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Coastal zone management in Denmark: ways and means for further integration

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Abstract

This article summarizes the findings of a research project on integrated coastal zone management (ICZM) in Denmark. The project comprises a study of the existing regulation and case studies of the management practices of the Danish coastal zone, as well as a study of international experiences with coastal zone management. The regulatory or institutional framework is seen as an important element that may facilitate or obstruct ICZM since ICZM essentially is about making well-balanced and well-reasoned decisions. The research project identifies several weak points in the legal and regulatory framework and in management practices. One major problem is the regulatory split between land and sea. This is reflected in the legal framework, in the distribution of powers and in management practices. On the other hand, the Danish Planning Act and the informal cooperation procedures established in Denmark form the basis of a high degree of integration between the authorities dealing with land-based coastal activities. On the basis of the findings a number of key issues to improve land–sea integration, horizontal and vertical integration are listed, comprising definition of a coastal zone that includes land and sea areas, coastal planning requirements as well as public participation,

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environmental considerations and co-ordination requirements in sectoral laws for coastal activities.

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1. Introduction

Denmark has a long tradition for regulation and planning in the coastal area. This situation explains the relatively well-preserved natural and cultural heritage of Danish coastal landscapes. These landscapes are unique in international comparison by virtue of their great variation and extension as well as by their many special habitats for endangered species of animals and plants.

Many interests are today at stake in the Danish coastal zone. The majority of the population is resident in urban zones in the coastal areas, and the greater part of the summer cottages and other holiday and recreation facilities are situated here. At the same time, the near-shore waters and the interface between land and sea are the basis for fishing, marine aquaculture, extraction of raw materials, land and sea transport, harbour activities, agriculture, etc.

In recent years, the coastal zone, probably more than any other part of society, has been exposed to pressure and processes of change. Among these changes are urbanization and new infrastructure, exploitation for recreation and tourism, acute nature and environmental problems, retreat of coastal occupations, reorganization of freight traffic between land and sea and changed functional demands and working conditions for harbours. The many interests and the large current potential for change in the near-shore areas, make it critically important to pursue the possibilities for holistic, integrated planning and management of the coastal zone.

The need for integrated coastal zone management (ICZM) has for long been recognized at international level and several international and supranational institutions have called for coastal zones to be put on the agenda, including the UN Rio Conference in 1992. In Europe, the Council of Europe has elaborated a so-called “Model Law” for ICZM, and the Commission of the European Union (EU) in 1996 initiated a Demonstration Programme on ICZM [1]. Following the Demonstration Programme, the European Commission in 2000 adopted a Communication to the Council and Parliament on ICZM and the European Parliament and Council Recommendation on ICZM was adopted in 2002 [2].

2. ICZM in Denmark: recent initiatives and a research project

In Denmark initiatives to promote ICZM have been few. More recently, the matter has been discussed, partly as a response to the above-mentioned EU initiatives and partly as a result of inadequacies in the existing regulatory framework and calls for protection of the coastal environment and of marine biodiversity. The latter was stressed by the Wilhjelmsen Committee in their 2001 Report on a National

Biodiversity Strategy. The Report particularly stressed the importance of coastal areas and the need for better co-operation among authorities.

In 2002, a Regional Planning Committee was set up under the Ministry for the Environment with representatives from various authorities and organizations. The Committee was given the task to suggest changes in legislation regarding regional planning in general. As a specific issue, planning in the coastal area should be dealt with by the Committee. The Committee in June 2003 recommended a continued focus on the importance of coastal zones in regional planning. While the Committee stressed the importance of careful planning and administration it also recommended a less restrictive practice compared to the previous quite restrictive administration. Under well-reasoned circumstances there should be a possibility to plan for urban development and new summer cottage areas within the existing 3 km coastal planning zone. Initiatives are now being taken to designate such areas in a dialogue between the Ministry for the Environment and the local authorities.

Significant changes in the Danish planning system, including planning for coastal areas, must be expected in the coming years due to a 2004 decision to restructure local and regional authorities. The so-called structural reform aims to reduce the number of local authorities from 274 to approximately 100 and at the same time to reduce the existing 14 regional authorities in number and powers. Planning and environmental responsibilities today vested in the regional authorities are expected to a major extent to be transferred to local and state authorities. At the same time the implementation of the EU Water Framework Directive [3] leads to new requirements for river basin-based water plans including coastal waters within 1 nautical mile. The new water plans will thus include certain measures of land–sea integration with the aim of maintaining or achieving at least good water quality for all waters.

It remains an open question whether such new initiatives will address some of the major flaws in the present regulatory framework. As demonstrated in this article a split of powers regarding management on land and sea, respectively, and the lack of comprehensive coastal planning including both land and sea areas have been major flaws, see Section 3.

