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COASTMAN – TOWARDS INTEGRATIVE APPROACHES TO SUSTAINABLE COASTAL ZONE MANAGEMENT IN THE BALTIC SEA

1. Introducing the "Coastman" project

Today around 60% of the earth's population lives within 60 km of a sea coast. In addition, tourism is very popular in the coastal regions of many countries. The burdens on coastal ecosystems are accordingly very heavy.

At present, there are many pressures on and threats to coastal regions in the Baltic Sea region: cargo shipping is growing steadily; commercial fishing now exceeds fishing limits; and now more and more exploration and pumping platforms are being built at sea, whilst wind parks have already been established along the coasts of Denmark and Sweden and the construction of such parks has begun in German waters. Additionally, there are plans for many other exploitative uses of maritime areas in the North Sea and the Baltic. Finally, many coastal areas suffer from problems (especially pollution) deriving from agriculture [Leal Filho, 2004].

All these developments increase pressure on coastal ecosystems. Furthermore, every use of the sea has its resultant effect on land: harbours, wharfs, company offices, processing plants, service and secondary companies. In short, one can say that coastal areas are being subjected to immense and growing burdens.

This developmental process is not happening within a comparatively resilient and stable system, but rather in areas characterised by their frailty and sensitivity. Two different ecosystems are not only juxtaposed in coastal areas; they actually constitute a continuum: the habitats of and sites favourable to many biotic elements in the two ecosystems – land and sea – overlap and impinge on each other and thus are particularly sensitive to disruption.

By reason of its dynamic nature and suitability as a transport medium, the sea itself is another important sensitivity factor.

Since the 1970s, the development of coastal zones has demonstrated that construction projects, which lead to the surface becoming impermeable to rainfall, unsecured waste, waste water and litter disposal, release of pollutants (either in major accidents such as oil spills or from small but persistent leaks) have all seriously damaged the capacity of coastal ecosystems to sustain life. One conclusion that can be drawn from this is that the principle of 'sustainability' must be more widely used and serve as a continual basis for action – although at first sustainability was taken to refer only to the preservation of natural systems. Sustainability may be attainable through holistic, literally ecological thinking and acting.

The beginnings of 'Integrated Coastal Zone Management' (ICZM) can be traced to the passing of the 'Coastal Zone Management Act' in the USA in 1972 to coordinate development planning along the American coastline. The four aims that it established are still valid today:

– to preserve, protect, develop, and where necessary and possible, to restore or enhance, the nation's coastal resources in the widest sense, although this was mainly taken to refer to ecological potential,

– to implement national environmental protection policy by supporting the coastal states in the creation of coastal zone management plans,

– to improve the quality of life by protecting valuable ecosystems and by ensuring security and long-term reliability,

– to involve governmental and local administrations and to work with regional and national authorities.

Due to the need to analyse the problems seen at present in coastal areas of the Baltic and identify ways to address them, the Coastman project („Coastal Zone Management in the Baltic Sea"– „Coastman") was created. It is an Interreg IIIB Project involving Estonia, Germany, Latvia, Lithuania, Russia and Sweden, which aims at analysing the interactions between environment conservation, conflict management and sustainable development in six coastal zones of the Baltic Sea.

2. The aims of Coastman and problems to be addressed

From the perspective of sustainable development, integrated coastal zone management needs interdisciplinary and spatially integrative approaches, where all the important stakeholders – especially those who are responsible for the planning and realization of the exploitation of coastal zones – are involved. Therefore, the central objectives in the Coastman project are:

– to demonstrate the conditions under which spatial conflict in coastal zone management can be resolved from a bottom-up perspective, starting from concrete case studies covering the scope of problems and different cultures around the Baltic Sea,

– to identify legal, organizational, economic, methodological and cultural frameworks for CZM in the participating countries,

– to find out how differences in these frameworks influence strategies for conflict resolution at local and regional levels in CZM and what adaptations of methods are necessary for each participating country.

Furthermore, *Coastman* intends to promote the sustainable development of coastal areas as a platform for information exchange, using promotional events and specialist workshops, combined with an exchange of experience and best practices in conflict resolution in CZM with related Interreg projects.

A further objective of the project is the development of joint educational programmes for coastal zone management in the Baltic region, with a focus on conflict resolution in spatial planning. This will be combined with initiatives to create awareness among various stakeholders in all the Baltic countries. In order to fully solve problems, a mixture of facts and values are needed and solutions must be found through participatory processes where all stakeholders are involved.

