LESSONS FROM THE EUROPEAN COMMISSION'S DEMONSTRATION PROGRAMME ON INTEGRATED COASTAL ZONE MANAGEMENT (ICZM) *

* This document has been compiled by the Demonstration Programme's team of thematic experts; it is based on their analyses and on inputs from the Project Leaders, the Technical Assistant to the Demonstration Programme and the Programme Management Unit.

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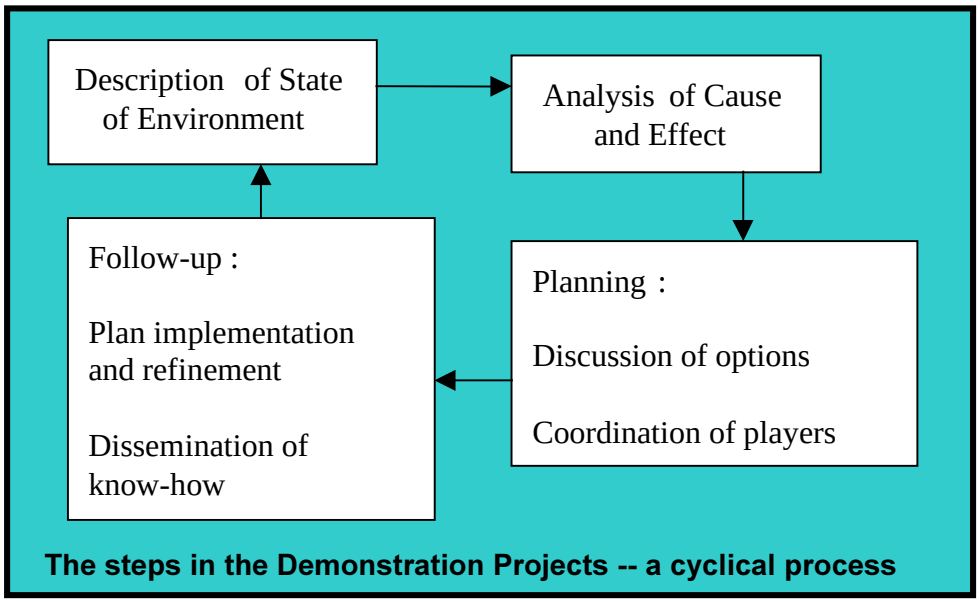
1. INTRODUCTION

This document presents the lessons that have emerged so far from the various components of the Demonstration Programme, namely:

- 35 demonstration projects distributed around the European coastline; see locator map in annex II of the document "Towards a European Integrated Coastal Zone Management (ICZM) Strategy: General Principles and Policy Options".



The steps in the Demonstration Projects -- a cyclical process

- Cross cutting thematic studies, based primarily on analysis of the demonstration projects, to consider:
  - Legislation and Regulatory Instruments,
  - Participation,
  - Technology,
  - Sectoral and Territorial Cooperation,
  - Role of EU Policy, and
  - Information.

- Research activities being carried out under the ELOISE programme and the JRC workprogramme.

- Formal meetings and workshops of the project leaders and the "national experts" group, as well as informal brainstorming with the thematic experts and other programme participants.

The Demonstration Programme has yielded a wealth of technical information about ICZM mechanisms and solutions to specific problems faced in the coastal zone. However, as the purpose of the present document is to generate discussion concerning a possible strategy for promoting ICZM in Europe, only those lessons with policy implications are discussed herein, leaving the more technical details to the final reports of the thematic studies. Furthermore, this document is focussed on the cross-cutting, non-sectoral issues of common interest to the range of stakeholders in the coastal zone, although some particularly important issues of a more specific sectoral, geographic or technical nature are introduced in Annex I of this document.

In order to keep this document as concise as possible, references to the demonstration projects are kept brief. The Demonstration Programme Web page (in English only) at http://europa.eu.int/comm/environment/iczm/home.htm includes further information about each demonstration project, with contact names and links to project Web pages where available. The reports of the six thematic studies will also be available on this site as they are completed. Readers without access to the Web, may request hardcopies of these pages from DG XI of the Commission.

Whereas the thematic studies are completed or nearing completion, many of the demonstration and research projects are still far from completion. This implies that many of the examples discussed in this document are still of a provisory nature and many of the projects will evolve over the course of the next two years. Nevertheless, we believe that the main lessons emerging from the projects will remain valid. Readers are invited to support or refute the contents, on the basis of their own experiences.

2. LAUNCHING THE ICZM PROCESS

ICZM will only become widespread through intentional introduction. This chapter investigates how this process can be launched.

Issue: Who Should "Do" ICZM?

It is important to recall that by "ICZM", we refer to the full cycle of information collection, policy development, management, implementation and monitoring. We have also discussed the importance of using participatory planning to build consensus; ultimately everyone has a role in ICZM. Because of the broad stakes, even the origin of an initiative could equally appropriately come from any number of sources, including private and non-institutional actors.

In practice, the demonstration projects are working at and led by agencies operating across the full range of administrative levels, reflecting different spatial scales. The choice of scale has been very deliberate in some projects.

In Norway, efforts are being made at county level to address problems which emerged during the recent local (municipal) level ICZM initiative - specifically conflicts between the Fishery Authority and the Coastal Conservation Plans drawn up at local level.

The Gulf of Finland project proposes that integrated planning should take place at the regional and local level.

The Wadden Sea project involves all of the counties bordering the Wadden Sea. The rationale behind this decision was that planning initiatives should stem from this regional (county) level and should be participatory in nature, but that they also need to be coordinated between regions in the trans-national context of the Wadden Sea and the Tri-lateral Wadden Sea Cooperation.

Storstrøm County is elaborating coastal planning at local levels under the overall control of the regional plan. Although detailed, the regional plan is not considered adequate to address the complexity of coastal issues and sustainability assessments in a given local situation, nor to deal with the concerns of the community that conservation initiatives may curtail their economic activities.

Several demonstration projects are aiming to identify the level at which practical development of ICZM can best occur in their own administrative and local circumstances. However, it is too early - and may well never be possible - to conclude whether working at one level is more effective or efficient than at another. The only general conclusion that can be drawn is that the level selected should be adequate to identify and address the scale of the principal problems at hand.

What has been shown repeatedly is the importance for all of the levels to be involved in their own capacity and sphere of competence. Almost without exception, the projects have indicated that local ICZM activity is not effective when there is a policy vacuum at higher levels.

A DG-XII funded research project coordinated by the L'OEIL, University Paris XII on "Environmental Protection, Subsidiarity Principle and Spatial Related Policies" (using 8 case studies in France, Italy, Spain and Switzerland) showed that the administrative level at which nature protection policy is managed and implemented is not critical to its success- however the nature of the relationships between the different levels of government was. It was also noted that all levels of government need to be involved in the implementation of any spatial policy.

Decisions taken at higher levels, are more frequently based on a global vision that can consider balancing regional specificities and creating competitive advantages. Decision making in decentralized agencies is often much more procedural. However, the advantages of taking decisions at lower levels include direct knowledge of the reality of local conditions, a priority for local concerns, and local accountability.

The Kent project notes that political sensitivity increases at lower levels of administration. At local government level, conflicting views are brought sharply into focus, not least because votes are at stake. The paradox is that multi-sectoral initiatives must obtain local political support if they are to be successful yet it is at the operational level that sectoral pressures on local politicians are greatest.

Local level administrations may be constrained in their ability to contribute to ICZM for several reasons:

- Personnel capacity can be very limited at local levels, not just in terms of technical skills but in terms of availability of all staff.

Local capacity is regarded as a particular constraint in Latvia.

The Cyclades presents an extreme example, where authorities on smaller islands employ only part-time, if any, administrative assistance. The Cyclades project is working with elected representatives on each island, to build capacity.

- Local politics and political will may adversely affect ICZM initiatives, particularly where there is no higher authority to oversee implementation.

Political struggles in Niedersachsen pose difficulties for the Wadden Sea Project.

The importance of local political will and support is stressed in La Gironde.

Local elections in Greece are altering the composition of the core group in several projects, as well as diverting attention and effort from the projects. Some of the projects have deliberately delayed formation of a broader forum, and even awareness-raising efforts (e.g. Magnesia) until after the new public officials are in office.

- Local politicians and administrators may be influenced in their decisions by their own economic interests or by considerations of revenue for the municipality.

Local authorities in the Gulf of Finland are "inclined to empathize " with land-owners - clearly a problem given the local authorities' central role in control of development.

An intermediate level between national and local administrative levels may have an important role to play in developing a coherent approach to ICZM.

The Dorset project has opted for the county as the appropriate level for coordination of their ICZM initiative, since many national organizations and agencies are administered through county units, which feed up to the regional or national level. This choice was based on a conviction that any unit smaller than the county could lead to parochial views being over-represented whilst anything larger would lead to a lack of "ownership" at the local level.

The Bantry Bay project notes that their project is hindered by "the lack of an effective regional tier of administration to translate the sectoral programmes into spatial planning objectives".

Many projects have called for guidelines and strategic action at the national level to facilitate local initiatives. Higher level participation is needed to advise from a broader strategic perspective, to provide technical guidance, to facilitate sharing of local lessons, to endorse (if not legitimize) the initiative and to promote replication.

In the US, although implementation of the Coastal Zone Management Act is the responsibility of individual States, Federal support depends on satisfactory evaluation by the Federal office responsible.

Issue: The Role of a Lead Agency

An individual or group with an understanding of the principles of ICZM and the drive to push the process forward can be a great asset to an ICZM initiative. A secretariat is also normally necessary to coordinate the logistics of the initiative and organize the required information. However, problems may arise if the lead agency is not regarded as even-handed, or is perceived as a threat to other participants.

A "neutral" actor such as a university may be able to facilitate an ICZM initiative by providing leadership in an impartial way and reducing conflicts between partners. Where a university does play this role, however, it is important to ensure that there is an adequate link to decision makers, so that the initiative is eventually integrated into the formal management system and does not remain an academic exercise.

The Strymonikos project is implemented by the Fisheries Research Institute and the Greek Biotope Wetlands Centre. These institutes provide neutral advice and information to the Steering Committee, which is made up of those Authorities with jurisdiction over the coastal area.

The University of the Aegean Department of Environmental Studies is facilitating the Cyclades project.

In Ria de Aveiro, the University Department of Environment and Planning is playing a similar coordination and information role. Its role is boosted though existing links with many of the other participants, who are ex-students.

The University of Littoral-Côte d'Opale, gives scientific credibility to their project, assuring the partners that the positions of the lead administration are not just based on political considerations.

Another approach is to leave the coordination in the hands of a local authority, but with the commitment that the project secretariat or Chairperson will be neutral on all issues.

The Dorset project is led by a local authority, which provides a professional secretariat. However, an independent Chairperson has been appointed.

A Local Development Agency was established by the Magnesia Prefecture partly as a response to difficulties experienced by local authorities in directly implementing measures, and establishing the partnerships required for an integrated approach.

In the Forth Estuary Forum, the coordinator explicitly agrees not to take positions on issues.

Some projects have indicated that just *having* a recognizable centre to champion coastal issues is probably more important than *who* is in the lead.

Both Kent and the Côte d'Opale have set up coastal and marine "observatories" as foci for raising awareness about the coast, providing information and advice to decision-makers and acting as catalysts in promoting ICZM within their regions.

Issue: An Explicit Statement of Mission and Scope

Any ICZM initiative needs to develop a mission statement reflecting the target society's vision for the future. This statement should make the initiative's goals clear to all participants, and serve as a statement of motivation. This statement should be complemented by a careful definition of the specific problems and objectives - at the right level conceptually, spatially and temporally. SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis may be a useful tool in this process, which should consider the legal, cultural and social environment. The results will help to indicate the appropriate approach to ICZM for a specific target area.

Issue: A "Focus" to Stimulate Action

The dynamics of the coastal zone are changing. Certain resource-intensive uses are expanding and certain environmentally or socially desirable land uses are declining. These changing dynamics can lead to particular sectoral problems and conflicts.

In the framework of ICZM, these problems cannot be addressed in isolation; an ICZM initiative should be multi-sectoral and multi-objective. However, ICZM initiatives are often launched in reaction to specific issues rising out of changing coastal dynamics.

Annex I of this document briefly introduces some of the issues that most commonly stimulate participation in ICZM. While this focus may remain at the center of an ICZM initiative, in most cases, the dynamics of the coastal zone are sufficiently complex that it is appropriate subsequently to broaden the range of issues under consideration.

Issue: Statutory and Non-statutory ICZM Initiatives

ICZM may either have a statutory basis or grow out of a voluntary, non-statutory initiative. Either type of ICZM initiative may develop an ICZM plan or strategy, which may itself be either statutory or not. This discussion thus makes a distinction between the ICZM process itself, and the instruments used to implement the policy recommendations arising from the process. (The latter will be discussed in chapter four.)

Almost all of the projects are using non-statutory approaches in their initial phases. Non-statutory approaches are often easier to launch and have proven a good way to broaden participation. However, they may be more difficult to maintain, particularly as initial financing sources dry up and if they are not seen to have acquired political "legitimacy".

The project in the Cote d'Opale derives its political legitimacy because this area, which has had its own specific development funding since 1998, was specifically proposed in a French government's inter-ministerial report on spatial planning as an testbed area for coastal zone spatial planning. The project also derives legitimacy from the involvement of the Université du Littoral Côte d'Opale and their DESS programme in coastal zone law.

The choice between approach will probably depend on the culture and tradition of participants, and either approach may be successful. Ultimately success of the ICZM initiative will depend on the commitment of partners in the project.

3. THE ICZM PROCESS

This section presents the lessons and experiences of the Demonstration Programme in relation to the central components of the ICZM process, namely collaboration (cooperation and participation) and information. It should be noted however that these components are not distinct, but intricately interconnected.

The inter-relationship between Information and Collaboration:

- Information supports informed cooperation and participation.
- Cooperation and participation are a means of collecting information.

3.1 Information Issues

Good, verified, and objective information sets the scene for well-founded decision making and sustainable management. It is the factual, neutral basis from which opinions can be formed and decisions taken.

Different types of information are needed at different phases of the ICZM process.

In the inception phase, information is needed to get people interested, develop their awareness of issues and problems and convince them of the need to establish and participate in an ICZM initiative. At present, the value of adopting a more integrated approach to coastal management is not always well understood by those formulating policy or concerned with sectoral interests, such as infrastructure development or coastal protection. Information about the functioning of both natural and administrative systems is needed to fill this gap.

In the policy development and decision making phase, information informs the analysis of issues, helps the participants to ask the right questions and distinguishes genuine from spurious conflicts. The type of information required includes not only state and pressure information, but also transparency about the activities of administrations and legislators, as a basis for assessment of options. Reliable indicators of the driving forces and pressures acting upon the coastal environment could be particularly useful in this phase. Information about behavioural patterns and expectations of socio-economic actors and the public is also relevant.

In the follow-up phase of management and monitoring, information provides a sound basis for implementing policy and assessing its effectiveness. State indicators could be particularly useful for this purpose, although to date there are no generally accepted indicators for the coastal zone. There is also need for information directed at the public explaining the objectives, modalities for implementation and consequences of policy decisions.

Up-to-date and accurate cadastral information is a pre-requisite in all phases of ICZM.

Although there is a need for more information to support ICZM, particularly for good quality maps, much can be achieved by making better use of that which exists already. The effective development and implementation of policy is not necessarily hampered by a lack of basic data, but by a failure to present derived information to those who “need to know”.

ICZM requires appropriate, reliable and timely information in a form which is suitable for the task at hand.

Useful information is:

- Presented in a form that is understandable by the end use, including laypersons and generalists
- Appropriate to the level of participation planned
- Credible
- Readily accessible and regularly updated
- Integrated

In view of its importance, the information component of an ICZM initiative should not be left to chance. An explicit strategy is needed for the collection, processing and diffusion of data and information.

The strategy should start by an assessment of information needs, reflecting the importance of having the correct knowledge base for the specific situation. It should acknowledge the high costs involved in acquiring, transforming and distributing information; these costs should be factored into the overall budget of the ICZM initiative.

This strategy should, of course, also meet any legal requirements for access to information, based on right to information laws, statutory publicity, and access to committees and public hearings.

Issue: Understanding the importance of contextual information

Planners and managers have a tendency to focus on the details specifically related to their own competences. They may concentrate on getting every last piece of data on one limited component of the overall coastal system, while ignoring the bigger picture. Ports authorities, for example, are notoriously blind about context. However, driving forces in other parts of the coastal system may have an overwhelming impact and should be considered in determining management action. **Irrespective of its size or orientation, there must be a strategic dimension to any ICZM initiative.**

Contextual information can be provided by "state of the coast" reports (at an appropriate scale) and cartographic materials showing transport networks, sea level change, tidal range etc.

In Athens, the future of the relatively narrow coastal strip is likely to be greatly influenced by the removal of the existing airport, which reaches to within a kilometer of the shore. This will free up a vast amount of coastal property, attracting even more uses and activities to the already intensely used littoral.

Over the long-run, a more general understanding of the importance of contextual information might be promoted by the introduction of multi-disciplinarity and systems training into sectoral curricula. Inclusion of geographers in the core group of an ICZM initiative might improve short-term results.

Issue: Identifying and Accessing Available Data

Data collection is one of the first tasks in an ICZM initiative. However, in an effort to ensure that the necessary information is available, too many projects start by setting out to collect *all* available data about the target area. This "information for information's sake" approach should be avoided as it often is a waste of resources. **ICZM initiatives need to be issue-led, not data-led.**

While it may be appropriate to do a quick preliminary scan to determine availability, an information strategy should start by analyzing what data and information are required, for whom and for what purpose. Such an assessment will also indicate the appropriate format and resolution of the data, as well as the level of accuracy and detail required for the management tasks at hand.

The Devon and Cornwall projects initially examined the information at hand, then decided what was missing for their purposes and set out to collect the relevant data.

Only after this initial assessment is it cost-effective to start a major data collection exercise, and even then the cost of data collection should not be under-estimated.

At an early stage, the Rade de Brest project set out to collate knowledge of available data in the catchment. This "stock take" provided a comprehensive description of the area and its environment, as well as an analysis of the issues to be addressed. This work was scientifically validated, using international experts as well as local academics. Subsequent use of computer-based technology has facilitated the assimilation of the information and will be used in its wide dissemination to stakeholders, including politicians. The whole process has been very effective. However, the financial investment and the number of individuals involved in the process have been high compared with other projects.

Similarly, the Isle of Wight has focused its initial phase on a state of the environment review involving extensive consultation with many organizations.

In Dorset, in contrast, a number of multidisciplinary topic groups have been responsible for assembling information, defining issues and circulating consultation documents.

A data collection exercise may run into various difficulties, the most basic of which occurs when the necessary data are not available and need to be generated. But even if the data exist, they may be difficult to access for reasons including:

- Perception of data gaps (where gaps do not actually exist) due to a lack of knowledge of existing data.
- "Data overload" as a result of overenthusiastic attempts to disseminate data, creating difficulties in identifying relevant or reliable data. The Internet may be unwittingly exacerbating this problem.
- Data licenses, confidentiality or legal restrictions may make data inaccessible or prohibitively expensive to acquire for copyright reasons
- Data are not in a form that can be readily accessed or used by technologies available to users.

The Taranto project is facing the problems of incompatible data systems.

Data producers and distributors can improve data accessibility by:

- Broad diffusion of metadatasets (or data catalogues), explaining the content of their databases, including their timeliness and level of aggregation.
- Making data available on-line via standard communications architecture (with or without an associated user fee).

The NOAA Ocean Data Centre serves as an archive for an extensive array of satellite imagery and derived image products and in situ environmental data. Using the Internet, these files may be accessed, downloaded, and displayed using a variety of standard software packages.

The DESIMA project, underway at the Joint Research Centre, is developing software to access data and models seamlessly on-line. The advantage would be ready access without the need for the user to store or manage large databases or systems. The project must still find solutions to issues of Intellectual Property Rights, and matching users to databases and models.

The participation process can be harnessed to promote the sharing of existing data held by stakeholders.

The Cyclades Project has carried out community mapping where islanders contribute their local knowledge in defining island resources and key issues.

Devon and Cornwall have established Coastal Environment Research Forums through which researchers and managers from all sectors can meet and share knowledge and develop collaboration.

Government (including the EEA at the European level) has a role to play in improving accessibility by:

- Working to remove financial and legal barriers to data exchange
- Establishing standards for metadata, for actual data and for agreed protocols for data and information exchange formats. On-going initiatives in this area need coordination.
- Providing information about data availability
- Investigating the terms for access to publicly funded data to ensure that the public investment in their production brings the maximum benefits in terms of widespread use.

The CEO, the Center for Earth Observation, is a Community funded project largely based on the Internet with the objective to contribute to a European system for Earth observation by stimulating user-oriented services. These will take advantage of established institutions, existing or planned networks and projects. The European Wide Service Exchange (EWSE) is an on-line information service for the Earth Observation community organised by CEO. Its goal is to help new and existing users find data and services and to allow service and data providers to find users. In this way the EWSE hopes to expand and promote the application of the wealth of data gathered by satellites.

Issue: Generating Useful Data

On a daily basis, large amounts of data about the coastal zone are generated by government departments, meteorological services, research institutes, transport authorities and NGOs, using traditional surveying and mapping, compilation of statistics, in-situ observations, automatic instrumentation, research ships and satellites. New technologies and methodologies are leading to more continuous and synoptic data collection; the possibility to collect event-related information is also increasing.

Nevertheless, ICZM initiatives often find that the data they require do not exist. Because the existing data are not generated with the user's needs in mind, they do not necessarily correspond to the desired scale, extent, format, thematic coverage or timeliness. Or, while individually the datasets might appear to meet user needs, they are in fact useless because they cannot be combined to create integrated information (see next issue). These are all symptoms of the gap that exists between data users and providers.

Useful data are:

- At an appropriate scale
- Comparable for the full extent of the "project area"
- Integratable
- Reliable
- Timely
- Available in time-series

In practice, much data collection is conducted for narrow project-oriented purposes with little, if any, consideration, of the data's potential future value to other users. This tends to lead to waste of resources in terms of duplicate collection of similar datasets. The incoherence, over time, between methodologies applied in one area also makes trend detection difficult.

Particular attention should be paid to sampling schemes in monitoring programmes, to ensure that adequate data are collected.

Findings from the land–ocean interaction study (LOIS) programme indicates that about 90% of the fluxes in nutrient budgets occur during only 5% of the time, i.e. "pulses" are very important in delivering nutrient loads to the sea. An inappropriately designed monitoring programme might miss such events.

Data providers (particularly those where data collection is supported by public funds) should give more consideration to identifying the nature of potential users. This can only be achieved through a priori dialogue with the potential users, who must themselves take an active role in

articulating their needs; local communities and stakeholders, for instance, can play a role in devising indicators and surveys to provide the information that meets their needs.

LOIS is a 6 year project (1992–1998) funded by the UK's Natural Environment Research Council involving more than 360 scientists from 11 institutes and 27 universities. It has collected a vast amount of data. The project requires dissemination of the results of the project, and this has been interpreted as meaning the distribution of the field data on six CD-ROMs. Late in the process a study was initiated to review the methods of dissemination – but too late to influence which data were collected. Prior consultation with users might have suggested focussing on data of a scale more immediately applicable to local ICZM initiatives.

There is also a need for a concerted effort at the European level to identify information needs and introduce standards in order to optimize applicability of individual efforts. While it is inconceivable to imagine that a system can be established in the short run that would provide for comprehensive data generation to meet the needs of all users, the potential application of existing efforts could be maximized by defining:

- Key variables (physical, socio-economic and policy) that are frequently required in the coastal zone and standard definitions of how they should be measured.
- A series of reference scales or resolutions for data collection.
- Standardized monitoring methodologies and sampling strategies
- Standardized data formats (or data interchange formats)
- Standards for quality checking and documentation of data applicability (temporal, spatial, thematic) at source
- Guidelines on how to incorporate existing data generation activities into a coordinated European network and how information about this network should be diffused to users.

Funding must be ensured for any additional costs to data generators in order to implement such guidelines.

The European Environment Agency and its Marine and Coastal Topic Center have a key role to play in developing and implementing such a coordinated data generation strategy. The EEA and the JRC also have direct roles to play in generation of datasets at the meso-regional and European level. Some of these issues are addressed in more detail in the final report of the thematic expert on “Information”.

The proposed introduction of the Global Ocean Observing System (GOOS) is an important opportunity to give an umbrella organization for the introduction and coordination of long term monitoring in the marine side of the Coastal Zone. However, at present, this is still very much a research-oriented initiative, which needs to develop a closer relationship with potential users. So far, it also has not adequately addressed linkage to terrestrial monitoring systems.

Issue: Turning Data into Information

Planners, decision makers and the general public generally do not want, or know what to do with, raw data. It is information that feeds the processes of planning and management; raw data only become useful information by analyzing them and putting them into context. This process of turning raw data into useful information is often complex, requiring knowledge of data processing and statistical techniques, as well as thematic expertise. It must be accomplished either by the generators of the data and/or by specialist members of an ICZM initiative.

Producing Useful Information from Satellite Data: The JRC LACOAST project has created maps and statistics of land use change over the past 30 years in European coastal zones on the basis of two sets of remotely sensed imagery.

It is only possible to generate useful information from appropriate datasets. It is impossible to produce useful information from data that are too aggregated, cannot be merged because of incompatibility between data sources or that are late and/or unreliable. Hence information producers are dependent on the work of data generators.

Starting from appropriate data, production of useful information implies:

- Using appropriate aggregation, analysis or transformation techniques are used (common mistakes include merging data collected at grossly different scales, and use of inappropriate statistical techniques);
- Presenting the information in a usable format or an intelligible manner; and
- Ensuring that the information commands general acceptance.

> *Submitting information to a public validation process, as was done in the Rade de Brest, may help to ensure the general acceptance of its credibility.*

Information may still be misused due to an incomplete understanding of its nature, quality and currency by planners. It is therefore the job of the information producers to ensure that this understanding is transmitted together with the information.

Useful information depends both on the existence of appropriate raw data and on its correct analysis and transformation into something that planners and decision makers can understand and use. This requires the involvement of appropriate specialists.

Issue: Undertaking Assessments

Assessments are a broad category of tools for collecting raw data and transforming them into useful information. They include environmental impact assessments, strategic environmental assessments, resource accounting, valuation exercises, spatial impact assessment, risk assessment, and cost/benefit exercises. Each of these tools aims to evaluate some of the impacts of actual or proposed management options.

