require permission from the Minister of Transport to establish coastal protection works and other technical changes on beaches and other non vegetated coasts and in a zone within 100m from where coherent vegetation starts. The Analysis and Design Department of the Danish Coastal Authority can also define projects depending on the outcome of the analysis of monitoring data (Van Barneveld *et al* 2002)

The counties are responsible for the setting up of regional guidelines for development in the coastal zone, including indications of in which areas development and construction can take place. They are also responsible for environmental quality to a depth of 6m or at least 1 nm from the shoreline (Van Barneveld *et al* 2002)

The Planning Act of 1992, which was revised in 1994 and 2000, adopted measures ensuring that special planning and function justifications are required for permitting building projects and the designation of new areas for development in the coastal zone. If such justifications exist, the main rule is to locate behind already existing settlements. The designation of new areas for summerhouses is not allowed. The coastal planning zone does not comprise the urban areas and the planning system does not function beyond the coastline. However, The Planning Act includes regulations for building in coastal urban areas. The main emphasis is

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placed on a quality-based incorporation of new building in the city, viewed in relation to the surrounding coastal landscape. Through the Danish environmental legislation the open coasts are preserved as an important landscape resource while in the areas where the population is actually living, planning requirements are only imposed when absolutely necessary. In relation to tourism, vacation centres and hotels with floor space above 50.000m² are subject to mandatory Environmental Impact Assessment (EIA). EIA and public participation are key elements to the Planning Act. This approach does not involve separate coastal planning but is integrated into the ordinary planning process (Gibson 1999). There is no legal basis for integrating planning across the intertidal shore – except for specific nature conservation purposes as previously mentioned.

The Coast Protection Act empowers regional authorities to protect against flooding and erosion. In the case that the regional authority does not have enough expertise, the Act makes it possible to involve at an early stage the Danish Coastal Administration (DCA) for assistance in further examination of the project. The DCA also has a management task for the coastal zone. The DCA consists of four major sectors:

- monitoring,
- analysis and design,
- contracting,
- legal and regulatory activities (Van Barneveld *et al* 2002).

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Case Study - Western coast of Jutland

Major parts of the 384 km of the Jutland West Coast are under the jurisdiction of the Dune Preservation Law. Legislation, therefore, has functioned as an early setback line and has prevented undesirable development in this century. Considerable public funds are allocated for the acquisition of areas which can form green wedges through the coastal zones. In the period 1981-1991 large national and international nature conservation areas have been established covering10% of the coastline.

The western coast of Jutland belongs to the highly exposed North Sea coast and it is a shoreline of adjustment controlled by promontories, with embayments protected by offshore bars. Many small villages are located on the western coastal strip. Furthermore, the area has a considerable recreational and environmental function. The risk over flooding and coastal erosion is considered to be high. In the Hvide Sand
Ringkobing Fjord flooding has become an increasing problem to the farmers of the area. Torsminde – Nissum Fjord has serious erosional problems similarily in the region of Thyboron chaneel Nissum Bay.

The policies for safety assessment, erosion control and cost of coastal protection were established between an agreement between local authorities and the government based on the Danish Coastal Authority recommendations. In 1982 it was decided to implement a coastal protection scheme to: re-establish a safety level against flooding to a 100 year return period minimum; to stop the erosion where towns are situated close to the beach; and to reduce erosion on parts of the coast where erosion in the near future would reduce the safety against flooding to less than 100 years. The policy line is a combination of a hold the line, do nothing, managed realignment and limited intervention depending on location, the function at the location and the current and future state of the coastal protection at the location (Sistermans and Nieuwenhuis 2004).

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4.7 Finland

4.7.2 Integrated Coastal Zone Management

In Finland, there is no single authority for coastal zone management and planning. The Ministry of Environment is responsible for national environmental policy and issues related to marine environment protection in general. The Advisory Board undertakes co-ordination for the Marine Environment which works in connection with the Ministry of the Environment to find common understanding in marine environment matters. Planning control is decentralised and in most cases undertaken at municipality level following the tradition of local autonomy. There are approximately 100 coastal municipalities (Wormgoor *et al* 2002).

The Ministry of the Environment, Land Use Department, is the responsible body for ICZM and sustainable development. The Advisory Board undertakes co-ordination for the Marine Environment which works in connection with the Ministry of the Environment to find common understanding in marine environment matters. The Council of State nominates members of the Board for a period of three years. The Board gives advice to the authorities in matters related to marine environment, mostly in the context of international co-operation. The Board has members from some Ministries, Central Associations for different sectors and nature protection organisations of relevance to marine protection matters. In the past it had stronger influence in decision-making but nowadays its role is mostly informative (Wormgoor *et al* 2002).

Case Study – Coastal Planning on the Gulf of Finland

The project *Coastal Planning on the Gulf of Finland is* one of the EU Demonstration Programmes on ICZM. The project comprised several municipalities regional councils and also the Uusimaa and Southeast Finland Regional Environment Centres drawing up master plans for their coastal zones. The master plans were to follow the new Nature Conservation Act, the new Forest Act and the new rules about planning and building in coastal areas in the Building Act and in the Water Act. At this moment the master plans have already been approved in each municipality and the administrative processes (final ratification and/or appeals) are ongoing (Wormgoor *et al* 2002). During the implementation, several goals were achieved: the municipalities succeeded in encouraging the participation of the inhabitants and landowners in the planning; solutions were found for some difficult conflicts and progress in integrating environmental impact assessment was made. Co-operation between municipalities helped them find new solutions to the problems and support each other in the ICZM process. The project team also co-operated with the main regional authorities and with other interest groups (*e.g.* local schools). Problems of sustainable development in coastal zones were discussed with some European countries. The co-operation with planning bodies in Sweden and Estonia was not as useful as expected because of the differences in their legal systems and their different problems (Wormgoor *et al* 2002).

A new Nature Conservation Act 1996 has been adopted with the aim of preserving the diversity of nature in Finland. The Act considerably extends the range of measures available for nature conservation. Sensitive areas can now be protected temporarily as well as being designated as permanent nature reserves. Other options include specific management and protection agreements for certain areas, legislation to help preserve certain protected species and areas of their habitat, habitat protection as such, and the designation

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of areas of valuable landscapes for protection. There are currently about ten conservation programmes still being implemented in Finland such as schemes to protect herb-rich woodlands, wetlands rich in bird life and old-growth forests. The Act also introduces new tools for the protection of valuable landscapes even in areas where human activity is minimal (Wormgoor *et al* 2002).

The new Act was drawn up to meet the latest conservation needs and Finland's obligations under the EU Bird and Habitats Directives. The Nature Conservation Decree 1997 lists protected species, threatened species, species needing special protection and species which need strict protection according to the EU Habitats Directive (Wormgoor *et al* 2002).

In 1990, a Shore Protection Programme was established with the aim of creating a network of protected areas. The areas included are to be maintained in a natural state without exploitation in the form of construction, building of summerhouses etc. Public access in accordance with the principle of 'Everyman's Right' will normally be allowed. The concept of Everyman's Right gives everyone the basic right to roam freely in the countryside, without needing to obtain permission, no matter who owns or occupies the land. These areas are intended to be either, purchased by the state, required by the state in exchange or protected by agreement with the owner. The landowners were compensated (Wormgoor *et al* 2002).

In August 1998, the Finnish government proposed to the EU Commission the inclusion of a total of 1,458 sites into the Natura 2000 Network. The total area of these sites is approximately 12 per cent of Finland's area cover. The areas proposed for Natura 2000 mainly consist of existing conservation areas, wilderness areas and sites covered by protection programmes (Wormgoor *et al* 2002).

4.7.2 Planning in Coastal Areas

In Finland, there is no overall national legislation specifically for coastal zone planning. Due to the absence of any significant tide, a relative sea level decline and moderate wave climate, coastal defence is not an issue in Finland (Wormgoor *et al* 2002). The Land Use Department of the Ministry of the Environment is responsible for the legislation and guidelines for an integrated approach to spatial planning and the management of land resources as well as environmental protection. Therefore, the ministry has an important role in the national co-ordination and guidance of land use planning. The Ministry of the Environment prepares non-binding national strategies such as the Finland 2017 Vision of the Spatial Structure, the Land Use and the National Environment Policy Programme 2005 and special programmes of forests, shoreline management, national parks, nature reserves, cultural heritage etc. Planning control is decentralised and in most cases undertaken at municipality level following the tradition of local autonomy. There are approximately 100 coastal municipalities (Wormgoor *et al* 2002, Gibson 1999).