The existing problems and need for new legislative and management initiatives regarding the coastal zone were addressed in a small-scale Danish research project initiated by the Department of National Spatial Planning of the then Ministry for the Environment and Energy in 1997. The research project had the aim of clarifying elements in the existing Danish regulatory framework, management practices and international experience that support or impede ICZM. The Danish Forest and Landscape Research Institute and the Institute for Fisheries Management and Coastal Community Development jointly undertook this research project during the period 1997–1999.

The research project was carried out in three separate sub-projects:

A study of international experiences from ICZM based on literature on cases from The Netherlands, Sri Lanka and USA and the trilateral Wadden Sea Co-operation between Denmark, Germany and The Netherlands [4].

A study of the existing regulation of the Danish coastal area was carried out as a systematic reading of the Planning Act, the Nature Protection Act, the

Environmental Protection Act, the Coast Protection Act and the relevant sectoral legislation concerning agriculture, fishing, extraction of raw materials, infrastructure construction, etc. and an assessment of the integrative elements herein was carried out [5]. This study also includes an assessment of the integrative effect of the means prescribed or allowed for by the legislation.

A study of the Danish coastal zone management practices investigating integration aspects and revealing elements in the administrative practice, which impede or expedite ICZM was undertaken [6]. The study focuses on planning and administration within the themes of town and harbour development, infrastructure, tourism and recreation and sea-based activities such as fishery, sea transport and extraction of raw materials (Fig. 1).

Integration or integrated management may be difficult to identify in legislation as well as in management practice. The research project focuses on the following well-known integration aspects:

1. integration between land and sea;
2. integration between sector interests comprising utilization and protection of coastal resources, commercial and recreational interests, etc. (horizontal integration);
3. integration between authorities at state, county and municipal levels and public participation (vertical integration).

3. The regulation and management of the coastal zone and its resources

3.1. Legal framework and regulatory instruments

The legal and regulatory framework for the Danish coastal zone is scattered across a number of different regulatory systems [7]. The most characteristic feature is the fairly clear split in powers regarding management on land and sea. The regulatory system that governs land areas and land-based activities is characterized by powers vested in the regional and local authorities and by a comprehensive planning system embedded in the Planning Act. The regulatory system that governs sea areas is characterized by a sectoral approach—harbours, fishery, navigation, energy installations, etc.—and by powers vested in national State authorities embedded in the State Supremacy over the sea. There are only few co-ordination or integration requirements among these two regulatory systems (Fig. 2).

The most important laws for protection of the coastal land areas are the Planning Act [8] and the Nature Protection Act [9]. The Planning Act establishes a 3-km inland coastal planning zone (outside urban zones) in which planning for new activities, etc. is restricted. Planning for new recreational facilities, urban areas, etc. requires a specific planning-related or functional justification. Within existing urban areas the visual interference with coastal areas should be given particular attention. The Planning Act does not, however, require separate coastal zone planning—



Fig. 1. The study of the Danish coastal zone management practices is based on a number of case studies in the two counties of North Jutland and Viborg as well as cross-county case studies from the Limfjord area and the Southern Danish Archipelago.

coastal protection considerations should be integrated into regional, municipal and local planning.

The Nature Protection Act lays down a 300 m in-land prohibition zone along almost the entire Danish coast. However, in summer cottage areas, the protection zone is reduced to 100 m and urban areas are exempted from the regulation. The exact delimitation of the 300 m beach protection zone has recently been determined

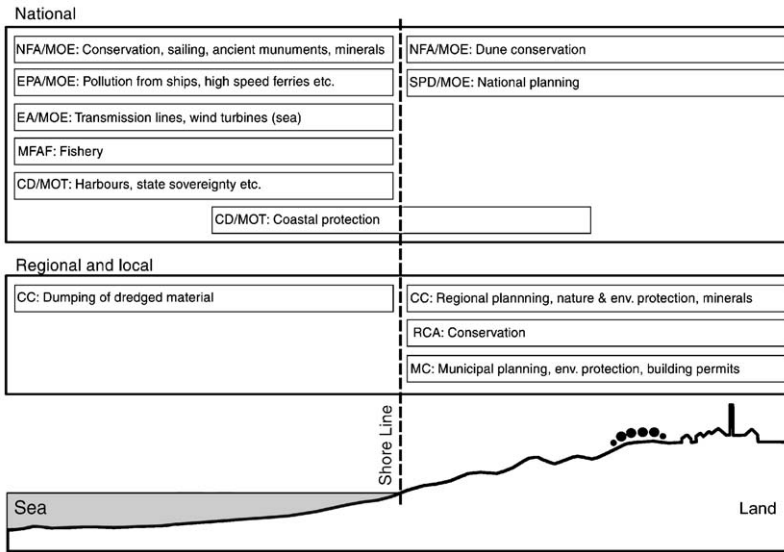


Fig. 2. Central powers in the Danish coastal zone. The legal and regulatory framework establishes a management barrier in the shore line. CC: County councils; CD: Coastal Directorate; EA: Energy Agency; EPA: Environment Protection Agency; MC: Municipal councils; MFAF: Ministry for Food, Agriculture & Fisheries; MOE: Ministry of the Environment; MOT: Ministry of Transport; NFA: National Forest & Nature Agency; RCA: Regional Conservation Authorities; SPD: Spatial Planning Department.