The specific objective of Environmental Impact Assessment (EIA) is to ensure that environment is one of the factors which is considered in decision-making. Required for certain projects throughout Europe by the Environmental Impacts Assessment directive, EIAs are normally done after development of project plans, primarily to mitigate impact. The use of EIA has been an important driving force in promoting sustainable development in the coastal zones. However, the integrity of EIAs might be improved if the local authorities had the funds to do independent assessments. (Some of the other problems cited by the demonstration programme in relation to implementation of the EIA directive are discussed in chapter six.)

> *In Canada, a federal government committee sets the criteria and factors to be considered in each EIA. Although the study is done by the developers, it is more concise and contains more useful information.*

Strategic Environmental Assessment (SEA) is seen as a promising approach whereby the principles of EIA are applied at a strategic level to plans and programmes, by undertaking environmental assessment of policies while development plans are being prepared. Although SEA is at present still a relatively new concept, there is a strong synergy between the SEA approach and the principles of ICZM. Successful wider adoption of Strategic Environmental Assessment will be dependent upon the development of tools compatible with the method of development plan preparation in each Member State. (At present, the proposed European directive on SEA - mentioned in chapter six - is still under discussion.)

The Community is now also required to consider the territorial impact of its programmes and activities. Spatial impact assessment can also be applied at the local or regional level.

Cost-benefit analysis is a tool that grew out of classical economics and which traditionally attempts to assign monetary values to the cost and benefits of different policy options.[*] Some of the difficulties in such an exercise, however, relate to the problems in assigning monetary values to goods that are not normally traded in a market situation and/or are inherently non-substitutable. How should natural capital and social values, for example, be assessed? Attribution of a monetary value for "option" (the

[*] It should be noted that some people now use the term "cost-benefit analysis" to mean a broader type of assessment, similar to the "broad-based valuation" discussed below.

value of conserving a resource so that is available for future use) is also problematic, as is the use of "discount rates" (through which future use of a resource is given a lower value than its present use). For these reasons, an attempt to assign monetary values to all options may be inappropriate for assessing policy options in a "sustainability" context.

Resource accounting was developed in response to certain of the limitations of classical economic accounting tools (based on market flows). The aim is to provide quantifiable, but not necessarily monetary, information about the actual or potential costs or benefits of projects in terms of resource use, and depletion or degradation.

Broad-based valuation is an extension of cost-benefit analysis and resource accounting, which explicitly defines and assesses the public interest by evaluating the full range of societal impacts (positive and negative) from a proposed project or programme. The values may be expressed in qualitative form. The range of value types to be considered in a valuation exercise should cover, at least, economic, educational, cultural, social, and environmental value (possibly from information emerging from specific environmental, spatial, social and other specific assessments), as well as consideration of issues of rarity and diversity, particularly at the international and national levels, the capability and capacity of the physical resource, and thus its value in terms of the range of alternative or competing uses possible. It is also important to ensure that indirect costs and benefits are evaluated. Furthermore, it should be noted that values are not absolute, but depend on the cultural context and may evolve with time.

A valuation exercise can identify not only the full set of advantages and disadvantages of proposed actions, but also who wins and who loses. Understanding of value to different stakeholders should be an important component in making decisions about management options. This is also important information for ensuring that all of the affected persons are brought into the decision making process, to defend their interests and visions.

Risk assessment is an important tool for decision making that identifies both the likelihood of an event, and the amount of damage that it might engender if it should occur. Risk assessment will therefore often draw upon the results of value assessments. Risk assessments are most often used in coastal zones in the context of marine accidents, however, they could be used more broadly to assess the risk of failure of infrastructure.

All assessments rely upon the existence of a solid base of data, and an accurate understanding of the natural and human systems and dynamics that affect the target area. While a certain number of studies and data collection exercises can be undertaken in the context of the assessment exercise itself, time (and financial) considerations constrain their scope. Appropriate long-term programmes for improved basic data collection and research are needed, to provide the basis for good assessments.

There is also a need for increased training and diffusion of information on undertaking assessments. Some project leaders noted, however, the need for a balance between effort given to "method development and training" and "common sense" in assessment of projects and programmes.

Any assessment exercise is an attempt to project into the future. It is normally based on an assumption that the future will be similar to the present, or will evolve in predictable ways. This is, however, a fallacious assumption. As well as the changing cultural context, the problems and needs of the coastal zone tomorrow are sure to be different from what we expect today as the future is inherently uncertain and unpredictable. Climate change is the most frequently cited driving force, but changes in demographics, economic trends, geomorphology and evolving energy needs might be equally important. Assessment exercises are also constrained by our limited present knowledge and understanding and by our limited technical ability to describe long-term and large scale changes for a given coastal system.

Nevertheless, the outputs of assessments are normally sufficient to give an indication of probable trends. However, in using these information products, planners and the general public should understand, and take into account, predictability limits and the inherent uncertainty of the future.

Assessments should not be seen as formula for making decisions, in lieu of a consultative/participatory process. Rather, their purpose is to inform the political debate. (Of

course, this implies that there is always the risk that the results of assessments will not be taken into account in "real world" decision making where power, political and financial factors intervene!)

Issue: Diffusion of Information and Knowledge

Information, knowledge and understanding of coastal processes (natural and human), can help planners, decision makers and the general public to realize the consequences of any particular action, and provide the basis for developing more sustainable policy and management actions in the coastal zones. However, information and knowledge are only useful if delivered when and where they are needed.

Members of the RICAMA project team have a good understanding of the relationship between sheep grazing and afforestation in the uplands and the delivery of sediment to the coastal plain. However, although the knowledge is good and the information to back it up is adequate, those who have beach concessions and others have not been adequately persuaded of the link. The prevalent, but mistaken, notion is that coastal defense structures can secure protection. (The fact that eminent scientists have previously promoted hard engineering solutions makes it more difficult for those who derive a living from beach concessions to accept that these structures could be adding to the problems of erosion.) Those who derive a living from beach recreation need to understand that beaches are not stable and that without new supplies of sediment some will disappear. This understanding has not yet been adequately diffused.

Historically, engineers and academics (including research scientists) have developed our understanding of coastal dynamics. Government agencies, private companies and NGO's have also been involved in data collection and information production. However, this work has often been undertaken in a non-participatory way, with scant consideration given to how the results might be disseminated effectively. The wealth of traditional knowledge residing with local residents is similarly often not communicated. The effect is that the information and understanding remain unused.

A failure in knowledge diffusion is one of the key reasons for the continuing destruction of coastal landscapes and resources. Many of the problems of the coast can be traced to the fact that the required information or understanding has never reached the correct audience.

Information diffusion must:

- have a specific purpose
- target specific groups of stakeholders, institutions or the general public
- be affordable and reliable

The JNCC coastal directories project set out to collect, collate and diffuse existing information for the whole of the UK coast, with the aim of helping inform coastal policy development and decision making at the national level. However through the involvement firstly of government departments and later of sectors such as oil, fisheries and aggregate extraction, it became clear that the local/regional scale was more appropriate, as represented by the 17 regions chosen for publication of the results. Not only has the scale of information provision proved an important backdrop for a number of further studies at local level, but also it is a contribution to better understanding by national and regional authorities and organizations.

There is a need for a comprehensive approach to pro-active and coordinated diffusion of the existing information in Europe. The Demonstration Programme has illustrated that efforts to date in this realm have been insufficient. A European ICZM "observatory" might be useful for dissemination of generic good practice and general knowledge. Other mechanisms are needed for diffusion of site-specific information and understanding.

In order to ensure effective diffusion of information and knowledge, an ICZM initiative should identify the policies associated with key issues – and identify the necessary pathways for information flow between the responsible organizations and the individuals, politicians and decision makers who need the information.

Issue: Appropriate Information Management Technology

Modern information technology can play an important role in enabling ICZM by providing powerful tools to manage and exploit a wide range of data, including historical, georeferential, statistical, remote and in-situ data.

Information management technology can be useful for:

- organizing data
- linking data and software to generate information (through modelling, analysis and synthesis)
- presenting simulations of impacts
- diffusing information in a variety of credible formats, including maps, graphs and tables

Geographic Information Systems are software systems to organize and integrate data with reference to spatial location. They can handle any geo-referenced data from sources including maps, satellites and in-situ or statistical sources. A GIS is also useful for diffusing data and information, both as paper maps, and by using multimedia visualization capabilities at dedicated information points or via the Internet.

Decision Support Systems, use built-in models, frequently linked to a GIS, to allow a manager to create simulations of the consequences of an action given an initial starting position.

As well as being functionally useful, computer systems generate products, particularly colourful maps that tend to be held in high esteem by the general public. Use of such a system can thus help to raise the credibility of the ICZM initiative. (There is however a danger of raising expectations among the public that the existence of such systems implies instant answers to problems!)

The rationale behind the use of information management systems is thus very powerful. However, the current crop of information management systems, often fails to provide information to users because of its highly technical nature. Academics and software developers are pushed to develop complex systems using the very latest advances in computer technology. This trend is compounded by the drive for an integrated approach to coastal zone management so that models from different sectors are bolted together to create ever more complex models. These systems may be technically superb, however most are too complex to be accessible to the coastal managers who are seeking better information on which to base their decisions.

RamCo, a system being developed by the Coastal Zone Management Centre in The Hague, Holland, is "a generic decision support system for the rapid assessment phase of sustainable coastal zone management". It aims to "assist decision makers to address semi-structured problems by allowing them to access and use data and analytical models". By setting numerical inputs to the dozens of models covering land use, water management, the economy, sustainable development and nature protection, simulations of development through time can be created. Those with sufficient time to gain an appreciation of both the way in which RamCo works and, more importantly, the assumptions that underlie the models on which it relies will find the product very useful. However, the complexity of the underlying models presents a real barrier to busy managers and policy makers.

Similarly, coastal managers are often convinced to purchase the newest technological solutions for the collation, storage, analysis and dissemination of data without sufficient consideration given to the real justification for acquiring such technology. Although, in the hands of specialist staff, such systems might be appropriate to the final needs of the user, their complexity can cause them to fail to live up to expectations. This leads to disillusionment with the techniques and often results in wasted financial and human resources.

For some projects an early decision to use simple “off the shelf” hardware and software packages to provide the necessary technological solutions appears to have paid off.

The Storstrøm project has a good strategic approach to data and information management using a GIS for land use planning.	*The Dorset project has successfully used a GIS to produce maps for “topic papers”, and to illustrate the nine priorities described in their Draft Coastal Strategy. The project is now working to develop 3-dimensional images (based on bathymetric surveys) to allow full representation of both the land and water segments of the coastal zone.*	*The Bantry Bay project is developing a simple, community-based GIS system.*

Information users in an ICZM initiative should:

- remember the rationale in purchasing any information system -- to provide improved decision making and consensus building
- remember than an exclusive focus on technology ignoring contents is inappropriate
- first identify their information processing needs and then choose a technology to suit those needs, not the inverse -- don't buy the biggest, flashiest system. Money spent on a needs analysis will be saved on expensive mistakes.
- envisage adequate resources for specialist personnel when sophisticated technologies are acquired.
- ensure that any models they use are applicable to their target site and problems.
- ensure that they don't get locked into technologies

Information systems developers could support ICZM, and improve uptake of their products by:

- Recognizing that although new approaches to dealing with complex systems may be intellectually challenging, simple solutions are often required by the coastal manager.
- Creating decision support systems based on full and careful briefing by those commissioning the systems. The needs and technical skills of the target audience should be paramount in the design process.
- Ensuring that policy and decision makers know the capabilities of existing systems and how best to take advantage of them. However, it will often be appropriate for the use of decision support systems themselves to remain within a research project or development environment where a full understanding of the system is available. The results can be diffused to the end users, rather than the software.

Improved communications between coastal managers and developers of information systems could help bridge the gap between these two communities.

3.2 Collaboration Issues

In the context of the Demonstration Programme on ICZM and for the purposes of this document, two types of collaboration have been distinguished with the following definitions:

> "Cooperation": the involvement and collaboration of the administrative partners at different levels of government and in different sectoral branches of the administrations. One of the objectives of cooperation is coordination of policy. Mechanisms to achieve cooperation may include consultation and joint working groups.
>
> "Participation": the involvement and collaboration of the private sector, NGOs, citizens groups and other non-institutional organizations or individuals interested in or affected by the management of the coast. Structures to achieve participation may include steering groups of key stakeholders, general forums that meet regularly, technical panels, newsletters and various topic or issue groups as required.

Although the structures for achieving them and the difficulties in implementing them may differ, both cooperation and participation are components of the fundamental process known as participatory planning.

"Collaboration" may range from information exchange through consultation to working together and ultimately to shared decision-making.

Degrees of Collaboration:

- Information giving -- where people are told what is planned with little opportunity for feed-back;
- Information gathering -- where comments are received and taken into account in decision-making (Information giving and gathering are the key components of consultation.);
- Shared working -- where participants are actively involved in jointly studying issues, e.g. through topic or issue groups;
- Deciding together -- where participants resolve differences together and take collective decisions;
- Empowerment -- involving greater freedom of decision making in defined spheres or through neutral facilitation, or via self-mobilization where people initiate action independently of external institutions.

The Demonstration Programme has shown that the degree and type of collaboration that can be found in existing ICZM initiatives differs across Europe, largely as a result of culture and tradition, and the stage of the ICZM process. These same factors will determine what minimum degree of collaboration might be considered as desirable in the medium term. In most cases, the degree of collaboration evolves during the lifespan of an ICZM initiative.

Collaboration should not be left to chance. Nor should it be considered without cost. In fact, cooperation and participation (together with information collection) are two of the most expensive and time-consuming elements of an ICZM initiative. There is need for an explicit strategy on how this aspect of the ICZM process should function and develop.

Different types of collaboration:

- *The seven linked initiatives in the Gulf of Finland derive their legitimacy from the existing institutional framework for statutory land-use planning. Collaboration in this case is an extension of the extensive consultation procedures that have been traditionally used.*

- *The Bantry Bay project draws on the principles of alternative dispute resolution (ADR) to look especially at marine issues which have previously been handled (or ignored) in a some-what remote fashion by sectoral agencies. Using a neutral facilitator, and extensive public participation, the project aims to develop a set of integrated policies based on the real needs of the community. A strong partnership led by the County Council provides the momentum for this approach.*

- *In the transnational ANAS project along the Algarve-Huelva border of Spain and Portugal, 30 municipalities have joined together to devise innovative ways to tackle local issues with European funding. Less focussed on the coastal zone as such, the process is an evolving flexible one with a strong lead from the project team working closely with the political alliance. Public involvement is hoped to grow out of the various issues as they emerge.*

- *In the RICAMA project, it was decided that full involvement of all stakeholders was not possible at the start. Technical studies conducted in the first phase of the project will be used to provoke local debate with municipal authorities at a later stage.*

A good collaboration strategy should:

- Provide a clearly presented framework that helps to prevent confusion and mistrust
- Be more than a piece of paper: it should convey the feel of the process, the style and tone, and the general ground rules for co-operation and working together.
- Be fully representative of stakeholders
- Use open and transparent proceedings
- Reflect local circumstances, including:
    - local and regional geography (the scale and character)
    - range and complexity of issues
    - the mix and status of local institutions
    - available resources
    - attitudes to participation generally
    - the technical process proposed
- Consider the time delay issue, and find a reasonable balance between the time needed for full participation / cooperation and the urgency to take concrete steps towards addressing problems.
- Earmark budget and other resources to implement the strategy.
- Be adequately flexible to allow collective learning, with continual adjustments expected throughout the initiative as priorities are identified and needs expressed.

The Cyclades project provides a good example of a clearly presented participation strategy set within an overall planning framework. Their project plan includes a flow diagram showing five key tasks inter-spersed with opportunities for involvement. The need for information dissemination is also highlighted.

The Cornwall and Devon projects are explicitly committed to an evolving process as networking takes place between partners and other stakeholders.

Issue: Identifying and Ensuring the Involvement of all Relevant Stakeholders

While it is important not to introduce unnecessary complexity into the process, failing to correctly identify all of the relevant stakeholders can defeat the collaboration process.

Identification of the relevant stakeholders should follow from the definition of the objectives and scope of the ICZM initiative, as discussed in chapter two. A stakeholder analysis should identify all organizations and individuals who:

- have management responsibilities in the coastal zone, or
- have the power to influence the decision making process, or
- could have a role in the implementation of decisions, or
- will be affected by the resulting management activities.

As an ICZM initiative evolves and new issues emerge, the relevant stakeholders may change and repeated stakeholder analyses should be undertaken.

Some of the difficulties in identifying all of the relevant stakeholders and finding appropriate interlocutors include:

- Sectoral concerns are represented both by Government, typically through line agencies associated with a particular ministry, and by private interests (commercial, individual, NGO concerns).
- Some concerns are more apparent than others (seasonality of some uses, secondary jobs etc.)
- Some stakeholders are not located in the coastal area (e.g. tourism and leisure interests)
- Many problems in the coastal zone are generated outside the coastal area by sectors that may have no direct concern with the coastal environment (e.g. upstream agriculture)
- Decisions taken in the context of an ICZM initiative may have an impact on the competitivity of neighboring, or even non-contiguous, regions.
- Future generations have a strong stake in ICZM initiatives but it is not evident who should represent their interests.
- The broad public is sometimes overlooked.

Having identified the stakeholders, it is essential to also ensure their involvement in the ICZM process. If key stakeholders are not involved, they may subsequently block the implementation of decisions. One of the most popular mechanisms to bring together different stakeholders is a broad-based consultative or participatory body or network. Recruiting stakeholders as "partners" in the initiative is also a common mechanism for ensuring involvement and generating funding.

Broad interests are represented by Coastal Fora in the Forth Estuary and Dorset, as well as elsewhere in the UK. In Côte d'Opale, the Syndicat is a similar body.

A more formal approach is illustrated by the Rade de Brest project's "Contrat de Baie", which has been signed by the 180 different partners involved in the project.

The Wadden Sea project's "NetForum" is a participatory network with special emphasis on securing collaboration between the many organizations and institutions concerned with tourism and environment in the Wadden Sea.

The La Gironde project stimulated the involvement of a large range of stakeholders through a wide consultation process held between February and November of 1998, in which 200 individuals or organizations were approached. On the basis of this consultation, 15 broad areas of work were defined.

As broad-based consultation and networking can be demanding of time and resources, a Steering Group may be a useful mechanism that is being employed by a number of projects.

The Strymonikos project initially planned to have a broad consultative body (Coordination Scheme) with representatives from all relevant groups, but decided such a group, with more than 120 members, would be inoperable. Instead the broader group meets on an annual basis - while the project Steering Committee is limited to those agencies with jurisdiction over the project area, including sectorally orientated Ministries.

The reluctance of certain stakeholders to get involved may reflect their distrust of the process, or the fact they do not see any need to get involved. Stakeholders may also be reluctant to invest their spare time and effort in ICZM if they fear that their views will not be heard, or will not have any impact on decision makers. To overcome this reluctance, it is important to open a dialogue, illustrate the commonality of long-term interest (real or political) in sustainable management of the coastal zone, and demonstrate a real commitment on the part of the institutional partners to listen to the concerns of all stakeholders.

It may take a considerable amount of time to bring all of the stakeholders on board, and this may appear to delay the ICZM initiative. However, this process of involving all stakeholders (and maintaining their involvement!) is itself a part of the integrated management process, a part which is essential to ensuring the success of the ICZM initiative.

The project in Lithuania initially faced problems of disinterest or suspicion from certain government departments. Everyone is now on board.

In Bantry Bay, the mussel growers felt that their interests would be ignored, and walked out of a general meeting. They have now agreed to re-join the initiative.

The distribution of a Draft Coastal Strategy in Dorset has stimulated additional organizations to join their Forum.

The Southern Danish Archipelago ICZM project in Storstrøm and Fyn Counties has built on the efforts over the past 20 years of Storstrøm County to develop a process for public participation to identify and ensure the involvement of all relevant stakeholders in the regional planning process. The task is now to keep the present participants involved and to commit new stakeholders for the ICZM process.

A complete identification and periodic reassessment of the relevant stakeholders should flow from the definition of the objective and scope of the ICZM initiative. It is particularly important not to forget future generations and those who are not physically present in the target coastal area.

Ensuring the involvement of all key stakeholders in an ICZM initiative is essential. It should not be short-circuited or abandoned.

Issue: Developing Good Communication

Collaboration is largely a matter of building trust, which in turn requires effective communication. Good communication keeps people in the picture; provides opportunities for dialogue, for discussing and resolving problems; and helps to attract and sustain interest to get things done.

As ICZM depends so much on voluntary collaboration, project leadership requires first-class communication skills to win and sustain the trust and mutual confidence of a wide range of coastal stakeholders. Stakeholders, too, require the capacity to present and defend their points of view.

Even if there appears to be little practical progress, continued communication builds determination to solve problems and convince all stakeholders of the relevance of the ICZM process to their own interests.

Effective communication is needed to prevent:

- unnecessary misunderstandings and conflict
- confusion over responsibilities
- difficulty in keeping to programme
- frustration and uncertainty for participants
- delays and extra cost
- a poor image for the project

Great care needs to be taken, as early mistakes in communication may be difficult to remedy.

Communication is a two-way process. Effective communication can be confounded by administrative secrecy and lack of government transparency. However, communication is also blocked by the use of technical terminology and jargon that means different things to different people. One of the first steps in creating effective communication is therefore the development of a "common language", which all of the participants understand.

Issue: Cooperation and Coordination Between Different Administrative Levels

Typically, management responsibilities with respect to coastal areas are spread across several levels of administration. Most sectoral interests and services are represented by one or more agencies of central government, and by their line agencies. While many sectoral activities and conflicts are played out in the coastal area, or their impacts felt there, the source of many of these activities is decisions made by sectoral agencies at more central (often ministerial) levels of administration. **The impact that higher level plans and strategies can have on the coastal zone implies that an ICZM initiative will fail without the involvement and commitment of middle and upper level authorities. The issue of consistency between decisions taken at different levels lies at the heart of subsidiarity and underpins the need for effective vertical coordination of sectoral activities.**

Nationally determined plans with a sectoral focus may include those for shoreline management, for designated (protected) areas of different kinds, and for tourism. Intersectoral strategies include those for economic development, Local Agenda 21, biodiversity strategies and estuarine management plans. Plans may overlap, and precedence between the various statutory and non-statutory plans stemming from different agencies and levels of government may be uncertain. Incompatibility or conflict between plans and strategies was noted in just over half of the projects.

Economic and physical planning strategies are inconsistent in Rade de Brest and Magnesia.

Poor consistency in actions of various players was noted in Côte d'Opale

The La Gironde project offers a good example of different administrative levels (department, municipality) having the responsibility over different activities (oyster cultivation, leisure navigation) in the mixed port management; the administrations, traditionally used to "doing it alone", must be convinced with the benefits of a consensual approach.

A particularly important obstacle to ICZM can occur when unexpected decisions or developments are determined sectorally by national or regional agencies without local involvement. In such circumstances, the public (and local politicians) may suffer from loss of motivation in trying to implement ICZM where they feel powerless to have an impact on significant decisions.

The possible national decision to establish a gold processing factory in Strymonikos causes considerable conflicts with other sectors and activities in the project area.

National housing policy is a pressure in Kent.

In the Isle of Wight, the nationally determined Natura 2000 network has the potential to conflict with other strategies, as it was imposed rather than developed through participation and consensus building.

Responsibilities for designation and management of protected areas often rests at a regional level, while land-use planning is more typically a local function in Finland and France.

The projects are putting a lot of effort into interpreting sectoral legislation as well as strategies and plans drawn up by different levels of government, or by different agencies, at the spatial scale relevant to the project. The majority of projects have established vertical cooperation mechanisms, and many are working with two or more levels of territorial authorities. Some have obtained formal approval from senior authorities. However, as well as having difficulties in keeping track of such plans which affect their area, local authorities may suffer from meeting fatigue, staff being distracted from their primary tasks etc. There isn't yet a good example in the Demonstration Programme of standardized and formal mechanisms to deal with such issues though, in nearly every case, the project has developed or is developing informal mechanisms for vertical communication.

Kent notes that there are simply too many plans and strategies, and is looking at how these can be harmonized.

The Isle of Wight project is specifically looking at the issue of coordination and integration of plans (both through the plan development process and during implementation) and lists nine types of strategies and plans which affect the project area.

Plans and strategies are being interpreted to local level in the Gulf of Finland.

In Ria d'Aveiro, the agriculture ministry is now working with local administrations.

Drawing on international experience, the Federal Consistency provision of the US Coastal Zone Management Act is of interest. The provision requires that all Federal (national) decisions regarding coastal developments must be consistent with State plans; this has proved an important incentive to States drawing up coastal management strategies.

Mechanisms are needed to ensure vertical communication and cooperation in policy development, as well as to ensure that the local individuals and organizations have a voice in any high level decisions that will have a significant impact on them. Such mechanisms might include:

-- synchronization of key planning operations in hierarchical context
-- a priori vertical and horizontal consultation in preparation of all planning operations.
-- formal advisory and guidance services operating between administrations.
-- agreements or charters

The Côte d'Opale project has developed a Charter for Development of the Littoral, designed to inspire the four levels of administration involved in development of coastal zone proposals (local, departmental, regional and national), and to be reflected in the local management schemes.

Issue: Achieving Coordination and Cooperation Between Neighbouring Territorial Authorities

The appropriate scope for ICZM normally reaches across administrative boundaries; for example, port developments in one town can have a major impact on neighboring towns and villages. This implies the need for horizontal cooperation and coordination between adjacent authorities, and **cooperation between neighbouring authorities is a logical component of most ICZM initiatives.** This cooperation can lead to a pooling of energies and resources.

Before embarking on ICZM, the municipalities in Latvia had little experience of working together. The ICZM pilot project "forced" them to meet and to plan together. In doing so, they discovered many shared concerns and also a new strength in tackling these problems jointly.

In a majority of cases, the relationship between neighbouring authorities is positive and overtures to cooperation are well received.

One of the triggers for the Ipirus project was the perceived need to collaborate with neighbouring Albania owing to the "geographical continuity of the coastal zone".

Storstrøm County is collaborating with authorities in the neighbouring area of Rostock (Germany), particularly with respect to regional planning and local Agenda 21 work in the coastal area and the development of compatible strategies for tourism.

Collaboration between neighbouring authorities may take various forms ranging from voluntary/informal to contractual. International conventions may be a trigger for cooperation between administrations of neighbouring countries. The demonstration projects illustrate several different successful mechanisms for collaboration.

