PROACTIVE STAKEHOLDER MANAGEMENT IN THE PORT PLANNING PROCESS: EMPIRICAL EVIDENCE FROM THE PORT OF BRUSSELS

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ABSTRACT

Port planning and port management are increasingly influenced by a variety of external stakeholders, each pursuing specific strategic objectives with regard to port activities and port development. A greater focus on external stakeholders may increase the port activities' legitimacy at the city and regional levels, and may also contribute to sustainable development. In this paper, a new port planning methodology is designed within the context of the development of the Port of Brussels (Belgium) Master plan, time horizon 2015. This new planning methodology describes the port planning process, building upon the decomposition of the total port area in several distinct port zones. Second, the paper will discuss in detail how the various stakeholders and their objectives were taken into account in this planning process, and how this multi-zone, multi-stakeholder approach can be generalized to improve upon conventional strategic port planning processes.

Keywords: Port planning, stakeholder management, evaluation methods

PROACTIVE STAKEHOLDER MANAGEMENT IN THE PORT PLANNING PROCESS: EMPIRICAL EVIDENCE FROM THE PORT OF BRUSSELS

1. INTRODUCTION

Port planning and port management are increasingly influenced by a complex environment, driven by a variety of social, political, economical and technological developments, as well as a variety of external stakeholders, each pursuing specific strategic objectives with regard to port activities and port development. Recent, applied academic research (Notteboom and Winkelmans, 2002; Dooms, Macharis, Verbeke, 2003) suggests that port authorities need to take into account these external stakeholders' objectives in order to secure the viability of long-term port development programs. In addition, a greater focus on external stakeholders may increase the port activities' legitimacy at the city and regional levels, and may also contribute to sustainable port development.

This new view on port planning and port strategy formulation needs a more holistic approach in terms of integration of research areas, as existing literature on port planning and port strategy does only partially provide the answer on how port authorities can integrate internal and external aspects of the port environment, including the objectives of different stakeholders, into their long-term development strategy. Frankel (1989) argued that strategic port planning should be performed from a top-down perspective, and the overall objectives of the port authority should guide the planning process, as they differ of those of other enterprises, in particular on the level of the influence of world markets, political factors, international trade and globalization. However, only taking into account these port authority objectives might hamper the implementation of the port strategy in the long term.

The first signs of taking into account external stakeholder objectives were given by Goss (1990c), as he argued that a port authority should also cope with the externalities port activity causes. More in particular, the need of spatial integration of the port and its environment was mentioned, under the form of the spatial/architectural design of a port, the integration of parks and viewpoints, in order to attract the local community (e.g. residents) or tourists to the port area, and increase the acceptance of port activities

and their externalities. A further integration of internal and external elements of the port environment and a first insight into stakeholder objectives, was set out by Coeck et al (1996). This research introduced resource-based thinking, originally developed for conventional business firms (see Prahalad and Hamel, 1989; Prahalad and Hamel, 1990; Grant, 1991), into the port sector. The proposed planning framework was developed from a port authority perspective (i.e. from the 'strategic intent' of the port) and did not explicitly include the objectives (or the 'strategic intent') of the different other actors involved in the port sector, such as government, local community stakeholders and port users. However, it was recognized that this multitude of actors, and their different and sometimes divergent objectives, make it difficult to formulate the port strategy (and the resulting short-term or long-term implementation scheme).

At this stage of the scientific discussion, it was clear that there existed no general agreement on which categories of stakeholders to include in the planning process, as sometimes government was mentioned as an important stakeholder, sometimes the local community, sometimes the port users. Notteboom and Winkelmans (2002) described the port environment and its internal and external stakeholders, and their impact on a process/decision. This discussion paper, which gave a first insight into the interaction between the different forces shaping the port environment, did not go into specific cases of long-term port planning processes or the development of port master plans (with a horizon of 10-25 years) where stakeholders are involved in the process.

Moglia and Sanguineri (2003) confirmed the need of a new approach to long-term strategic port planning, as they identified important challenges which port authorities face when developing a master plan. According to these authors, the development of this master plan should include very diverse elements and interests, e.g. economic impacts, environmental impacts, the relationship between port and city. They argued that a port authority has difficulties with dealing simultaneously with the needs of local communities, the strategic objectives of government and answering the needs of the port users and port operators, which are influenced by market forces and globalization. Moreover, a new approach to port planning should also allow each port to tailor its own solution.