by a National Beach Protection Commission. New activities, construction works, afforestation, etc. are prohibited in the beach protection zone, unless particular circumstances indicate a need to grant an exemption. The Nature Protection Act also ensures public access to the coast.

Relevant authorities according to the Planning Act and the Nature Protection Act are primarily regional and local authorities. The Planning Act also provides for public participation in planning procedures and environmental impact assessment (EIA) procedures. The Planning Act, however, focuses on land-based activities. Regional planning aims to co-ordinate different land use interests, which are regulated more specifically by other pieces of legislation, e.g. the Environmental Protection Act [10], the Raw Materials Act [11], the Water Supply Act [12], the Forest Act [13] and the Agricultural Act [14]. Regional plans provide guidelines for administration and planning by regional and local authorities.

Sea-based activities are mainly regulated by sectoral laws, e.g. the Marine Environment Protection Act [15], the Raw Materials Act, the Harbour Act [16], and the Fishery Act [17]. The relevant level of decision-making is normally state authorities. The Coast Protection Act [18] deals with primarily coast erosion issues and the Danish Coastal Authority under the Ministry of Transport administers this Act. The Danish Coastal Authority also controls and administers the State Supremacy of the sea and may grant permits for different kinds of activities on the sea territory.

The legal and regulatory framework thus displays an array of different laws, measures and authorities relevant to the coastal area. Together with the relatively strong separation of powers regarding land- and sea-based activities, there is a clear obstacle to ICZM, which has been confirmed in management practices, see Section 3.2. (Table 1)

However, a number of new legislative instruments may promote integration of coastal zone interests. Such instruments are, inter alia, planning and co-ordination requirements, EIA requirements, hearing and co-operation procedures and requirements for public participation.

It is possible to distinguish between two different tendencies of integration in legislation—namely (a) strengthening of the role of planning and (b) incorporation of cultural heritage, environment and nature protection interests into sectoral legislation. Planning is generally an integrative instrument regarding vertical and horizontal integration. This is also confirmed in the case studies that demonstrate the general trend of integration via the planning process. The studies of legislation show that environmental provisions and co-operation requirements have increasingly found their way into sectoral legislation. Examples include high-speed ferries, coastal protection measures, raw material extraction, agriculture, etc. However, some inadequacies are still found, e.g. regarding harbours and other sea-based installations. In these circumstances there are no formal co-ordination or integration requirements apart from a general consultation between State authorities.

EIA is an integrative instrument, which comprises both horizontal and vertical integration aspects, i.e. between different sectors and between levels of decision-making, including public participation. Assessments of both projects and plans are important in this respect. The EU Strategic Impact Assessment Directive has been implemented by a new Act in 2004 that requires strategic environmental assessment of, i.e., regional and municipal plans. Since the procedural requirements differ it is necessary to distinguish between assessment of land-based activities according to the Planning Act and assessment of sea-based activities according to sectoral legislation. According to the Planning Act extensive consultation of relevant authorities and public participation is required during the EIA process whereas public participation and consultation requirements are much weaker regarding sea-based activities.

Procedures for *consultation or hearing* of relevant authorities and organizations are often part of the legislative requirements, e.g. in relation to EIA, or part of more informal procedures, e.g. co-operation between authorities and establishment of ad hoc fora. Consultation requirements often intend to achieve horizontal integration of sector interests. It may, however, also reflect a vertical integration, in particular when planning authorities at various levels are involved. The Danish administrative culture which emphasizes informal personal contacts cutting across different authorities and levels of administration, also represents an important, yet informal and not very transparent integrative element.