As far as the problems to be addressed are concerned, coastal zones in the Baltic region have great potential for economic growth. There are, however, several serious threats to the sustainable growth of coastal zones in the Baltic region. Two of the main threats are conflicting interests and goals, together with environmental pollution. In addition, there is potential for conflicts of a multi-dimensional nature, including cultural and spatial dimensions. Environmental threats to coasts are also very complex and wide-ranging. Several of the existing problems have historical roots, but the rapid growth of the economies in the region (the rate of economic growth in Estonia, Latvia and Lithuania for the years 2005 and 2006 is well above the EU average) will no doubt create new problems, which might prove to be even worse than we can imagine today. One important example is oil transport from different terminals around the Baltic Sea. This has already created conflicts at both local and regional levels. There is often a lack of a holistic view in the handling of this problem. This is also the case regarding investments in environmental technologies. Solutions have to be found through a process in which all the spatial aspects are considered and stakeholders take part, in order to prevent intractable conflicts appearing.

Many on-going and planned projects in the region are aimed at handling environmental problems or problems resulting from economic growth (usually in different sectors such as fisheries or tourism) separately. The problem with such an approach is that conflicting interests and goals cannot be properly

handled. Hence, there is a risk that the results of such projects are jeopardized. In specific cases it is often obvious that conflicting opinions and values hinder the search for practical solutions. The *Coastman* project undertakes the task of analysing concrete approaches in specific cases studies. In this way, there is potential for the exchange of "hands on" experience between the participant countries, thus contributing to the harmonisation of strategies and methods for resolving conflicts in the Baltic region.

3. The approaches used

The main approach of the *Coastman* project, which involves universities, municipalities and companies in the Baltic region, is to apply existing methods of system analysis and conflict resolution to coastal zones, in order to handle the multidimensional aspects of sustainable development.

Many of these methods are in use today in educational programmes, in order to get students to realize that there are often many dimensions and conflicting interests in problems related to spatial planning. Conflicts can often be resolved when stakeholders shift their perspectives on a problem. The methods used have to be simplified, validated, and integrated, in order to be of value in a process where stakeholders work together in a process for finding solutions. In many of the Baltic countries participatory processes are not common and it will be an important part of the project to harmonize the way in which all stakeholders can be involved in conflict resolution. The process of developing indicators may be useful in this process [Bach, 2004], whilst environmental information plays an important role [Langaas et. al., 2002].

To demonstrate and evaluate the available methods, the project uses selected case studies where coastal zones are exploited for oil terminals and waste water treatment plants. In some of these cases, there are intractable ongoing conflicts which have developed over several years and threaten continued economic growth in the area. Joint workshops focus on benchmarking and evaluation of collective methods to see what roles cultural, social and economic differences play.

The project partners involved come from several important coastal zone areas around the Baltic region: the south-east coastal area of Finland, the St. Petersburg area, coastal zone areas in Estonia, Latvia, Lithuania, Hamburg, and Stockholm.

The central parts of the project are the following case studies which are carried out in several partner countries:

– the Loudden oil port located in the central part of the City of Stockholm,

– the Ventspils oil port located on the coastline 200 km West of Riga,

– the Klaipeda oil port located in the central part of Klaipeda,
– the Haapsalu waste water treatment plant, located on the coastline 100 km SW from Tallin,
– the Primorsk oil port west of St. Petersburg (case study work within the TACIS project).

Further outcomes of Coastman:

– **Pilot course:** under the project, a joint educational program on coastal zone management in the Baltic Sea Region focusing on conflict resolution in spatial planning is being developed. As part of this, an international "Pilot Course on Conflict Resolution" was arranged under the leadership of the Royal Institute of Technology (KTH) The course took place in Riga, 2–3 October and Stockholm, 14–15 December 2006, with over 40 participants from all over the Baltic region. This web based course included on-line material focusing on methods for conflict resolution associated with infrastructure planning processes in coastal areas. This course is intended to be given at regular intervals after the conclusion of the project.

– **Training schemes:** Another feature which deserves mentioning is the set of cross-sector training schemes, focusing on practical methods for conflict resolution. These are being designed and documented. Courses will be available on the web after the project has been completed, to be used by people working in government agencies, NGOs, universities and companies.

– **Handbook:** Moreover, a "Handbook" on conflict resolution will be prepared and translated into various languages. It is also envisaged that the technical development of a platform for information exchange will be completed during the project, in which a "Pool of Excellence" will be created and where descriptions of cases of successful conflict resolution in the Baltic region will be disseminated.