Informal / Voluntary Mechanisms:

-- The Dorset Coast Forum brings together representatives from all the coastal districts in Dorset County, as well as representatives from neighbouring coastal counties.

-- Cooperation between neighbouring island authorities is at the heart of the Cyclades project.

-- Associations of local authorities are a feature in several projects including La Gironde, ANAS (Huelva-Algarve), and Latvia.

-- The Gandia (La Costera-Canal) project is based on a voluntary cooperation between neighbouring local authorities; they hope to use the results of the project as a stimulus for promoting a more formal association.

-- The Gulf of Finland has facilitated exchange of ideas and information between the seven municipalities working in parallel to develop local coastal management plans.

-- The Cornwall, Devon, Dorset and Isle of Wight projects have established the "Western Approaches Group" to help achieve coordination.

Semi-formal mechanisms:

All municipalities whose territory drains fully or partly into the Rade de Brest are signatories to the Contrat de Baie, which has been formally approved by the Préfet of the principle region concerned.

Formal Mechanisms:

In Norway, neighbouring communes as well as sectors, local associations and residents have a statutory right to consult in local development plans.

International cooperation based on Conventions:

The Wadden Sea project is facilitating coordination of activities between all of the regional authorities bordering the sea, and involves three countries. The Interregional Wadden Sea Cooperation (IRWC) complements the existing Trilateral Cooperation between the Governments of Denmark, Germany and the Netherlands, which seeks to harmonize policies, laws and management measures to achieve the common purpose of sustainable use of coastal areas and resources.

In a few cases, the relationship between neighbouring authorities is neutral, or even competitive, and the establishment of cooperation is more difficult. Information explaining clearly the common interest in collaboration, possibly presented or endorsed by a "neutral actor", may help foster a desire to cooperate.

In the RICAMA project, partisan politics have limited the cooperation between neighbouring local authorities. The project is working to gradually overcome distrust and hostility, by bringing new knowledge into the public arena and working to raise public awareness of the issues.

In many cases, the adjacent authorities may in fact be the local administrations of another country. One of the difficulties in developing cooperation across territorial boundaries is that the different authorities may have differing eligibility for funding. This is a particular problem for collaboration with non-EU countries.

> *Cooperative projects in the northern Adriatic are hindered by the non-eligibility of Slovenia and particularly Croatia for certain funding sources.*

Funding mechanisms for ICZM initiatives must ensure that all relevant neighbouring authorities can participate.

Issue: Cooperation across the Land-Sea Boundary

Discontinuity in the management arrangements for land and sea are a feature in many countries. The divide results from different legislative arrangements for land and sea, and is reinforced by tradition and ownership issues.

In a sense, cooperation across the land-sea boundary is only a special case of "cooperation between neighbouring authorities". It is included here as a separate issue because it is frequently particularly difficult to realize, and is more complicated than most cooperations between neighbouring authorities because of the concomitant sectoral divide. **Cooperation across the land-sea boundary is, however, absolutely fundamental to the development of ICZM, as the integration of the management of the land and sea is one of its fundamental objectives. This can only be achieved by ensuring that the authorities responsible for both domains and the economic actors active in both domains are involved in the process.**

Although the system of competence for management of the marine resources varies among Member States, there is a common need to encourage the responsible government department to link up with ICZM planners from the terrestrial side.

> *In many countries, including the UK, Ireland and Denmark, activities in the land side of coastal areas are largely controlled by planning legislation; offshore, they are controlled by sectoral legislation. Most uses of the marine environment depend at least to some extent on land-based facilities and infrastructure, yet offshore uses are rarely coordinated with local authorities because of these distinct control systems.*

There is also a need on both sides for a better understanding of the nature of the interactions and interdependencies between the land and sea components of the coastal zone.

While a weaknesses of several of the Demonstration projects is that insufficient attention has been given to involving the marine authorities, some of the projects are specifically addressing this issue and investigating possible mechanisms to ensure that marine issues are adequately linked to land-based planning and management activities.

> *Dorset's Coastal Forum includes representatives of offshore sectors and the Forum as a whole has made representations on issues such as ship-to-ship transfers of oil, and on coastal fisheries.*

> *The Bantry Bay project is working assiduously to ensure that the Department of the Marine is an active partner in their initiative.*

> *The Kent project is using by-laws to overcome the legal constraints to an integrated land-sea approach.*

> *The Côte d'Opale project is seeking to promote changes to the legislation so that the terrestrial part of the coastal zone and the marine side would be managed under one coherent approach.*

In Sweden, municipal level planning powers extend to the limit of territorial waters, 12 nautical miles. Similarly, in Norway and Finland, planning powers of local (County or Municipal) authorities may extend outwards to the edge of the archipelago. At least two projects (Irish Dunes, Kent) would like to see a similar extension of local authority statutory planning powers seaward in their country. The question of extension of planning powers offshore, however, is not always a politically acceptable solution. It raises several issues including that of local capacity, of costs and possible duplication of expertise,

uncertainty for commercial sectors, the need to redefine seaward local boundaries, and difficulties in applicability to temporary or shifting activities. In some cases, the hesitation to extend planning jurisdiction seaward is motivated by a fear of an unwieldly sub-division of planning for some sectoral activities, such as marine transport, that need a more holistic approach.

Issue: Cooperation and Coordination Between Local Sectoral Administrations

Sectors include economic sectors, such as tourism or fisheries, and non-economic sectors such as nature conservation or education. Services such as transport infrastructure, national security and coastal defense are also covered under this heading.

Sectoral pressures and conflicts are widespread in Europe's coastal zones and frequently one sector may see the others as a threat to its own objectives. These conflicts and the need to resolve them are often the trigger for ICZM initiatives.

The Norway project is in part a response to the inability for environment-fisheries conflicts to be resolved at the municipal level.

Environment-development is noted as a general conflict area by the Isle of Wight project. For example, offshore dredging conflicts with seabed conservation, and there is insufficient knowledge to fully assess environmental and fisheries impacts.

Strymonikos is an area of multiple conflicts: extraction industries (gold mining)- tourism; urban development - nature conservation; tourism-nature conservation; agriculture-nature conservation; and coastal fishery-pelagic fishery.

Departure of military with related employment problems is a problem in Dorset and Brest.

In Storstrøm, there are local concerns, mainly among landowners, that national conservation objectives expressed in the new 300m protection zone may check or limit local economic opportunities, especially tourism. Agriculture-environment conflicts are also noted. One way of handling these conflicts is through the new system for water management planning, by giving subsidies to farmers, for example for making new wetlands.

Kent notes that conflict often arises because of the competing objectives of statutory bodies.

Intra-sectoral conflicts can often be as damaging and intractable as inter-sectoral conflicts. Local initiatives can have an important role in facilitating understanding between different interests in the same sector.

In Kent, a conference has brought together for the first time fishermen, fish processors and retailers, academics, regulatory authorities and NGOs to discuss the future of inshore fishing in the region.

Sectoral activities in Europe are, with few exceptions, governed by sectoral laws, implemented by sectoral branches of administration. These laws are not generally related to the location of an activity, but rather to its nature. Because of the wide variety of sectoral activity in the coastal zone, a wide range of sectoral branches of the administration should be involved in its integrated management.

However, there are a number of problems in getting the various sectors to work together:

- each sectoral administration is typically on a different cycle of planning
- sectoral administrations do not normally have any tradition of working together and may even have strict descriptions of competence that prevent them from working together.
- each sectoral administration has a different constituency; the administrative sectors cannot always realistically work as independent agents.

Furthermore, horizontal administrative authorities often have little experience in working with sectoral authorities, and may not even recognize the need to do so.

In view of the significant number of perceived conflicts between sectoral interests, it is essential for the relevant branches of the administration to work together to find common solutions.

Development of mechanisms to facilitate this cooperation may be a gradual process that needs to break down traditional barriers such as mutual ignorance of need or competition, and may even require changes to legal competences.

Convincing the public of the long-term interest in finding common solutions may lead to pressure on sectoral administrations to work together.

Issue: Involving the Citizen and Interest Groups

While the different branches and levels of administration are clearly charged with working towards the public good, experience shows that they cannot equally represent all aspects of this "public good" in their decision making. **Public participation is particularly important to ensure that an ICZM initiative addresses issues related to quality of life, cultural and social heritage, and leisure time pursuits.**

> *The interests of the citizen as a tourist, for example, cannot always be represented by the tourist industry or national tourism boards whose interest is primarily commercial.*

Public involvement in an ICZM initiative also helps ensure the implementability of any recommendations or plans it produces.

Involving the citizen may be difficult for a number of reasons, including:

- no tradition of public participation
- no specific provision for direct citizen participation in some more formal ICZM structures (such as the "contrat de baie")
- logistical difficulties related to the time and cost needed to participate actively
- planning "overload" from unharmonized planning systems that can seriously stretch the resources of many stakeholders.

> *Many stakeholders find their capacities overstretched in attending and participating in more than one initiative, such as projects at various levels, regional and local, including local bio-diversity plans, Agenda 21 initiatives, shoreline management plans, and development plans.*

- the feeling that it is not worth their time to comment on a virtual "fait accompli" (particularly if if citizen participation is limited to consultation at the end of an ICZM initiative)

Specific mechanisms for stimulating the involvement of the public in ICZM are discussed in detail in the final report of the thematic expert on "Participation".

Specific mechanisms listed by four projects for involving the public include:

LATVIA	*NORWAY*	*BANTRY BAY*	*MAGNESIA*
Newsletters	*Newsletters*	*Newsletters*	*Press Releases*
Newspaper Articles	*Meetings*	*Questionnaires*	*Exhibitions*
TV Features	*Seminars*	*Web page*	*Mapping*
Draft Plans in Halls	*Conferences*	*Public meetings*	*Priority Search*
Public Meetings	*Newspapers*	*Discussion Groups*	*"Planning for Real"*
Municipal Info Centre		*Mapping*	*Workshops*
Questionnaires		*GIS*	*Public Meetings*

The ANAS association (leader of the Huelva-Algarve project) is creating an intranet structure among 30 municipalities in the south of Spain and Portugal, with the purpose of benefiting the citizens as its final users. The main objective is to favour citizen access to the public administration, including information about taxes, procedures, etc.

NGOs and civic organizations can also play an important role in an ICZM initiative by defending certain specific aspects of the societal good. Civic organizations may serve as representatives of citizens who do not individually have the resources to participate actively.

In some cases, there has been a reluctance to involve NGOs where they are seen to be unaccountable, have fixed agendas or be unwilling to work towards compromise. This may be overcome by insisting that all participants, including NGOs, enter the ICZM initiative on the basis of the same "ground rules" - namely a stated commitment to work towards finding solutions that optimize the public good over the long-run.

The role of NGOs is more developed in some countries than others. In the UK and Denmark, for example, NGOs play an important role in maintaining a balance of power, and in driving some ICZM initiatives. In Spain, NGOs are only starting to develop.

ICZM initiatives should ensure the effective involvement of the public throughout their activities.

Issue: Involving the Private Sector (and Stimulating Private-Public Partnership)

Many elements of the private sector have a large economic stake in decisions about management of the coastal zone. Many of these actors also have the political power to block actions via pressure on sectoral administrations. In addition, the environmental business sector has a particular role to play in sustainable development of the coastal zones, through promotion of new "green" technologies.

For these reasons, **it is important to engage the private sector as active partners in the ICZM process. Their participation can frequently also bring financial resources for implementation activities.**

The partnership funding the Dorset project is drawn from both the public and private sectors.

The Teeside and Humber Estuary Strategies (not Demonstration Programme projects) have mobilized the commercial and business sector to take an active role and contribute funding.

The private company constructing the "Egnatia" highway has made substantial donations to the Strymonikos Information Centre.

Frequently members of the business community and industry show only limited interest in getting involved in ICZM initiatives, for reasons including:

- They are not convinced of their interest in sustainable long-term management of the coastal zone, because of a short-term perspective;

- They may not realize the nature of the impact or dependence of their activities on coastal zone resource;
- Some of their activities may be unauthorized;
- A general suspicion of experts and controls and government administrations;
- Control for business activities may be remote or responsibility diffuse leading to difficulties in finding an appropriate representative (particularly in the tourism industry);
- A long history of autonomous powers and action in certain sectors, such as ports;
- Marine industries are used to operating within very different sectoral guidelines and regulations;
- Participation costs time and money
- Some sectors are made up of many small operators with no representative voice.

One of the reasons why small fishers have only a limited voice in decision making is because they are normally unavailable at sea from the early age when they start their careers. Furthermore, their "culture" frequently does not include interaction with planning processes. There is a particular need for further action to improve capacity building in participation and communication (especially at the local level) for these stakeholders. Norway has experience in addressing this issue.

In the Cyclades, tourism operators are organized at the island but not inter-island level.

The Dorset project encouraged the tourism sector to organize themselves in order to select representatives to their Coast Forum.

Several of the demonstration projects have made concerted efforts to overcome these difficulties and involve the private sector.

In the Forth Estuary project, Chambers of Commerce and retail trade representatives are used as specialists to help find solutions to specific problems.

The ANAS (Huelva-Algarve) project has signed several protocols and conventions with private entities in Portugal and Spain, including several companies in the telecommunications sector.

Involvement of financial institutions is a particular case, which is frequently forgotten. Financial institutions interact with the coast in several ways, namely:

- as *investors (shareholders and lenders)* - supplying the investment needed to achieve sustainable development.
- as *innovators* - developing new financial products to encourage sustainable development
- as *valuers and insurers* - pricing risks and estimating returns, for companies, projects and others.

Financial institutions can exercise considerable influence - in some cases, control - over decisions taken by other parts of the private sector. To encourage the investment sector to promote ICZM-compatible activities, a number of obstacles need to be overcome, the main ones being market inertia, the conservative behaviour of financial institutions and the imbalance between long term and short-term analysis.

In response to the challenges faced by environmental sector companies, certain financial institutions have already developed a number of innovative approaches, including environmental and ethical banks, specialist environmental financiers, and environmental funds.

Improved communication and information availability may be key in convincing the private sector that ICZM is in its best long-term interest, and mobilizing investment that supports ICZM.

Comprehensive information at all phases of the process also plays an important role in sending the correct signals to the market system, thus improving the chances that the market will promote ICZM-supporting activities and exchanges.

Legal or economic instruments may be needed to encourage short-term players to act sustainably.

3.3 Legal Issues

Law defines the powers and duties of the many public and private bodies and individuals involved in the management and use of the coastal zone, and it provides the legal framework within which they operate. Law therefore has the potential to facilitate the process of ICZM, but it also has the capacity to limit or impede it.

Legislation has an impact on all of the phases of an ICZM initiative, from information collection through to policy implementation.

Component of the ICZM process	Examples of Relevant Legislation
Information collection	EIA requirements Information collection laws
Participation	Access to information laws Requirements for consultation / participation
Administration Cooperation	Laws defining spheres of competence
Policy Development & Implementation	Existing sectoral laws

An analysis of the coastal laws of Member States reveals a diversity of legal systems but a similarity of legal problems. Although ICZM is a modern development, it must inevitably function within a complex legal framework, most of which pre-dates the concept of ICZM and was created for different purposes.

Issue: Legal definition of the coastal zone

The coast has traditionally been regarded as a jurisdictional boundary between land-based laws and marine laws, and has rarely been recognized as an integrated zone of legal competence.

There is no common practice on the definition of the coastal zone, although restricted concepts of the seashore have arisen within the legal systems of some States (including Greece, Italy and the United Kingdom) in the context of land ownership, by reference to selective tidal criteria. These criteria are too restrictive for ICZM, but are now often used for inappropriate administrative purposes.

In Greece, a 1940 law concerning the shore and foreshore (2344/1940) defines the foreshore as a strip of land washed by the highest winter waves. This is a Roman law concept, which is found in legal systems based on the civil law, and refers to an area under public ownership. The same Greek law defines the shore as the adjoining strip of land within 50 metres from the landward limit of foreshore, on which the erection of buildings is prohibited.

In the United Kingdom, the foreshore is defined as the intertidal area between high and low water marks The separate status of the intertidal foreshore from other coastal land is a relic of the common law, and is due to the historical property rights of the Crown. However, the low water limit of the foreshore has also been adopted as the boundary of local government areas, and is consequently the normal seaward limit of planning control.

It is probably not desirable to have an exclusive legal definition of the coastal zone for general purposes, but preferable to include all areas where land and sea exert a mutual influence. However, specific boundaries do need to be defined at the stage when management is applied to particular places. Those boundaries should be flexible enough to embrace the dynamic nature of the coast. In particular, the boundaries should not subdivide natural areas such as estuaries that ought to be managed as a whole.

The 1992 Danish Planning Act was amended in 1994 to create a coastal planning zone, which extends 3 kilometres inland from the coast, and is protected from new development as far as possible through the regional and municipal planning system.

The US Coastal Zone Management Act 1972 defines the coastal zone flexibly in terms of the interdependence of land and sea:

"The term 'coastal zone' means the coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes islands, transitional and intertidal areas, salt marshes, wetlands and beaches."

The US coastal zone extends seaward to the outer limit of the territorial sea, and inland to the extent necessary to control the uses of shorelands that have a direct and significant impact on coastal waters.

The definitions of the coastal zone for all EU countries are included in the final report of the thematic expert on Legislation.

Legal definitions of the coastal zone should be specifically designed for the context in which they are used, and should be broad and flexible enough to embrace the dynamic nature of the coast.

Issue: Complexity of existing legislation

The coastal zones of Member States are governed by a complex framework of laws, which are usually sectoral, uncoordinated and unsuited to ICZM.

Upon the historic definition of the coastal zone, a large number of administrative laws have subsequently been superimposed. Such laws usually deal with particular sectoral issues on land or sea, and prescribe the functions of individual regulatory bodies responsible for them. Thus, separate codes of law exist for such matters as land-use planning, local government, flood prevention, nature conservation, shipping, ports, pollution, fisheries, minerals, recreation, defense and archaeology. Inevitably, these have often been produced in isolation from each other, and tend to exclude issues outside their own sectoral remit or ignore their relationship with other laws. Such sectoral laws may unintentionally work against the objectives of ICZM.

Italian health regulations preclude beach nourishment with dredged sediment, as movement of anything that is potential contamined is prohibited. This eliminates one means of building up natural defenses, and as such provides a barrier to better management.

Sectoral laws may also be inadequate in that they may not cover both the land and sea components of the coastal zone.

Laws specifically referring to the coastal zone exist on a range of different levels. Within a State, laws affecting the coastal zone may be national, regional or local in scope, which not only results in complexity but also may also produce inconsistencies or conflicts between tiers of jurisdiction and between the legal regimes of particular localities. In addition, the coastal laws of individual States are also increasingly influenced by supra-national legislation.

Arrangements are particularly complicated in a federal State (such as Germany) where different levels of law present jurisdictional problems. There are also complications according to whether types of law apply to both land and sea or, more commonly, are confined to one medium.

New Zealand: Until 1991, there were over 50 laws governing the use of land, water and air in New Zealand, which often served contradictory purposes, and overlapped or conflicted with each other. After four years of legislative review and public consultation, the Resource Management Act 1991 introduced a fundamental reform of those laws, and created a single legislative framework to replace over 20 major statutes, including legislation relating to coasts, planning, water, soil, geothermal resources and air and noise pollution.

The 1997 Irish discussion document "Coastal Zone Management: a Draft Policy for Ireland", accepts that the legislative framework for the coastal zone is very complex and intricate, and that a fundamental restructuring of legislation is very difficult to achieve. It concludes that a more realistic and desirable approach is to build on the existing systems, but argues that any model for ICZM in Ireland must include amendments to legislation.

The Côte d'Opale project proposes a general law to establish a hierarchy among and coordinate the laws applicable to use of the three parts of the coastal zone - the land, the sea and the air.

In order to promote integrated management, there is a need for a thorough review of these laws, to identify overlaps, lacunae, and inconsistencies, at each level of administration and between levels. As far as possible, these inadequacies should be corrected to harmonize the legislation relevant to the coastal zone, even if consolidation is not possible.

In the United Kingdom, the House of Commons Environment Committee, in its 1992 report on Coastal Zone Protection and Planning, identified over 80 Acts dealing with the regulation of activities taking place in the coastal zone of England and Wales. It concluded that current legislation was too diffuse to provide an integrated or efficient framework for coastal protection and planning. The report recommended that existing legislation should be reviewed for consolidation and updating. However, this recommendation was rejected as impracticable by the UK Department of the Environment. They also stated "Nor would it be desirable to do so."

Issue: Overlapping Competence or Jurisdiction

If the parameters of each government agency's area of responsibility are not clearly defined, conflicts are likely to arise both between different tiers of government claiming jurisdiction in respect to the same matter ('vertical overlap') and between different sectoral agencies operating in coastal areas ('horizontal overlap')."

Complex and overlapping or conflicting jurisdiction (roles and responsibilities) of management bodies have proved a problem in Strymonikos.

In Bantry Bay, uncertain and possibly overlapping jurisdiction over waters between the mainland and Whiddy Island resulted in ineffective management of marine uses and resources.

If the same activity in the coastal zone is regulated by more than one authority, and is governed by different legislation, confusion about responsibility may result in the law not being enforced by any authority.

As a result of this jurisdictional uncertainty, Irish legislation to regulate aquaculture has not been adequately enforced in Bantry Bay. Legal anomalies in the relationship between mariculture structures or marine licensing with planning control juridictions have to be clarified between Harbour Authorities, Fishery Harbours, Marine Department and County Council.

Relevant sectoral legislation should be amended or replaced by provisions that explicitly define the responsibilities of each authority, and explain the relationship between them.

Some projects have found that producing a simple guide to "Who Does What, Where and How?" has proved very valuable in clarifying which institutions have which responsibilities.

Issue: Private ownership and public rights

Where coastal land is privately owned, the legal property rights of individual landowners may sometimes conflict with the public needs of management.

Coastal zones provide a range of benefits to society as a whole – including both social/cultural and recreational opportunities and the resource base underlying future economic well-being. The market system is frequently inefficient or inequitable in allocating such resources among users, with over-

exploitation and degradation as the result. This implies a need for government leadership in defining public and private rights and obligations.

Indeed, the earliest laws concerning the coast generally relate to the ownership of coastal land and the division between public and private property. They also provide the basis for public rights of access to coastal waters for such purposes as navigation and fishing. In offshore areas, rights are affected by more recent principles of international law.

In many countries, the shorefront is public or State property, but inland from this point most land is privately owned. In contrast, the sea is usually in the public domain as far as the limit of territorial waters (up to a maximum of 12 miles), although a distinction may also be made between the sea-bed and the water column. Beyond the territorial limit, States have rights of exploitation rather than ownership in their continental shelf or exclusive economic zone (200 miles).

In Spain, the Ley de Costas 1988 (Shores Act) declares the extent of coastal public property. It also defines four overlapping zones measured from the landward limit of the seashore in which the rights of private landowners are subject to restrictions in order to protect public use, passage and access to the sea, and to ensure that development is compatible with the protection of coastal public property.

In Southampton UK, public access to the shorefront is severely restricted in some locations as a result of extensive private dockland development.

The Finnish way of living - having your own holiday house - has resulted in overdevelopment of summer cottages. In Finland, until 1997, landowners had a right to construct dispersed buildings on the shore with a building permit, if the land was still quite undeveloped. The amended building act of 1997 requires plans for shorefront development.

In Barcelona, private land of high ecological value near the airport cannot be protected from development under the Ley de Costas, although the planning authorities would like to do so, because it is defined as urban land and is excluded from the controlled zone.

In Greece, the land use planning law of 1983 require that land owners have to contribute a percentage of their property for the creation of public use green areas when the zone is urbanized. (This law is not specific to coastal zones, but is implemented nonetheless in coastal urban and suburban areas.)

Where law has traditionally given certain unsustainable rights to private landowners, the public acquisition of coastal land by negotiation or compulsory purchase confers the opportunity to manage it. **Acquisition is an important method of safeguarding sensitive sites, however it is only feasible if corresponding funds are available; it is also not politically acceptable everywhere.**

In the United Kingdom, an independent charity, the National Trust, currently protects 565 miles of outstanding coastline in England, Wales & Northern Ireland.

In France, the Conservatoire du Littoral, a public administrative body established in 1975, has acquired 750 km of shoreline. Most acquisitions are made by private agreement, but compulsory expropriation is occasionally used in the public interest. The land cannot be sold thereafter, and public access is generally provided. It is managed primarily by local authorities on their behalf.

Nevertheless, State or public ownership does not necessarily guarantee protection. Military ownership of land is particularly problematic, due both to strict access limitations and to confidentiality of activities on the property – making it difficult to even assess the impact that the activities are having.

As an alternative approach, **public authorities may be able to enter into contractual agreements with private landowners who accept restrictions or undertake positive measures on their own land in return for compensation.**

Under the Agri-Environmental Regulation 2078/92/EEC, national schemes may provide financial aid for farmers who undertake to set aside farmland for at least 20 years for purposes connected with the environment. In the United Kingdom, this has led to the Habitat Scheme, which offers payment for the conversion of land to saltmarsh, and can be used to support the managed retreat of coastal defences.

In addition to ownership, the coast is subject to important public rights, which may be claimed by everyone, and allow activities such as navigation and fishing. Historically, these public rights originated from practical or economic necessity, but they are now increasingly used to support recreational and leisure activities as well. Although the exercise of ownership and rights may be regulated by legislation, measures that interfere with fundamental interests may be legally and politically difficult to achieve.

In Denmark, the public has the right to walk along the coast and to stop for bathing during the daytime. Public access to holiday harbours is also secured by legislation.

In Finland, "everyman's right", which has evolved from custom and practice over the centuries, entitles the public to go where they like on land and water in the countryside, including shore zones, provided that they behave responsibly. The public also has the right to take berries, mushrooms and some wild plants, and to fish with hook and line. "Everyman's right" inevitably leads to multiple recreational activities in natural areas, which can produce conflicts of use.

In the United Kingdom, the Courts have ruled that fishermen have a public right to take shellfish (and also lugworms for bait) on the foreshore, despite the risk that it may lead to a decline in species diversity. However, in May 1998, the UK Government used statutory powers to ban dredging for razor shells in the Wash because the mudflats are important feeding grounds for wintering birds.

3.4 Assessing the Effectiveness of an ICZM Initiative

ICZM is a long, gradual process, involving cycles of policy development and implementation. In order to ensure that this process is really having an impact, it is important to periodically assess its effectiveness, and take steps to change methods whenever indicated. It should be remembered that **the real purpose of an assessment is to learn how to improve the ICZM process.**

There are two approaches to such an assessment. One is to assess the process and methods being used; the other is to examine the results in terms of changes in the status of the coastal zone.