Public participation is a central element of the Danish Planning Act, but not a characteristic of other parts of environmental legislation or of other regulatory systems, e.g. at sea. In the planning system coastal issues have a fairly high degree of

Table 1

Overview of the most important laws and their application in the coastal zone

Act	Application area	Measures, e.g.	Authorities
The Planning Act	Land-based activities	Coastal planning principles, e.g. avoid non-coastal dependent developments. Coastal planning zone (3 km—outside urban areas), e.g. only development with specific justification. Regional planning, e.g. for coastal land. Municipal and local planning, e.g. visual impacts in urban areas	Regional and local
The Nature Protection Act	Land and sea	Prohibition zone (300 m in-land). Conservation orders	Regional (land) / National Forest and Nature Agency (sea areas, dunes)
The Environmental Protection Act	Land and sea	Environmental licences Waste water permits Marine aquaculture	Regional/local
The Marine Environmental Protection Act	Territorial seas and continental shelf	Licenses	Ministry for the Environment/Regional (dumping of dredged material)
The Raw Materials Act	Land and sea	Licenses	Regional (land)/ National Forest and Nature Agency (sea)
The Underground Act	The under-ground and continental shelf	Licenses	Ministry for Economics and Business
The Coastal Protection Act	Coastal areas	Licences for coastal defence works	Ministry for Transport
The Harbour Act		Permits	Ministry for Transport
The State Supremacy Regulation	Territorial seas	Permits for all installations	Ministry for Transport
The Fishery Act	Salt and fresh waters	Catch quotas, etc. Marine aquaculture	Ministry for Food, Agriculture & Fisheries

public attention and involved parties and citizens normally participate actively in EIA and nature management projects. It is, however, unclear whether a similar interest will manifest itself in relation to coastal zone planning or environmental

assessment of planning initiatives. The case study material supports the opinion that public participation promotes ICZM, cf. Section 3.2.

3.2. *Management practice*

The study analyses the management practices in the counties of North Jutland (4 cases) and Viborg (3 cases), as the coastal zone management problems in these two counties are considered typical and relevant to the rest of Denmark. In addition, two cross-county case studies concerning the Limfjord area and the southern Danish Archipelago are included which represent problems of particular relevance for coastal zone management (cf. Fig. 1) [5]. The study of management practice comprised the analysis of written material, review of the relevant law basis (on the basis of sub-project 2) and interviews with representatives of the municipal, county and state authorities involved.

In the county of North Jutland the cases were: (1) extension of the Port of Aalborg to accommodate the production of large tow-away tunnel and bridge components; (2) establishment of an exhibition and amusement park on the coast near the county capital of Aalborg; (3) construction of a coastal holiday resort at Egense, on the Danish east coast (Sea of Kattegat), and (4) deposit of huge volumes of sand recurrently excavated from the inlet to the port of Hirtshals on the Danish west coast on the shore next to a public nature resort.

In the county of Viborg the cases were: (1) upgrading of the port of Skive in the Limfjord; (2) extension of the fishing port of Hanstholm on the Danish west coast to accommodate more business enterprises, and (3) re-shaping of the freshwater Hjarbaek Fjord area (part of the Limfjord) to its former saltwater status through the permanent opening and possible removal of the sluice gate on the Virksund Dam. This latter case, where part of the Limfjord in the early 1960s was reclaimed for grassland use at the expense of fisheries by the construction of a road dam, has a 40 yr long history of fierce coastal zone management debate in Denmark. Unexpected environmental impacts, mosquito plague in particular, affecting the recreational quality and amenity value of the area have in the late 1990s led to partly restoration of the natural aquatic milieu in the fjord.

The two cross-county studies comprised a fisheries management plan for the Limfjord area and an integrated development plan for recreational activities and nature protection in the southern Danish Archipelago. These two cases represent activity-oriented coastal management whereas the seven other cases mostly represent construction-oriented management.

3.2.1. *Integration between land and sea areas*

The analysis shows only few examples of successful integration between land and sea areas in terms of: (a) recognition by competent authorities of opportunities/problems in the transition zone between land and sea; (b) planning and management actions initiated in response to such opportunities/problems, and (c) solutions found that are integrative and well balanced. The holiday resort in Egense is one such case and the restoration of the Hjarbaek Fjord may be considered another. The reason

for this state of affairs is most probably the management barrier which the shore line is representing in the Danish regulatory system, see Section 3.1.

The analysis of management practices demonstrates that the missing integration of legislation, planning and resource management across the coast line, in some cases leads to situations which conflict with the overall goals and strategies for the coastal zone. One such case is the Hirtshals port sand deposit, which intended to supply material in short natural supply in the region to ongoing and planned major road construction works, but happened to have no alternative options, to be situated at the verge of a nature resort and therefore was in conflict with recreational policies and priorities.

3.2.2. *Sector integration*

The criteria applied for analysing sector integration in management practice are: (a) how the competent authorities deal with sector integration when this is a legal requirement, (b) the extent and scope of the voluntary collaboration between management authorities on integration of different sector interests in the coastal zone, and (c) how the various sector interests are mitigated and if holistic solutions are reached.