– **Foster dissemination:** As far as dissemination is concerned, the project uses a number of means such as:

- a project website (www.coastalmanagement.net), which is constantly updated and marketed. It contains a description of projects, activities and case studies, as well as guidelines and other materials developed, together with information concerning dissemination workshops and other project events,
- a project newsletter, published on a regular basis,
- workshops and training courses organised for different stakeholders.

The guidelines and recommendations developed will be disseminated through networks established during the project. In addition, the mass media will be involved in dissemination. Moreover, the establishment of an educational programme in the Baltic region will start a long-term process of dissemination.

4. The Coastman case study in Hamburg

Hamburg is culturally and commercially the centre of Northern Germany. The Hamburg Metropolitan Region consists of 3.5 million people. For all of them, Hamburg is a shopping and cultural metropolis. The municipal area of 755 km² is seven times the size of Paris and 2.5 times that of London. For this very reason, Hamburg presents an exceptionally high standard of living and housing.

With 30 m² living space per person, Hamburg enjoys the largest average personal living space of all the big cities in the world. In fact, 14% of the city is made up of green and recreational areas. Hamburg is administered by a local government (Bürgerschaft) and its main economic activities are all harbour related (*e.g.* shipping, transport of goods). Table 1 presents some facts and figures about Hamburg.

Table 1. Facts and Figures about Hamburg

	Hamburg		Germany		Germany [%]
Inhabitants	1729000		82537000		2.1
Total Area	75532	ha	35703099	ha	0.2
Built-up Area and Open Space	26878	ha	2308079	ha	1.2
Recreational Area	5702	ha	265853	ha	2.1
Road Area	8860	ha	1711764	ha	0.5
Arable Land	21000	ha	19102791	ha	0.1
Forested Area	3432	ha	10531415	ha	0.0
Water Area	6115	ha	808462	ha	0.8
Share of Gross Domestic Product	70.243	Bill.	1984.300	Bill.	3.5
Gross Value Added	67.933	Bill.	1919.020	Bill.	3.5
of which:					
Agriculture, Forestry, Fishing Trade	0.13	Bill.	24.23	Bill.	0.5
Manufacturing Trade	11.64	Bill.	536.84	Bill.	2.2
Trade, Repair, Gastronomy	9.52	Bill.	207.72	Bill.	4.6
Public and Private Service Industry	12.35	Bill.	396.47	Bill.	3.1
Unemployment Rate in %	9.9		10.7	(As of 04/2005)	
Gross Per Capita Earnings/Year in Euro	29319				

Source: *Hamburg Port Authority*, 2006; *Statistisches Amt für Hamburg und Schleswig-Holstein*, 2007.

The Hamburg case study focuses on the conflict which exists with regard to the use of the Elbe River, which is essential for harbour operations. Existing

regulations are focused on the local impact of the relocation of contaminated sediments and do not take the whole catchment area into account. The European Water Framework Directive demands a holistic approach to a river basin when considering water resources. However, the Water Framework Directive does not explicitly mention sediments, nor sediment quality and quantity, and it is not even clear how sediments will be incorporated into the new regulations which still have to be developed.

This case study will address the problem posed by the accumulation of sediments, while at the same time taking into account stakeholders and environmental questions, *i.e.* the impact of dredging, nature conservation and environmental protection concerns, as illustrated in Figure 1.