An assessment of the status of the coastal zone should examine the social, ecological, and economic systems, their state as well as the direction and rate of change of that state. It could examine whether or not:

- the human activity in the coastal zone is sustainable and reflects the costs and benefits for human and ecological systems, in monetary and non-monetary terms;
- the natural resources of the coastal zone are being adequately protected, preserved, restored, and enhanced in diversity;
- economic income, and job opportunities are adequate;
- the safety of present and future human life and property is ensured against disasters;
- the public has rights to access to and enjoyment of the coastal zone in a manner that is compatible with private and public property rights and other uses of the coastal zone;
- there is a balance between the benefits from economic development, the benefits from protecting, preserving, and restoring coastal zones, the benefits from minimizing loss of human life and property, and the benefits from public access to and enjoyment of the coastal zone; and
- the residents of the coastal zone feel a sense of social cohesion and cultural inclusion.

Assessing these factors clearly depends on the availability of adequate information. Also, due to the time-lag factor, on-the-ground results may not be readily apparent for many years. Assessment therefore often focuses on the process and methods of ICZM. While this is useful, it is important not to lose sight of the need to eventually produce measurable results.

An assessment of process could evaluate:

- the level of coordination between policies and activities affecting the coastal zone;
- the efficiency and effectiveness of decision-making;
- the level of public participation, the amount of education that supports ICZM;
- the availability - to those who need it - of relevant information;
- the existence of a coherent data collection system;
- the level of activity focussed on addressing real issues of local importance; and
- the level of political support (at all levels) for ICZM.

Since participatory planning is a key component of ICZM, it may be particularly appropriate to focus on an assessment of the collaboration component of an ICZM initiative. Ultimately the effectiveness of the participatory planning mechanism can only be assessed subjectively by those involved, in the light of progress made and results achieved. However, indicators of achievement would include charters, contracts, memoranda of understanding, structures and processes developed, forms of working and networking, results of trans-disciplinary studies, and the nature of integrated policies. Specific criteria for such an assessment are presented in the final report of the thematic study on Participation.

The three year exercise to establish ICZM in Latvia has changed the outlook within the municipalities quite significantly. Previously, plans in Latvia were relatively simple and unsophisticated. During the establishment of ICZM, all of the participants learned a great deal about what was going on in their region and discovered ongoing plans, projects and ideas which they had not known about. The result is that plans presently being developed are more comprehensive and holistic.

One of the most important criteria for assessing an ICZM initiative is whether or not it has succeeded in generating and sustaining sufficient interest and support to ensure its continuation through to implementation of plans and recommendations.

4. ENABLING MECHANISMS

One of the general principles emerging from the demonstration projects is that ICZM initiatives need to adapt to the existing institutional and political structures, and make use of existing legislative and institutional systems. However, at present, these systems are not optimized for ICZM.

There are different legal methods that could be used to facilitate ICZM. None is necessarily better than the others, but they are alternatives with advantages and disadvantages. One model is that used in the United States, which pioneered the concept of ICZM, and which recognizes the desirability of diversity.

> *The US Coastal Zone Management Act 1972 sets out the basic objectives of ICZM, and requires American States to draw up coastal management programmes that will meet those objectives. However, it leaves each State free to choose its own methods, and consequently each has devised its own system. There is no necessity for each coastal State to have an identical system of ICZM, provided that the methods they adopt work and are capable of operating in harmony for the benefit of the coastal zone as a whole.*

However, it is important to emphasize that integrated coastal zone management will normally require a combined approach, using a broad mix of instruments and techniques. This section will investigate how various types of instruments and mechanisms might be brought to service in the implementation of ICZM.

Issue: Legal Instruments to Require Information Collection and Diffusion

Law may be used to ensure that basic information, pertaining to the public good, is collected and available. The principle mechanisms include requirements for impacts assessments, and laws on public access to databases.

All EU directives impose requirements on the Member States to collect information related to the directive's implementation. The EU Member States, as members of the European Environment Agency, also accept obligations to collect and diffuse a wide range of information on the environment.

Directive 85/337/EEC on environmental impact assessment imposes public information requirements on the development of consent procedures for prescribed types of projects that are likely to have significant effects on the environment. The environmental information provided by the developer must be published, authorities with relevant information in their possession must make it available to the developer, and the public must be informed of the result of the decision-making process. In addition, recent amendments introduced by Directive 97/11/EC require decisions on the need for environmental assessment to be published, as well as the reasons for consent decisions. However, all of these obligations apply only to certain types of projects, which are listed in the Directives. Environmental impact assessment is therefore an important, but selective, legal instrument for public information.

A more general public right is provided by Directive 90/313/EEC on freedom of access to information on the environment. Subject to some exceptions, public authorities are required to make available information relating to the environment to any person on request. This Directive has broadened the approach in Member States from exclusive reliance on statutory registers, and has facilitated access to other sources of information. There have been some difficulties of interpretation in Member States about the identity of public authorities and the scope of environmental information; the grounds for exemption, the reasonableness of charging arrangements and the effectiveness of appeals and enforcement mechanisms have also been controversial in practice. The Directive will be supplemented in the future by the 1998 Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which contains some wider provisions. The success of such measures, however, depends crucially on the public exercising their rights, and it is therefore important that sources of information are well publicised, conveniently located, clearly presented and economical to use.

Issue: Non-statutory coordination between administrative departments

The non-statutory approach to both the ICZM process and implementation of ICZM policy has tended to be favoured by States (including the United Kingdom) which already have highly developed environmental laws that their governments believe are working well, which are reluctant to increase their levels of regulation, and where there is a tradition of non-legal guidance by central government to regulatory agencies and local authorities.

Non-legal arrangements can be introduced more quickly than laws, and can be altered without the need for amending legislation. One basic non-statutory approach, which is currently adopted by the United Kingdom, is simply to attempt to implement ICZM through co-ordination of the decisions of all the authorities responsible for every sector without new legislation, so that they act in accordance with commonly agreed objectives. Those objectives and the arrangements for mutual consultation can be contained in plans or programmes, which need not themselves take the form of legislation, but are policy documents instead.

The advantages of this approach are its simplicity, as no change in the law is involved, and its flexibility. However, the existing laws may be inadequate. There is also no guarantee that all authorities will follow voluntary policies as there is no legal mechanism to compel them to do so.

The Forth Estuary project Is developing an "implementation action plan" which invites various agencies and organizations to voluntarily implement relevant aspects of their strategy. The emphasis of the Forum's work is on building "ownership", in hopes that the various actors will adopt the strategy and work towards its implementation. However, the Project leader commented that "it remains to be seen whether or not the partners will implement the results, as they are under no legal obligation".

States that begin by introducing informal procedures may end by replacing them with laws. The reverse is much less likely to happen.

Devon and Cornwall have achieved success in implementing the management schemes for statutory Marine Natura 2000 sites on the foundation of an established voluntary approach.

Issue: Legal and Regulatory Instruments to Enable Collaboration

Because the functions of public authorities are defined by legislation, they may be legally prevented from co-operating with others in the coastal zone if their statutory powers and duties are expressed in narrow sectoral terms.

Before 1992, most harbour authorities in the United Kingdom, which were established to serve the interests of commercial navigation, had no statutory powers or responsibilities to promote nature conservation in their harbours, even if they wished to do so. Sea fishery committees, which were established to conserve commercial fish stocks, were arguably subject to a similar limitation, which would restrict their legal ability to make bylaws protecting marine nature reserves.

Legislation defining the functions of public authorities in the coastal zone should provide them with powers and duties to co-operate with other authorities, and should be sufficiently flexible to enable them to exercise their functions in the overall public interest.

In 1992, the Harbours Act 1964 was amended by the Transport and Works Act 1992 to place a statutory duty on British harbour authorities to take nature conservation into account when exercising their functions. They were also given a discretionary power to acquire the right to make byelaws regulating harbours for nature conservation purposes. Likewise, the Sea Fish (Wildlife Conservation) Act 1992 gave sea fishery committees a responsibility to take account of nature conservation, and this was subsequently extended by the Environment Act 1995 to enable them to use their regulatory powers for the same purpose. As a result, both harbour authorities and fishery authorities will now be able to participate in the protection of marine special areas of conservation (SACs) designated under the EU Habitats Directive.

Legislation also has a role to play in enabling participation. Many countries have legal requirements for consultation of the public on a variety of issue. The weaknesses in some of this legislation include:

- no legal requirement to act on the results of the public consultation
- public involvement is limited to consultation at the end of the policy development process, with no requirement to involve stakeholders at an earlier phase when changes are more acceptable
- procedural rights and mechanisms for social actors to intervene in the decision making process do not necessarily cover all government levels, despite the fact (already discussed elsewhere) that law at more central levels may have a strong impact on coastal dynamics.

Legislation should facilitate collaboration. The minimum requirement is legislation that allows, or enables, cooperation and participation. An ICZM-supportive structure would also allow any stakeholder (public or private) to launch an ICZM initiative.

Requirements for involvement of all of the interested and affected actors, whether institutional or not, can also be built into the law. Such requirements are most effective if they cover all phases of the planning and decision making process and all government levels.

Issue: Consultation

Consultation is commonly used as a mechanism for collaboration, both between different levels of administration and different sectoral branches, and as part of the participation process. However, for several reasons, consultation frequently ends up being a pro-forma task, rather than a useful tool:

- A good consultation requires adequate time for reflection, but bureaucrats are often overworked leading to quick and superficial consultations
- Often consultations do not get to the correct person
- Many sectoral administrations do not have the technical capability to respond to consultation requests related to ICZM; in particular, many administrators are not able to conceptualize spatially
- Consultative opinions may be ignored. This provokes a cycle in which administrators and the public lose motivation to provide thorough responses to consultation requests.

The Cyclades and Magnesia projects have each developed good practice in consultation.

The intended use of results of the consultation should be made explicit, and adhered to.

The effectiveness of consultation can be increased by moving it to earlier in the decision making process when there is a real possibility to change proposals.

The consultation process must be considered a priority activity. This means allocating adequate time and appropriate staff resources to respond to consultation requests and to process responses.

Cross-sectoral training of administrative consultees may improve their capacity to answer consultation requests. In the long run, it may also reduce the need for consultation as administrators learn to build multi-objective and spatial concerns into their own work.

Issue: Legal and Regulatory Instruments for Policy Implementation

The choice of instruments used to implement policy defined by the ICZM process is often guided by concerns as to whether non-statutory policies, strategies, and plans can be enforced, and whether, in the event of conflict, they have any standing against statutory plans or sectoral legislation. In general, some type of link to the statutory system will be required to implement policy.

The Størstrom County project involves extension of the regional planning procedures on a non-statutory basis and thus depends on local government will and on public participation- the project would like to see the sustainability assessment a statutory part of the regional plan.

In Norway, the Planning and Building Act, the principle instrument for coastal planning, is being revised. The results of the demonstration project will be fed into this process.

In Belgium, since 1995, there has been consultation between the federal (Belgian government), the regional (Flemish) government and the Province of Western Flanders. This will soon be enhanced by a formal cooperation agreement.

In France, a 1983 law provides for the preparation of Schémas de Mise en Valeur de la Mer (SMVM). These are zoning plans for areas of sea and adjacent coast, adopted by the State on the submission of the Préfet du Département, after consultation with local authorities and interests. They are legally superior to local plans, which must conform to them, but they have proved difficult to agree in practice due to a lack of resources. In addition, the Loi Littoral 1986 amends the Code de l'Urbanisme by introducing national land use planning restrictions to control urban expansion on the coastline, and protects a 100 metre coastal strip from construction (la bande littorale non constructible). Although the relationship between the SMVM and the Loi Littoral is not entirely clear, they provide a potential statutory planning framework for the coastal zone, and the Côte d'Opale project is proposing an SMVM to support ICZM in their area.

A statutory approach to implementation of ICZM policy through co-ordination of existing laws requires the enactment of ICZM legislation, setting out a framework within which existing laws can be co-ordinated. An example is Florida in the United States. The essential contents of such legislation are as follows:

- It should define the coastal zone. Different definitions are possible, but they must be sufficiently broad to cover the areas of coastal influence and interaction. For example, in Florida, the whole of that State is defined as the coastal zone.
- It should set out the broad objectives of ICZM, identify the levels of government (national, regional or local) responsible for producing coastal zone management plans, and place a legal duty on them to do so. It could also provide for the approval of those plans by a higher authority.
- It should provide for the financing of ICZM.
- It should specify how existing laws should be used to implement ICZM, for example:
    - by placing a legal duty on specified authorities to take account of or follow ICZM plans. This could include authorities at levels above those who make the plan. For example, Federal agencies in the United States must follow approved State plans, unless they are exempted by the Secretary of Commerce.
    - by creating duties for specified authorities to consult other authorities involved in ICZM before making decisions that affect the coastal zone.
    - by amending existing laws to remove impediments to ICZM, and enabling them to be used to achieve ICZM.

Such an approach has many advantages, namely:

- It gives legal and political recognition to ICZM.
- It give statutory status to plans.
- It creates legal duties to achieve ICZM.
- It creates the minimum disruption to existing laws and procedures.
- It maintains the maximum consistency with procedures outside the coastal zone.
- It should be cheaper to operate than adding new procedures.

The disadvantages are the difficulty in cooperation between a large number of sectoral authorities, the fact that existing laws may not cover all the issues that need to be regulated in the coastal zone and/or that existing laws may not work.

For these reasons, some countries have chosen an approach involving a new legal procedure for authorizing developments in the coastal zone. This model also involves new coastal zone management legislation, which would do all the same things as the previous model, except that there would also be a new procedure for authorizing developments in the coastal zone. This legislation should therefore identify an authority responsible for permitting developments, which could be either an existing body or a new one created for the purpose. It should also specify the type of projects or activities that must be submitted to this authority, but would probably retain some existing procedures and authorities for less significant matters.

The Resource Management Act 1991 of New Zealand abolished numerous existing authorities and Acts and amalgamated all planning, water and soil legislation under the jurisdiction of the Department of Conservation and local authorities, which must follow a national coastal policy statement and regional coastal plans.

Such an approach creates a single integrated procedure for decision making, rather than requiring co-ordination of a range of different decisions. Furthermore, as it is designed specifically for the purpose of implementing ICZM, it is not dependent on existing laws. However, it requires major legislative and administrative changes, and is therefore more costly to introduce and politically difficult to agree. There is also the risk that a single authority will not necessarily produce a balanced judgement; wide consultation is therefore essential. This type of approach also creates a new jurisdictional barrier between the coastal zone and inland areas, whereas many coastal problems originate from decisions relating to inland areas, such as polluting inputs into river catchments. While a State might choose to adopt such a fundamental reform, it is hardly a requirement that the European Union could impose.

Issue: Voluntary Agreements with Economic Actors

Voluntary agreements can be an effective means of achieving ICZM objectives and in many situations can work more quickly and with more flexibility than regulatory regimes. Voluntary programmes can also serve to build up trust and credibility between industry, government bodies and the public. Voluntary programmes are an adjunct to, rather than a replacement for, regulations and economic instruments for protecting the environment.

In practice, voluntary agreements are a pledge by one or more sectors of the economy to behave in a certain way in order to attain environmental goals. Voluntary agreements may play an important role in decisions to develop and deploy ICZM-friendly technologies, however they must be carefully examined to ensure that they do not directly or indirectly discourage investments. In most cases, voluntary agreements by the private sector are almost always motivated either by government threats of regulations and/or taxes or by government pledges of financial support. For any voluntary agreement, a key issue is to decide, on an objective basis, how well the agreement is being implemented by parties to it. Policies in this area are still evolving. Choosing a segment of the private sector that can offer a unified negotiating stance, monitoring compliance and assuring accomplishment of the terms of the voluntary agreement on each subscriber are particularly difficult issues.

In Storstrøm County, there are voluntary agreements with the tourism sector, through the regional and local tourism organizations and with the trade itself. The agreements concern information diffusion, protection of nature and the environment, and green tourism initiatives. The tourist sector cooperates because it is very aware of the necessity of a clean environment and an unspoiled coast to keep and develop tourist visits.

Associated British Ports has entered an active voluntary collaborative arrangement with the Solent Forum (in which the Isle of Wight project participates), to improve dialogue over port development proposals.

In Côte d'Opale, two structures -- OPAL'AIR and the Secrétariat Permanent pour la Prévention des Pollutions Industrielles -- provide an interface between local institutions, the services of the State, industry and associations for environmental protections. These structures take collective decisions to reduce the pollution generated by human activities.

Government may encourage the use of voluntary agreements through economic instruments

Issue: The Land Use Planning System

The planning system is regarded as the principle mechanism for coastal management in a number of the countries involved in the demonstration programme (e.g. Denmark, Norway, Sweden, Finland). In other countries, the planning system is often considered adequate to deal with landward aspects of ICZM. In general, the need for vertical consistency of land use plans is assured within a hierarchical system, most commonly top-down in nature, whereby land-use plans made at each level must take into account the planning provisions of authorities at more central level, and typically need to be approved by those authorities.

Although land use planning is a principal instrument through which administrations can shape the future of their territory and implement policy objectives, it is important to remember that it is only one component of the ICZM process. There are several reasons why land use planning alone is not a sufficient vehicle for ICZM, the most important two being:

Limited scope --

- Most planning systems cover only the terrestrial parts of the coastal zone
- Many planning systems take a narrow perspective, focusing narrowly on development control (buildings) rather than broader land-use issues and implications for infrastructure etc.

A good example of a more comprehensive spatial planning system is the Danish system, as seen in Storstrøm. In Denmark, the regional plan is a tool for coordination between sectors and between vertical levels of administration. However, the increasing complexity of the regional planning system is running into problems of insufficient resources.

- The linkages between the land use planning and sectoral planning systems are often weak. Spatial plans (e.g. zoning plans) may restrict the location of certain developments while permitting procedures may provide a means to prevent or modify certain sectoral developments.
- Planning controls may have limited applicability outside urban areas

There may be uncertainties regarding precedence of different plans if these are not amended in a coordinated manner; this issue has arisen in the project in La Gironde.

and, Lack of flexibility --

- Provision of special planning zones and coastal setbacks are valuable coastal management tools but may need to be adapted to the coastal system in question, in conformity with the general principle that ICZM needs to take a systems perspective
- Frequency of plan production or revision is limited by resource implications, and time required for procedural consultations in drawing up plans
- Appeals are time consuming and costly

The implementations of land use planning that best support ICZM follow certain principles:

- **Planning authorities need the mandate to implement plans, as well as issuing permits**
- **Individual decisions need to consider the broader context and a coherence needs to be introduced into the system**, to avoid unintended cumulative effects of many "small" decisions. Impact assessment should be as broad and comprehensive as possible.

Fragmented land use planning is noted in Strymonikos, Ipirus and Cyclades.	*Poor spatial consistency in decisions is noted by the Ria de Aveiro project.*	*The combined impact of many small coastal defense projects is evident in Pescara (RICAMA project).*

Some of the projects have noted that although Environmental Impact Assessments are normally conducted for most individual development proposals, cumulative effects are not

taken into account, as this is not required by most national EIA laws. Consequently, local planners must make decisions without having adequate information on the capacity of their coast or the cumulative effects of the development proposals.

- **Mechanisms are needed to ensure compliance with permitting requirements**
- **Broad opportunities for consultation or participation should be built into the planning process**
- **Close coordination needs to be established between the land use planning and sectoral administrations**
- **Land use planning at different levels must be coherent.**

> *The Athens project notes that the separation between the General Urban Plan and the Local Street Plan is generally an obstacle to creating a composite and specific approach to coastal zones.*

Issue: Economic Instruments

Economic instruments include taxes, subsidies, and rebate systems, as well as the creation of tradable permits (such as tradable development permits). These instruments can be harnessed to provide incentives for ICZM, to redirect the drive for economic profit so that it supports the societal good. In economic terms, they can be used to correct markets that do not assign the correct value to certain components of the coastal system.

One economic instrument that would go a long way to promoting sustainable development, not only -- but particularly -- in the coastal zone, would be environmental tax reform to shift the burden of taxation away from employment and towards environmentally undesirable impacts. This should not be seen as introducing a market "distortion", but as replacing accidental and undesirable consequences of taxation with planned and beneficial ones.

Tourist taxes and greening of public procurement procedures are two other viable options.

> *The Danish Ministry of Environment and Energy is developing a system to restore wetlands, river functions and other public services on "reclaimed" agricultural lands through "economic rents", as an alternative to land acquisition. Ownership would remain with the farmers who would receive these payments for allowing the rehabilitation of former wetlands, flood plains and coastal marshes.*

> *In Belgium, private owners are given incentive payments to implement management of "protected" areas.*

> *In France, there is a Taxe Départemental d'Espace Vert levied on any construction works; the income is used for interventions for the acquisition, management and maintenance of environmentally sensitive areas.*

Economic instruments show great potential but are not widely used to implement ICZM at present. Guidelines that might encourage their use include:

- Economic instruments should be used in conjunction with (not instead of) other policy instruments
- Effectiveness of the instrument should be monitored during their implementation to ensure that the desired results are being obtained.
- The revenue generated by economic instruments should be seen to be used to promote ICZM objectives.
- A significant portion of the revenue generated should be attributed to the local administrations to raise their incentives in implementing the instruments.

It should be noted that the use of economic instruments is contingent on adequate information about the societal costs and benefits of different coastal activities, in order to set fair levels for taxes and subsidies.

Issue: Using ICZM-Friendly Technologies

In the coastal zone, technologies can represent a support to "look" at the Coastal Zone or can "act" on the Coastal Zone. Those technologies that look at the coastal zone usually support ICZM through data collection and information production or management, and have already been discussed in chapter 3.1.

This section considers those technologies that act on the Coastal Zone, including technologies adopted for specific sectoral needs but compatible with ICZM strategies in decreasing the adverse effects of coastal activities (ICZM-friendly), those that are necessary to correctly implement or safeguard the implementation of ICZM plans and strategies (ICZM-supporting), and those that work against the goals of ICZM (counter-ICZM).

Technologies can be either part of the problem or part of the solution in coastal zones, depending on how and where they are used.

Large-mesh nets are an example of an ICZM-supporting technology. Their specific purpose is to reduce by-catch of juvenile fish.	*Desalination technology is an example of ICZM-friendly technology. While its purpose is sectoral – to provide drinking water – it supports the objectives of ICZM by helping to protect aquifers from overexploitation.*

In most of the demonstration projects, the role of technologies that “act” on the coast are not given adequate consideration. This may be as a result of the land use planning focus of many ICZM initiatives.

ICZM initiatives can help ensure that technology is part of the solution through:

- Involvement of the appropriate technical specialists in the ICZM initiative.
- Legal standards, such as emissions standards, licensing requirements and standards for best environmental practice (BEP), best available techniques (BAT) or integrated pollution prevention and control (IPPC). These remain the primary instruments in many countries for stimulating the development and implementation of environmentally-friendly technologies, however, short-term deadlines for attaining compliance with new regulations can discourage investments.
- Sufficiently stable regulatory requirements allowing for long-term investment strategies to incorporate environmentally-friendly technologies. Yet, overly inflexible technological specifications can discourage innovation.
- Promoting industry’s interest in improving its competitive position through development and use of ICZM-friendly technologies.
- Voluntary agreements and the possibility to adopt eco-labelling schemes, environmental impact assessment, and education about ICZM-friendly technologies can play a major role for the promotion of the informed application of technologies with reference to ICZM.
- Training of creative technologists and a new generation of scientists and technicians. General education can be used to engender a strong preference and demand for cleaner production and products, thus creating a market.
- Environmental audits and environmental reporting (ISO14000 and EMAS) may encourage use of ICZM-friendly technologies by providing facility managers with a systematic, documented, regular and objective evaluation of performance. The ISO 14000 framework represents a move toward integrating sustainable development principles into our free

market economic system through stimulating new approaches to materials selection, product and process design, and transportation logistics at each step of the product life cycle.

- Dissemination of good practice and expertise. It has proven difficult to effectively disseminate information about technologies particularly to small and medium-sized enterprises. Governments are currently using a variety of information transfer approaches including technical publications, computer databases, local workshops and demonstrations, telephone "hot-lines" and video presentations. Many believe that, especially for small and medium-sized enterprises, the most effective information transfer approach for promoting more environmentally-friendly technologies is by means of consultants who work on-site for some period of time.

- "First mover advantage" in developing green technologies; this has enabled some countries, notably Germany and Denmark, to develop lucrative new industry sectors. Economic regeneration is more likely to achieve economic objectives if local communities are actively involved in ensuring that proposals meet social as well as economic objectives, and that environmental quality improves both well-being and an area's attractiveness for developers.

Issue: International Conventions and Agreements

The Member States of the European Union, either individually or as members of the European Community, are signatories to a wide variety of international agreements and conventions with relevance to the coastal zone. These include conventions specifically referring to marine and coastal areas, as well as sectoral conventions whose application also covers these areas, such as CITES, CSD, the Montreal Protocol, etc.

Any European level strategy on ICZM must, as a minimum, be compatible with the Member States' obligations under these international agreements.

International conventions and agreements have been developed to deal with particular trans-national environmental issues, particularly marine pollution and the protection of the resources of the sea. Although land-based sources of marine pollution have long been included, a more general desire for integrated management of land and sea has not been the principal stimulus for these arrangements, and therefore ICZM itself does not figure prominently within them. Nevertheless, many of the issues with which they deal are matters that must also be addressed in coastal management, and international action helps to promote consistency in national measures.

Marine and Coastal Conventions and Agreements to which the EU or some of its Member States are party include:

- *Tri-lateral Wadden Sea Cooperation*
- *Ministerial Declaration of the International Conferences on the Protection of the North Sea*
- *Ramsar Convention*
- *OSPAR*
- *UNCLOS -- the U.N. Law of the Sea Convention*
- *FAO Code for Sustainable Fisheries*
- *RAMOGE*
- *Barcelona Convention*
- *Helsinki Convention*
- *Bonn Agreement*
- *the Copenhagen Agreement*
- *the Lisbon Agreement*

International shipping and maritime safety conventions include:

- *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter at Sea (London Convention)*
- *International Convention for the Prevention of Pollution from Ships (MARPOL)*
- *International Convention on Intervention on the High Seas in Cases of Oil Pollution Casualties*
- *International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC)*
- *Convention on Civil Liability for Oil Pollution Damage (CLC)*
- *Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND)*
- *International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances (HNS)*
- *International Convention on Salvage*
- *Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil*
- *Convention on the International Regulations for Preventing Collisions at Sea (COLREG)*
- *International Convention for the Safety of life at Sea (SOLAS)*
- *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)*

The most significant conventions and agreements for ICZM that are those that seek to promote common policies for regional seas: the Mediterranean, Baltic, North Sea and Wadden Sea. Thus, the Joint Declaration on Protection of the Wadden Sea, signed by Denmark, Germany and the Netherlands in 1982, has promoted trilateral co-operation between those States and has led to the adoption of a common Wadden Sea Plan. In another example, the Helsinki Commission adopted a Recommendation (15/1) in 1994 on the Protection of the Coastal Strip, which advised the Baltic Sea States to establish a protected coastal strip at least 100 to 300 metres landwards and seawards from the mean water line and a coastal planning zone extending a minimum of 3 km inland.