The character and extent of sector integration in Danish coastal zone management is evidence of the management barrier that the coastline constitutes between the dominantly land-oriented competencies that rest with the regional and local authorities according to the Planning Act and the Environmental Protection Act, and the primarily sea-oriented competencies that various sector authorities have according to specific sectoral laws.

Sector integration is mandated in the Planning Act but the integration only comprises those sectors where counties and municipalities are competent authorities (e.g. planning for the land area).

Some sectors are not subject to legal requirements for integration of specific protective measures in the coastal zone. As an example, local authorities cannot establish geographically differentiated requirements for agriculture in coastal areas in order to meet quality standards for coastal waters.

Because of the lacking land–sea integration in legislation, management of fishing, sea transportation, raw material extraction, etc. is, by and large, not integrated with the management of other activities in the coastal zone, e.g. recreation and tourism.

Increasingly, there is a wish in the coastal communities to have a bigger say in local business development and the commercial utilization of the coastal resources. This is reflected in the importance given to commercial development policies by county and municipal councils. The reason for this is that it is the local communities that have to deal with the social consequences of sector policies that fail, as experienced particularly with fisheries.

Only a few of the cases analysed have sector integration as a legislative requirement, apart from where the general integration provisions of the Planning Act apply. These cases are the extension of the Port of Aalborg case and the case of an exhibition and amusement park near by. In both cases EIAs were required by law (construction works in the sea territory). However, other cases demonstrate that

voluntary cooperation between different authorities have been established in order to find balanced solutions to development opportunities, problems and sector conflicts. Voluntary collaboration between authorities and citizens in strategy planning, spatial planning and action-oriented management, as demonstrated in the southern Danish Archipelago, shows what may be achieved from ICZM.

The majority of the cases investigated indicate insufficient sector integration in relation to the national goals for the resources and activities of the coastal zone and in relation to the functional relations across the coastline. This is primarily considered to be the result of the limited scope of the Planning Act regarding the sea territory and in a number of sector areas. The Planning Act thereby constrains the formal possibilities for regional and local authorities to undertake sector integrative planning and management.

The analysis has demonstrated that the Planning Act's exclusion of the coastal part of urban zones from the coastal planning zone and the associated general coast-political strategies that are managed by the county authorities can hamper a holistic, sector-integrative management practice. The Hanstholm fishing port case is an example of this.

3.2.3. Integration between different authority levels and public participation

The analysis of the vertical integration is based on the following criteria: (1) If the competent authorities on all administrative levels are involved in the management and if the general public is adequately involved/informed, (2) if the collaborative relations between the parties are professional, and (3) if viewpoints and answers are internally balanced with authorities having responsibilities in multiple areas of management.

Denmark has a long tradition for vertically integrated management of the landward part of the coastal zone, including substantial decentralization and management integration between authorities at national, regional and local levels. This applies to both comprehensive spatial planning and sector planning in general and to the administration of specific cases of resource utilization and/or protection. Equally, there is a tradition for involvement of the public as a hearing party in the process of planning and EIA. This is, however, first and foremost the case within those parts of coastal zone management that are covered by the Planning Act. The greater part of the sectoral legislation which regulates the coastal zone does not have similar provisions for decentralization of the management competence and ex ante involvement of the public and the affected citizens in the decision process, e.g. through information dissemination and hearing.

Many of the cases studied show a management practice in Denmark that involves and integrates authorities at different management levels in accordance with the Planning Act. Involvement of the public and NGOs also seem to be as prescribed in the Act. However, it appears from the two cases from Aalborg that political interest in a coastal project both at local and regional level as well as interest from the media, may enhance the integration process significantly.

Several of the analysed cases, such as, e.g. the Skive Port case, have, however, shown processes and results which, despite compliance with the prescriptions of the

Planning Act, including hearing of port users and the general public, are inadequate in relation to the intentions of an integration of resources and activities in the coastal zone. It seems that a better integration could have been achieved through overall coastal policy strategies and spatial planning comprising both land and sea territory.

Moreover, the analysis of the management procedures applied shows from successful and less so examples that it can be advantageous for the cooperation between different authorities if one authority is given the overall responsibility for the sector integration.

3.2.4. *Integration through instruments*

The coastal zone legislation in Denmark comprises a full range of different regulatory systems, which implies a split of competencies and powers on many different authorities. This set-up implies a high risk of insufficient integration. However, a number of new laws and management instruments indicate that there is a political intention to promote integration in the management of the coastal zone.

Each regulatory system within the coastal legislation makes use of different instruments that to a larger or smaller extent promotes the integrative aspect, such as, e.g., requirements for planning and/or coordination, hearing procedures, requirements for participation and EIA. In addition to the different regulatory systems the choice among the above-mentioned instruments is important for the practical realization of the integration. The assessment criteria applied in the analysis are: (1) if other instruments than those prescribed by law have been applied and if they have facilitated integration, (2) if the application of certain instruments prescribed in the legislation has been particularly supportive of integration.