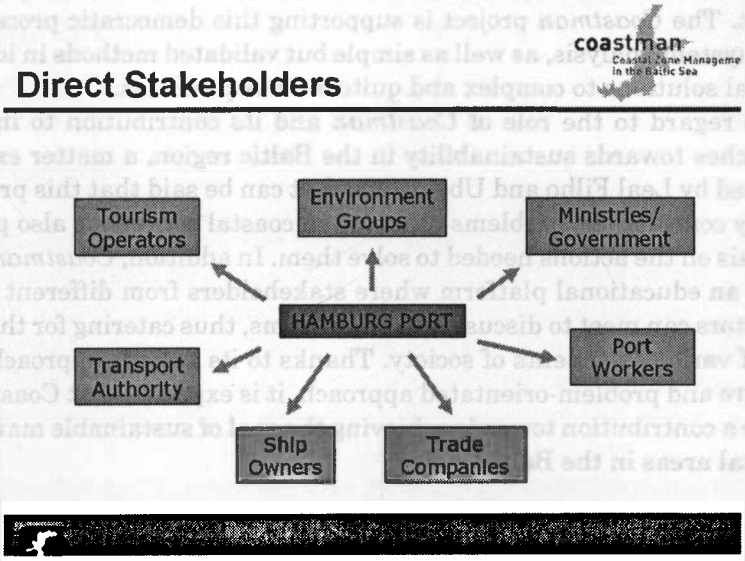

Fig. 1. Stakeholders in the Hamburg case study

The Hamburg case study deals with a long-term conflict, since the problem of sedimentation is long-term and needs constant attention. The subject matter of sediments in the Elbe has been extensively analysed before [Arevalo and Heise, 2003; Behrendt and Hoffmann, 2002; Frey et al., 2002], whilst studies have been carried out in other countries [Ditschke and Markofsky, 2003].However, there are many gaps which need to be filled. This case study will, among other things, analyse the extent to which a reduction in the contamination of dredged materials – a contribution to the concept of a sustainable, clean port and environment – can be achieved.It is expected that new insights into this problem will be provided and ways to address it will be suggested.

5. Conclusions: Coastman and sustainable development in the Baltic region

It is widely acknowledged that sustainable development combines both social equity and environmental protection and these items need to be considered in pursuing economic development. This is true on a worldwide scale and this line of thinking is especially relevant to the Baltic region, a semi-closed system in which environmental impacts and contamination are felt in an especially strong way.

In order to achieve integration between sustainability and coastal conservation, it is important to realise that this has to be done through a democratic process, where the opinions and values of different stakeholders are taken into account. The *Coastman* project is supporting this democratic process by applying system analysis, as well as simple but validated methods in identifying practical solutions to complex and quite serious problems.

With regard to the role of *Coastman* and its contribution to integrative approaches towards sustainability in the Baltic region, a matter extensively discussed by Leal Filho and Ubelis [2004], it can be said that this project does not only consider the problems observed in coastal zones, but also puts great emphasis on the actions needed to solve them. In addition, *Coastman* is establishing an educational platform where stakeholders from different countries and sectors can meet to discuss actual problems, thus catering for the involvement of various segments of society. Thanks to its holistic approach, flexible structure and problem-orientated approach, it is expected that Coastman will provide a contribution towards achieving the goal of sustainable management of coastal areas in the Baltic region.

Literature

Arevalo, E., Heise, S., *Sustainable Solutions to the Sediment Management on the River Basin Scale: The Elbe river case under specific concideration of risk management and communication aspects.* 2nd SedNet-Conference, September 2003.

Bach, H., *Methodology and Process for Indicator Development.* Available from: http://www.nea.gov.vn/EIR/english/Workshop_Training/Documents/Workshop_Indicator/TA/Methodology-process-indicator-development_ver1-10.htm (Accessed 30.08.2004).

Behrendt, H., Hoffmann, J., *The Elbe Catchment and Related Coastal Area: German Bight and Wadden Sea. Part A: catchment profile.* Berlin: Institute für Gewässerökologie und Binnenfischerei im Forschungsverbund Berlin e.V., May 2002.

Ditschke, D., Markofsky, M., *Optimization of a Structure to Reduce Sedimentation in an Estuarine Harbour.* Colombo, Sri Lanka: COPEDEC VI, 2003.

Frey, M., Borchardt, D., Funke, M., Geffers, K., Schleiter, I., *Heavily Modified Waters in Europe – case study on the river Elbe.* Available from: http://www.wasserblick.net/servlet/is/13045/Elbe.pdf?command=downloadContent&filename=Elbe.pdf.

Hamburg Port Authority, *Geschäftsbericht 2006.* Hamburg: HPA, 2006.

Langaas, S., Aliakseyeva, N., Gooch, G., Lopman, E., Nilsson, S., Timmerman, J., *Environmental Information in Transboundary River Basin Policy-Making and Management: selected European case studies*. October 2002. Available from: http://www.lwr.kth.se/publikationer/PDF_Files/MANTRA_East_WP.pdf.

Leal Filho, W. (ed.), *Ecological Agriculture and Rural Development in CEE Countries*. Dordrecht: Kluwer Academic Publishing, 2004.

Leal Filho, W., Ubelis, A.,(eds.), *Integrative approaches towards sustainability in the Baltic Sea Region*. Frankfurt am Main: Peter Lang Scientific Publishers, 2004.

Statistisches Amt für Hamburg und Schleswig-Holstein, *Monitor Wachsende Stadt*. Hamburg: SAHS, 2007.