Moreover, although The UN Law of the Sea Convention has now provided an overall framework for marine environmental law, however, the variety of international measures and the variability of participation means that consistency between them is not always achievable: Although international conventions are legally binding, they can only bind those States that agree to join them. Declarations, on the other hand, are non-binding expressions of intent, and implementation is dependent on political will.

Issue: Regulatory Compliance and Enforcement

Good laws are necessary to implement policy, but they will only work if there is also the political will and the resources to use them effectively. Unenforced law is can be worse than no law at all. Not only has it wasted time and resources in development, but also it establishes a pattern in which policy development and legal structures are considered irrelevant, generally undermining the effectiveness of law and of the public sector.

Lack of enforcement may be a symptom of inadequate resources and/or corruption; however it is often at least partly due to a lack of public support for the legislation. This lack of support equates with pressure on local administrations to disregard its implementation. Another source of enforcement problems is where the law or regulation works against the interests of the local administration, either politically or financially.

> *Although Denmark has very good legislation for cleaning wastewater, many coastal municipalities with less than 5,000 inhabitants do not adequately clean their wastewater, due mainly to a lack of human and financial resources.*

In order for environmental laws to be capable of implementation, they must be well drafted, solidly based on scientific knowledge, and not be administratively impractical or too expensive. The practicality and cost implications of legislation need to be known at the time when it is prepared, and it is important that wide consultation takes place at the preparatory stage.

The effective enforcement of environmental laws requires:

- monitoring and inspection to assess compliance;
- public access to the results of monitoring and inspection;
- availability of appropriate legal remedies and sanctions; and
- public accountability of regulatory bodies.

The Commission, in its Communication on *Implementing Community Environmental Law*, COM(96) 500 final, issued in October 1996, proposed to consider:

- establishment of guidelines to assist Member States in carrying out environmental inspection tasks, and the possibility of a Community body with auditing competencies;
- establishment of minimum criteria for the handling of complaints and carrying out environmental investigations in Member States where such mechanisms/procedures are lacking; and
- the need for guidelines on the access to national courts by representative organisations with a view to encouraging the application and enforcement of Community environmental legislation in the light of the subsidiarity principle, taking into account the different legal systems of the Member States.

One of the benefits of the ICZM approach is the possibility to develop law that is more easily enforceable, through the involvement and participation of all of the relevant stakeholders in the early stages of policy development.

An ICZM initiative may also provide the opportunity to break the circle of unenforceability of law and disrespect for policy, by bringing all of the relevant stakeholders together to evaluate the alternatives for best management of the coastal zone. If this evaluation determines that certain laws or regulations are inappropriate, steps should be taken to repeal them; if on the other hand, their utility is reconfirmed, the ICZM process has given an endorsement that mandates their proper application.

5. SUSTAINING THE PROCESS OF ICZM

ICZM is in the long-term general interest. However, it is a long slow process that may take three to five years just to establish, with the length of a full cycle of ICZM, including policy implementation and assessment of results, being on the order of 10 to 15 years. This is beyond the length of most planning and political cycles; politicians may thus not see a personal interest in promoting ICZM as the results will only be apparent during the term of a successor. Even if other stakeholders see an interest in initiating ICZM, their interest may wane over the length of the initiative as unrealistic expectations of quick results are deceived.

For these reasons, ICZM cannot be considered a self-sustaining process, at least not until it is sufficiently common for there to be a plethora of examples to convince the general public of its overwhelming necessity and effectiveness.

Therefore, in order to promote ICZM, there is a need for an enabling environment consisting of a clear policy/strategy, and guidelines for sustainable use of the Community's coasts, set out at the EU level. However, there is also need for supporting measures to sustain the process of ICZM.

The measures discussed in more detail in the rest of this section are those which need to be undertaken by society at large to support ICZM. However individual project teams can help to ensure the durability of their initiatives by:

- Working to ensure political will. Political will depends on an understanding of the benefits of a more coordinated approach, and above all on public support (see also section 5.1 below).

Ipirus notes a general lack of awareness of the needs / benefits of sustainable development / ICZM.	*The Magnesia project is tackling the project durability problem by developing a succession (or exit) strategy through an audit of institutional involvement leading to greater commitment to the process, so that momentum may be sustained in future years.*	*Strymonikos is specifically attempting to demonstrate the benefits of a coordinated approach.*

- Building project team capacity by developing appropriate skills

- Establishment of long-term structures and networks

This is anticipated by several projects including:
An information centre for Strymonikos
A coastal observatory in Kent
Various networks including NetForum (Wadden Sea)
Expert group, with representatives from academia, NGOs and the private sector (Storstrøm and Fyn Counties)
The Centre for Coastal Environment on the Isle of Wight

- Adoption of the initiative by an established agency as a means to ensure its survival as well as its legitimacy.

The Local Development Corporation of Cyclades may provide a long term vehicle for the project.

- Securing long term funding, in particular for the employment of permanent staff to facilitate the initiative.

This is particularly necessary in the case of voluntary approaches such as the coastal fora of Dorset and the Forth Estuary.	*Some projects have already identified or are setting out to identify new sources of funding (e.g. Wadden Sea). Others anticipate integrating the administrative tasks associated with coastal management into existing agencies (e.g. Magnesia).*

- Not raising expectations too much at the start; understand that progress is slow

- Establishing long-term contractual obligations between partners
- Adopting an incremental and adaptive approach in order to learn from experience, while at the same time achieving results within existing means and capacity. ICZM is thus an iterative process, with the scope of the initiative expanding over time.
- Allowing management structures to change as the project progresses through the project cycle, to reflect changing needs of projects.

The Scientific Committee established for the Rade de Brest project was a temporary structure though members continue to provide advice to the follow-up groups working on specific issues. The Technical Group takes a wider perspective.

Dorset established theme related working groups to elaborate individual issues, but these groups will give way to a more integrated approach to look at management options.

In Latvia and Lithuania, temporary administrative structures were established to manage the coastal management initiatives through a period of rapidly changing national policy.

In Cyclades, the role of the university will diminish as local capacity for management develops.

In Down, the local community is expected to take an increasing role in decision making.

On the Isle of Wight, liaison and steering committees were established for the development of an Estuary Management Strategy for the Western Yar. A project officer has now been appointed to implement the strategy.

5.1 Building Public Support

ICZM cannot work without widespread public support. This support is necessary to motivate participation, but also to give legitimacy to the process itself.

ICZM is really primarily about changing mentalities and behaviours. For the public to support ICZM, it must turn from familiar ways of thinking and adopt new patterns. Attitude shifts are already occurring as summed up in the following table drawing on global practice:[*]

CONVENTIONAL PRACTICES	EMERGING PRACTICES
Mechanistic	Organic/Cybernetic
Imposed control	Self organizing/adaptive
Compartmentalized	Holistic/Ecological
Elimination of uncertainty	Accepting uncertainty
Avoid overlap	Unavoidable overlap
Ends given	Goals developed
Fixed course	Flexibility and learning
Neutral to politics	Working with politics
Monolithic government	Government of many agencies
Rational linear	Rational and intuitive
Pragmatic or visionary	Pragmatic and visionary

However, until problems are of such a magnitude as to be almost insolvable, humans tend to stick to comfortable and familiar behaviours. It is therefore essential to raise the general public awareness of both the importance of the problems in the coastal zone, and the potential of ICZM to change them. This is a matter of positioning ICZM in the community.

[*] adapted from "Coastal Planning and Management", R. Kay and J. Alder - Chapman & Hall 1998

At present, those who live, work or derive pleasure from the coastal zone have an inadequate understanding of its dynamic nature, of the relationship between the coastal zone and its hinterland and of the importance of human influence in the evolution of the coastal zone. There is a need to raise awareness of the economic and social value of adopting a more sustainable approach to human activity in the coastal zone. In the ultimate analysis, such public understanding is the only way to guarantee long term sustainability of ICZM initiatives.

An overt diffusion of information about early benefits or long term economic advantages of ICZM is one means of increasing support for ICZM initiatives.

In Dorset, the Draft Coastal Strategy specifically attempts to increase public support by demonstrating the advantages of ICZM. In the first two months following its publication, the Draft Strategy appears to be having the desired effect as more agencies "sign up" to the actions suggested in the document.

The Taranto project has benefitted from increased public support since key actors have come to see ICZM as a means of addressing unemployment problems.

The traditional media is an important tool for effectuating this transfer of knowledge, and promoting changes in attitudes and behaviour. Information about good practice and "success stories" (including those from our Demonstration Programme) can be made eye-catching and provoking. Modern telecommunications and information networks provide new opportunities for information diffusion.

The ANAS (Huelva-Algarve) project is developing a system of intercommunications between the public and administrations of the south of Portugal and Spain, which will contribute to promoting involvement in the ICZM process.

Several of the demonstration projects have established visitors' centres to disseminate information and build public support.

The Coastal Visitors Centre in the Isle of Wight is the first of its kind in the UK. Students have free access to a comprehensive technical library and workspace. Teachers' packs have been prepared on key topics and field visit and lectures are arranged.

A "label" or endorsement for good practice can also help publicize ICZM, while rewarding the practitioners.

"Blue Flags" are awarded to beaches meeting stringent quality requirements.

Educational systems will also have to play an important role in bringing about the needed changes in everyday attitude. Over the long run, support for ICZM should be introduced into the curricula of schools at all levels. Concepts such as the interdependence of humans and natural systems in the coastal zone, the principal problems in the coastal zone, and the role of clean technologies can be introduced in the school systems. However, in many cases, introduction of ICZM concepts into the curriculum may not be realistic in the short term; the national standardization of school curricula in some countries and the corresponding requirements for teacher training imply that this can only be a long-term objective.

Using the school curriculum: In Slitere (Latvia), a pilot project will provide education for local students in specialities related to those branches of economy which are typical for the coastal area, as well as an understanding and capacity to engage in the integrated management and planning of these activities.

For 20 years, the Espace Naturel Régional in France has produced a "Cahier des Enfants" for students; a special edition on "Integrated Management" is in preparation.

An alternative approach is to bring schools into local ICZM initiatives. Through involvement in surveys of coastal resources and their use, students can gain first hand experience in the process of evaluating the impacts and consequences of coastal zone activities. Through building solid links between the educational system and local/regional authorities, students can be directly associated to the ICZM process.

Public support for ICZM is essential. The process of ICZM itself raises support for its objectives, however specific actions are necessary to ensure maximum support. This can be built both through concerted efforts, such as media campaigns, and through developing links with the educational system.

5.2 Human Resources Development

Most coastal planners and managers have a strong sectoral education, such as in land-use planning, or fisheries or urban development, etc. However, ICZM is a process involving the integration and coordination of objectives, requiring a holistic, multi-disciplinary understanding of the systems driving the coastal zone. Although this holistic vision may sometimes be achieved by bringing together all of the relevant specialists, this method is not always successful because people may be limited in their outlooks by the conceptual boundaries of their specialized field of training.

A partial short term solution may be to undertake capacity building in public administrations, and among participants in an ICZM initiative. As well as introducing the concepts of multi-disciplinarity, this training should focus on developing a capacity:

- to encourage integrated responses and policy formulation
- to develop inclusive institutional structures and processes
- to seek "win-win" solutions transcending narrow self-interest

The participants in an ICZM initiative must also "learn to learn". Learning of this kind rests on attitudes which:

- value improvisation as much as forecasting
- dwell on opportunities rather than constraints
- invent new solutions rather than borrow others
- support experimentation and action-research
- respect diversity
- seek innovation
- win trust

All 35 Demonstration Projects are on a sharp learning curve responding to pressures and opportunities in their own specific environmental and institutional contexts. The Magnesia project, for example,, is experimenting with new modes of participation, including brain-storming and "planning for real" role play.

The most efficient long-term approach to capacity building would be to build the multi-disciplinary perspective into the educational system. While emerging university programmes in ICZM, may help to build expertise in ICZM per se, they are not sufficient to ensure that all of the main participants in an ICZM initiative have received a level of multi-disciplinary training adequate to the nature of their work and their level of responsibility. A holistic understanding of coastal dynamics must therefore be built into the traditional disciplines, including those like geography which have traditionally had a broad focus but are presently splintering into sub-specialities. An appreciation of the possibilities and limitations of models, statistics and information technology should also be widely integrated into specialist curricula.

Beyond these general types of capacity building, there is a need for specific training for certain participants in ICZM initiatives in technical issues such as conflict resolution and information handling. The latter refers to both an introduction to leading information technologies, such as GIS, and also training in the use and misuse of data and information. Issues such as data compatibility, information reliability, error, and scale-dependence are particularly important. This technical training could be given in various ways, ranging from building it into general curricula to organizing specific short training sessions for participants within the context of an ICZM initiative itself.

The Down project is working with the local community to develop its capacities for decision making in local planning.

Capacity can be built by promoting:

- a broad understanding of the multi-dimensionality of the coastal zones at all levels of the educational system in order to ensure both mutual understanding between planners and managers, and the support of the general public.

- better training in understanding the value and limitations of data, including the problems of using data at an inappropriate scale.

- introduction of the importance of clean technologies and life-cycle approaches in minimizing these environmental harms into the curricula of schools at all levels.

- training for teachers and educators in the basic principles of ICZM.

- training in undertaking EIAs and valuation exercises, at least in those countries where such training is not widely available, such as Portugal, and possibly more generally in local governments.

- scientific support at the local level.

- networks for exchange of expertise

The 7 projects in the TERRA COASTLINK network (Ipirus, Kent, Devon, Cornwall, Storstrøm, Down, ANAS) emphasize the significant advantage of networking to learn from the experiences of other ICZM projects.

5.3 Research and Development to support ICZM

Studies into the ways in which coastal systems change and interact are legion. Similarly, many countries have programmes aimed at promoting development of technologies that support ICZM. However, much of this research is never actually applied to improving the management of the coastal zones. Beyond issues of knowledge diffusion, the main reason for this gap between the production of knowledge and its use is that the research work does not address the users' needs.

Research programmes are too often determined on the basis of academic requirements rather than the need to solve practical issues on the ground. As a result, it is often difficult to apply the results of research studies to policy formulation and practical management. This criticism applies both to EU funded programmes (see chapter 6) and to national research.

Some of the causes of this problem include:

- lack of consideration/contact with the potential customers for the research and an assessment of their needs at an early stage;
- relying on scientific peer review as a means of assessing the work without paying attention to its practical value and
- an unwillingness among academics to consider undertaking practical and workable approaches to applying science to "simple" situations.

Mathematical modelling plays an important role in coastal research and is essential for the prediction of the long-term impacts of natural or human forcing. Increased availability of mathematical models greatly benefits many other research tasks and may also directly serve managers and planners. However, mathematical modelling is an area where the gap between researchers and users is particularly evident.

Most coastal research institutes have developed advanced mathematical models of the surrounding estuarine and coastal waters, describing the dynamics of relevant physical, chemical and biological phenomena. However, the models are generally shared only by small groups of specialists and few projects produce user-friendly software. Furthermore, many of these models are very site specific. Models intended for wider dissemination, even within the research community, should be based on practical, not theoretical, examples and applied to real situations. One way to promote the standardization of models would be the establishment of standard data sets for testing particular process descriptions in models.

The driving forces of the academic research scientist tend to promote the creation of very large, multi-variant models which provide closer and closer approximations of the real world. Many models are highly theoretical, difficult to understand, complex and use notations and structures alien to policy and decision-makers. However, for a model to be of any practical value to managers, its outputs must be simple to use, must be available when needed and must be at the appropriate scale for management. (In general, the requirement of managers and decision-makers is for the knowledge gained from such models to be disseminated, not for the models themselves to be more widely deployed.)

Currently, there is a trend away from basic R&D toward support for the demonstration phase. Still, OECD research indicates that programmes in place are not as efficient or effective as they could be. Although there is need for more dialogue between researchers and users to determine needs, the projects and studies in the Demonstration Programme have indicated some topics that could be of particular utility, including:

- Full strategic assessment of the importance of the coastal zone to Europe
- Development of integrated assessment methodologies and tools, and procedures for incorporation of this assessment into decision making and policy development
- Development of a methodology for identifying coastal areas at risk from large transport infrastructure at the European scale.
- Further development of techniques to derive input conditions from observed concentration distributions (inverse modelling).

- Optimizing the use of available computing infrastructure for coastal zone modelling
- Development of classifications, typologies and indicators of the coastal zones - to assist in stratifying policy responses, and monitoring change in the coastal zones
- Improvement of emergency intervention techniques in cases of oil spills and other catastrophes, anthropogenic or natural.
- Research specifically adapted to meeting local needs, such as:
    - local studies on economic and environmental benefits of transport subsidies
    - benefits of small-scale port development
    - travel behaviour of visitors in cars (Is this type of tourism really most environmentally friendly?)
    - sustainable transport for local needs
    - Development of ICZM-friendly and ICZM-supporting technology
- Policy research, particularly related to:
    - transport and tourism
    - comparison of urban planning and transport planning policies
    - financial audit of practical vs. scientific R&D

One of the major obstacles to achieving progress in understanding of coastal processes is the limited availability of field data at appropriate scales. Many features of the coastal system exhibit a variability in space and time which is distributed over a broad spectrum of frequencies. However, the equipment available to individual nations is often too sparse to run experiments at a sufficient scale. Mechanisms promoting the pooling of international equipment resources for joint research projects in coastal areas are not yet well developed. Conflicts arise from national priorities and from incompatibility of different measuring systems. By joining European facilities and equipment, research programmes become possible at a scale that cannot be realized at the national level. This is essential to make the step from isolated process studies to integrated programmes that address long term evolution of the coastal system. High priority should be given to the building of an adequate infrastructure for coastal research at the European level.

There is a need for coordination of and cooperation between the many individuals and organizations involved in knowledge production, particularly in order to address large systems issues.

Research work should be clear about who will be the recipients of their results (NOT just other research workers!!) Research proposals should show how potential users have been brought into the process of identifying research needs.

Research proposals should include a clear statement of how the results will be applied to the problem and who will benefit, and a clear diffusion plan, for dissemination of results to both other research and to end users; provision for this should be made within the budget proposals.

Research projects should seek to generate knowledge that is useful beyond the limited confines of a small project area.

Wide diffusion of research results within the research community is also important to ensure that projects build on the existing knowledge base, rather than duplicating it.

5.4 Financial Aspects

Lack of sufficient resources is frequently cited as a prime issue for ICZM. ICZM is not free; the process can entail many costs, particularly those related to the collection and diffusion of information. The complexity and time-consuming nature of managing an extensive programme of participation is also often under-estimated, and not budgeted accordingly. Sufficient resources must be allocated to prepare and disseminate reports, consider their implications, and respond effectively.

> *Currently, the demonstration projects allocate between 10%-30% of their resources on participation. Many, such as Latvia, state they require more. For resource reasons, the Forth Estuary Project has decided not to undertake extensive community participation, relying instead on involvement of local authorities and their representatives.*

While projects may secure short term funding to launch an initiative (such as from the LIFE and TERRA instruments), lack of sufficient resources becomes an increasing problem as these sources of funding expire. Since coastal management requires a long-term perspective, and in order to sustain the present initiatives, projects need to look beyond the span of their immediate financial and technical support from sources such as these EC instruments.

The funding problem is two-fold in nature:

- a need to secure sufficient funds to support the on-going process of ICZM
- a need for funding to go beyond planning and to fund implementation and monitoring

Where an ICZM initiative is, or becomes, a statutory activity, the financing issues may be eased; in other cases there is a need for creativity to make the best use of existing funding mechanisms. Bringing these together in an integrated way might help reduce rather than add to costs; certainly this should be an aspiration of the process. Some relevant suggestions arising from the demonstration programme include:

- Costs should be reduced by avoiding over-sophisticated technology, concentrating on essentials and choosing tested mechanisms
- Costs should be somehow divided among participants
- The full range of potential direct sources should be investigated, including:

  steering group partners (inc. local authorities)
  EC funding from various programmes (ERDF, LIFE, INTERREG, PHARE, etc.)
  national funding sources
  lotteries
  local commerce and industry
  tourist boards
  environmental and countryside agencies
  sponsorship
  voluntary assistance by NGOs.
  local communities
  universities and colleges

- Draw on local knowledge of funding sources
- Trawl grants and learn to prepare competent bids for support funding
- Encourage the lead agency to act as magnet
- Mobilize resources from all partners

- Secure political support for actions -- An investment in awareness raising may return as future funding.

The Isle of Wight noted that it is necessary to 'sell' to politicians and others the concept of ICZM in order to obtain funding for development and implementation. Key local issues of concern can be raised to provide examples of the way that ICZM can make a difference. (Topics of "political" importance in the Isle of Wight coastal zone include impacts of aggregate dredging, coastal instability, climate change impacts, oil pollution and safety at sea.)

Kent notes that politicians are most responsive to projects that:

- *Have a clear sense of direction*
- *Do not suggest an open-ended commitment by the authority*
- *Are stronger on taking action than talking about it.*

- Find ways of building costs into statutory activities
- Harmonize activities with other (already funded) programmes, e.g. Agenda 21.
- Consider need for succession strategies at an early stage
- Disseminate news on project achievements to potential funding sources
- Harness economic instruments to make ICZM in the economic interests of private sector and to make the initiative self-financing in long run.

Funding is a critical issue for the durability of many ICZM initiatives. Funding is needed not only for running the initiative, but also for implementation of resulting recommendations. The latter may be very expensive, including requirements for funds for land acquisition and compensation.

The EU might have a catalytic role to play in identifying and publicizing significant sources of funding that are available for ICZM initiatives.

6. THE IMPACT OF EU POLICY

This chapter will present a preliminary review, gleaned from the Demonstration Programme, of the Community policy that either presently has, or potentially could have, an impact on the coastal zones. It intends to show examples of both the problems and opportunities presented by EU Policy. It is hoped that this brief review may serve as a starting point for a more extensive review of EU Policy and as a guide for conducting similar reviews at national and regional levels.

External Relations and Enlargement:

In the context of ICZM, the approximation process offers a unique opportunity - denied to existing Member States - to integrate the application on the coast of various separate EU measures. For example, future implementation of the Bathing Water, Urban Waste Water Treatment, and Integrated Pollution Prevention and Control (IPPC) Directives as a "package" could produce valuable synergies and avoid the unnecessary costs of separate implementation. Moreover, the anticipation of the requirements of the draft Water Framework Directive, with its requirement for River Basin Management Plans (which also apply to the adjacent coast) would represent an important step towards ICZM in those countries.

The Commission's Communication *Accession Strategies for Environment: Meeting the Challenge of Enlargement with the Candidate Countries in Centyral and Eastern Europe* I(COM [1998] 294) emphasises the need for the riparian states of international rivers to establish jointly an integrated river basin management approach to tackle cross-border pollution of water. However, the Commission could go further and require applicant countries with a significant shared coastline also to develop cross-border systems of integrated coastal zone management . In addition, National Approximation Strategies that are currently being developed by each of the applicant countries could be encouraged to refer to ICZM. The development of ICZM in the applicant countries should be eligible for assistance from the future ISPA structural fund.

The Latvian and Lithuanian projects are the only two in the ICZM Demonstration Programme to be located in those countries of central and eastern Europe (CEECs) which have applied for membership in the EU. Unlike all other projects in the programme (except the Norwegian project), EU legislation does not currently apply to them. However, they are required as a condition of membership to approximate their environmental and other legislation to that of the EU over a comparatively short period. Work on the approximation of various items of EU legislation, many with significant implications for the coast, is being separately financed by PHARE, the DISAE Facility (Instrument for Support on approximation in the Environment), and the World Bank. PHARE is presently also supporting preparation of a Strategy for Investment in the Latvian Coast, to enable prioritization of investments in the context of pre-accession and in line with Agenda 2000.

The desire of all of the applicant countries to accede to the EU as quickly as possible gives the Commission and the existing Member States some leverage over the development of their domestic policies.

Opportunities to make the enlargement policy better support ICZM objectives include:

- Closer information ties should be established between the different sectoral foundations, State support programmes, IFI's and EU funds to co-ordinate the funding of the projects and programmes. An open flow of information between Ministries and between levels of Government should be encouraged.

- The State support programmes should be more focused on support of territorial development rather than on support of separate sectors.

- When the new laws and institutional arrangements have been adopted, a special effort must be made to embed them in the practice of the administration and to provide the technical assistance, training etc necessary for their success.

- There is a need for further demonstration projects in accession countries to publicize that ICZM planning for accession countries is a tool which could assist the development of co-operative and participative relationships between key stakeholders and which can assist the building of consensus about key issues on coastal zones.

Agriculture:

Many of the trends in contemporary agriculture, including intensification, specialisation, concentration and marginalization, can be damaging to the delicate environment of coastal zones. The CAP is acknowledged as a significant driving force, with investment in drainage and irrigation schemes having been substantial in certain coastal areas over the last decade.

Intensive agriculture encouraged by high Common Agricultural Policy support prices has produced high nutrient loads in tributaries to the North Sea, resulting in increased eutrophication in the Wadden Sea. Agricultural intensification has led to considerable losses of biodiversity and landscape interest on the islands and along the coasts, particularly in wetland areas. High sheep headage payments contribute to high grazing densities on coastal salt marshes - a particular problem in Germany.

The current Agenda 2000 proposals are intended to mark a shift towards 'multi-functional' agriculture with a greater emphasis on integrated rural development and a shift towards more direct income payments, rather than production support. The new rural development Regulation is aimed at promoting a more integrated approach including rural development, agri-environment, aspects of forestry and support for a range of rural development measures within rural development plans. It proposes to introduce environmental conditions on direct payments by Member States, which could be used to encourage appropriate grazing regimes, for example.