Planning as an instrument is prescribed in the Planning Act. It promotes integration, but in practice it has limited impact on sectors that are not within the resort of the Ministry of Environment. This is particularly the case for sea-based activities that are normally not included in the planning according to the Planning Act. On the basis of the cases analysed, it can be stated that planning in general supports the integration of resources and activities in the coastal zone.

EIA is an integration facilitating instrument which comprises horizontal and vertical integrative elements (land–sea integration and integration between different administrative layers). The study has found that in the cases subject to the EIA requirements of the Planning Act all the authorities affected and also the general public have been involved in the planning process. Because of the few (two) examples of a full EIA it is not possible to conclude on the importance of the EIA instrument for integration.

Consultation or hearing of all authorities and organizations affected is in the cases of the study either implemented because it was a legal requirement, e.g. as part of EIA, or the result of a voluntary initiative as in the case of the development of the fisheries management plan of the Limfjord and the Hjarbaek Fjord case as well. It appears that consultations are supportive for integration, the more earlier in the process they are implemented.

Public participation is considered crucial for integration in the international debate on ICZM. In Denmark participation is prescribed in the Planning Act and the

general public has been involved accordingly in all cases within the domain of this law. The case study shows that coastal zone issues are of interest to the public, and that affected land owners, users and the public in general participate actively in the debate and in the planning process on new constructions and activities in the coastal zone.

Voluntary collaboration between public authorities or between authorities and the citizens on urban/regional planning and management has demonstrated that ICZM has a lot of potential. Again the fisheries management plan for the Limfjord is a case in point together with the development plan for the southern Danish Archipelago. The holiday resort at Egense is another example.

3.3. *Relevance of experiences from abroad*

3.3.1. *Integration between land and sea areas*

The foreign cases analysed comprise USA (Florida and Rhode Island), the Netherlands (Eastern Scheldt), Sri Lanka and the trilateral collaboration between Denmark, Germany and the Netherlands in the Wadden Sea.

All the cases are characterized by the coastal zone being defined both seawards and landwards, and that the management competence includes resources and activities both on the sea territory and the land territory. In most cases the situation is that the sea territory in the coastal zone, as defined in the coast management acts, stretches longer (2 km—3 nautical miles) from the shoreline than the land territory. This definition of the coastal zone reflects a clear understanding of the fact that it is in the interface between land and sea that the special coastal zone problems occur, which necessitate special attention to the coastal zone management.

Apart from the trilateral cooperation in the Wadden Sea, where the Danish area includes both land and sea territory, it is characteristic for the Danish coastal zone management that there is no definition or delimitation of the coastal zone that includes any part of the national sea territory. The provisions of the Danish Planning Act only regulate the activities and the exploitation of resources which take place landwards along the shore line, irrespective of the close relations which often exist between the activities on land and at sea.

For this integration aspect it seems evident that the experiences and practices outside Denmark should be drawn upon in the Danish coastal zone debate. Experiences from the analysed cases as well as from other examples show that the coastal zone should include both a land and a sea territory. The extension of the territory on land and at sea should ideally be determined by the nature of the problems, which would be solved through the establishment of ICZM rather than by administrative criteria. This means that the spatial definition of the coastal zone should be variable, so that the coastal zone includes land areas with decisive influence on water quality, fauna and flora in the sea territory and vice versa.

3.3.2. *Sector integration*

Most foreign cases show a development in coastal zone management from an initially rather narrow focus, typically on coast protection, towards a situation

characterized by a more holistic approach to management with an understanding of the interdependencies between the many problems in the coastal zone.

Even though most cases point towards a future wide range of Special Area Management Plans which integrate the management of many, often competing, sectors in given locations, it is characteristic that important coastal zone activities, such as fishing and oil extraction, are only rarely included in the integrated plans. This often causes problems, as other sectors have to endure the derived and often negative effects from these two sectors. Here, Denmark makes no exception. Even if a number of sectors are involved in the management of the coastal zone, it is characteristic, *inter alia*, for the reason of lack of land–sea integration that fishing, sea transportation, etc. are not integrated into coastal zone management.

The foreign cases hold examples of the establishment of unitary administrations with responsibility for the use of the coastal zone and its resources, as well as institutional solutions in the form of coordinating networks between independent sector authorities. The different institutional alternatives found in the study, range from the establishment of a new centralized management unit, as was the case in Rhode Island, to the establishment of an inter-ministerial cooperation forum as was the case in Florida and in the Netherlands. It is important to mention that ICZM does not call for new decision-making fora, but for better integration obtained within established decision-making structures. This applies especially at national and regional levels. At the local level, it would often be advantageous to establish integrated management units.