The evolution of these different views on port planning, and the increasing complexity of the planning process, is summarized in figure 1:

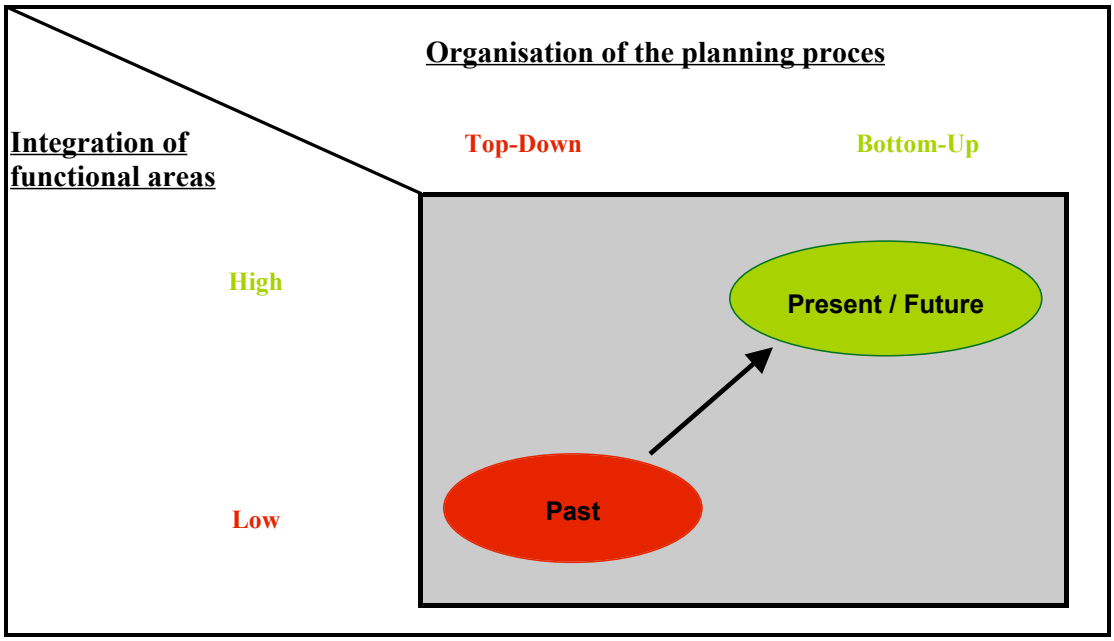


Figure 1: Evolution of the long-term strategic port planning (Source: authors)

Figure 1 argues that the port planning process has moved from a top-down organization (i.e. exclusively taking into account the 'strategic intent' of the port authority) to a bottom-up approach (i.e. taking into account the 'strategic intent' of different stakeholder categories, in addition to the strategic intent of the port authority). Furthermore, where in the past the financial-economical dimension dominated the process of port planning, the planning process must nowadays integrate in an explicit way other functional areas such as safety and security, local mobility, noise and light pollution, spatial design, architectural and visual quality of the port area, etc..

In this paper, a new long-term planning methodology is introduced for port authorities, that takes into account the different interests of different stakeholders. This planning methodology was developed during a research project for the (inland) port of Brussels (Belgium), which will result in the development of a master plan for the port authority with a time horizon of more than 10 years (time horizon 2015). In the second section, the general objectives of the port master plan are described, and the specific objectives for the Port of Brussels. The third section of this paper will describe the planning methodology that was applied for a separate port zone, with particular attention to the

identification of stakeholders and the definition of separate port 'zones'. The fourth section will show some empirical results of the applied methodology, in particular the changing nature of stakeholders and interests in different zones. Finally, the conclusion will set out directions for further research. rt

2. DEFINITION OF A PORT MASTER PLAN

2.1. The port master plan: general principles

When starting a strategic planning process, the time horizon is an important parameter to define different types of port planning. In the case of port authorities, three different types of planning exist (see Coeck et al., 1997 who summarized World Bank, 1993a), which can be considered independent of the nature of the port (seaport or inland port):

(i) Short-term planning serves the purpose of solving current practical problems on the operational level, whereby the time horizon varies from one (also considered as 'operational' planning) to three (also considered as 'tactical' planning) years.

(ii) Medium-term planning, with a time horizon from three to five years, is characterised by the development of strategic plans in which 'management by objectives', in particular on the marketing and financial level, plays an important role.

(iii) Long term planning is aimed at the development of port master plans, whereby a time horizon of 10 to 25 years is considered. This requires a visionary approach to the development of port infrastructure for the whole port area.

This paper focuses entirely on the third type or long-term planning, and more specifically the development of strategic master plans for ports.

According to Moglia and Sanguineri (2003), a port master plan sets out a 10-year port development option, taking into account different interests. The result of a master plan should be an agreed course of action for the time horizon (10-25 years) as set out by the

port authority. Although these authors take a 10-year horizon as the normal or usual time horizon, a master plan could to some extent go beyond 25 years. However, an extension of the time horizon beyond 25 years makes it difficult to provide the port authority with a concrete port development scheme (e.g. with plans and options for new infrastructure), which should be the end result of the process of the development of a master plan. This visionary view becomes very questionable after this horizon.