These changes derive from several objectives fixed in Agenda 2000, namely:

- The desire to integrate environmental objectives into the CAP and to develop the role of farmers as resource managers and landscape guardians.
- The need to assure the safety and quality of products notably through methods of production that are compatible with ecological needs
- The importance accorded to agro-environmental instruments aimed at contributing to sustainable development in rural zones and at responding to a cross-section of societal exigencies related to ecological services.

This new approach could thus help to promote ICZM, by supporting appropriate agriculture in coastal zones, with part of the cost met from the EAGGF.

Attention will need to be given to how these opportunities provided by the Agenda 2000 proposals are applied in practice in the Member States.

The existing agri-environmental measures which the Member States are required to implement in accordance with Regulation 2078/92 can already potentially contribute to improving conditions in the coastal zones; in particular agri-environment schemes can be of great benefit in relation to the management of coastal wetlands, such as grazing marshes. However, to qualify, such land must be under agricultural management. At present, some coastal marshland is severely undergrazed or semi-abandoned, and in these areas there may be a place for reintroducing grazing, eg by sheep or cattle.

A further weakness of the Regulation 2078/92 is that Member States have had very wide discretion in establishing such schemes in relation to national and regional farming practice, so that their effectiveness depends on the areas selected by the Member State (or region) and the size of the compensating payments offered to farmers.

In the Wadden Sea area, the participation rate in several such schemes is limited because compensation payments paid by the Member State/region are low in relation to other mainstream agricultural programmes.

The Agenda 2000 proposals should lead to the improvement of agri-environmental schemes financed within the rural development Regulation. There would be opportunities for improved environmental targeting and higher payments if necessary.

Transport, Telecommunications, Energy and Industry:

Coastal areas often are the sites of dense transport networks both onshore (because of coastal plains) and at sea, including components of the Trans-European Transport Networks (TEN-T). So far, however, insufficient emphasis in the TEN-T programme has been given to support for the development of transport modes that support ICZM, such as short sea shipping as an alternative to road construction (this despite promises in the Commission's 1995 Communication on Short-Sea Shipping).

> *More financial support for short sea shipping and associated port development could be particularly beneficial in Devon/Cornwall, the Forth Estuary and Finland.*

In identifying TENs road networks, the EU could also be more sensitive to the development pressures thereby generated on the coast.

> *Examples include the routes of planned roads in Taranto, Southern Finland and SW Ireland.*

There is very little scope for regionalization in the Trans European Transport Networks (TEN-T), because of their very nature and purpose. However, following Austria's accession to the Community, the principle has now been established that regional needs may in certain circumstances be given precedence over freedom of movement within the EU.

> *Austria has been given the right for a transitional period to maintain restrictions on the use of Alpine passes by heavy goods vehicles in order to protect Alpine biodiversity. During this period the Commission is required to review EU transport policy generally to seek an EU-wide solution which would accommodate Austria's needs.*

Opportunities to make the EU transport policy better support ICZM objectives include:

- Supporting creation of new mechanisms or institutions for managing non-infrastructure aspects of transport planning, and non-commercial aspects
- Promotion of less polluting modes of transport
- Limitation to development of ports in important wetlands

Related issues are discussed in the "transport and accessibility" section in Annex I of this document.

The development of Trans-European telecommunications networks and the "information society" provides an opportunity to improve the quality of life and open economic possibilities to its citizens. As many coastal zones include populations on islands or remote continental areas, they particularly stand to benefit from these advances. Development of EU policy in this area needs to give due consideration to the specific needs of these populations and ensure that electronic assess does not marginalize the "computer-phobic" part of society.

EU policy to improve telecommunications also stands to advance ICZM by encouraging participation and transparency.

EU energy policy covers traditional fossil fuels, nuclear energy and energy sources based on solar, wind, water and biomass resources. All of these energy sources are concentrated in coastal areas and their production, transmission and distribution can have a significant impact on coastal land use patterns. EU policy in their area, including EU commitments to reduce the use of fossil fuels, often guides important choices in this sector.

The three priorities for this policy area are: overall competitiveness, improvement of security of supply and environmental protection. The balancing of these objectives is compatible with the goals of ICZM, although European wide networks may not always take into account the impact on local planning and land use.

The proposed guidelines for the structural funds suggest that in the next programming period, emphasis should be given, in the less developed regions, to financing projects to complete network interconnections, improve energy efficiency and promote renewable energy resources. In other regions investments should focus on small-scale innovative infrastructure projects, particularly those compatible with reducing pollution and promoting energy efficiency.

Industry is a common activity of many coastal zones, some of the prominent industries being the maritime industries, engineering and construction industries and a range of industries that benefit from the easy access to cheap cooling water.

The key objective of EU industrial policy is to promote the competitiveness of European industry; as such it may have an impact on industrial activities in the coastal zones. In particular, the EU Industrial Policy regulates the internal market for products, and promotes research and innovation by instigating and supporting projects aimed at developing and applying new technologies.

The Commission has a number of activities that specifically target maritime industries. As well as hosting the Maritime Industries Forum, DG III coordinates the "Maritime Systems of the Future" Task Force. Through these activities, the Commission is in a position to promote integrated approaches to management of the coastal zones, and to encourage industrial actors to develop better communications with other coastal zone stakeholders.

The purpose of the "Maritime Systems of the Future" Task Force is:

- *to provide expertise and technical assistance for the restructuring of the sector;*
- *to provide an appropriate Interface and ensure cooperation between Industry and Member States;*
- *to contribute to facing the effects of the Asian crisis on shipbuilding;*
- *to ensure appropriate support for enlargement issues in the maritime sector;*
- *to contribute to the research and demonstration efforts associated with the maritime industries;*
- *to develop synergies with other relevant bodies.*

The DG III programme IDA ("Interchange of Data between Administrations") could also be a useful instrument for improved decision making in the coastal zones. This programme aims to establish a rapid and more simplified exchange of information between authorities - and with European citizens.

Environment:

A broad range of EU environment directives and policies has an important impact on the management of coastal resources.

The Athens project notes that EU environment policy has a strong direct impact on planning policy; its effectiveness is due to the fact that environment policy is normally based on directives that require direct and verifiable transposition into national legislation.

In particular, the range of legislation controlling pollution and quality of air and water resources has contributed to improving the coastal environment. In particular, the Urban Waste Water Treatment Directive is producing significant improvements in the water quality of many coastal areas.

Untreated sewage sludge from Edinburgh has traditionally been dumped in the Forth Estuary, but the UWWT Directive has required the abandonment of this practice by the end of 1998. A new sewage sludge incinerator has been constructed in the Seafield area on the outskirts of Edinburgh. Improved water quality in the Forth is likely to encourage more coastal tourism and improve sales of locally caught fish.

To date, however, implementation of many of these measures has been uncoordinated and sometimes contradictory. The Integrated Pollution Prevention and Control Directive (96/61) aims to attain a 'high level of protection for the environment taken as a whole' through preventing or reducing emissions to all environmental media - air, water, and land - and through measures to tackle waste generation.

> *Although the IPPC Directive will not apply to new plants until the end of October 1999, nor to existing plants until the end of October 2007, the UK's system of Integrated Pollution Control (IPC) anticipates many of its requirements. As a result of IPC, a proposal to fuel a power station in Pembroke with the high-sulphur fuel orimulsion was withdrawn by the developer, because, among other reasons, the IPC screening procedure revealed the potential warming effect of emissions on Milford Haven Bay, a potential SAC under the Habitats Directive.*

The draft Water Framework Directive, with its requirement for River Basin Management Plans including adjacent coastal areas provides another opportunity for advancing the principle of ICZM. The proposal requires an integrated planning approach to achieving good ecological status, taking account of the range of environmental issues and economic activities. It is, therefore, important for water and near-shoreline planning, but will have to sit alongside other development planning systems which take account of more landward issues. The actual planning process itself, taking account of many stakeholders in assessing impacts and developing objectives, will also aid in the general integration of coastal management. The details of the proposal are currently under active debate and so it is not yet clear what the final adopted text might specify in terms of integrated planning of coastal waters.

The Environmental Impact Assessment Directive (85/337) is also an instrument that should support ICZM. In practice, the demonstration projects have identified various problems with the implementation of this directive by the Member States, problems which mean that it is less valuable for ICZM than it might be. In particular:

- Implementation of the EIA directive is variable between Member States; in some cases it is applied in letter, but not in spirit. There is also difficulty with the treatment of alternatives.
- It is not always clear who is responsible for an EIA in the coastal areas, and the marine aspect is often left uncovered.
- EIAs are too often lacking in integrity.
- Leaving impact assessment until project proposals are brought forward (as in an EIA) has disadvantages where the development plan is the legal framework.

EIA amendment 97/11 does extend coverage to a greater number of coastal projects e.g. offshore oil extraction, and coastal and maritime works "capable of altering the coastline". However, coverage of projects beyond the mean low water mark is still very limited - and the amendment does not take effect until March 1999.

As the principles of ICZM incorporate major aspects of the approach followed in Strategic Environmental Assessment (SEA), the ICZM Demonstration Programme can provide useful input to the ongoing discussion on the significance and appropriateness of an SEA directive**. All of the demonstration projects considered that the proposed Directive on SEA would be a useful instrument for promoting sustainable management of the coastal zones of Europe.** The major limitation of the present SEA proposal, however, is that it covers only public (and not private) programmes.

The Habitats Directive (92/43) is designed to establish a European network of areas to protect threatened habitats and species - 'Natura 2000'. While having clear sectoral objectives, the spirit of the directive is entirely consistent with the "integrated" approach of ICZM: Article 2(3) states that "Measures taken pursuant to this Directive shall take account of economic, social and cultural requirements, and regional and local characteristics". As such, it is compatible with promotion of ICZM in the coastal zones.

However, there is some confusion in the Member States about article 2(3). It is widely believed that it should influence the process of designating SACs as much as the decision-making process in relation to SACs after they have been designated. This confusion and the heavy-handed application of restrictions in the name of this directive have led to conflicts in some of the project areas. (A European Court of Justice ruling in relation to the Birds Directive has established that socio-economic factors should have no bearing at all on the designation of special protection areas for birds - only on their subsequent management.)

The Isle of Wight (UK) Council claims that the provisions of article 2(3) of the Habitats directive apply also to designating SACs, and opposed the extent of English Nature's two proposed marine SACs covering almost the entire coastline of the Island. The boundaries were reduced, but the Isle of Wight's objections remain in place; the Council believes there was insufficient coordination on the drawing up of the boundaries, and that the process was neither transparent, nor based upon strong science. (Conservation objectives have still not been set almost a year after delineation of the boundaries was finalized). The UK Government has also gone further than the Habitats Directive in requiring that any candidate SAC proposed to the Commission (but not yet formally accepted by the Commission) be treated as though it were already an SAC.

English Nature has adopted what the Isle of Wight Council considers an inflexible attitude in opposing even minor developments within the boundaries of the two proposed marine SACs, and there is great concern that this could affect the future economic development of the Island, one of the poorest parts of the UK. The perceived inflexibility of English Nature has alienated many coastal interests on the Isle of Wight and in the Solent, and is considered by many to be contrary to the need for an integrated approach to coastal zone management.

The Habitats Directive has also been plagued by delays by the Member States in its implementation.

Information and Statistics:

The main bodies involved in collection, coordination and diffusion of information relevant to ICZM at the European level are the European Environment Agency, the European Statistical Office (Eurostat) and the DG "Joint Research Centre". The relative roles of these different institutions is based largely on their orientation (research vs. operations), and their scope (environmental specificity vs. a broader mandate).

The EEA was set up specifically to deal with environmental information and its application to policy formulation and decision making. Within this framework, the European Topic Centre for Marine and Coastal Environments has a remit to establish a regional forum to facilitate information exchange across the regional seas of Europe as well as compiling quality-assured data and developing indicators for environmental assessment.

At the same time the Centre for Earth Observation (CEO) of the Joint Research Centre has been developing an approach to provision of satellite data and information about its availability. In this context, they have developed an information exchange system called EWSE – the Earth Observation Information Exchange System of the CEO programme. Essentially this will allow those working in the field of remote sensing to advertise their products and for the potential user community to search for information about those products. The J.R.C. is also developing various specific tools for information collection and sharing.

Eurostat is charged with providing the European institutions with statistical information for policy development and implementation, and setting up a European statistical system using a common language linking the national statistical systems. It thus works in close cooperation with the statistical offices of the Member States.

At times, the distinction between the roles of these three bodies is not always clear to third parties, and a certain amount of work is duplicated. A better coordination of their activities could make their work more efficient.

A coordinated, transparent European information strategy built around the needs of stakeholders, including rapid deployment and wider dissemination of the products would be an

asset for coastal zone planning and management. To be of use for integrated planning, such a strategy (discussed further in the final report of the thematic study on "Information") needs to address the integration of environmental data with socio-economic, and institutional information.

Research, Development and Training:

Chapter 5.3 has already addressed the general importance of research in supporting ICZM, and provided a list of topics identified by project leaders as priorities for research.

National research programmes added together far exceed the support provided through EU funding. The role that EC funding plays in research is to solicit integration, promote cooperation, and stimulate large scale and multidisciplinary activities.

The Fourth Framework Programme for Research, which is shortly coming to its end, has supported a package of marine and coastal research activities under the umbrella of the ELOISE (European Land Ocean Interaction Studies) programme. While this programme has worked to ensure coherence within the research agenda, it is clear that further efforts must be employed to develop closer links between researchers and practitioners.

The Fifth Framework Programme for Research has a specific programme on "Energy, Environment and Sustainable Development", including key actions related to Water Management and Marine Ecosystems. These key actions follow a problem-solving approach that should provide useful contributions to Community policies and will provide opportunities for research to support ICZM. One of the biggest advantages of the Fifth Framework Programme is the opportunity to promote more integrated, multi-disciplinary, problem-solving research; it will be important to ensure that project selection seizes this opportunity.

The Demonstration Programme has indicated a problem with diffusion of the results of EU-funded (and other!) research. Emphasis should be given to ensuring the research projects address the needs of end users and that the results will actually be applied.

There is a role for the Commission in consolidation and targetted diffusion of existing experiences and completed research related to ICZM.

While Member States have full responsibility for their national education and training systems, the EU policy in this area contributes to the development of quality education by "encouraging cooperation between the Member States and, if necessary, by supporting and supplementing their action ..." and by "implementing a vocational training policy which shall support and supplement the action of the Member States...".

Within this competence, the EU has a role to play in promoting the multi-disciplinary and integrated approach to learning and thinking that is necessary to support ICZM. The EU might also help meet the other training needs identified in section 5.2.

Fisheries and Aquaculture:

The Common Fisheries Policy (CFP): This relationship between the Common Fisheries Policy (CFP) and ICZM concerns two main issues:

-- the existence of open access to fisheries which has led to overcapitalization, overfishing, depletion of resources and conflicts, and ultimately socio-economic difficulties for fishing communities; and

-- the loss of fish habitats and deterioration of water quality brought about by environmental pressures generated in other sectors.

The current Common Fisheries Policy (CFP) has been criticized in several of the demonstration projects, for not adequately promoting sustainable fishing. Criticisms of the project leaders focus on:

- the quota system that has not prevented depletion of fish stocks -- because it intervenes a posteriori and often too late, after the depletion is already underway.;
- threats to both marine and avian biodiversity through industrial fishing;
- threats to local inshore fishing communities after 2002 by a possible revision of territorial waters; and inadequate scope for local/regional fisheries management.
- the difficulty in undertaking long-term planning with the uncertainty about the longevity of the 12-mile derogation

These issues need to be addressed in the revision of the CFP post-2002. It should be noted, however, that the permanent incorporation of the 12 mile derogation into the Common Fisheries Policy could only be undertaken through an amendment to the Treaty of Rome, not through an act of Council.

> *The Forth Estuary project is concerned that industrial fishing for sandeels by Danish fishers on the Wee Bankie sandbanks just outside UK territorial waters may have contributed to decline in bird numbers in the Forth Estuary, e.g. puffins in the East Forth and Isle of May SPAs designated under the Birds Directive.*

Specific suggestions arising in the Demonstration Programme about elements that could encourage an ecosystems approach to fisheries management include:

- a demonstration programme on good fishing practice
- assistance in consolidation of information on aquaculture for improved EIAs.
- reorientation of the Fisheries policy away from negative limitation of fishing towards positive promotion of sustainable fishing
- schemes to provide aids for more sustainable fishing (similar to the existing agri-environmental schemes).
- labelling schemes for sustainable fishing, such as those recently introduced in the UK by the Marine Stewardship Council.

The EU Fisheries policy is one of the EU policies that is least adaptable to regional needs. By its overcentralized and global nature, the CFP fails to respond to the specific needs of particular fisheries and fishery dependent areas operating within its framework. In the run-up to the reform of the CFP in 2002, pressure is mounting for a greater degree of regional control over fisheries management. Suggestions include support for locally-tailored schemes that integrate fisheries management with biodiversity needs, modelled on current agri-environment programmes. Facility to adapt to local socio-economic and cultural conditions might also support ICZM.

The Demonstration Programme has also suggested the need to introduce somewhat more flexibility in the definition of fora in which fisheries may be officially discussed. As all matters related to fisheries (except within the 12 mile derogation area) are exclusive Community competence, the present interpretation does not allow discussion on by-catch from commercial fishing actions, for instance, at meetings of the Oslo and Paris Convention. In view of the fact that the EU is a contracting part of the Convention, there could be more flexibility.

The EU subscribes to the FAO Code of Conduct for Responsible Fisheries, art. 10 of which concerns integration of fisheries into Coastal Area Management. This article requires that signatories should promote the establishment of procedures and mechanisms at the appropriate administrative level to settle conflicts both within the fisheries sector and between fisheries resource users and other users of the coastal zone area.

There is now also a treaty obligation to integrate interactions between fisheries activities and marine ecosystems into the CFP, and the concept of integrated management, as endorsed by the Intermediate Ministerial Meeting on the integration of fisheries and environmental issues (Bergen, 1997) has gained increasing emphasis. The integration of environmental considerations into the CFP necessitates consideration of both the direct and indirect impacts of fisheries and aquaculture activities on marine flora, fauna, food chains and habitats. On the other hand, the viability of fisheries and aquaculture is dependent on the quality and availability of marine resources, which in turn depend fundamentally on the state of the marine environment.

In line, with this new emphasis, the establishment of measures designed to reduce and ultimately eliminate overexploitation and hence to reach a sustainable equilibrium between fishing activities and the targeted stocks will be one of the main goals of the CFP, now and in the foreseeable future. In addition to this, it may prove necessary to develop specific policy measures to reduce or modulate the adverse impact of certain types of fisheries on certain parts of the marine biota. Possible examples of this approach are the safeguarding of food needs for certain species of seabirds or the protection of certain benthic habitats from certain types of fisheries.

Now the ecosystem approach has to be realized in practice. In the course of 1998, the International Council for the Exploration of the Sea (ICES) adopted a precautionary approach to fisheries management, which was fully incorporated into their management advice on commercial fish stocks for 1999. This approach was adopted to a significant extent by the Commission when it prepared its proposal for the 1999 TACs. In March 1998, the Council also adopted a completely revised regulation on technical conservation measures, which will become effective on 1 January 2000. The new regulation should lead to an increase in overall selectivity of fishing operations and a decrease of the amount of mandatory discarding, both inside and outside of 12-mile-zones.

The institutions must also admit new stakeholders' interests, as the Commission has been seeking to do by initiating, in 1998, a series of informal meetings with non-governmental organisations expressing an interest in fisheries.

The Fisheries Structural Funds:

The objectives of the structural policy "Fishery" are directly linked to the double origin of the Financial Instrument for Fisheries Guidance (FIFG – established and integrated within the Structural Funds in 1994): common fishery policy and socio-economic cohesion. This involves on the one hand guaranteeing a sustainable balance between fishing efforts and fishery resources through the restructuring of the Community fleet, and on the other hand strengthening economic and social cohesion[1] as well as the viability of the Areas Dependent on Fishery (ADFs) by modernizing all the structures of the production chain and by accompanying socio-economic measures.

The integration of the FIFG within the Structural Funds and the addition of ADFs under Obj.1, 2, 5b and 6 marked a fundamental evolution from a sectoral policy into an integrated policy better suited for coastal zones. Indeed, the majority of ADFs can benefit from the interventions of the other Structural Funds, in particular the ESF and the ERDF, for socio-economic conversion measures (tourism, services to companies, professional upgrading etc.). The FIFG applies, moreover, to the entire territory of the European Union through the Obj. 5a and measures covering mainly the restructuring and the modernisation of the sector. Globally, the FIFG represents today 31 programmes: 19 territorialised (17 Obj.1 and 2 Obj.2) and 12 horizontal (Obj.5a). In financial terms, 65% of the budget is territorialised and 35% is allocated through the Obj.5a.

The Community initiative PESCA – also launched in 1994, principally in support of ADFs located in regions eligible for Objectives 1, 2 and 5b – aims at supporting the sector to face the consequences of restructuring, the professionals to reconvert themselves and maintain their competitiveness and the coastal areas to diversify their activities and to revitalise their socio-economic fabric. PESCA is complementary to the FIFG and to the regional socio-economic measures.

The economic impact of fishing being concentrated on narrow coastal zones and its multiplier effect being high, a recession in this sector inevitably affects the activities located downstream; the sector has therefore a driving role for the economy and for maintaining the socio-economic fabric of ADFs, at the same time as it constitutes a fundamental element of the cultural heritage of numerous coastal communities.

In order to manage fishing resources, fishery and its products, it is necessary to consider the entirety of the coastal territory in a multisectoral approach by integrating the links and the necessary harmonisation between this sector and the other economic (industry, urban infrastructure, trade, tourism, services) and non-economic activities with a view to maintaining and creating permanent jobs and diversifying the socio-economic structure.

[1] The FIFG effort for the reinforcement of socio-economic cohesion is evident in that the four cohesion countries receive 56% of the financial resources available. This effort should be increased in the future through assistance tailored to small coastal fishery, which is a particular feature of cohesion countries (Greece and Portugal in particular).

This diversification should apply to the entire production chain: upstream (shipyards, suppliers), fish product with high value added, aquaculture and processing industries. However the fishery processing industry is located today either near large fishing ports, or inland near consumer markets; an increasing dichotomy between small-scale inshore fishing and industrial development of the captures is emerging, the transformation chain no longer being systematically located on the coasts and no longer reinforcing automatically the activities of fishing.

The Community initiative PESCA also supports actions combining cultural, tourist and commercial vocations. The combination between primary and tertiary activities, can constitute a development factor if the limits of the carrying capacities of coastal areas are not overcome (environmental protection) and if local management of potential conflicts is ensured: numerous conflicts exist, for example, between nautical sports and aquaculture. In addition, a number of activities may have negative effects on coastal fishery and fishing stocks either via a reduction of accessible sites and maritime habitats or by a reduction in the quality of water and of the coastal environment.

One of the ten measures of the FIFG concerns support to aquaculture development and represents 11% of the FIFG allocation. The aquaculture structural measure covers support to increase of capacities (new production units and extension of existing units) and support to modernization of units. It also includes provisions to limit the environmental impact of intensive aquaculture and it encourages extensive aquaculture and investments to improve hygiene and health aspects.

In the new regulation for the fishery Structural Fund, support to aquaculture could be maintained, with a priority given to investments aiming to reduce negative effects on environment and to collective investments.

In order to better advance the objectives of ICZM, the structural fisheries policy needs to be better articulated with:

- **the other structural policies (with a socio-economic cohesion perspective): in this connection, the difficulties of articulation between national and regional logics have to be pointed out, the structural fisheries policy answering national sectoral programming logic (in particular the actions in the field of the adjustment of the fleet).**
- **environment policy (with a sustainable development perspective): an integrated management of the marine ecosystems requires a vision of the broader environment than the simple incorporation of "ecological" objectives into the management of the fisheries.**

Regional Policy and Cohesion:

Of all EU policies, the implementation of Structural Fund programmes is the most decentralized. While the basic Regulations governing the Structural Funds encourage the Member States to integrate environmental and social considerations into development activities, the final use of the Structural Funds has not always done so to a satisfactory degree..

Kent, UK: Objective 2 programme for the Isle of Thanet, Kent, is part-financing a consensus-building project organized by English Nature to secure agreement among local stakeholders to a future management plan for a proposed marine SAC in the Thanet area.

Solway, Firth - N.England/SW Scotland: EAGGF funding through the current Objective 5b Scottish Borders programme has part-financed the development of the Solway Firth Strategy , published in July 1998, for managing the many conflicts in the estuary.

Environmental safeguards included in the 1993 revision of the Structural Fund Regulations require a prior environmental appraisal of the impact of the proposed regional development plan; and the involvement of "environmental authorities" in the Structural Funds decision-making process. These requirements have not always been followed by the Member States, allowing in some cases possibly unsustainable projects to receive EU support. Examples include the coastal protection measures in Ria d'Aveiro, and may include similar works in Pescara, Abruzzo (although special measures adopted by the Commission in relation to the Italian Objective 1 programme may have had the effect of exempting such measures from an environmental appraisal).

Ria d'Aveiro, Portugal; and Abruzzo, Italy. Objective 1 funding has part-financed coastal protection works which have contributed to beach and dune erosion further along the coast, necessitating further expenditure on yet more coastal protection - with similar effects.

Although the early history of the Structural Funds contains examples of environmentally-insensitive developments, significant improvements have been made, even though there is still some way to go before use of the Structural Funds by Member States becomes truly sustainable.

Ireland's Tourism Operational Programme 1994-1999

Within the Irish Community support Framework (1994-99), the tourism sector has been targeted as a major source for economic development. The stated aim of the tourism Operational Programme (1994-1999) is to double tourist visitors by the year 2010. The physical and cultural environment is clearly a prominent asset for the tourism sector, and achieving the target will depend on the ability to ensure that Ireland's assets continue to be attractive.

Despite this need, however, there appears to be poor coordination between funding programmes and local plans or designations. Evidence is cited that ad hoc developments have occurred affecting proposed SACs, for example. The level of infrastructure is also often unable adequately to cope with tourism demand during periods of peak activity, with water and waste treatment facilities becoming overloaded. This is thought to have resulted in local pollution incidents, in turn affecting the use of marine resources for aquaculture, recreational and tourism purposes.

Although the environment OP may provide funds to mitigate water and waste problems, money is not always available until after pollution problems have arisen, or may be limited to projects unsuited to the local area. It is clearly preferable for pollution problems to be treated at source, and considered as part of the tourism Operational Programme.