It may be necessary, however, that one sector authority as “lead agency” takes the overall responsibility for integration between sectors and authority levels, respectively, in the coastal zone management. If the initial step towards ICZM is the establishment of an inter-ministerial council or commission, which is often the case, it is important that one of the participating parties is given the responsibility to drive forward the initiative and the integrative purpose, e.g. via a presidency and/or a secretarial function.

3.3.3. Integration between authority levels and involvement of the public

Most foreign cases show a clear development of coastal zone management from centralized management towards vertically integrated management, where the responsibility is shared between national, regional and local authorities. The cases also show a development towards a “bottom–up” approach to management with emphasis increasingly put on the active participation of the public in planning, implementation, monitoring and evaluation.

The only case representing a slow development towards increased vertical integration and involvement of the users is the trilateral Wadden Sea cooperation which is still characterized by a “top–down” approach to management dominated by national level authorities.

In relation to the coastal zone management problems in Denmark, it seems foremost in relation to the activities on the sea territory that foreign experience can be useful. The Danish Planning Act and the informal cooperation procedures

established form the basis of a high degree of integration between the different authority levels dealing with land-based activities.

4. Discussion

Although Danish legislation may show a relatively high protection level regarding coastal landscapes, and management practices also demonstrate certain elements of co-operation and public participation this does not necessarily imply an ICZM approach. Rather, the traditions for protecting coastal areas may have led to a neglect of the ideas of ICZM as such.

This appears in particular to be the case regarding land–sea integration, which is the integration aspect that most clearly is in conflict with both legislation and management practices. This is primarily due to the regulation system's failure to transcend the shore line, whether from the seaside or from land. Particularly notable is the distinction between national level management of the sea territory and regional or local level management of the land territory. This is demonstrated in many sectoral laws for activities at sea and in the limitation of the Planning Act to relate to land-based activities only.

The two other integration aspects of horizontal and vertical integration are more often found in legislation as well as in management practices although not necessarily directed towards the coastal zone.

A particular aspect should be kept in mind when ICZM in Denmark is discussed, viz. the interplay between the formal regulatory basis and the way in which the laws are administered in practice. It may happen that formal integrative requirements do not penetrate into practical management or that in practical management emphasis is put on particular integrative elements, which do not relate to the legal framework. The latter is the case regarding informal consultation procedures between different authorities at national, regional and local levels. Such informal integrative measures can be of great importance in respect of integration, but they can also make decision-making less transparent to the individual citizen, unless it is made clear who is involved in the decision-making and how. A more fundamental issue is, however, to improve knowledge about coastal zone processes and the interplay between land and sea.

4.1. *Key issues for enhanced integration*

The research project has identified a number of key issues for enhanced integration. The points identified include both innovations within the legal system and initiatives within practical planning and administration. Whether such regulatory issues should be embedded in law or in management practices alone depends on the context of the more specific measures.

Key issues for future ICZM in Denmark are:

- clear definition of the coastal zone, including both land and sea areas;
- stipulation of the fundamental principles for the management of the coastal zone;

- coastal zone planning;
- integration into sectoral legislation;
- EIA;
- consultation requirements;
- involvement of the general public.
- appointment of advisory coastal zone committees and co-ordinated supervision and enforcement.

In Denmark there is generally little support for new legislative integration or co-ordination requirements. However, choosing an informal implementation mode does not eliminate the fundamental problem that the regulatory system covering the coastal zone is not easily comprehended, because a great number of different laws and authorities are involved. At the same time, the introduction of new integrative measures can result in other (new) integration problems.

A solution to the lack of clarity and to the complexity of the regulatory system could be the passing of a special coastal zone act, laying down the fundamental requirements and procedures for activities in the coastal zone.

4.1.1. Clear definition of the coastal zone

A possible integrative measure would be a clear definition of the coastal zone to include both land and sea areas. However, a definition does not need to specify the delimitation of the coastal zone in detail. Rather, it might be preferred to have a variable definition of the zone to be specified either in individual cases or in the planning process.

4.1.2. Fundamental principles

Fundamental principles for ICZM can be drawn from international initiatives, e.g. from the EU and the Council of Europe. Such principles may include, e.g., public access to the shore, protection belts, avoidance of non-coastal-dependent activities, public participation and consultation.

4.1.3. Coastal zone planning

Another important element in a Danish context could be to widen the scope of the Planning Act to include near-coast sea territory, e.g. in regional planning or in specific coastal management plans. Such plans could be drawn up on the basis of holistic coastal policies, including both land and sea territories and coastal activities, e.g. harbours, roads and railways, sailing, fishing, tourism, raw material extraction, wind mills, protection of nature and cultural heritage, etc. A further step would be to include sea-based coastal activities and their interplay with land-based activities. A widening of the scope of the Planning Act was proposed by the so-called Wilhelm Committee in their 2001 Report on a National Biodiversity Strategy [19].

