

Module name: Environmental issues in port development and port operation

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Table of Contents

Table of Contents	3
1 Introduction	5
1.1 Content and purpose of the course	5
1.2 Basic drivers and considerations	5
1.3 Environmental issues in ports	6
1.4 Legal obligations	6
1.5 Interested parties	6
1.5.1 Methodologies	7
1.6 Institutional aspects	8
1.7 Integration of environmental issues in port planning and design	8
1.7.1 Port developments and environmental considerations	9
1.7.2 Operational activities and environmental considerations	9
2 Environmental issues for ports	11
2.0 Introduction	11
2.1 Port development, land- and water-use planning	11
2.1.1 Planning legislation and regulation	12
2.1.2 Port development within regional development	12
2.2 Handling and transport of dangerous goods	13
2.2.1 Risk	13
2.2.2 International conventions and standards for hazardous cargoes	14
2.2.4 Recommendations reducing the risk of handling dangerous goods	14
2.3 Dredging and dredged material management	15
2.3.1 Environmental aspects of dredging	15
2.3.2 Consequences of contamination	15
2.3.3 Sources of contamination	16
2.3.4 Dredging operations	16
2.3.5 Management of dredged materials	17
2.3.6 Standards and authoritative information	18
2.4 Prevention of nuisance	20
2.4.1 Dust	20
2.4.2 Noise	21
2.4.3 Vibration	22
2.4.4 Light	22
2.4.5 Odours	22
2.4.6 Measures to prevent nuisance	22
2.5 Port waste management	23
2.5.1 Reception facilities	24
2.5.2 Standards	25
2.5.3 Recommendations for port design and port management related to waste	26
2.6 Water and soil quality management	26
2.6.1 Sources of industrial contamination	26
2.6.2 Standards	27
2.6.3 How to deal with contamination of soil and water	27
2.7 Habitat management	28
2.7.1 Wetlands and protected species	28
2.7.2 Standards	29
2.7.3 Recommendations: Incorporating the value of wetlands	29
2.8 Landscape and visual amenity	30
2.8.1 Sources of poor visual amenity	30
2.8.2 Measures for a good landscape and visual amenity	30
3 Relevant aspects for the Environmental Impact Assessment	32
3.1 The EIA	32
3.1.1 Environmental Impact Statement (EIS)	32
3.1.2 Procedure	33
3.1.3 Environmental Issues	34
3.2 Health and safety	34

3.2.1	Recommendations: Key considerations for health and safety.....	34
3.3	Pollution control	35
3.3.1	Environmental contaminants	35
3.3.2	Water quality and impact on the hydrologic system.....	36
3.3.3	Sediment quality.....	37
3.3.4	Air quality	37
3.3.5	Quality of soil and groundwater	38
3.3.6	Main points related to pollution control	39
3.4	Ecology and nature habitats	39
3.4.1	Ecosystem.....	39
3.4.2	Dynamic processes	40
3.4.3	Natural habitats.....	40
3.5	Use of resources	40
3.5.1	Waste processing and secondary resources	40
3.5.2	Primary resources and raw materials	40
3.5.3	Energy	41
3.6	Social aspects and the quality of life.....	42
3.6.1	Socio-economic	42
3.6.	Socio-cultural	42
3.6.3	Socio-environmental	43
3.6.4	Socio-political	43
3.6.	Coping with port activities in a sustainable urban environment.....	44
Appendix 1	Overview of EU and international environmental rules and policies which affect the port sector	46
Appendix 2	Dutch national legislation.....	47
Appendix 3	IMDG code of dangerous goods.....	49
Appendix 4	Selection of international associations related to port development.....	51
Appendix 5	Checklist for the management of the port.....	52

1 Introduction

1.1 Content and purpose of the course

Port development and port operation activities (may) affect the environmental quality. Therefore environment is an essential component in port management. The basic principle for the environmental considerations has been founded in the concept of sustainable development as agreed upon during the Rio Convention on Bio Diversity in 1992, sustainable development was defined as:

“Development which meets the needs of the present without compromising the ability of future generations to meet their own needs”.

This concept of sustainable development has led to a series of international treaties and conventions, which are continually being updated and developed. The countries that are contracting members to the convention have to comply the obligations of the convention by implementing these in national legislation. This has led to the introduction of stringent regulations for environmental sound port operation.

Port managers, responsible for port planning and design, or with responsibility for the management of the operations in a port have to be aware of the growing importance of environmental issues. Many times they will be confronted with resistance to planned projects, with unfeasible time limits, with cost which pass all bounds and even with projects that will not be realized at all, due to environmental constraints. So it is essential to be able to handle these subjects in an efficient and practical way.

Civil engineers, responsible for port development and port management therefore need to know the relevant themes and (international) obligations. They have to incorporate these elements in their design and management. Accordingly, from the very first starting point of the design process, an integrated approach is necessary. That means that it is important to know:

- what are the basic drivers and conditions
- what are the environmental issues in ports
- what are the legal obligations
- which parties to involve in this process
- which institutional aspects to incorporate in the design
- and the way to integrate the environmental issues to be considered in port planning and design

In this chapter these items will be explained. The next chapters will describe more into detail the environmental items related to port development and port operation.