However, of all EU policies, the future role of the Structural Funds (as set out in the Commission's Agenda 2000 proposals still under negotiation) has the most potential for advancing ICZM. This is because of:

- the strengthened requirement that Member States develop integrated regional development plans which bring together separate interventions in declining industrial, urban, rural and fisheries-dependent areas;
- the reinforced requirement that the Structural Funds contribute to sustainable development, as one of two horizontal principles to be integrated into all Structural Fund programmes (the other being "equal opportunity");
- the statement that plans will be evaluated with reference to compatibility with Community policies;
- requirements for ex-ante environmental evaluation of the concerned region, and the expected impacts of the programme and interventions on the environmental situation.

Commission proposals for the reform of the Structural Funds Regulations after 2000 contain a number of encouraging features. The requirement in eligible areas for integrated regional development plans, and extended partnership arrangements (including organisms working in the areas of the environment, when appropriate), could be used to promote integrated management of the coast.

However, experience from the 35 ICZM demonstration projects suggests that regulations could also be amplified and/or improved by:

- making Structural Funds support in coastal areas conditional upon including development of an ICZM plan as part of the Single Programming Document;
- developing policy and funding opportunities for appropriately-scaled infrastructure (incl. transport infrastructure), rather than imposition of large infrastructure in all cases.
- enhanced requirements for participation and transparency in development of the Single Programming Document;
- requirements for assessment of project impacts on all affected stakeholders;
- a risk and hazard assessment requirement, particularly a requirement to take into account the transitory nature of the coastal area (due to sea level rise, natural erosion, subsidence or anthropogenic causes);

- including a significant ICZM priority in future Community Initiative actions, with due attention, however to ensuring that the money is really targetted for ICZM.

Article 10 of the Structural Funds provides for community-initiative actions. About half of the projects in the Demonstration Programme receive financing from the TERRA programme on this budget line. The INTERREG IIC and the proposed INTERREG III programmes also contain explicit reference to integrated management of coastal zones.

> *Pilot projects under Art. 10 of the ERDF are the only possibility for local authorities to obtain direct funding from the structural funds, which are otherwise distributed at the national level. There is therefore a temptation for local authorities to bend their proposals to meet the stated requirements, even if they are not really a local priority!*

The Commission services are producing guidelines for Member States on how the requirements for prior environmental appraisal, monitoring and evaluation of the impact of Structural Fund programmes should be undertaken in practice. The Member States should implement these guidelines and define the precise role that environmental authorities are to undertake in local "partnerships" and Monitoring Committees.

> *Coordination problems:*
> *The Athens project notes that the national policies based on the European Structural Funds are not properly always interrelated with physical planning policies. Especially in Attica, where the Regional Authority (responsible for the Operational Programs) has no competence over planning, the goals of the Physical Planning department, namely the Structural Plan of Athens, are not interpreted as priorities for funding of infrastructure. In contrast, the URBAN programme had a positive impact on integrated planning.*

Spatial Planning:

At present, there is no specific community competence in spatial planning. However, the Commission has been cooperating with the Member States in the development of the European Spatial Development Perspective (ESDP). This document seeks to define a set of guiding principles and a general vision for the sustainable management and development of the European territory based on an integrated approach. The draft European Spatial Development Perspective (ESDP), as adopted in June 1997 in Noordwijk, proposes a greater territorial differentiation of EU policies.

ICZM is an inherently spatial approach that conforms to the philosophy espoused in the draft ESDP. ICZM thus contributes directly towards the goals of spatial planning by addressing the management of a strategic part of the European territory. It also proves the practicality of an integrated approach, an approach which could be adapted readily to the needs of other landscapes.

Considering that the coastal regions of the EU will form the focus for the concentration of population and for the expansion and diversification of the economy over the coming decades, it is particularly crucial for the coastal regions to be adequately addressed in the ESDP. Furthermore, considering the complexity of the coastal zones, they provide a good test-bed for an integrated territorial approach to planning. If the integrated approach can be made to work in the coastal zones, its application elsewhere will probably also be successful.

Tourism:

Although tourism is one of the major socio-economic drivers throughout Europe, and particularly in the coastal zones, as well as being one of the major pressures on the environment (see Annex I of this document), there is presently also no specific EU legal basis for activity in tourism; the Commission activities in this area derive from the general reference to "measures in the sphere of tourism" in article 3u of the Amsterdam treaty.

Tourism is seen as a sector that has a potential to contribute to sustainable development in the coastal zones through a) offering opportunities to diversify the economy in regions where the traditional activities are in decline, and b) contributing to the good management of areas where neglect could

have negative environmental consequences. In particular, DG XXIII, of the Commission, recently completed a study on "Visitor Payback: encouraging tourists to give money voluntarily to conserve the places they visit".

Many individual Community policies and instruments affect tourism, including internal market measures, the Structural Funds, support for SMEs, transport, employment, education and training, consumers, environment, culture, energy and external relations policies. In order to encourage the development of sustainable tourism in coastal areas, there is a need for the better use of existing mechanisms, including improved inter-service co-ordination within the Commission; cooperation between Member States through the Consultative Committee on Tourism; and enhanced consultations with professional organisations and associations in the tourist industry.

The Commission's work in the area of tourism is thus based on objectives aimed at improving quality and competitiveness in European tourism. The key issue for promoting ICZM is to ensure that the concept of quality tourism in the coastal zones encompasses the long term objectives of social, economic, cultural and environmental sustainability.

ANNEX I

SALIENT ISSUES RELATED TO SPECIFIC ECONOMIC SECTORS OR PHYSICAL PROBLEMS

The review here is intended to highlight the importance of those issues that frequently "spark" or dominate an ICZM initiative, to ensure that they are given due consideration within the framework of an integrated, multi-sectoral approach to planning and management of the coastal zones.

The table at the end of this annex indicates which issues have been particularly important in demonstration projects.

Issue: Alternative Energies

The use of renewable energies in the European coastal zones is set to take off:

- Renewable energies are ideal for islands and isolated areas remote from the main power grids.
- Europe as a whole must increase its use of renewables to meet the Kyoto commitments and the coastal zone is well suited for development of two of the most promising types of renewable energy -- wind and wave power.

> *In signing the Kyoto agreement, the EU made a commitment to reduce carbon dioxide equivalents by 8 percent below 1990 levels over the period 2008-2012. While energy efficiency may contribute towards meeting this objective, a switch away from fossil fuels must be part of the long-term strategy.*

- Renewable energies are also seen increasingly as an alternative to nuclear power.

> *The Belgian government is expected to approve a law that authorizes the construction of wind parks along a dozen kilometers of the Flemish coast, as part of an overall strategy to reduce the use of nuclear energy.*

As well as meeting local energy needs, renewable energy production can provide an alternative source of jobs and income for coastal zones. It is a hi-tech and innovative sector that can help to revitalize the economy without damaging the soil, water, air or natural ecosystems.

> *The Cyclades islands in the Aegean sea are interested in developing Small Scale Plants & Offshore Wind Farms. The exploitation of these resources requires further fundamental R&D and demonstration activities. However, these plants have the potential to serve the needs of the small (and often isolated) communities on the islands.*

Energy installations, however, frequently require large amounts of land and may be considered noisy and aesthetically unpleasing. There is also some concern about infra-noise and electro-magnetic fields, particularly with respect to birds. They may therefore be opposed by local residents, the tourist industry and other sectors competing for space. Land prices are greatly elevated by the right to build windmills - and there is some competition to obtain such rights.

Location issues are at the heart of the issue of renewable energies. Whether the intention is to sell the energy to the grid, or to provide power for local use, the installations cannot be located too distant from their target, which often means in close proximity to other land uses. In many cases, an off-shore siting may reduce conflict with other stakeholders.

> *The Danish Ministry of Environment and Natural Resources has proposed to build an windmill park in an offshore area which Storstrøm County feels is inappropriate (migratory bird flyways, opposite areas of natural coast, just outside a special protection influencing area, etc). The County has proposed that farms be located in less sensitive areas bordering dyked coasts, and there is an ongoing dialogue with the Ministry of Environment and Natural Resources.*

> *In Denmark,windmill building is now restricted to non-pristine areas (near roads etc), and should follow regular patterns to minimise visual disturbance!*

> *Kent and the Nord-Pas de Calais have joined together in a transfrontier study evaluating the potential for offshore wind generation in the Transmanche region.*

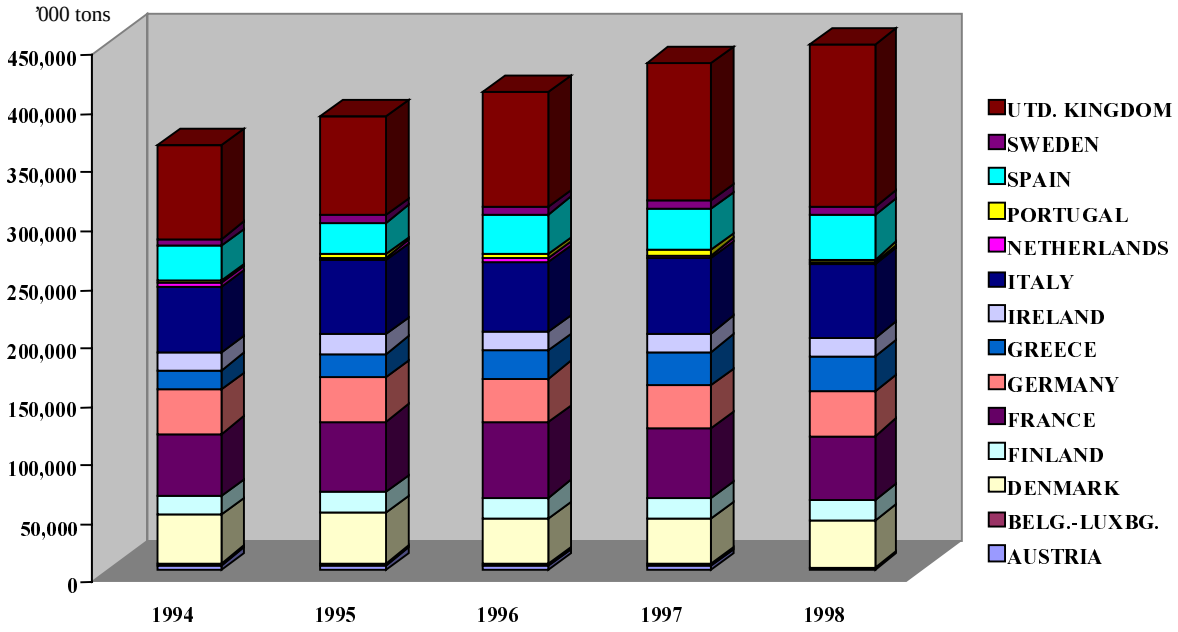
Technological advances are also likely to increase the acceptability of wind and wave generation as more discrete installations become able to produce more energy. Appropriate R & D is therefore part of the solution.

Issue: Aquaculture

As the aquaculture sector is growing in Europe, the potential for conflict between aquaculture and other users of the Coastal Zone is likely to increase.

Aquaculture Production for the EU (EUR-15)				
Species	*1975 Production (tonnes)*	*1985 Production (tonnes)*	*1995 Production (tonnes)*	*1995 Value (Mécus)*
Salmon and trout	*57.000*	*188.000*	*316.500*	*810*
Carp and other fresh water species	*27.000*	*49.000*	*30.000*	*48*
Eels	*14.000*	*13.000*	*7.500*	*57*
Bass and Sea Bream	*1.000*	*1.000*	*30.000*	*205*
Sub-total fish species	*99.000*	*251.000*	*384.000*	*1.120*
Oysters	*98.000*	*153.000*	*160.000*	*240*
Mussels	*350.000*	*615.000*	*445.000*	*240*
Clams	*2.000*	*2.000*	*75.000*	*157*
Sub-total mollusc species	*450.000*	*770.000*	*680.000*	*637*
TOTAL	*549.000*	*1.021.000*	*1.064.000*	*1.757*

EU Fish Production Development



Aquaculture can generate diversification of the economy, increased job options, local income generation, and produce added value in terms of quality. However, aquaculture can lead to problems

of waste disposal and aesthetics and can have negative impacts on the marine coastal environment: Some aquaculture activities can contribute to nutrient enrichment and the risk of eutrophication, the transmission of disease to natural populations can occur, the introduction of exotic species can have consequences on the habitat, problems for wild stocks can arise from escaped aquaculture fish in terms of ecological competition and genetic change. Demonstration project leaders have also indicated that the big trucks that are needed to transport aquaculture produce are contentious in many small communities for causing congestion and pollution.

Conflicts between aquaculture and other land uses is the main issue in Bantry Bay. Mussel lines are considered unsightly, block navigation channels, and have been placed in areas used directly by inshore fisheries or recognized nursery grounds. There is concern that mussels may compete for food with other shellfish. Debris has led to fouling of nets, blockage of pipes at the Whiddy Island terminal, and beach littering and associated onshore use or storage of equipment is also considered messy and unsightly.

However, in many regions in the Union mussel farming is a traditional activity, and the rafts or poles used for cultivation are considered as part of the “natural” landscape. Site alterations resulting from aquaculture civil works have a negative impact on the environment during the construction phase. When the works are completed, the effects may be much less than originally imagined by lay viewers, and are not necessarily unattractive. Critics of new pond farms may also find it pleasant to travel around a pond farming region established a decade or two ago, with its environmentally-friendly well-landscaped atmosphere, with lines of trees and sets of ponds surrounded by grass covered levees. In fact, what may be seen during construction as irremediable damage to a virgin site may be considered by the following generation as a perfect example of the intelligent and well-landscaped site structuring effect of a traditional culture. So, there are positive as well as negative interactions between aquaculture, the tourism industry and nature conservation. In particular, aquaculture can provide an "image" that attracts a certain type of tourism, and is more environmentally benign than many alternative development options.

At the heart of the issue lies the choice of location for the development of aquaculture, and the scale and standards of operators.

The Norwegian project on developing local management plans along the coasts has faced the issue of aquaculture in conflict with nature protection. The problem is being resolved through the use of voluntary codes of practice.

The expansion of aquaculture is occurring at the same time as the increasing demand by society for environmental protection. This includes notably the desire to prevent excessive exploitation and appropriation of coastal areas and the seabed, particularly in tidal areas. As a consequence, many sites which had been identified as potential areas for aquaculture development in coastal marshes and tidal flats, particularly for extensive or semi-intensive systems, have now become inaccessible through the passing of laws and regulations prohibiting any form of alteration of the habitats concerned.

Conflicts related to aquaculture are often intractable where the sector is managed and regulated by marine authorities without adequate interaction with land-based sectors and administrations. Decisions on aquaculture siting require consideration of a wide range of matters and should involve all of the relevant stakeholders, as well as a mechanism for public consultation.

Aquaculture in Ireland is administered by a national government ministry, the Department of the Marine. Until 1997, aquaculture licenses to cultivate fish or shellfish could be granted only in areas designated for that purpose under the Fisheries Act 1980. This procedure was intended to replace a more complex system of fish culture licenses, oyster bed licenses and oyster fishery orders under the Fisheries (Consolidation) Act 1959, although that legislation remained in force as well. In addition, the Department of the Marine had powers under the Foreshore Act 1933 to issue licenses for aquaculture installations or structures on the foreshore and sea bed. However, these controls overlapped with local authority planning powers. Although planning jurisdiction in Ireland does not normally extend below the mean high water mark, Bantry Bay is unusual because its waters were included in the administrative county of Cork by the Local Government (Reorganization) Act 1985. This was intended to give Cork County Council control over the waters around the oil terminal at Whiddy Island in response to the disaster there in 1979. However, the co-existence of complicated statutory powers created confusion about the division of responsibility between central and local government, which enabled illegal aquaculture to take place unchecked. This issue has surfaced in the Bantry Bay pilot project, where there are environmental problems due to uncontrolled aquaculture developments. Although legislation to regulate aquaculture has existed for many years, it has not been adequately enforced due to jurisdictional uncertainty created by overlapping sectoral laws.

New legislation to regulate aquaculture in Ireland was enacted in 1997, which introduces a new system of aquaculture licensing by the Department of the Marine. Applications for licenses are no longer restricted to designated areas, but may be made in relation to any waters. Although there is a risk that this may lead to excessive aquaculture development, it should also discourage unlicensed activities. The legislation provides for consultative procedures, and the Department of the Marine is statutorily required to consider a variety of factors, including development plans and environmental and economic effects. Enforcement provisions and penalties are strengthened, and there are new powers to remove unauthorized aquaculture structures. In addition, an independent Aquaculture Licenses Appeals Board, which must be representative of a wide range of interests, is established to determine appeals against the Department's decisions. Appeals may be submitted by any aggrieved person, including third parties, and statutory time scales (which are modelled on streamlined procedures for planning appeals) are set for their determination.

The new aquaculture licensing system does not replace local authority planning controls, but is intended to operate in conjunction with them and to follow a similar time scale. Following a decision of the State Planning Board (An Board Pleanala) in 1995, it is now clear that the mooring of mussel rafts in Bantry Bay is development requiring planning permission from the local authority. A foreshore license from the Department of the Marine under the Foreshore Act 1933 will also continue to be required for aquaculture installations, but the new fishery legislation clarifies the relationship between the two regimes by requiring the decision on the aquaculture license to be taken into account when the application for the foreshore license is considered.

In countries with few available sheltered sites, offshore and submerged fish enclosures have been tested. However, they have proven difficult to operate, as well as costing more to operate than conventional systems.

Early attempts to adopt offshore aquaculture techniques in the Finnish Archipelago have proven to be unsuccessful because of the high costs (in a period of low market prices).

Where it is a societal decision to move the enclosures off-shore, it may be relevant to find economic instruments to subsidize the high costs.

Science and technological development has a role to play in making aquaculture safer and more acceptable, particularly by development of:

- Disease monitoring systems, disease and parasite treatments compatible with environmental sustainability, and technology to prevent the spread of disease from, and within, aquaculture and offshore aquaculture installations.

- Integrated farming systems that permit recycling of wastes from other resource users while determining effluent quality criteria for these wastes and methods to comply with these criteria.
- Substantial performance improvements of the water recirculation farming systems, including optimisation of water treatment, increasing of filter efficiency, proficient management of the farms.
- Cheap and reliable mathematical models to predict the consequences of various impacts on different aquatic systems, including large coastal and oceanographic areas.
- Strategies to allow the farming of introduced species in a safe and sustainable way, through controlled introductions and agreed codes of practice, involving official quarantine laboratories, as well as structures and procedures to reduce or avoid the escape of farmed fish.
- Remote control and surveillance of offshore and submerged fish enclosures.

There is a need for improved dialogue between scientists and aquaculture producers to refine this list of topics and ensure that academic exercises are directly applicable to real situations.

Issue: Tourism and Recreational Use of the Coast

Tourism is one of the fastest growing and most economically profitable sectors in many coastal areas. The traditional attraction is the "sun and sand", with marine sports (boating, water skiing, diving…) on the increase as well. The tourist sector provides jobs and income not only to hotels, restaurants and tour operators, but also to their many suppliers and support industries. The availability of recreational and leisure-time opportunities is also an important component of a high quality of life.

In Storstrøm County, tourism, particularly in the low season, is seen as one of the keys to the region's future prosperity, helping to compensate for declining employment in fishing, agriculture, industry and - to some extent - shipping.

However, tourism is frequently very resource intensive, consuming large amounts of water and fossil fuels while generating large amount of congestion, wastes and pollution. Tourism is commonly in conflict with other activities over access to land and other resources. It can also be socially disruptive as the temporary residents splinter the social fabric and local communities are displaced by increased land prices.

In Cyclades, there are conflicts between tourism and the extraction industries; tourism has also led to a decline in the traditional labour-intensive agricultural techniques, in turn presenting problems relating to freshwater recharge and soil erosion;

In La Gironde, boats for pleasure fishing are frequently treated with TBT, which has had a negative impact on aquaculture.

Tourism is also a risky business, dependent on changes in fashion and characterized by extremes of seasonality. (Seasonality is both an economic and environmental problem as the extensive infrastructure needed to house, transport and provide sewerage for the high season remains unproductive for much of the year - while still incurring environmental and economic costs.) Tourism is even plagued by intra-sector conflict as swimmers clash with jetskiers and bird-watchers clash with other visitors whose activities scare away the birds.

Strymonikos is expecting to face a heavy influx of tourists from East European countries in the next five to ten years.

In contrast, tourist numbers have declined in the German part of the Wadden Sea region, primarily due to the economic difficulties in Germany as a whole. The heavy reliance upon German tourists as the main customers has made the Wadden Sea region vulnerable towards changes in this particular customer segment.

In Strymonikos, the population rises from 16,860 people in the winter to over 150,000 in summer.

Kent is facing the decline of the traditional English "bucket and spade" holiday, which once brought hundreds of thousands of Londoners to Kent each summer. The Kentish towns cannot compete with more sophisticated resorts or with holidays abroad and are trying to promote themselves as conference centers and "short break" destinations.

In the context of sustainability, the objective is to limit tourist development to the carrying capacity of the region, and to promote models of tourism which have an acceptable level of societal and environmental impact, while maximizing the economic return from the infrastructure load (by encouraging year-round exploitation). What levels are acceptable can only be determined by broad consultation with local stakeholders.

Encouragement of alternative forms of tourism, building on local characteristics is one solution: small fisheries and their communities, for example, may attract cultural tourism thus combining social, economic and environmental objectives.

In southern Denmark, they are taking a pro-active approach, through promotion of "green tourism" including fishing. Similarly, the Waddensea Project is addressing the promotion of environmentally-friendly tourism to create jobs and generate local income. Such successful positive actions are an important component of changing perspectives of the local community.

A footpath network being drawn along the coast of Ipirus to connect sites of natural, cultural and landscape heritage is expected to improve infrastructure for the development of alternative forms of tourism. Through this initiative, the local community is becoming more interested in providing alternative tourist activities, as the current traditional tourism model does not represent particularly high incomes for the community, with seasonality and short stays being the most important problems.

One of the key problems with managing tourism in the context of an ICZM initiative is that, in most places, no one is really planning tourism; at least no one is looking at the spatial consequences. Where local authorities are involved in tourism management it is usually only in terms of urbanization and land use planning, or possibly tourism promotion.

The Draft Coastal Strategy for Dorset proposes that the rural coast be recognized as an integral part of the tourist economy. A partnership is currently being formed by Forum members to create a new post of Sustainable Tourism Officer.

On the Isle of Wight, where the local economy is heavily reliant upon tourism, the need to promote sustainable tourism has been recognized. A Sustainable Tourism Group is feeding information into the local Agenda 21 Strategy.

Assessment and analysis of the role of tourism in meeting local objectives is primordial in this process. There is a need to understand who is driving tourism development and who is benefitting from it. Broad impact assessments, expanding from the Environmental Impact Assessment and Strategic Environmental Assessment concepts may be useful tools.

Issue: Public Health

While frequently forgotten in the debate between environmental and economic objectives, ensuring public health should also be a key issue in any ICZM initiative. Both the water and the beaches are areas where sound management can help prevent public health problems. Uncontrolled dumping of waste, including hospital waste, has led to concern in many parts of the world.

As well as being of significance in its own right, this issue is one which can help to raise the enthusiasm of the public for ICZM.

Issue: Transport and Accessibility

Transport and accessibility is a key issue in a large number of the pilot projects. Dense transport networks in coastal zones play a critical, multi-facetted role, particularly in islands and remote continental areas, where accessibility is an issue of strategic importance:

- Transport infrastructure lays out the backbone that determines many other decisions about the location of goods, services, industries and residences.
- Adequate accessibility is also key in addressing peripherality, maintaining local residents, providing commercial links, conveying visitors and opening areas to development. However,

over-dimensioned accessibility can bring problems of over-loading the natural or social carrying capacity of the region.

- In areas prone to natural hazards (such as Napoli), the transport network is central to ensuring the safety of the populations by meeting evacuation needs.
- Transport accidents, particular maritime accidents involving oil or hazardous cargoes present significant risks to Natural Parks or Marine Reserves. Long-term pollution or the introduction of exotic species are also a concern.
- Local transport plays an important role in regional development, including both economic development and development of a sense of identity.
- The transport sectors itself, particularly marine transport, may be an important source of jobs and income

In recent decades, the limited accessibility of remote Coastal Areas and Small Islands has been a major factor in a decrease of year-round inhabitants in areas such as the Finnish, Danish and Greek Archipelagos. Outside assistance may be required to reduce their isolation.

Isolation caused by modifications to transport infrastructure is an issue in Valencia, which is effectively bypassed by the new road system.

In Napoli, the entire gulf is an urban center where all the activities and problems that can exist in Coastal Zones are concentrated: congestion, industrial decline, intensive tourism, pollution, abandonment and deterioration of the natural and cultural heritage, potential in jobs and wealth. Rationalization of the transportation network is seen as a key element in restructuring and stimulating this region, and also in the Palermo project.

Major transport-infrastructure developments such as the Channel tunnel linking Kent and Côte d'Opale have had major impacts on the economy and environment, both negative and positive, in ways that were not foreseen prior to its construction.

Improved transport links will reduce isolation and open new economic opportunities in Ipirus, but will also play a strategic role with subsequent implications for the coastal environment due to the intensive development which is anticipated as the coastal zone becomes more easily accessible.

Transport is very expensive in the Isle of Wight; this has severely affected the GDP and unemployment levels on the island.

Achieving sustainable accessibility is a vital step in the overall improvement of the coastal environment and maintenance of economic viability. Meeting environmental and transport objectives requires integrated approaches combining transport, environmental and spatial planning. However, relatively few areas have fully integrated systems. Current actions towards sustainability in this field mainly seek to reduce road traffic and congestion, essentially by encouraging a modal shift from private cars to public transport and, less often, to cycling and walking. Whilst these actions are important, they do not in themselves constitute sustainability measures.

Institutional issues are frequently at the root of the problem. Transport is often planned from inside transport administrations and the industry, with the resulting network fixing the framework for broader development plans; the original purpose of the network (providing access and economic links) is frequently forgotten or obscured. The problems often arise from sectoral administrative structures that work in isolation; these structures also present difficulties for creating mechanisms for managing non-infrastructure aspects of transport planning.

The railway running along the Adriatic Coast of the Italian Peninsula was built considering only transport needs; it was constructed along the most economic path -- minimizing the need for tunnels and bridges. Nowadays this decision is causing serious constraints to Coastal Space utilization as well as problems with local erosion in many areas.