Furthermore, the societal legitimacy of a plan that goes beyond 25 years in terms of quantitative measures (i.e. economic variables such as employment, added value, cargo throughput) is very difficult to obtain, as a number of assumptions have to be accepted, and such plans are as a consequence often considered as too optimistic from the viewpoint of government and local community stakeholders. As a conclusion, it could be suggested that an exercise with a time horizon beyond 25 years could not serve as a master plan itself, but can be useful as a support to the definition of the different options of long-term development within the time horizon of the 'real' master plan (horizon 10 to 25 years). In the next section, the specific characteristics of the master plan of the Port of Brussels are described, as set out by the port authority. In this regard, it is useful to mention that the Port of Brussels is an inland port that lies about 50 km into the hinterland of the port of Antwerp, and is connected to the sea by a canal that allows fluvial and maritime vessels up to 4500 tonnes (9000 tons for push convoys).

2.2. The master plan of the Port of Brussels

2.2.1. The Port of Brussels

The Port of Brussels can be considered as a 'landlord' port authority, which is responsible for the exploitation, management and development of the canal, the port area, port infrastructure, and a limited number of port supra-structure (storage buildings). The Port of Brussels is an organization that serves public interest, as the main shareholder is the Brussels Capital Region.

The Port of Brussels manages a waterway of 14 km in the Brussels Capital Region, on which several bridges and two locks are located. The port consists of 12 km of quays,

of which 2,8 km are maritime quays. Each year, more than 15 000 vessels transit on the canal, representing a total cargo load of about 8 million tons. The port area consists of 70 ha, on which more than 300 port companies are located, consisting of stevedores, port companies, customs offices, storage space,… in a dense urban environment. The waterborne traffic handled at the port of Brussels was about 3,8 millions in 2003. Total traffic (including rail and road traffic) equals about 20 million tons in 2003.

The port infrastructure guarantees the supply of goods for the metropolitan region and the regional industry, and plays an important role in the sustainability of the regional mobility, as the presence of the port reduces heavy truck traffic in the dense urban region with about 400 000 lorries of 20 tons a year (including transit traffic in the canal). Furthermore, the port companies supply a large part of regional direct employment and regional added value.

2.2.2. The master plan of the port of Brussels

In the case of the Port of Brussels, the master plan is an ambitious and integrated development plan for the whole port area with a time horizon of 2015, and must define a consistent long-term framework, which the port authority can use to make and implement their strategic decisions, and to make the right decisions in the short term in order to prepare for the long term objectives. The master plan should be evaluated during the implementation process and should be flexible for new evolutions. The master plan should also be based on the main elements of the mission of the Port of Brussels:

- Contribution to the creation of regional added value and employment;
- Contribution to the sustainability of the general mobility in the region;
- Contribution to the integration of port and city;
- Social-economical integration of the port activities in the Trans-European Networks (TEN) of transportation.

The master plan should also take into account different functional areas, which are influenced by the port activities, such as:

- The management of the waterway;
- Social and economical parameters;
- Environmental parameters;
- Mobility;
- Institutional environment;
- Relations with local community stakeholders, e.g. residents;
- Security and safety;
- Urban planning and architectural parameters.

The development options of the master plan should integrate these different functional areas, taking into account technical and financial feasibility, and an evaluation of public return on investment. The master plan should provide the port authority with a decision support tool to evaluate each lease at the expiry date, and to redirect the port activity for each site, taking into account the long-term strategy as outlined by the development options. Furthermore, the master plan should identify potential expansion possibilities of the port activities in the urban and industrial environment.

In the next section, the planning methodology, which resulted from the execution of the research project will be described. The research project was commissioned to two separate research teams (a social-economical team and an environmental-urban planning team), which consisted of experts of all functional domains mentioned above and which worked under intense collaboration and coordination. This intense collaboration and coordination of functional areas was an important requirement of the port authority, in order to create a coherent plan, both on the economic and on the environmental-urban planning dimension. In the next section, it will be described how the research process has coped with the integration of different functional areas, and the involvement of the different stakeholders in the process.

3. THE PLANNING METHOLOGY

3.1. The definition of stakeholders and the introduction of port 'zones'

In order to include stakeholders in the port planning process, existing literature in the specific area of strategic management that covers stakeholder management must be studied. One of the main issues of the scientific discussion in this research area is the identification of the critical stakeholders (or categories of stakeholders) of an organization. Even the concept of the 'stakeholder' itself is not universally defined (see Donaldson and Preston, 1995). However, a basic step in the process of strategy formulation that takes into account these stakeholder objectives, is the definition and identification of the critical stakeholders.