A new Land Use and Building Act (132/1999) and Land Use and Building Decree (895/1999) came into force on 1 January 2000 replaced the Building Act of 1958. The main aims of the new act are to create a sustainable basis for the development of communities, to improve public participation in area development, to delegate decision-making to local authorities and to improve building quality. Planning and building in coastal areas follows the guidelines laid down in 1997 legislation (Ministry of the Environment, Finland, 1999, Gibson 1999).

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The land use planning system operates on regional and municipal levels. National land use goals set by the Finnish Government additionally cover key infrastructure networks as well as natural areas and built-up areas of national significance. National and regional goals are expressed in regional land use plans, which are the only plans that need to be submitted for government approval. These regional plans are prepared by the 19 regional councils, which consist of the representatives of local authorities (Ministry of the Environment 2004).

On the local level, land uses and the locations of land uses and activities are controlled in Local Master Plans. Municipalities may also decide to co-operate on the drafting of joint master plans, covering the planning of major roads, and the location of significant retail outlets, workplaces, and residential areas. Such joint planning requires the approval of the Ministry of the Environment (Ministry of the Environment 2004). There is no definitive setback line policy in Finnish law. Guidelines issued by the Ministry of Environment stipulate that development should be controlled by a planning requirement on a 100 m strip along the coastline, which can be increased to 200 m. The Local Master Plan determines how near to the shore development can take place. This can include building closer than 100m to the sea (Wormgoor *et al* 2002).

Local decision-making powers were enhanced in the new Land Use and Building Act of 2000. The local authorities have more suitable resources and expertise to deal with local planning issues, and the local detailed plans drawn up at municipal level to control building do not need to be approved by higher authorities. The national government continues to safeguard the achievement of national goals, however, and also provides assistance to local authorities as necessary. Appeals against local land use planning decisions are handled by the administrative courts. Existing local plans are reviewed after a maximum of 13 years to confirm that they are up to date, and plans are implemented with greater flexibility than previously. The Land Use and Building Act contains special stipulations on certain development areas and local planning needs. Public participation has been strengthened at the local level, and is encouraged from the earliest stages of open planning processes. Procedures for participation and impact assessment must be set at the start of every planning project (Ministry of the Environment 2004).

Shoreline Master Plans

Shoreline Master Plans have been an important element of planning in Finland since the national Government approved a national shoreline protection programme in 1990. Since 1997, building has not been permitted along shorelines unless they have been specifically designated for building in previously approved plans (Ministry of the Environment 2004).

The Land Use and Building Act allows national urban parks to be designated on land owned by the State or the local authorities. Urban parks are designated to safeguard extensive green belts within urban areas, in order to improve the residential environment and recreational amenities, while also protecting Finland's natural and cultural heritage. Building permits may only be granted for new commercial premises of more than 2,000 square metres in extent where a site has already been designated for commercial land uses in existing plans (Ministry of the Environment 2004).

Revisions made to the Land Use and Building Act in 2003 oblige landowners who benefit significantly from changes in local detailed plans to contribute towards the costs of redrawing the plans concerned. This change was introduced to ensure that planning expenses will not be a limiting factor where local authorities are working to maintain a suitable supply of development sites (Ministry of the Environment 2004).

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Case Study – DALO project

The DALO project is an ecologically acceptable method and demonstration for controlled, progressive use of the shore zone. The aim is to present decision makers with proposals for concrete measures for planning and investment and other efforts that will contribute to positive development in the Bothnian Arc region. The project is to create long term networks for regional cooperation, encourage vital agreements for development and new project ideas. It represents a totally new planning method. The project also includes development of ecologically acceptable methods for controlled and progressive use of shore zones (Wormgoor et al 2002).

Finnish legislation on land use and building includes certain general minimum requirements and conditions for building permits. More detailed building regulations are set out in the National Building Code for Finland. In 2000, the Finnish Council of State set the first national land use guidelines. The EG93 Finland's National Land Use Guidelines outline Finland's land use far into the future. The guidelines indicate which issues should be taken into account all over the country in all land use and land use planning. Under the Land Use and Building Act, regional planning, planning at the local level, and the activities of government authorities should promote the implementation of these guidelines (Council of State 2000).

Finland is also party to the Helsiniki Convention on the Protection of the Marine Environment of the Baltic Sea Are and the requirement for plans in the shore zones is intended to implement HELCOM Recommendations 15/1 concerning the protection of the coastal strip (Gibson 1999).

In 1997, the new Nature Conservation Act came into force. The aim of this act is to protect endangered plants and animals and some valuable habitat types. The shore is not considered a protected environment in Finland so the law does not prevent building in the shore zone. The overall guidance of land use and the siting of various activities take place locally by means of master plans. The introduction of a provision into the Building Act states that building in the shore zone requires a land use plan drawn up by a local authority. This was meant to ensure sustainable use of the shore areas. For this reason the main instruments used for land use planning of shorelines are the “shoreline master plans” (Wormgoor *et al* 2002).

In most cases coastal management and planning is undertaken at municipality level following the tradition of local autonomy. There are approximately 100 coastal municipalities. The authorities and available instruments for spatial planning are shown in figure 15 (Wormgoor *et al* 2002).

	Responsible authority	Instrument
National	National government	*Legal framework and main legislation* Land Use and Building Act 2000
Regional	19 Regional counties and Åland	*Strategic plans* Regional plans
Local	454 Municipalities	*Framework plans* Local master plans *Regulatory plans* Local master plans Local detailed plans

Figure 6: The responsible authorities and available instruments for spatial planning in Finland (Source: Wormgoor et al 2002)

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4.8 Latvia

The major stakeholders concerning the natural Baltic Sea coastal hazards and climate change in Latvia are the:

- Ministry of Regional Development and Local Governments;
- Ministry of Environment;
- Latvian Hydrometeorological Agency; and

Latvian Environmental Protection Fund Administration (Cilinskis 2004).

There are 7 cities, 21 civil parishes (*pagasti*) and 20 other urbanised areas built along the coast with direct access to the Baltic Sea or Gulf of Riga (about 50% of population of Latvia live in the coastal are). The Ministry of Regional Development and Local Governments is responsible for spatial planning and the sustainable development of territories (Cilinskis 2004).

4.8.1 Spatial Planning

The Spatial Planning Law was adopted by the *Saeima* on 22 May 2002 (superseding the Territory Development Planning Law, *Latvijas Republikas Saeimas un Ministru Kabineta Ziņotājs*, 1998, No. 23). The Spatial Planning Law prescribes the following planning principles:

- the principle of sustainability, which ensures a qualitative environment, balanced economic development, rational utilisation of natural, human and material resources, development and preservation of the natural and cultural heritage for the present and next generations;
- the principle of interest co-ordination, which ensures that a spatial plan is developed in accordance with other spatial plans and the plan co-ordinates State, planning region, local government and private interests;
- the principle of diversity, which ensures that in the development of a spatial plan the diversity of nature, the cultural environment, human and material resources, and economic activity is taken into account;
- the principle of delineation, which ensures that spatial planning at the national, planning region, district and territorial local government level is provided for with a differing level of detail;
- the principle of competition, which ensures that a spatial plan creates equal pre-conditions for entrepreneurial activities;
- the principle of continuity and succession, which ensures that when the justification for a plan that is in effect changes, the spatial plan shall be amended preserving those parts of the spatial plan the justification for which has not changed; and
- the principle of openness, which ensures that a spatial plan is developed by involving the public and ensuring the openness of information and decision taking (Straume 2002).

The Law states that '*by developing mutually co-ordinated spatial plans, spatial planning shall be implemented at the following planning levels: national, regional, district, and territorial local levels*'. The National Spatial Plan sets out all national interests and requirements for the utilisation and development of the territory of the

State, in accordance with the State Regional Policy Guidelines, the National Development Plan and a national or sectoral development programmes (Straume 2002).