1.2 Basic drivers and considerations

Ports around the world face increasing pressure for development of newer, larger and more efficient facilities to accommodate increased waterborne transport carried by larger vessels. At the same time ports by nature are in close relation with sensitive resources and are under increased scrutiny by the community, both by regulators and public/private interest groups. However a port can play an important role in protecting and enhancing the environment through careful planning and implementation of appropriate measures.

Trends in environmental policy nowadays are mainly guided by three principles: public access to information, participation in the decision-making and the "polluter pays" principle.

Important items within the environmental policy are:

- Conservation, protection and restoration of natural values
- Balanced decision making based on environmental, social and cost-benefit evaluations.
- Mitigation and compensation of environmental effects

1.3 Environmental issues in ports

Environmental issues in ports are related to:

- Human health and safety.
- Nature and natural resources.
- Quality of life.

These environmental issues in ports may be associated with

- Port layout in relation to land and water functions and dynamics
- Cargo handling and cargo transport
- Port (industrial) activities
- Port and ship waste
- Water, sediment and soil management

The following environmental parameters are basic:

- Water, sediment, soil and air quality
- Integrity of the natural system
- Noise, dust and odour
- Landscape

Environmental impact has two main causes. It may be direct or indirect effects of emissions of contamination or nuisance, or it may be associated with infrastructural changes that change the systems dynamics. Causes can be local, regional or global and related to port activities, shipping or coming from outside.

1.4 Legal obligations

For the protection and improvement of the environment, specific conventions and legislative regulations have been developed. In many cases these require legal permits to be obtained or management agreements to be implemented for both existing and proposed activities. It is important to be aware, that the legislation is constantly changing, as knowledge increases and implementation frameworks evolve.

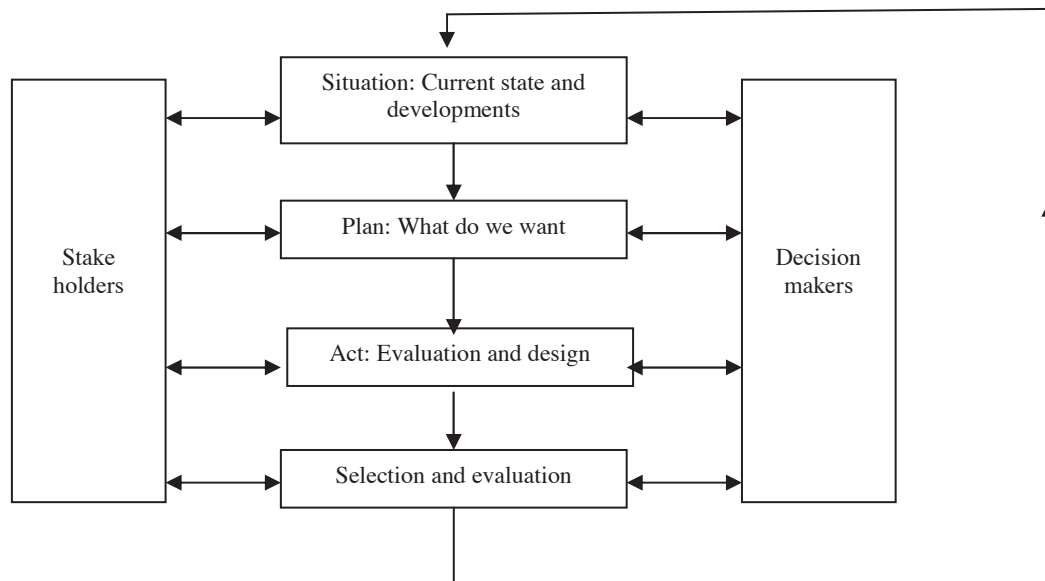
Legal implications nowadays for European ports are dominated by EU policy and EU law. The legal effects of a policy or legislative instrument very much depend on its nature. Within the EU community there are regulations that are binding and directly applicable and directives that only bind states to results that should be achieved. The states should transpose the latter into the national legislative frame work which leaves a margin for interpretation. Next to that the EU uses formal decisions that are fully binding to whom they are addressed and recommendations that are non-binding. Policy documents are divided into so-called white papers that contain proposals for specific community action and green papers that are discussion papers for EU wide consultation. Examples of important EU Directives for ports are the Directive on Environmental Liability, Public Access to Environmental Information, Strategic Environmental Assessment, Water Framework Directive, Port Reception Facilities for Shipgenerated Waste and Cargo Residues, Conservation of Natural Habitats and Flora and Fauna, Control of Major Accident Hazards involving Dangerous Substances, Community Vessel Traffic Monitoring and Information System.

Setting the scene for the national regulations are also the Global and Regional Conventions. The most important for ports are the global conventions on Prevention of Pollution from Ships (MARPOL) and Safety of Life at Sea (SOLAS) and regional Conventions like the Convention on the Protection of the Marine Environment of the North-East Atlantic (OSPAR). For information on the international rules and policies which affect the port sector, an overview that has been prepared by the European Seaports Organisation (ESPO) is included in appendix 1. A brief overview of the relevant Dutch regulations is included in appendix 2.