Some of the conclusions arising from the projects include:

- Transport planning needs to take a holistic strategic approach, in which transport decisions are based on an understanding of the implications and anticipation of the consequences of transport decisions. Transport should be seen as a tool to meet other societal goals, not an end in itself. This implies a move away from the focus on individual projects or modes of transport (the "bits and pieces"). One component of such a strategy should be promotion of multi-modal transport systems. There is also a critical need to plan transportation and land use together.

- The primary obstacle to a holistic approach is poor coordination; there is a need to bring together transport planners at different government levels and from the land, marine and air "sectors", and to bring together transport planners and land use planners. This is both an institutional and a cultural issue; information and demonstration programmes can help address the cultural resistance.

- The Strategic Environmental Assessment approach to pro-active strategic planning and guidelines for major transport and mobility planning (including the Trans-European Networks) should be promoted. For example, guidelines could suggest that it is generally preferable to keep as far inland as possible any major road or rail axes that runs parallel to the coast (the additional construction costs being offset by reduced damages from congestion and pollution of coastal areas, and reducing the possible costs of coastal erosion.)

- The transport system needs to be planned to meet the range of user needs, and adapt to changing needs in different seasons of the year. (In areas such as the Greek islands, transport services are tailored to the needs of tourists but curtailed during low tourist season, leaving residents immobile. On the other hand, in other low-density rural areas, dependence on cars leads to problems of congestion during the tourist season and limited options for tourism development.)

- Local transport needs and proposals for solutions need to feed into the planning process, even when the competence for decision making rests at a higher level. This will probably lead to more implementable solutions. Associations of local entities could help ensure that the local administrations have a voice in the planning; mechanisms need to be developed to also ensure that the view-point of the local citizen is considered.

- Needs of the local populations could also be better served by eliminating monopolies in transport (road and rail) and lobbies in the ship industry (marine), or finding mechanisms that require the service providers to provide certain services even if they are not economically profitable for the company.

- Transportation plans must meet specific needs of remote coastal zones (islands and isolated mainland areas)

- Technologies may help overcome some of the physical limitations represented by the sea-front and make better use of the sea bottom. As an example the adoption of submarine tunnels as well as submarine parking facilities may free valuable space and ameliorate living conditions by reducing traffic on the seafront.

- Adoption of more “transversal” rather than “longitudinal” transport systems. Radial or transversal systems can provide access and development opportunities without opening the full coastal zone to massive "strip development", thus ensuring better preservation of zones of natural vegetation.

In Latvia, major road and rail developments are unlikely to follow the Latvian coast, but rather be East-west and based on transhipment routes. This will be positive in that it will discourage linear development along coastal routes. The cost is that this may retard co-operative development programmes between major urban centres and reduce the possibilities to link major coastal cities and for multi-centre or cross-border tourism development.

- Information technologies could represent a way to bring work and occupation to remote coastal areas and small islands. Possibilities offered by tele-working and service provision

through the Internet should not be underestimated. However, it should be noted that these technologies will not necessarily reduce the need for physical mobility.

The ANAS (Huelva-Algarve) project is creating an Intranet system between the 30 Portuguese and Spanish municipalities which compose the ANAS association. It will favour the integration and exchange of experiences at an economic, social, administrative and cultural level, overcoming the relative isolation of some of these municipalities. This will also benefit the integration and proximity of both sides of the frontier, promoting the principle of a "Europe without frontiers".

- Encouraging (and planning) how coastal zones can benefit economically from break of bulk / modality shifts

Issue: Fair Competition in Ports and Maritime Industry

The maritime industry of the European Union has a strong position in certain markets, and is an important economic player in many coastal zones. There is, however, concern among certain parts of the industry that the playing field is not entirely equal. In effect, in some areas, ports have received considerable contributions from national and EU financing sources, funding which is not available in other countries. There is also some controversy over differential implementation of the Birds and Habitats directive.

The Commission might, in co-operation with European industry representatives and Member States, progressively put into place a structured action plan, and actively follow the evolution of the competitiveness of the European Maritime sector and the adoption of the various measures.

Issue: Protection of Landscapes and Cultural Heritage

The landscape is composed of both physical and cultural elements; it is the result of the super-position of human activities on the natural environment. Although the value of landscape is notoriously difficult to assess, it is an important aspect of regional identity while also being an asset to the tourist trade. Cultural heritage includes living societies and their customs, as well as archeological treasures both above and below the high-water mark; it is a component of our collective human patrimony.

The intertidal area of Fishbourne and Wootton Creek on the Isle of Wight is a rich archaeological site with remains at different levels, which illustrate the historical use of the coast (and its physical evolution) back through the Bronze age to the Mesolithic period. Drawdown from ferries passing into the Fishbourne terminal has resulted in exposure and potential destruction of these remains, however a donation of funds by the ferry company for beach replenishment works should repair and protect the site. The site now provides a practical example of the seamless approach which is advocated for the care and protection of coastal archaelogical heritage.

The collective memory that is part of cultural heritage is itself an important factor in understanding the dynamics of the coastal zone, and to prepare the future, taking into account lessons from the past.

Unfortunately, the changing dynamics in many coastal areas are leading to the destruction of irreplaceable landscapes and cultural heritage, as modern infrastructure is expanded, villages are abandoned, and social structures are destroyed. The processes of coastal erosion, mineral working and sea level rise are also a threat to inter-tidal heritage.

Concerns about destruction of landscapes and elements of cultural heritage are frequently a trigger for ICZM, and should be given due consideration and protection in any plans for development or management of the coastal zone. ICZM should focus upon what to protect and then how to protect it.

The French Fédération Réfionale pour la Culture et le Patrimoine Maritimes participates in the Côte d'Opale project, and has proposed 15 actions to integrate the cultural dimension into sustainable coastal zone management.

Issue: Coastal Fishing

Coastal fisheries are presently facing many difficulties. In many areas, overfishing has led to diminished resources. Combined with the necessary imposition of quotas, the absence of fish has been translated into loss of jobs and decline of the sector. This has had a negative multiplier effect on local suppliers and the commercial and service sectors catering to fishing families. People are emigrating and the social fabric is changing. With the loss of the fishing community, the local "image", itself a tourist resource, is also lost.

A number of coastal activities (such as sea front planning, mooring of boats, and leisure navigation) may have negative effects on coastal fishery and fishing stocks, either via a reduction of accessible sites and marine habitats (feeding, spawning and rearing grounds) or by a reduction in the quality of water and of the coastal environment.

In La Gironde, professional coastal fishing is increasingly being out-competed by sport fishing.

Integrated solutions to coastal zone management must either enhance the fishing stock through appropriate ecosystem management or find alternative employment for the local fishing populations. In an increasing number of areas, the solution is being found in a combination of fishery activities and tourism.

The major difficulty remains, however, that in numerous regions the opportunities of alternative employment (out of the fishing sector) remain rare. Another important obstacle to the diversification of the sector is the low mobility of fishermen due primarily to the absence of technical qualification (early entry age in the activity of fishing). The Community-initiative fund PESCA aims to help resolve some of the problems of restructuring in the fishing sector and assist the professionals to develop new skills in order to maintain their competitiveness and revitalize the socio-economic fabric of fishery-dependent coastal areas.

Frequently the values and perceptions of the fishing communities are not those of other sectors or residents. Joint participation in ICZM initiatives should provide an opportunity for exchanging views and finding compromise solutions. However, there is a weak culture of concertation and planning among fishers, which - together with their weak level of political power - makes it difficult for the fishing community to get their rights and concerns legitimitized in multiple-use situations. Some professional organizations (local and regional fishery committees) are presently developing their own management and concertation abilities to improve their abilities - and willingness - to participate in ICZM initiatives.

The sectors dealing with processing, marketing and transport of fish products, even if not physically located in the coast, also have a stake in coastal zone management and should be called to contribute to the ICZM process, particularly by taking into account the constraints of carrying capacities.

Issue: Public Access to the Foreshore and Beaches

In many areas, access to the foreshore has traditionally been a public right. The very identity of many towns and cities (and even countries such as Portugal) has been defined by this widespread and persistent contact between people and the waterfront.

Today, with increasing private ownership of beachfront property, the situation has changed. In many areas, there is a need to consider the implications of this gradual change. Do steps need to be taken to ensure public access? If so, how?

In Barcelona, the Olympic games of 1992 represented the opportunity for the city to "re-open" itself to the sea and give the opportunity to the inhabitants (and the tourists) to actually begin using the waterfront again (after almost one century). This involved dismantling transport routes that cut off the city from the waterfront and rehabilitating areas of derelict industry.

The Isle of Wight successfully opposed a proposal by the Port of Southampton to extend its 'harbour limits', a move that might have restricted recreational opportunities.

Issue: Second Homes and Urban Sprawl

Over the past century, urban sprawl along the coastline has become increasingly common. One of the driving motors behind this sprawl has been the increase in ownership of second homes, for use either during the summer or at weekends throughout the year. This phenomenon can be observed across Europe, from Finland to Portugal.

Apart from problems related to habitat destruction and foreshore access, many of these constructions have waste deposal and septic systems that overload the ability of the natural systems to absorb pollutants. Promotion of appropriate technology is part of the solution.

Particularly in southern Europe, many of these constructions are illegal or "semi-legal" and contravene zoning and construction regulations. Enforcement of existing legislation might be aided by information campaigns illustrating the negative impact of this constructions.

In some areas landowner rights and zoning regulations may need review. In Greece and Finland, landowners have rights of construction on plots over a certain size. Removing these rights, to limit urbanization, would have economic implications on land values and is not widely supported. Public consultation is needed to find acceptable solutions.

Issue: Dredging and aggregate extraction

Dredging involves the removal of sediment in its natural (new-work construction) or recently deposited (maintenance) condition, either mechanically or hydraulically. After the sediment has been excavated, it is transported from the dredging site to the placement site or disposal area. Dredging is normally undertaken to keep waterways and harbours open for navigation.

Aggregate extraction refers to the mining of sands and agglomerates for commercial sale.

The two activities pose similar problems in the context of coastal zone management, in that they can disturb the natural ecosystem and impact sediment balances. Dredging may also pose problems concerning the disposal of the spoils, particularly if they are contaminated.

In the context of ICZM, it is important to treat both of these activities as valid economic activities in the coastal zone, and to integrate them into the planning and decision making process equally with other economic sectors. At the same time, dredging should be carried out according to guidelines and used appropriately, to ensure that it serves as part of the solution to managing coastal problems, rather than as a new source of problems. In certain instances this might mean selecting alternatives to dredging.

Since the impacts of these activities may be far-reaching spatially, there is some difficulty in evaluating their impact. Increased data and knowledge about coastal dynamics would facilitate the process.

Research and application of best practice can help ensure that the dredged material is used for some productive purpose (such as for beach nourishment or rebuilding eroded salt marshes), that any contaminants spoils are adequately managed and that unintentional impact on sediment regimes is avoided.

Issue: Chemical and Heat Pollution

The coastal zones are subject to various types of chemical and heat pollution, coming from sources including industry, power generation plants, agriculture, sewerage outflows, mining operations and oil spills. Pollution of coastal zones may present dangers to ecosystems, human health or aesthetics.

Two types of pollution in the coastal zone are particularly difficult to address because their sources are frequently external to the planning and management activities of the coastal zones, namely:

- Pollution that is generated outside of the coastal zone and transported there through the hydrographic network and ocean currents. Pollution from agro-chemicals is a particular worry.

- Historical pollution remaining from old industries or military establishments. The restructuring of heavy industry in general and the changing socio-economic dynamics in the coastal area have left large areas of vacant but contaminated land.

Examples of historical pollution can be seen in the Latvia and Lithuania (military and fuel storage) projects, as well as in Taranto (old industry in lagoons).

Historical pollution in the sediment is limiting mussel production in Devon and Cornwall.

About a third of the projects noted runoff derived from the watershed as a source of pollution.

Remote polluters may be brought into the ICZM process through an adequately broad definition of the scope of an initiative and/or more comprehensive definitions of impact in implementation of Environmental Liability and EIA laws. When the polluters are no longer alive or legally disbanded, society at large may need to assume the costs of clean-up. Although the cost may be significant, as well as eliminating the pollution per se, the recycling of previously developed derelict or contaminated land has the potential to achieve the retention of green field sites, and protection of countryside, open space and wildlife.

Barcelona and Forth Estuary are two areas where old industrial areas have been "recycled".

Pollution from marine accidents is a particular problem in coastal zones that include, or are adjacent to, major transportation networks. In general, marine transport is considered environmentally friendly, however accidents can inflict significant damage to coastal ecosystems, and sectors such as aquaculture, fisheries and tourism that dependent on a clean environment. There is a need to make adequate risk assessments and implement sufficient preventive and preparedness measures against pollution from these sources.

In many cases, coastal pollution can be addressed through technical solutions (such as improved waste water treatment or precision farming), encouraged by adoption of BAT and BEP and supported by improved detection and emergency intervention techniques. Alternatively such pollution and/or its impacts can be prevented through sound zoning (including use of buffer zones or integrated solutions like locating aquaculture activities in areas of thermal discharge) and correct local application of EIAs and the polluter pays principle. ICZM may help to resolve conflicts between pollution generators and those whom the pollution impacts. In particular, there is a need to communicate the strategic importance of the precautionary, prevention and polluter pays principles to all individuals and organizations in the coastal zone.

There also a need to resolve difficulties in the implementation of environmental liability laws.

Issue: Habitat Destruction and Loss of Biodiversity

In many coastal zones, population increase and changes in economic activities is leading to alterations of coral reefs, the seafloor, beachfronts and shorelands. Urban expansion can result in destruction of important coastal habitats, particularly wetlands. As individual species respond to new conditions, the composition and geographic distribution of ecosystems will change and biological diversity may be threatened as species become locally extinct. In general, the losses can only be reversed at great cost, and sometimes not at all.

Rapid development threatens to degrade the Ria Formosa wetlands in the Algarve.

In some planning circles, these losses might be considered irrelevant. Legislation designating protected areas may have large spatial planning implications as extensive areas or particular biotopes

are set aside or subject to restricted uses. Protected areas may then be regarded as an imposition, or undue restriction on economic options.

However, habitat loss can have a direct economic impact on the fishing sectors where fish spawning grounds are involved; habitat destruction also eliminates options for "eco-tourism", certain outdoor leisure time pursuits, and educational facilities. Furthermore, the cumulative impact of many "small" habitat losses and species extinctions presents a threat to the functioning of the global ecosystem, as well as threatening local ecosystem functions and services such as flood absorption, filtration, groundwater recharge These factors should be considered in the context of evaluating the costs and benefits of land use changes in an ICZM initiative.

Education and research have an important role to play in ensuring that the full role of habitats and species is generally acknowledged. Mechanisms for controlled - but compulsory - acquisition of property by the administration (with payment of compensation) can play an important role in assuring that key habitats are adequately protected. It should, however, be noted that habitat protection does not need to be interpreted as excluding economic activity; many human land uses can co-exist with species and their habitats, and many have done so for centuries.

The Kent Biodiversity Action Plan has identified over thirty actions necessary to prevent further habitat loss and arrest species decline on the Kent coast. An early success has been the reappearance of breeding pairs of peregrine falcons on the famous White Cliffs after an absence of nearly thirty years.

Where important natural habitats have already been destroyed, an ICZM initiative may investigate the possible use of renaturalization techniques to restore a more healthy and productive environment.

The Flanders project (TERRA CZM) is working to "engineer" greater biological diversity by developing an intertidal sea in-let in the dunes, by partial removal of a concrete dike in front of the Flemish Nature Reserve De Westhoek, and by using novel groyne design to attract species and flora which are associated with rocky coasts.

Issue: Natural Catastrophes and Climate Change

Natural catastrophes, including earthquakes, flooding, droughts, land slides, and storms represent dangers to both humans - their home, incomes, culture and lives - and to natural ecosystems. Climate change is expected to increase the risk of these events in many coastal areas. A rise in relative sea level (also possibly due to subsidence) or changes in storms or storm surges could result in the displacement of wetlands and lowlands, erosion of shores and associated habitat, increased salinity of estuaries and freshwater aquifers, altered tidal ranges in rivers and bays, changes in sediment and nutrient transport, a change in the pattern of chemical and microbiological contamination in coastal areas, and increased coastal flooding.

On the North Kent coast, large areas of saltmarsh are being rapidly eroded as sea levels rise and storm surges become more frequent. The impact is felt by the hundreds of thousands of wildfowl and waders who use the marshes for overwintering or breeding. Saltmarsh also acts to dissipate the power of the incoming tide - as it erodes, the sea rushes with greater force towards the land, causing problems of coastal defense.

In general, however, it is not these events themselves that cause the greatest threat to human life and property, but the juxtaposition of these events with inappropriate land uses and inadequate contingency plans. In many areas, intensive human alteration and use of coastal environments already have reduced the capacity of natural systems to respond dynamically.

Hazard mapping for natural catastrophes is now quite good. (Flood models are often very complex systems considering not only topography, but wave patterns, land stability calculations, channelling effects, etc.). With this improved prediction capability, there is no excuse to increase human vulnerability to these events by allowing risky siting of homes or economic activities. Coastal planners and decision makers must take these threats seriously.

The threat presented by Mt. Vesuvias is a central concern for the TERRA Posidonia - Napoli programme. Land use siting, and particularly transport decisions, must ensure adequate evacuation options.

The Isle of Wight is undertaking risk assessment for the parts of their coastline which are particularly susceptible to landslides and cliff falls.

ICZM should promote policies that work with nature to increase resilience. The resilience of a system is defined as how it copes with major perturbations to its operating environment. ICZM should aim to ensure that local land uses are not increasing the probability of such events by reducing resilience. Flooding, for instance, can be the result of anthropogenically caused land subsidence. The best known example is the case of Venezia where over-exploitation of an underlying aquifer caused land levels to drop, increasing the risk of floods during high water events.

Decision making in the context of ICZM also presents a possibility to contribute to reducing the global threat of climate change by favouring activities that do not contribute to global warming, or even act as carbon sinks.

Issue: Coastal Erosion

For planning purposes, coastal erosion can be defined as a "unacceptable landward movement of the coastline". It may be due to actual sediment removal by the sea, reduced deposition and/or due to subsidence (anthropogenic or natural) of the land. The fact that it is unacceptable depends on the fact that there is some kind of human interest or some kind of values that is affected.

Extraction of gas is one of the factors leading to land subsidence and coastal erosion in the Waddensea area.

In some parts of the Baltic Sea coast in Latvia, natural coastal erosion has been going on for several thousand years at a rate of approx. 1.2 m/year. Erosion processes were greatly accelerated after the construction of the Ventspils Oil Harbour so that the coast now retreats by 2.5-3.5 m/year.

Coastal erosion and consequent flooding are a concern for many who live or work immediately adjacent to the coast because of the risk, or perceived risk, of costly property loss or damage. Such fears have intensified in recent years due to widely publicized forecasts of increases in sea level that may result from global climate change. Importance habitats may also be threatened in cases of accelerated erosion, particularly where the adjacent inland area is built up, preventing the natural progression of the ecosystem landward.

The first step in combatting coastal erosion, or its impact, is gaining a thorough understanding of its causes. Causes and effects are being increasingly confused by large number of short term and small scale defense intervention typically based on the adoption of "hard protection technologies".
Where the underlying cause of the erosion is anthropogenic such as human interventions in the sediment budget (such as from dredging or damming), subsidence caused by gas or aquifer exploitation, or infrastructure that has amplified the erosive power of the waves, management decisions may be based on a public debate over the relative value of the causative human activities and the potential costs of coastal erosion. However, in much of Europe, coastal erosion is a natural process and the management possibilities are more limited, as removal of the underlying causes is not an option.

In West Flanders, human intervention makes it difficult to appreciate the natural erosion of the Flemish coast. However, overall, approximately two thirds of the Flemish coast is erosive.

Hard engineering works to prevent shoreline erosion have proved to be very expensive to maintain, and are not always successful in stabilizing the present coastline. Furthermore, they may cause negative side-effects further along the coast (see example in section 2 of the document "Towards a European Integrated Coastal Zone Management (ICZM) Strategy: General Principles and Policy Options").

"Soft" coastal defenses, such as dune re-vegetation, may be more successful and entail less maintenance costs under certain circumstances. They also can help to conciliate protection needs, with needs of nature conservation and can represent a more sustainable interface between natural and rural areas. But such measures are also not always possible or cheap to implement (such as where infrastructure has been constructed on the foreshore).

Tourism, and particularly high quality tourism, represents the most important development force for the Regione Abruzzo, where the RICAMA project is situated; coastal erosion is locally perceived as the most significant threat to maintaining this tourism. However it is clear from past experiences, and from the recognized causes of the erosion, that it cannot be sustainably countered just by adopting the traditional hard protection technologies. "Soft", more environmentally compatible, approaches are required.

The forests in Latvia play a significant role in the prevention of coastal erosion; there is need for further scientific work to identify which forests are crucial for this purpose.

In cases where the threatened land uses are not of overriding cultural, social or strategic importance, the cheapest long-term solution may be "managed retreat" and prevention of new construction in the nearshore area.

On the south-west coast of the Isle of Wight, cliffs have receded by 400 meters over the last 150 years. Protection is inappropriate for environmental and physical reasons and a form of "managed retreat" has been practiced by local businesses and residents for many years.

"Managed retreat", however, also entails costs -- to relocate both public and private constructions and infrastructure. Land use modifications may affect not only the nearshore but also sites chosen for the relocation of the affected activities or habitats. Some form of compensation for certain private losses may be appropriate.

Economics is thus at the heart of the coastal erosion issue. Damage from erosion is costly, but so it its prevention whether through removal of causes or through defense. Debate over the best solution in any specific situation, must therefore consider the full costs of each option and find solutions to the question of "who should pay?".

National governments and local administrations are increasingly aware of the true costs of maintaining coastal defenses. The Agriculture Committee of the British House of Commons recently produced a discussion document on this issue. It concluded "coastal defence policy cannot be sustained in the long term if it continues to be founded on the practice of substantial human intervention in the natural processes of flooding and erosion…The legacy of flooding and erosional problems arising from this practice and the likely increase in future of climatological and other environmental pressures on the UK's ageing flood and coastal defence infrastructure – might combine to present flood and coastal defence authorities with insuperable difficulties."

However, developing a general public understanding of coastal dynamics is also part of the long-term solution to coastal erosion problems, as this understanding can help prevent the creation of future problems. This will require modifications to the type of research and modelling underway, as well as changes in the ways in which information and knowledge are diffused.

Understanding the way in which Italy's deltas have developed in response to human population levels (through cycles of erosion and accretion) might have helped prevent some of the inappropriate development and with it the need for costly coastal defense structures and in some cases loss of expensive infrastructure.

Issue: Water Management

Water pollution, the main sources being agro-chemicals, sewerage and industrial waste-water, has already been mentioned in the issue on "Pollution". However, many coastal areas face other water management issues, particularly issues related to balancing supply and demand. These issues are most salient in the coastal zones in the south of Europe where coastal agriculture and tourism can lead to water demands that are in excess of the available supply. The short term response is often to increase use of groundwater supplies, but unsustainable levels of groundwater extraction can themselves exacerbate water shortages by aquifer compression, lead to problems of water quality (through salt intrusion) and cause land subsidence. Salt water intrusion is of particular concern in

lagoonal and estuarine environments where it can also adversely impact the natural ecosystems, and in areas already threatened by rising sea levels.

Not only a problem for the south: In Latvia, overextraction of groundwater for human consumption has caused intrusion problems. Water in the wells near the Baltic Sea coast tends to contain excess hydrochloric salts, sodium, potassium and sulphates. Due to unsatisfactory condition of the fresh water supply network, the demands of quality and quantity of water cannot be met. Furthermore, household pipes are severely affected by corrosion.

Technological solutions to improve water management include low-flow toilets and showerheads for residences and tourist establishments, waste-water recycling, desalination, detection and repair of network leaks, and improved irrigation scheduling and delivery systems. Demands for drinking quality water can also be reduced through using lower quality water (brackish water and "grey" water) for uses where human and ecosystem health would not be compromised.

In the planning context, the solution is to move to a system where land use is planned to conform to water availability, rather than the converse. While this may involve limiting development plans, the objective can also be met by more subtle changes such as shifting to salt tolerant and dry-land crops.

Themes of particular importance in project areas:

PROJECT	Alternative Energies	Aquaculture	Tourism & Recreation	Public Health	Transport & Accessibility	Ports & Marine Industry	Landscapes & Cultural Heritage	Coastal Fishing	Public Access	Second Homes & Urban Sprawl	Dredging & Aggregate Extraction	Pollution	Habitats & Biodiversity	Natural Catastrophes & Climate Change	Coastal Erosion	Water Management
Wadden Sea	v	v	v				v		v		v		v	v	v	
Rade de Brest		v	v	v		v	v	v				v	v			v
Cote d'Opale	v		v	v	v	v	v		v	v		v	v		v	v
Gulf of Finland			v		v		v	v	v	v			v			
Cyclades	v		v		v		v		v			v	v	v		v
Strymonikos		v	v					v		v		v	v			v
Magnesia		v	v			v	v	v		v			v			v
Ria de Aveiro		v	v	v		v	v		v			v	v	v	v	v
Dorset			v	v	v	v	v	v	v	v	v	v	v		v	
Irish Beaches			v				v						v	v	v	
Forth Estuary			v	v		v	v	v			v	v	v	v	v	
Isle of Wight			v	v	v	v	v		v	v	v	v	v	v	v	v
RICAMA			v		v		v	v	v	v		v		v	v	
Bantry Bay		v	v			v	v		v	v		v	v			
Storstrøm	v		v				v		v	v			v			v
County Down			v				v						v		v	
ANAS (Huelva-Algarve)			v			v						v		v	v	v
Cornwall		v	v		v	v	v	v	v			v	v			
Devon		v	v		v	v	v	v	v				v			
Ipirus		v	v		v	v	v	v		v		v	v			
Kent	v		v	v		v	v	v			v	v	v	v		

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Algarve (Ria Formosa)			v			v		v					v	v	v	
Kavala			v		v	v				v			v			
West Flanders										v						
Napoli			v	v	v	v	v		v			v				v
Palermo			v	v	v	v	v		v			v				v
Taranto		v	v	v		v	v	v	v		v	v	v	v	v	v
Athens			v	v		v	v		v			v				v
Barcelona			v	v		v	v		v		v	v			v	v
La Costera – Canal			v			v		v				v			v	v
La Gironde		v	v	v		v	v				v		v	v	v	
Vale do Lima			v			v		v				v	v		v	
Norway		v				v		v					v			
Latvia			v		v	v		v				v	v			
Lithuania			v			v		v				v	v			