A planning region spatial plan specifies the development possibilities, directions and restrictions of the planning region territory are specified. The district local government spatial plan specifies the development possibilities, directions and restrictions of the district local government territory, the present and planned (permitted) utilisation of the district local government territory, as well as details of the requirements, territories and objects specified in higher level spatial plans (Straume 2002).

Finally a territorial local government spatial plan specifies a detailed plan and binding building regulations, the development possibilities, directions and restrictions of the territorial local government territory, the present and planned (permitted) utilisation of the territorial local government territory, as well as detailed requirements, territories and objects specified in higher level spatial plans (Straume 2002). The Law on Territory Planning promotes sustainable development using effective territorial planning system and regulates the National Spatial Plan (Straume 2002a).

The Regional Development Law adopted by the *Saeima* on 21 March 2002. promotes and ensures balanced and sustainable development of the State, taking into account special features and opportunities of the entire State territory and of separate parts, to reduce the unfavourable differences among them, as well as to preserve and develop the features characteristic of the natural and cultural environment of each territory and the development potential. Five planning regions were established – Kurzeme Region, Latgale Region, Rīga Region, Vidzeme Region and Zemgale Region. The Cabinet determines the territories of the planning regions in accordance with proposals submitted by local governments (Straume 2002a).

The Construction Law adopted by the Saeima on 10 August 1995 'determines the mutual relations of persons participating in construction, as well as the rights and obligations thereof during the construction process and liability for the conformity of the structure which has emerged as a result of construction with the task thereof, economic viability, the intended lifetime and the relevant regulatory enactments, as well as the competence of State administrative and local government institutions in the relevant field of construction. This Law shall apply to all types of structures. Construction shall be regulated by this Law, the Civil Law, other laws and regulatory enactments, as well as international agreements binding on Latvia. For the implementation of this Law, the Cabinet shall issue the General Construction Regulations, construction norms and other regulatory enactments' (Ulmanis 1995).

The Law on Protected Belts prescribes types of protected belts and stipulates business activity limitation and prohibitions in protected belts and the dune zone of the Baltic Sea and Riga Bay. Other legislation concerning the environment include the Law on the Protection of Species and Habitats and the Law on Specially Protected Nature Territories. Additional policy documents include the National Program on Biological Diversity, 2000 and Nature protection plans for individual nature reserves. From 1997 to 2004 more than 25 projects for conservation of the seacoast have been funded by the Latvian Environmental Protection Fund (Cilinskis 2004).

The National Environment Policy Plan for 2004-2008 has to adopt the Integrated Coastal Management Plan in 2005. One of the major goals of this plan is to increase scientific research to assess the impact of global

warming on ecosystems in Latvia, including the coastal zone, to evaluate socio-economic effects thereof and to prepare proposals concerning the adoption measures until 2008 (Cilinskis 2004).

4.8.2 Climate Change and Coastal Management

The Ministry of Environment is involved in the national climate change mitigation policy, accomplishing monitoring on geological processes of the seacoast annually, developing nature protection plans and individual protection and management regulations for nature reserves in the coastal belt cover alongshore of 234km (or 47% of total length). A proposal for *Climate Change Mitigation Programme* is currently under preparation. The mechanism for evaluation of climate change impacts, vulnerability and adoption measure will be included in the Programme. Currently scientific research studies on possible climate change impact on national economy are lacking, as well as economic and social adoption measures are not elaborated (Cilinskis 2004).

Case Study - Jurmala and Riga

A number of houses adjacent to the foredune in Jurmala and to the harbour facilities a Ziemas osta in Daugavgriva have been abandoned as a result of shoreline recession. In other districts of Jurmala and Riga erosion of beaches threatens economical assets of associated with leisure facilities.

Recent studies have evaluated that up to three million euros of capital are at direct risk of coastal erosion in Riga. In addition to this there are potential damages as a result of storm surges as witnessed by the coastal flooding in 2001.

Latvian authorities have developed an approach based on a combination of different measure. Replanting of foredunes with maram grass and other hard coastal defence techniques (Eurosion 2004).

In spite of legislation on coastal protection, effective shoreline management along the Gulf of Riga suffers an overlap of responsibilities among national and local institutions and from conflicts with other existing legislation. In the future reinforced spatial planning regulations are expected to better control the development of assets along the coast and to clarify the responsibilities of the various stakeholders towards coastal erosion and associated risk of flooding. This is expected to be achieved in connection with the ICZM recommendation by the Latvian government (Eurosion 2004).

4.9 Sweden

4.9.1 National Planning

The Swedish Environmental Code (1999) includes special management provisions for particular coastal zones in Sweden. The inland and off-shore extent of the coastal zone is not explicitly defined in the Code but the areas were comprehensively showed on maps connected with the bill in which the regulations were proposed. According to the bill the more detailed definition of the various coastal zones is a task for the municipal comprehensive (physical) planning. The extension off-shore is suggested to be 1 – 3 nautical miles from the base-line (Van Barneveld, Duyvestein and Pickaver 2002).

The central government ministries most relevant to coastal zone planning and management are the Ministry of the Environment and to some extent the Agricultural Ministry where issues concerning fisheries are handled. The National Boards or Agencies in Sweden also have great responsibilities regarding environmental issues and planning since they produce guidelines and some of them give permits to larger projects within their sector. Most important are the Swedish Environmental Protection Agency (EPA), the National Board of Fisheries, the National Board of Shipping and Administration, the Swedish Board of Housing, Building and Planning and the Coast Guard. With the purpose to achieve a sustainable community, these agencies together with the regional organisations have a responsibility to inform, consult and co-operate with the municipalities in different matters concerning physical resources (Van Barneveld, Duyvestein and Pickaver 2002).

The municipalities in Sweden are responsible for physical planning both at the comprehensive and detailed level although the County Administrative Board can intervene if decisions by the municipalities threaten national interests (Van Barneveld, Duyvestein and Pickaver 2002).

In April 1999, the Swedish parliament decided on 15 national environmental quality objectives which are important to obtain sustainable development. Many of the objectives are relevant to coastal areas and one of them - “A balanced marine environment, sustainable coastal areas and archipelagos” - is specially addressed to the coastal areas (Van Barneveld, Duyvestein and Pickaver 2002).

The environmental quality objective is an action plan for environmental policy. The environmental code is adjusted to the development within environmental policy and the legislation is used as a tool for reaching the environmental objectives. Environmental quality objectives are political by nature and should provide a basis for the forthcoming environmental policy. The rules and prescriptions of the code are tools to reach the targets. There is no contradiction between the code and the environmental quality objectives; they interact to reach the final objective of sustainable development. It should be stressed that Spatial Planning is an instrument to achieve environmental objectives (Van Barneveld, Duyvestein and Pickaver 2002).

In 1997, a national project started, called Environmental Objectives and Indicators in Spatial Planning (SAMS). The aim of the project was to find out how environmental objectives could be adapted to spatial planning and which indicators could be used to determine whether a planning alternative contributes to, or obstructs, the environmental objectives. The project was finished in the autumn of 2000 and has resulted in a

lot of publications in which methods, tools, good examples and case studies are presented. The focus is not specifically on the coastal areas but the methodological results presented could be applied in the coastal areas (Van Barneveld, Duyvestein and Pickaver 2002).

The National Board of Housing, Building and Planning is responsible for the general supervision of the planning and building administration within Sweden. The Planning and Building Act 1987 (amended 2003) provides for the planning of land under which, each municipality prepares a comprehensive plan. The comprehensive plan provides guidance for decisions about the use of land and water areas and on development. The plan is not binding to authorities or municipalities. The regulation of land use and of building within a municipality is exercised through a detailed development plans (National Board of Housing, Building and Planning 2005).

Where required for securing the purpose of the comprehensive plan or for safeguarding national interests in accordance with Chapter 3 and 4 of the Environment Code (1998:808) (amalgamates all the previous Acts referring to the coast), area regulations may be adopted for limited areas of the municipality, which are not covered by a detailed development plan. Property regulation plans may be adopted for the purpose of facilitating the implementation of detailed development plans. For the coordination of the planning for two or more municipalities, regional plans are adopted (National Board of Housing, Building and Planning 2005).