1.5 Interested parties

From the very beginning it is important to incorporate, apart from the economic aspects, the environmental and social aspects which should be taken into account in port planning and design. Looking at the steps to be taken during the whole process it is essential to derive a

policy, in which the views and interest of NGO's and other stakeholders have been integrated. Not only the parties with economic interests in the development of port and water transport should be involved in the design process, but also those parties with interest in social and ecological consequences of port development. That is called stakeholder participation. A simplified model of the masterplan process shows the role of the parties involved.



Depending of their position during the design process the parties involved have a different way of interaction: those of the NGO's, stakeholders, industry and other parties involved on the one hand and those of the politicians, policymakers and other decisive parties on the other hand. Consideration of the pros and cons against each other should be incorporated in the final decision. It is always a difficult process to reach an agreement between the various economic, social and ecological interests. However, involving the various parties at an early stage will allow them not only to bring in their interest, but also their knowledge and experiences. In this way the management of the port gets the opportunity to develop and resolve issues in a constructive manner rather than possibly provoking a formal confrontation at a public enquiry. In many cases this consultation has proved to be useful as a first step to improve public relations and to create public acceptance.

The consequence of the approach from different viewpoints is that many alternatives will be generated. A first screening of these by the outcome of feasibility studies will reduce the amount of alternatives. Legislation on EIA (Environmental Impact Assessment) oblige for transparent evaluation of the alternatives, including the development of the alternative most ecologically sound: the optimum solution from the point of view of the environment.

1.5.1 Methodologies

The areas most likely to be used for port development will be in or adjacent to:

- urban areas, potentially creating social problems. It is not unknown for a whole village to be moved to a new location. Inhabitants may be affected by increased traffic, noise, risk of accidents etc.;
- natural areas which may be designated areas for protected habitats for flora and fauna, which imply far reaching environmental constraints;
- agricultural areas, fishing areas, recreation areas and other areas with economic values. Accordingly economic consequences for related communities are part of the planning and design process.

That's why the extent and magnitude of the impact of port developments have to be considered, with respect to social and environmental values. Civil engineers should know which legislation is applicable and which mitigation and compensation measures need to be

taken to avoid adverse effects. Positive and negative impacts can be weighted in order to determine the best practical environmental option. Components of the mitigation process are:

- Avoid the adverse effects altogether by not taking a certain action or parts of a certain action;
- Minimize the adverse effects by limiting the degree of the action;
- Ameliorate or rectify the impact by repairing, rehabilitating or restoring the affected environment;
- Reduce or eliminate adverse effects over time, by preservation and maintenance operations;
- Compensate for unavoidable adverse effects by replacing or providing substitute resources

1.6 Institutional aspects

Environmental care does not stop with the presentation of the masterplan. After approval of the design the stages of appraisal and negotiation, construction, completion and exploitation will start. One should realize that also during appraisal and negotiation the conditions for invitation to negotiate should incorporate environmental inputs. It is also possible to incorporate environmental covenants in the loan agreement and conditions of disbursement and compensation of unexpected effects. The same holds for the stage of construction and completion. Monitoring and control of the environmental impact should be an integrated part of the program of supervision as well as of the project completion report.

During the succeeding exploitation of the port, the question: "What will happen with the investment in a few years time" is of central interest. Many examples show that the quality and responsibility of the port management influences the way of operation as well as the further development of the port. That's why organisation and management, exploitation and maintenance beyond the point of completion of the new ports area should be incorporated in the procedure of an integrated design. Central element is the harmonisation of administration and management. Roles, responsibility and authorities should be defined, documented and communicated.

It is good to realise that each port has his own organisation structure. Many ports are partly or completely privatised. There is a separation of tasks and responsibilities. Usually, there is a core body that can be referred to as the Port Management. The Port Management has a commercial, technical and nautical identity and has responsibilities for port development, commercial exploitation and maintenance such as maintenance of the navigable waterway, provision of navigational aids, vessel traffic management services within the harbour area and construction and maintenance of the quays. In other cases national authorities may deal with these duties. General services such as stevedoring, towage, dredging, provision of bunker facilities and provision of waste reception facilities may be carried out by the port or by private contractors. Mostly other services such as the processing of cargo, storage, distribution, agency, forwarding and the management or operation of land transport are in the hands of private companies.

The management can be supported by a regular auditing process. This can be an important element for ensuring continuous improvement. An audit is a systematic, documented, periodic and objective evaluation of the performance and environmental quality of the port, the organisation, management, facilities and processes for protection of the environment. They might be related to the services of the port, to the environmental conditions, the efficiency of the port, etc. So the environmental audit, as an environmental management tool, can be employed to evaluate the environmental performance of the port.

1.7 Integration of environmental issues in port planning and design

The creation of port areas has influence on the surrounding areas and the concerning a-biotic and biotic environment. A careful investigation of the environmental impact of port planning