Another measure regarding coastal planning could be a widening of the Planning Act to incorporate important (i.e. commercial) sector interests in the planning and management of the coastal zone which at the moment are outside the resort of the Minister for the Environment, e.g. regional harbour and sea transport planning

coordinated with the other transport strategies in the regional plan. This might also facilitate the co-ordination of tourism and other activities—possibly in management plans for specific coastal areas in combination with the use of support schemes for nature restoration, agriculture, fisheries, etc.

The latest initiatives of the present Danish Government does not support a widening of the scope of the Planning Act regarding regional planning or coastal planning. However, the implementation of the Water Framework Directive will imply the inclusion of coastal waters in water plans.

4.1.4. Sectoral legislation

A number of sectoral laws specifically regulate sea-based activities, e.g. harbours and fishery. Also on land a number of sectoral laws are important to the coastal zone, e.g. agricultural legislation and raw material extraction legislation. In a number of such land-based sector areas, there is already an important element of integration of environmental concerns (i.e. reduction of pollution). However, the regulations are only to a very limited extent directed towards particularly sensitive coastal areas. Zoning might as an integrative measure comprise a differentiation of general rules for pollution reduction, e.g. regarding nitrate discharge from agriculture, to accommodate needs in environmentally sensitive coastal areas. Today, differentiation primarily takes place in relation to individual regulation, e.g. waste water permits, environmental permits, etc.

4.1.5. Environmental impact assessment, consultations, etc.

Incorporation of provisions for coastal protection and management co-ordination across the shore line in more sectoral laws, may also improve land–sea integration through greater incorporation of “land-interests” in the sectoral legislation on sea-based activities, e.g. consultation procedures and requirements for EIA. The Coast Protection Act shows a number of examples of land–sea integration in connection with coast protection measures, primarily through involvement of a range of stakeholders and authorities. Something along the same lines might be tried out in relation to, e.g., harbour legislation.

4.1.6. Involvement of the general public

Involvement of the general public requires that the material disseminated for debate has a certain quality and a certain level of detail. Whereas involvement of the general public is prescribed by the Planning Act and performed as part of the planning process in counties and municipalities, involvement of the general public is a weak point in the major part of the sectoral legislation—also within environmental legislation.

4.1.7. Coastal committees and co-ordination of supervision and control

Generally, increased incorporation of consultation procedures, advisory committees, etc. or the appointment of advisory (regional) coastal zone committees with representation of relevant sector interests is likely to improve sector integration. Specific problems regarding co-ordination between authorities may exist within the

more centralized regulation systems. Co-ordination might *inter alia* be sought regarding supervision and enforcement—in fact a special co-ordination committee has been established for supervision of sea-based infrastructure. There is, however, in Denmark a strong opposition, in particular among practitioners, towards new formalized co-operation procedures. Appointment of an inter-ministerial coastal zone committee may also be an appropriate measure.

A number of the integrative measures mentioned above cover more than one integration aspect, e.g. integrated coastal zone planning, EIA, hearings, advisory committees, etc.

5. Conclusions

The Danish planning system secures a certain degree of vertical integration between the different management levels (national, regional, local) and the involvement of the public. This is, *inter alia*, stated in the special coastal planning provisions of The Planning Act. However, the exemption from the coastal planning zone of the near-shore parts of the urban zones is problematic as national or regional protection interests at times collide with local development interests.

A possibility that would reflect needs of integration could be holistic regional coastal policy strategies and comprehensive spatial planning for the entire coastal zone, comprising the sea territory as well as the rural areas, the summer cottage areas and the near-shore parts of the urban zone. Another possibility could be increased involvement of the public, in thematic planning for the coastal zone or in the administration of sectoral legislation, e.g. in connection with increased requirements for EIA. The above-mentioned appointment of advisory coastal zone committees with representatives from sector interests and local communities could also improve integration. A less interfering mechanism could be the appointment of a lead agency or contact persons within the authorities or, possibly, an inter-ministerial committee which can/must be consulted in the particular cases.

It is possible to identify a number of regulatory initiatives that may promote ICZM. Since ICZM is not easily identifiable as a concept, however, one may expect the question whether new initiatives are required at all when the existing regulation at least to some extent accommodates certain features of integration. Are other factors more decisive to ICZM than regulation, e.g. information and dialogue combined with economic development? If, however, ICZM essentially is about making well-balanced and well-reasoned decisions, the regulatory framework plays an important role as a factor that may facilitate or obstruct ICZM.

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