Other laws of particular concern for the coastal areas are the Swedish Economic Zone Act and the Fishery Act. An economic zone was established in 1993 outside the Swedish territory. The Swedish Economic Zone Act consists of the regulations concerning protection of the marine environment and utilisation of natural resources in the zone. The Fishery Act regulates fishing (Van Barneveld, Duyvestein and Pickaver 2002).

In 1998, a national project named the Archipelago project was set up. It was initiated by the Swedish national government for the development of all archipelagos around Sweden. The aim was to create a concrete action programme designed to achieve sustainable development of the archipelagos. Seven County Administrative Boards were involved. The County Administration was the project leader and so had total responsibility for the project in which there was also a group of coastal specialists from the municipalities and other people with special knowledge of the coast. The project was completed in 2000 (Van Barneveld, Duyvestein and Pickaver 2002).

As a part of the project, Regional Environment and Management Programmes were developed for four coastal areas: the coastal area in the counties of Stockholm, Uppland and Södermanland, the coastal areas of Östergötland and Kalmar, the Blekinge Coast and the coastal zone between Gothenburg and the Norwegian border. Besides some legal aspects the Regional Environment and Management Programmes included the following components:

- definition of issues and problems of the environment and management of natural resources in a way which is beneficial to the environment and at the same time integrated with employment and economic growth;
- economic possibilities and conditions for support of development, for example EU Structural Funds Programmes, to achieve ecologically sustainable solutions; and

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- special programmes developed to deal with the environment and management issues in regional and local planning (Van Barneveld, Duyvestein and Pickaver 2002).

4.9.2 Government Assistance for Areas Affected by Landslides

The Swedish Rescue Services Agency (SRV, *Räddningstjänstlagen*) is the government authority responsible for safety against accidents in society; Tasks include risk assessment and management. Municipalities in Sweden are responsible for carrying out risk inventories within their own borders, taking preventative measure, establishing emergency plans and taking measure in the event of accidents. The Government provides general assistance in urban areas to identify zones that are susceptible to landslides and floods. This is being achieved via a general stability survey. SRV has the responsibility of making these maps and the priority of municipalities to be mapped is decided according to the level of risk within the municipality (Edsgård 2003).

Ground stability assessments are made by evaluating old surveys, conducting new geotechnical surveys and studying soil types and topographical conditions. The survey covers the whole of Sweden but is carried out at municipal level and only in urban areas. In addition to showing areas of instability the maps show the areas that require further study. The results are presented as a report with printed maps to the municipalities to carry out analysis with a GIS. The maps also form part of the basic information for everyday risk management (Edsgård 2003).

The survey began in 1978 in the most vulnerable municipalities and due to changes in surveying guidelines issued by the Swedish Commission on Slope Stability (*Skredkommissionen*) the areas are being re-surveyed (Edsgård 2003).

In 1986 the Government introduced an appropriation of 2.5 million Euros per year for preventative measure regarding landslide and floods. Municipalities with areas that have been built up without conducting sufficient surveys can apply for a grant from this appropriation to take preventative measures. SRV deals with these grant applications (Edsgård 2003).

The Swedish National Board of Accident Investigation (*Boverket*) investigated the 1997 landslide in Vagnhärad and insisted that if the new guidelines issued by the Swedish Commission on Slope Stability had been followed then the clay hillside would never have been built on (Edsgård 2003).

To increase the level of knowledge concerning landslide issues both during planning and when measures such as, slope unloading, drainage of water and protection against erosion are being implemented in existing settlements, the Swedish Geotechnical Institute (*Statens geotekniska institute*, SGI), the National Board of Housing, Building and Planning, the National Board of Accident Investigation and SRV are now running a joint campaign to increase knowledge on landslide targeting personnel dealing with planning, rescue services and politicians (Edsgård 2003).

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Case Study - Landslide in Trosa

In 1997, a landslide occurred in the municipality of Trosa, community of Vagnhärad in the Södermanland province about 70km south-west of Stockholm. The residential area of Vagnhärad known as Ödesby was developed in mid 70s. The plan for building Ödesby recommended that the area should be built with 'one family' houses. In the building plan it was suggested that 45 'one family' houses should be built in the area and that these should only be one-story houses. There were also restrictions about the height of the houses, the living area of each house and the number of main buildings and outbuildings. Geotechnical investigations prior to planning and development of the area were carried out in the early 70s. In these investigations restrictions for development of the area and general recommendations for foundation of buildings were given. It was states that the soil was sensitive to settlement for increased loads and that there was a risk for landslides even with small load increases. Concerning the planning of houses in the area, a more detailed geotechnical investigation was carried out, which included detailed recommendation for foundations of buildings and restrictions on the height of fillings in the area (Löfroth and Kjellberg 2003).

Early evidence indicated the likelihood of the event and a rescue service phase was applied in accordance with section 2 of the Rescue Services Act (*Räddningstjänstlagen*). An initial risk zone was cordoned off and three houses evacuated with the support of section 45 of the same Act. Although the rescue system was effective afterwards it was thought that information to victims could have been better distributed prior to the event (Löfroth and Kjellberg 2003).

A new survey was carried after the event which showed that several areas needed to be studied in greater detail on order to ascertain ground stability. A detailed geotechnical study was also carried out in those areas that could not be classified as stable. the municipality of Trosa have applied for grants and in 1998 received a total of 2.5 million Euros (Edsgård 2003).

Swedish Commission on Slope Stability

The Swedish Commission on Slope Stability was active from 1988 to 1996. Its tasks were to initiate research on the subject and disseminate knowledge about slope stability, landslides and methods of preventative measure. Members of the commission included personnel from municipalities, authorities, geotechnical advisors, contractors and technical universities. The commission also produced several paper, reports and videos (Edsgård 2003).

Civil Protection Act

On 1st January 2004 the Civil Protection Act (2003:778) replaced the Swedish Rescue Services Act. The structure of the act is based on the three phases: preventive measures, emergency response, and post-response measures; as well as on the responsibilities of the individual, the municipality and the state. Reduced detailed regulations in relation to previous legislation of, first and foremost, the municipal fire-rescue services. National objectives have been implemented for both emergency prevention and emergency response work. Programmes of action for civil protection (emergency response and emergency prevention)

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will be established by the municipalities. The individual's responsibility is made clear, for example, by the obligation to draw up written accounts of fire prevention measures for certain operations, and by the municipality's safety inspections being by supervision (Butler 2004).

Increased emphasis is placed on emergency prevention work, the municipality should promote safety for people in the municipality, and in addition be active within civil protection for other emergencies. The municipalities and national emergency services authorities will to a reasonable extent investigate the causes and courses of events of emergencies; and also evaluate how emergency response operations have been performed (Butler 2004). Provisions for compensation for municipalities and individuals is given under the Civil Protection Act.

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4.10 The Netherlands

As a low-lying country, the Netherlands is very vulnerable to flooding. 60% of the population is living in the low-lying polders, behind the sea defence, and 65% of the national gross product is earned. The pressure on the coast is increasing, both from the sea and the land. The pressure from the sea is increasing because of sea level rise and the expected increases in storm intensity The pressure from the land is increasing as a result of the growing number of inhabitants and the intensification of the land use (Arends 2004).

The Dutch coast is an erosive coast and there is a long tradition in coastal protection. In 1990, the Dutch Government decided that further loss of land to the sea was no longer acceptable as too many interest were at stake. The Ministry of Transport, Public Works and Water Management established the 'basal coastline' as the position of the coastline on the first of January 1990. The technique for coastal protection is beach nourishment and the policy can be described as '*soft where possible and hard where necessary*' (Arends 2004).

The Province of North and South Holland Coast (Source: Arends 2004).

Sea Level Rise

The Directorate–General of Public Works and Water Management 2002 states '*In the future coastal defences will face heavy battering from rising sea levels and an expected higher frequency of storms. The ability to combat these challenges requires space in the coastal zone*'. In response to the threat the government is '*undertaking the duty to guarantee the safety of the hinterland and maintain – and where necessary enhance*

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the spatial quality of the coastal zone' (RIKZ 2002). According to current estimates '*an 85cm sea level rise per century would require replenishments of 10 million m3 of sand a year, and an extra 10 million m3 of sand a year will be needed to compensate for losses in deeper water'* (RIKZ 2002).

In 1999 the Ministry of Transport, Public Works and Water Management, the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Agriculture, Nature Management and Fisheries, and the Ministry of Economic Affairs produced a preliminary study '*A coastal Zone Perspective'* outlining the growing tension between rising sea levels and the pressure society is placing on the coast; and present the government with a wide range of policy issues.

Case Study - Sea Level Rise Scenarios

The *Third Coastal Policy Document 2000'* published a series of sea level rise scenarios for The Netherlands based on the IPCC reports.

Low Scenario: 20cm/century
The scenario is applied to take decisions regarding projects with a short term design period (approx 5 years) requiring limited investments and flexible solutions, such as sand replenishment.

Median scenario: 60cm/century
The scenario is applied to take decisions regarding projects with a longer design period (50-100 years) requiring major investments and little flexibility solutions, such as the construction of dikes and storm surge barriers.

High scenario: 85cm/century and a 10% increase in wind
This scenario is applied to make spatial reservations for the purpose of flood defence.

This document applies a 200 year policy horizon in accordance with the *Third Coastal Policy Document* and the recommendations of the Technical Advisory Committee for Flood Defence Structures (RIKZ 2002).

Following on from this report and in response to the '*Third Coastal Policy Document 2000'*, The State Secretary of Transport, Public Works and Water Management presented the policy agenda for the coast '*Towards an integrated coastal zone policy*' in 2002. The policy document places the key challenges for the coast, which are mentioned in earlier reports, on the policy agenda. High on the policy agenda were: weak links in the coastal defence; the safety of the hinterland; risk management; coastal foundation zone (as a follow up to the *5th National Policy Document on Spatial Planning,* stating that sand is the best defence); coastal policy and administration; storm surge awareness; and ICZM.

For each subject discussion meeting were organised in the spring 2002 to discuss the solutions with representatives of administrative organisations, scientific organisations, interest groups, land management organisations and local citizens. The results of these meetings and the Policy Agenda for the Coast together

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form the construction of a policy line for the coast. The Government published the '*Line of Policy for the Dutch Coast'* in 2003.

Liability

Section 7 of the Flood Defence Act determines which interested parties should be involved in flood defence structure activities. Flood defence managers are responsible for the defence structure and standard of and the government is responsible for overseeing that the basic coastline is maintained. There is a lack in clarity with regard to who is liable for areas outside defence structures (dikes) in the erosion zone for which no legal safety standards apply. In principle the owner of the property in question is liable. Anyone who wants to build in areas outside the dikes, where no legal safety requirements apply, requires a permit issued by the municipal authorities and the water board. The municipal authorities assess building permit applications using a limited general assessment framework, which does not take into account possible damage to the buildings. The water boards' decision depends on whether the flood defence structure is likely to sustain damage (RIKZ 2002).

The government is liable for damages where the government has acted unlawfully and negligent in the performance of its tasks which could have prevented the damage. The Netherlands Civil Code stipulates that it has acted unlawfully and must fully compensate for damages. Although property owners in the erosion zone bear primary responsibility and liability, the government may decide to provide partial compensation in the event of rare calamities (RIKZ 2002).

The Flood Defence Act has been amended to take into account the 5th National Policy Document on Spatial Planning, therefore the location of flood defence structure must be integrated into zoning plans, taking into account the 'high' scenario of 200 years of rising sea levels.

The Spatial Planning Decree prescribes consultations between spatial planning bodies and water management bodies in preparation of zoning plans. The Spatial Planning Act was amended in 2004 to improve policy implementation and enforcement powers and changes the current planning structure; regional and zoning plans are replaced by the strategic policy document .The General Administrative Law Act (amended 2004) introduces new regulations for information provision and coordination to improve the permit procedure.

The main administrative bodies dealing with coastal hazards are: the Ministry of Transport, Public Works and Water Management, the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Agriculture, Nature Management and Fisheries, and the Ministry of Economic Affairs. The *Rijkswaterstaat Rijksinstituut voor Kust en Zee* (RIKZ ~ National Institute for Coastal and Marine Management) is one of the six specialist services of the Directorate General of Public Works and Water Management, the RIKZ is the main supplier of knowledge, particularly sustainable use of coasts and seas and protection of the land against tidal flooding.

5. EUROPEAN EXAMPLES OF GOOD PRACTICE IN HAZARD MANAGEMENT

There is a need to adopt a more proactive and integrated approach to hazard management, based on planning, monitoring, evaluation, and ICZM in view of the impacts of climate change. This summary has identified examples of good practice in EU Member State coastal zones to assist long term planning and risk management of natural coastal hazards. For a more detailed review of good practice, see the RESPONSE publication "Responding to the risks from climate change: a good practice guide".

In the UK coastal instability issues are addressed through the framework of plans (e.g. PPG20 Coastal Planning) and strategies that have been developed with government guidance and EC support. The Coast Protection Act 1949 gives local authorities (LAs) powers to carry out works in areas deemed at risk, to prevent coastal erosion or encroachment by the sea; whilst the Environment Agency (EA) addresses flooding under the provisions of the Water Resources Act 1991. Shoreline Management Plans (SMPs) and Coastal Defence Strategies within a sustainable coastal zone management framework (as promoted recently by the EC through their Demonstration Programme on the ICZM), provides the basis for sound decision-making in relation to coastal hazards. In the UK the Department for the Environment, Food and Rural Affairs (DEFRA) High Level Target No 5 states, *"Coast protection authorities are to report to DEFRA and the Department for Communities and Local Government (DCLG) on development plans identifying the extent to which they contain coastal erosion statements and reflect the assessed risk of coastal erosion as set out in, inter alia, SMPs".*

DEFRA is working with the DCLG in reviewing PPG25 to take account of any changes in knowledge on climate change. DCLG has publicly consulted on strengthening this policy in a new Planning Policy Statement (PPS) 25 which will help manage future flood risks in a sustainable way. DCLG is aiming to publish revised guidance and related changes to the planning system in autumn 2006.

Most coastal instability issues in the UK are well documented and understood, enabling problems to be identified, assessed and eventually managed providing sufficient resources and expertise are made available. An excellent base for the assessment of coastal risks such as erosion and instability is provided by the comprehensive knowledge of British topography and land-use illustrated by Ordnance Survey maps on a range of scales, and geological maps which have been prepared by the British Geological Survey.

The UK differs from some other EU member states over the question of insurance in relation to risks arising from coastal erosion and landsliding. In France Law Barnier authorizes the expropriation and compensation by the Government of all property threatened by natural risks. Compensation is funded from a State Surcharge of 12% which is added to all property insurance premiums. There is no similar provision in the UK from central government, although private insurance companies may in certain circumstances provide cover for property owners against landslip but this is not the case with coastal erosion. For more information regarding insurance against natural hazards, see the RESPONSE report "The economic impacts of natural hazards in European coastal zones, taking account of the consequences of climate change".

In Italy the General Direction for Maritime Works with the assistance of the Ministry of Environment maintains a strategic coastal overview; however issues relating to coastal hazards are addressed substantially on a

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regional level (e.g. RESPONSE Coastal Study Area - Regione Marche). With respect to landslide management in Italy, planning policies are shared by various bodies: Municipalities, Provinces, Regions and Central Government. The Regions have the most important responsibilities for soil defence and mitigation measures on landslides. They are provided with special funds for the management of landslides affecting inhabited areas and particularly important transport infrastructure. The government intervenes directly on a financial level through the Department for Civil Defence. Land-reclamation Syndicates also operate in some catchment basins. They deal with soil defence problems and carry out interventions on landslides: their activities often overlap (sometimes in an un-coordinated way) those pertaining to the Regions. A law was recently proposed in the Italian Parliament which recommended the abolition of these syndicates with the transfer of their areas of responsibilities to the Regions themselves.

In France statutory powers are split between the Commune and the Government. The Commune and has a general obligation to ensure public safety standards in relation to natural coastal risks and to take into consideration the potential of any natural risks when planning land occupancy. In addition, the Commune may (in accordance with Article R.111.2 of the Code of Country and Town Planning) refuse to grant planning permission for a development, subject to case by case conditions. The Commune may be held responsible in the case of an obvious error of judgement where it is found that a potential risk has been ignored. However, a Commune has no obligation to carry out coastal defence civil engineering, nor to finance its maintenance or repair. The Government has a general statutory power available for use wherever safety measures have not been implemented by the Communes or where the risk extends to several Communes.

Preventative information measures are disseminated in those Communes which include inhabited areas subject to risk. They correspond to areas where Risk Prevention Plan (PPR), Hazard Exposure Plan (PER) or an R111-3 border, Submersible Surface Plan (PSS), Particular Intervention Plan (PPI), General Interest Project (PIG) are in place. Similarly, in Italy information systems have been set up at national and local levels through the media and operational centres.

In France, the PPR (February 1995) relate to natural hazards such as flooding, landsliding, avalanches, forest fires, earthquakes, volcanic eruptions, storms and cyclones. The PPR delimits the geographical areas exposed to natural hazards and considers methods of prevention and protection measures to be implemented by the owners, local organisations and the public establishments. A PPR contains 3 documents:

- A presentation of the geographical area considered and the identification of the natural hazards and their possible consequences.
- Graphical documents that delimit the areas in which regulations of the PPR must be considered. The “Red Zones”, where new constructions are prohibited, are distinguished from the “Blue Zones” where new constructions are authorised subject to particular recommendations.
- The regulations that define the rules to be considered within that zone.

The PPRI (PPR Inondations) is a particular kind of PPR which deals with flooding hazards. In 2003, nearly 13,000 French communes were considered at high level for flooding risks and 9,500 of them had a PPRI.

The law of the 2nd February 1995, known as ‘Law Barnier’, allows the French Government, the Communes and the EPCI (Etablissements Publics de Coopération Intercommunale - Public Organizations for Inter-

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communal Cooperation) to allocate specific funds for natural hazard prevention (Fonds de Prévention des Risques Naturels Majeurs, also called Barnier Funds). The fund is supplied by a household tax of 4% on the natural catastrophe premiums, incorporated into house insurance. The fund may also receive advances from the State. The Barnier Funds are used to purchase properties within an area exposed to natural hazards which present a serious threat to human life, thus providing a form of compensation to home owners. The decree of the 15th January 2005 also authorises the financing of studies and works in the areas belonging to a PPR. This innovative example of hazard management through compensation may be considered an example of good practice in Europe, though with the increased risk of natural hazards due to climate change, such a funding resource may be under increasing pressure.

Poland faces the long term problem of an eroding coastline, particularly in view of increasing risks due to climate change. In order to try to mitigate these effects, a long-term (50 year) strategy of coastal protection has been developed, which includes not only technical, but also land management, legal and organisational measures, a strategy of selective retreat was also adopted. Poland has introduced a policy of setback lines along the entire length of the Polish coast. The setback lines comprise two types of delineation:

1. The Technical Belt – to ensure safety of the environment. The belt extends up to 200m inland, depending on the type of coast. The relevant regional Maritime Office must approve all uses of this belt of land.
2. The Protective Belt – to manage the impact of human activity. The Protective Belt extends up to 2km inland, from the landward boundary of the Technical Belt. The aim of the Belt is to limit the effects of human activity on the Technical Belt.

In Denmark the Coast Protection Act (Act no. 243, 5 April 1994) empowers the counties (regional authorities) to protect the coastal areas against flooding and erosion. It also provides improved co-ordination of coastal protection and development schemes within a coastal environment perspective. The Danish Coastal Authority can be consulted at an early stage for assistance of a project. The integrated process of coastal erosion management leads to local plans with a few prerequisites: coherence with the planning system; set back lines and building regulations.

In Sweden, the Civil Protection Act (2003:778) replaced the Swedish Rescue Services Act. The structure of the act is based on the three phases: preventive measures, emergency response, and post-response measures; as well as on the responsibilities of the individual, the municipality and the state. The main government authority dealing with coastal hazards in Sweden is the Swedish Rescue Services Agency (SRV). SRV tasks include risk assessment and management. Municipalities in Sweden are responsible for carrying out risk inventories within their own borders, taking preventative measure, establishing emergency plans and taking measure in the event of hazards such as landslides. The Government provides general assistance in urban areas to identify zones that are susceptible to landslides and floods via a general stability survey. SRV has the responsibility of making these maps and the priority of municipalities to be mapped is decided according to the level of risk within the municipality. Ground stability assessments are made by evaluating old surveys, conducting new geotechnical surveys and studying soil types and topographical conditions. The survey covers the whole of Sweden but is carried out at municipal level and only in urban areas.

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In 1986 the Swedish government introduced an appropriation of 2.5 million Euros per year for preventative measure regarding landslide and floods. Municipalities with areas that have been built up without conducting sufficient surveys can apply for a grant from this appropriation to take preventative measures. To increase the level of knowledge concerning landslide issues both during planning and when measures such as, slope unloading, drainage of water and protection against erosion are being implemented in existing settlements, the Swedish Geotechnical Institute, the National Board of Housing, Building and Planning, the National Board of Accident Investigation and SRV are now running a joint campaign to increase knowledge on landslide targeting personnel dealing with planning, rescue services and politicians. Provisions for compensation for municipalities and individuals are given under the Civil Protection Act.

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6. CONCLUSIONS AND RECOMMENDATIONS

The geology and topography of the European coastline present an enormous variety of coastal conditions, natural hazards and problems resulting from historic development in unsuitable or marginally stable locations. The interaction between coastal erosion, ground stability and development results in a need for sustainable planning and legal frameworks to ensure that appropriate development takes place. It is necessary to adopt sound approaches to planning and development of coastal land taking account of the physical and human environment and in view of the anticipated impacts of climate change.

In many European countries there are no statutory powers to protect coastal communities from the impacts of erosion and instability. Regional or local authorities, or land owners themselves, often construct coastal defences and in the case of France, compensation may be provided to communities living in areas of significant risk. For financial, environmental and technical reasons, the natural processes of coastal erosion and instability cannot be prevented in all locations. An integrated approach to the management of natural hazards must be put into practice to ensure that a sustainable balance is achieved between the economic and environmental costs and benefits for the nation as a whole.

In relation to the management of natural hazards in the coastal zone, decisions and strategies should be based on sound knowledge and understanding of geological and geomorphological information. It is also crucial to understand historical patterns of behaviour in order to best address current and future hazards and risk. The RESPONSE Project Training Pack details a transferable approach to assign and prioritising coastal hazard and risk at a regional scale. Such a methodology demonstrates the process of data collection, and interrogation and illustrates how this information is transferred into planning guidance.

In locations where it is unacceptable or unachievable to provide protection against natural hazards, alternative management strategies must be considered. Increasingly, communities are being forced to accept a certain level of risk, and to adapt to the consequences of living in a hazardous environment. Politically, it can be very difficult to inform communities that risk prevention is not possible, and to encourage an approach of adaptation. More work must be done to assist local authorities in making these difficult decisions and communicating these decisions to communities in order to ensure sustainable management of natural hazards.

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7. REFERENCES

Anker,H, T, Nellemann, V. and Sverdrup-Jensen, S (2003) Integrated Coastal Zone Mangement in Denmark. Paper submitted for the conference „Rights and Duties in the Coastal Zone", Stockholm, June 2003.

Arends, A. 2004. Holland Coast - The Netherlands. National Institute for Coastal and Marine Management-RIKZ. The Hague. http://www.eurosion.org/shoreline/table.htm

Atkins 2004. ICZM in the UK: A Stocktake. Undertaken by Atkins on behalf of DEFRA.

Ballinger, R. 2002. *An evaluation of integrated coastal management in the united kingdom,* Sustainable Coastal Management: A Transatlantic and Euro-Mediterranean Perspective, 75-93.

Ballinger, R. and Dodds, W. 2004. Local Government Reform and the Role of Local Government in Coastal Risk Management. Research Paper No. 3. A Research Paper for the Local Government Association's Special Interest Group on Coastal Issues. Local Authority Coastal Risk Management: Information Pack. Isle of Wight Centre for the Coastal Environment, UK

Ballinger, R. *et al*, 2005. *Final Report. A review of coastal and maritime initiatives and pressures.* Report to the Wales Coastal and Maritime Partnership/Welsh Assembly Government.

Blincoe, P 1999 The Status of Wetlands in Poland. WWF European Freshwater Programme. WWF.

Bonora N., Immordino F., Schiavi C., Simeoni U. and Valpreda E. 2002. Interaction between Catchment Basin Management and Coastal Evolution (Southern Italy).
Department of Earth Science, Ferrara University and Energy and Environment (ENEA) – Bologna.

Brondi, F. and Salvatori, L.. 2003. The 5-6 May 1998 mudflows in Campania, Italy. Lesson learnt from landslide disasters in Europe. Edited by Hervas, J. NEDIES Project. European Commission Joint Research Centre.

Brook, D. 2000 PPG14: developing on unstable land (new Annex 2): Consultation draft. Department of the Environment Transport & the Regions. London, UK.

Butler, J. 2004 Civil Protection Act. Swedish Rescue Services Agency. (12/10/04) www.srv.se. (Updated 23/11/04).

Cilinskis, E. 2004. Ministry of Environment of the Republic of Latvia. Deputy State Secretary. Personnel Communication.

CIA 2005. CIA World Fact Book (Accessed 12/02/05) www.cia.gov/cia/publications/factbook/.

Council of Europe 1982 "Socio-economic development and planning in European coastal regions," Jacques Robert, Series "European Regional Planning," No. 43, Strasbourg, 1982.

Council of State. 2000. EG93 Finland's National Land Use Guidelines. November 30, 2000. Environment Guide 93, Land Use, p. 38. ISBN 952-11-1084-8 (PDF). Also available in print (ISBN 952-11-1083-X).

DOE 1990 Planning Policy Guidance - Development on unstable land. PPG14. Department of the Environment, London, HMSO.

DOE 1992 Planning Policy Guidance 20: Coastal Planning. (1992). Department of the Environment Welsh Office.

Defra, 2002. Safeguarding our seas. A strategy for the conservation and sustainable development of our marine environment. London.

Defra, 2006. A Marine Bill. A consultation document for the Department for Environment, Food and Rural Affairs. London.

DEFRA 2005. Draft HLTs consultation. High Level Targets for flood and coastal erosion risk management.

DEFRA 2005a Climate Change: Action to tackle Global Warming
(Updated 16/2/2005) www.defra.gov.uk/environment/climatechange. (Accessed 2/3/05)

EA 2005. Environment Agency: Flooding. (Accessed 13/01/05) Website http://www.environment-agency.gov.uk (last updated 2005).

EC 1993 Towards Sustainability. A European Community Programme of policy and action in relation to the environment and sustainable development. Official journal of the European Community. No. C138/5

EC 1994 Council Resolution of 6 May 1994 on a Community strategy, for integrated coastal-zone management (94/C 135/02) *Official journal of the European Community.* No. C 135, 18/05/1994 P. 0002 - 0002

EC 1995. Communication from the Commission to the Council and European Parliament on the integrated management of coastal zones. Brussels.

EC 1996. Demonstration Programme on integrated management of coastal zones. Brussels.

EC 1999a. Lessons from the European Commission's Demonstration Programme on Integrated Coastal Zone Management (ICZM). Luxemburg.

EC 1999b. Towards a European Integrated Coastal Zone Management (ICZM) Strategy. General Principles and Policy Options. Luxemburg.

EC 2000a. Commission proposal for a European Parliament and Council Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe (COM/2000/545), adopted 8 September, 2000

EC 2000b. Communication from the Commission to the Council and the European Parliament on integrated coastal zone management: A strategy for Europe. Brussels.

EC 2001. Communication from the Commission. A Sustainable Europe for a Better World. A European Union Strategy for Sustainable Development. COM(2001)264 Brussels.

EC 2001a. Executive Summary. Consultation paper for the preparation of a European Union strategy for Sustainable Development.

EC 2002a Recommendation of the European Parliament and of the Council of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe. *Official journal of the European Community.* No.L 148, 06/06/2002 P. 0024 - 0027

EC 2002b Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme. *Official journal of the European Community* No. L 242/I

ECCCZ 1999 European Code of Conduct for the Coastal Zone. Committee for the Activities of the Council of Europe in the Field of Biological and Landscape Diversity. CO-DBP (99) 11. *Document established by the Secretariat General, Direction of Environment and Local Authorities*.

Edsgård, S. 2003. Government assistance for municipalities affected by landslides in Sweden. Lesson learnt from landslide disasters in Europe. Edited by Hervas, J. NEDIES Project. European Commission Joint Research Centre.

EEA 2005. European Environment Agency: Glossary (Accessed 13/01/05) http://glossary.eea.eu.int/EEAGlossary/searchGlossary. (updated 2005).

EUROSION 2004 Living with coastal erosion in Europe: Sediment and Space for Sustainability. Part I – Major findings and Policy Recommendations of the Eurosion Project. RIKZ/EUCC/UAB/BRGM/IFEN/EADS

EUROSION 2004a Living with coastal erosion in Europe: Sediment and Space for Sustainability. Results from the EUROSION Study

ESDP 1999 The European Spatial Development Perspective. Comment and recommendations from the European Consultative Forum on the Environment and Sustainable Development. July 1999.

French Republic 1997. French Report on the Convention of Biological Diversity. Implementation of Decision II/17 taken at second conference of parties to the Convention of Biological Diversity.

With the contribution of the LIFE-Environment financial instrument of the European Community

Foresight 2004. Future Flooding. Office of Science and Technology. April 2004

Gibson, J 1999 Legal and Regulatory Bodies: Appropriateness to Integrated Coastal Zone Management. Final Report. EC – DG XI.D.2 On behalf of Macalister Elliott and Partners Ltd. UK. Contract B5-9500/97/000597/MAR/D2.

HELCOM 1993 The Baltic Sea Joint Comprehensive Environmental Action Programme (1993). HELCOM; Katajanokanlaituri 6 B, FIN-00160 Helsinki, Finland. *Baltic Sea Environment Proceedings No 48*. Published by HELCOM, Helsinki. Pages: 96, ISSN: 0357-2994

HELCOM 1995 Technical Guidelines on Elaboration of Integrated Coastal Zone Management Plans for HELCOM MLW Task Areas (1995). HELCOM PITF MLW Secretariat. Published by HELCOM, Katajanokanlaituri 6 B, FIN-00160 Helsinki. 19 pages.

Helsinki Commission 1995 HELCOM 16/17, Annex 6, Baltic Marine Environment Protection Commission, Helsinki, 1995

IEEP (1999) The influence of EU Policies on the evolution of coastal zones (Thematic Study E). Final Report. Study Contract ERDF No. 98.00.27.049. ICZM Demonstration Programme. Institute for European Environmental Policy. London, UK.

Local Government Association, 2001. *On the Edge – The Coastal Strategy.* Coastal Special Interest Group.

Löfroth, H and Kjellberg, U. 2003. The May 1997 landslide in soft clay at Vagnhärad, Sweden. Lesson learnt from landslide disasters in Europe. Edited by Hervas, J. NEDIES Project. European Commission Joint Research Centre.

Lee E.M. 2000. Preparing for the impacts of climate change. Notes for SCOPAC study (unpublished).

Lee, E.M, and Jones, D.K.C. 2004. Land Risk Assessment. Published by Thomas Telford Publishing Ltd, London, UK.

Lynn, V. 2004. Donegal County (Accessed 25/01/05) Eurosion website www.eurosion.org

Maritime Office (2004) Maritime Office of Gdynia, Poland, Andrzej Cieslak, personnel communication.

McInnes, R.G. 2004. Implementing integrated coastal zone management – The development process on the Isle of Wight and its wider contribution within the EU. PhD Thesis. Portsmouth University.

McInnes, R., Jakeways, J. and 2000 Coastal Change, Climate and Instability. Non-technical Summary Report. European Commission LIFE Project. LIFE – 97 ENV/UK/000510 (1997-2000). Isle of Wight Council, UK.

Menoni, S. 1996 NA-Tech Risks from a Planner's Perspective. The 1996 Annual Meeting of the Society for Risk Analysis-Europe Dipartimento di Scienze del Territorio, Politecnico di Milano, Via Bonardi 3, 20154, Milano, Italy

Ministry of the Environment, Finland. 2004. Land Use and Building Legislation. (Last updated 12/15/2004). http://www.environment.fi (Accessed 5/1/2005).

Ministry of the Environment, Finland.1999. Land Use and Building Act. Issued in Helsinki on 5 February 1999.

Monod de Froideville, G., Sprink, N. and Pickaver, A 2002 Coastal Management in Poland. Prepared by EUCC - The Coastal Union. Commissioned by HELCOM HABITAT. It has been reviewed by Monika Stankiewicz, Ewa Wlodarczyk (Ministry of the Environment).

National Board of Housing, Building and Planning. 2005. Legislation – The Planning and Building Act.

ODPM 2001 Planning Policy Guidance 25: Development and Flood Risk. (2001) Office of the Deputy Prime Minister.

ODPM 2003 The Strategic Environmental Assessment Directive: Guidance for Planning Authorities. Practical guidance on applying European Directive 2001/42/EC 'on the assessment of the effects of certain plans and programmes on the environment' to land use and spatial plans of England. October 2003. Office of the Deputy Prime Minister. London.

ODPM 2004 A Draft Practical Guide to the Strategic Environmental Assessment Directive. Proposals by the ODPM, the Scottish Executive, the Welsh Assembly Government and the Northern Ireland Department. July 2004. Office of the Deputy Prime Minister. London.

ODPM 2004 Delivering a Fundamental Change. Office of the Deputy Prime Minister. (Accessed 31/01/05) http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_605832.hcsp

Potts, J. 2004 Implications of the Water Framework Directive for Coastal Risk Management, LGA Coastal Risk Information Pack, Research Paper 5.

Randazzo, G. 2004 Giardini – Naxos, University of Messina, Italy (Accessed 25/01/05) Eurosion website www.eurosion.org

RIKZ 2002. Towards an integrated coastal zone policy: Policy Agenda for the Coast. RIKZ ~ National Institute for Coastal and Marine Management. the Ministry of Transport, Public Works and Water Management, the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Agriculture, Nature Management and Fisheries, and the Ministry of Economic Affairs. Hague, The Netherlands.

Simeoni, U. 2004 Goro mouth – Po delta. Department of Earth Sciences, Ferrara University, Italy (Accessed 25/01/05) Eurosion website www.eurosion.org

Sistermans, P. and Nieuwenhuis, O. 2004 Rosslare. DHV group (Accessed 25/01/05) Eurosion website www.eurosion.org

Sistermans, P and Nieuwenhuis, O. (2004) Western Coast of Jutland (Denmark). EUROSION Case Study. (Accessed 24/12/2004) http://www.eurosion.org/shoreline/7jutland.html DVH Group. The Netherlands.

Straume, J 2002 Spatial Planning Law. Latvia. Acting for the President,
Chairperson of the Saeima, Rīga, 12 June 2002.

Straume, J 2002a Regional Development Law. Latvia. Acting for the President,
Chairperson of the Saeima, Rīga, 12 June 2002.

Szulczewska, B. 2001 Spatial planning in Poland (accessed 14/12/2004) Website for European Cooperation in the field of Scientific and Technical Research Greenstructures and Urban Planning http://www.map21ltd.com/COSTC11/poland.htm (last updated 2001)

Taussik, J. 2004. Changes to the planning system that impact on the management of coastal risk. Research Paper no.1. A Research Paper for the Local Government Association's Special Interest Group on Coastal Issues. Local Authority Coastal Risk Management: Information Pack. Isle of Wight Centre for the Coastal Environment, UK

Taussik, J. 2004a. Development control in areas of coastal risk. Research Paper no.2. A Research Paper for the Local Government Association's Special Interest Group on Coastal Issues. Local Authority Coastal Risk Management: Information Pack. Isle of Wight Centre for the Coastal Environment, UK

Thompson A., Hine P.D. Poole J.S. and Greig J.R. 1998. Environmental Geology in Land Use Planning. Report by Symonds Travers Morgan for the Department of the Environment, Transport and the Regions, UK.

The French Republic 1997 French Report on the Convention on Biological Oiueristy. Implementation of Decision II/17 taken at the second Conference of the Parties to the Convention on Biological Diversity. December 1997. Compiled by the French Government.

UN 1992. REPORT OF THE UNITED NATIONS CONFERENC ENVIRONMENT AND DEVELOPMENT (Rio de Janeiro, 3-14 June 1992). A/CONF.151/26 (Vol. I) Distr. GENERAL 12 August 1992

UN 2001 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA, Prepared by the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations. (Accessed 12/12/04) http://www.un.org/Depts/los/convention_agreements/texts/unclos/closindx.htm (Updated 2003)

UN 2003 Agenda 21, Chapter 17, Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources, (accessed 12/12/04) http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm (update 22/01/2003)

With the contribution of the LIFE-Environment financial instrument of the European Community

UNDP 2003 Development of a "Framework for disaster risk reduction for guidance and monitoring" (UNDP/ISDR). Information and discussion. Presented in 8th ITAF meeting, 5-6 November 2003.

UNDP 2004 Reducing Disaster Risk: A Challenge for Development. A Global Report. United Nations Development Programme, Bureau for Crisis Prevention and Recovery, USA. ISBN 92-1-126160-0

UNESCO 1998 Coastal management and sourcebook 1; Coping with Beach. ISBN 92-3-103561-4. By Cambers, G with contributions from Hendry, M. Published by United Nations Educational, Scientific and Cultural Organization 1998. 7, place de Fontenoy, 75352 Paris 07 SP, France Erosion.

Ulmanis, G. 1995 The Construction Law. Latvia.
President. Rīga, 30 August 1995

Van Barneveld, R., Sprink, N. and Pickaver, A 2002 Coastal Management in Denmark. Prepared by EUCC - The Coastal Union. Commissioned by HELCOM HABITAT. It has been reviewed by Ole Norden Andersen and Malene Wiinblad (Ministry of the Environment).

Welsh Coastal & Maritime Partnership, 2005. What is Integrated Coastal Zone Management. A summary produced by the Welsh Coastal & Maritime Partnership.

Wiebusch, M 2004 On the road to a European Spatial Planning System? Urban Planner, Delegate of SRL, ExCo Member ECTP, November 2004

Wismar Declaration 2001 Wismar Declaration on transnational spatial planning and development policies for the Baltic Sea Region to 2010. *Conference of Ministers for Spatial Planning and Development, Wismar, 20-21 September 2001*

Wormgoor, J. Duyvestein, F. and Pickaver, A. 2002. Coastal Management in Finland.
Prepared by EUCC - The Coastal Union. Commissioned by HELCOM HABITAT. Reviewed by Blankett, P. and Nordberg, L. (Ministry of the Environment).

Zieschank, R. 2004 Analysis of National Strategies for Sustainable Development. Poland Case Study. Prepared by Roland Zieschank in collaboration with Aleksandra Zlobinska. Environmental Policy Research Centre of the Freie Universitat Belin (FFU). Berlin.

Websites

The Coastal Zone Law Web Site http://www.cf.ac.uk/uwc/claws/gibson/iczm

Countryside Division of the Department of the Environment Transport and the Regions http://www.wildlife-countryside.detr.gov.uk

Countryside and Rights of Way Act 2000 http://www.hmso.gov.uk/acts/acts2000/20000037.htm

The Conservation (Natural Habitats, &c.) (Amendment) Regulations 1997 (Statutory Instrument 1997 No. 3055) www.hmso.gov.uk/si/si1997/97305501.htm

The Conservation (Natural Habitats, &c.) (Amendment) (England) Regulations 2000 (Statutory Instrument 2000 No. 192) www.hmso.gov.uk/si/si2000/20000192.htm

The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (Statutory Instrument 2001 No. 1754) www.legislation.hmso.gov.uk/si/si2001/20011754.htm

Environment Agency UK http://www.environment-agency.gov.uk
http://www.characterisationqualityreview.org.uk

LINK TO POLISH LEAGL ACTS http://www.mos.gov.pl/mos/akty-p/index_eng.htm

http://www.mos.gov.pl/integracja_europejska/index.shtml

European Environmental Law http://www.eel.nl

Ministry of the Environment, Finland http://www.environment.fi

DPPI http://www.dppi.info/actionplan0206.htm

Stability Pact Eastern Europe http://www.stabilitypact.org/dppi/default.asp

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