For the port sector, a broad definition may be applied: a stakeholder could then by definition be any individual or group of individuals that can influence or are influenced by the achievement of the port's objectives (based on Freeman, 1984). On the basis of this definition, a lot of different stakeholder categories can be identified, as Notteboom and Winkelmans (2002) have done in their discussion paper, making a distinction between internal stakeholders (groups inside the port authority) and external stakeholders (groups which are not part of the port organization). These external stakeholders consist of three groups, i.e. economic/contractual external stakeholders (e.g. port companies or their representative bodies), public policy stakeholders (e.g. government bodies) and community stakeholders.

From the perspective of the development of a port master plan, these four categories can provide the basic or 'generic' categories of stakeholders whose characteristics and specific interests with regard to development options of the port have to be defined. This leads to a problem in terms of a clear definition of the different stakeholders, as the port area is in most cases dispersed over a large geographical area, and characteristics, interests and criteria of the stakeholders can change within this area, according to the characteristics of the different parts of this geographical area. As a consequence, a new approach seems a necessity, as planning from a bottom-up perspective (i.e. taking into

account the strategic intent of different stakeholder categories) can only be done taking this heterogeneity of zones within the larger port area into account. Hence, if a stakeholder-based planning process is to be introduced and different functional areas are to be considered, a division of the port area in separate geographical areas or port 'zones' is appropriate. Figure 2 describes this evolution from a 'one stakeholder' (the port authority) to a 'multi stakeholder' (taking into account the 'strategic intent' of different stakeholders) approach, and from a 'one zone' (i.e. the port area as a homogeneous area) to a 'multi zone' approach (i.e. the division of the port area in different zones).

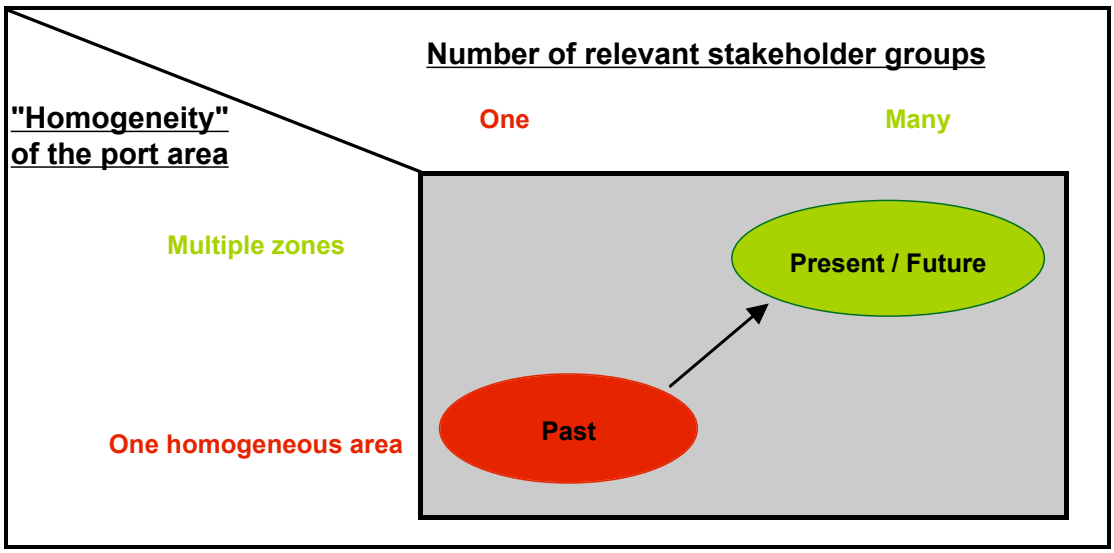


Figure 2: Conceptual basis of the stakeholder-based port planning process (Source: authors)

In the next paragraph, the framework that was developed during the research process of the master plan will be further discussed. In this paper and more particularly in the next paragraph, the discussion will also be focused on the involvement of the different stakeholders in the planning process, simultaneously providing a view on the complete planning methodology. In section 4, a summary of empirical results concerning the characteristics of zones, stakeholders and criteria will be discussed.

3.2. The planning methodology

3.2.1. Introduction

The planning methodology that is shown in figure 3 starts from the conceptual basis of a division of the port area in several port zones, each having different characteristics on the level of the different functional areas. After the division in several zones, the step-by-step methodology shows the process of strategy formulation for one separate zone. Before discussing stakeholder involvement more in detail, the assumptions and guidelines of this port planning methodology are described. The main assumptions are:

- It is assumed that the port authority is organized under the form of 'landlord' model, i.e. it controls the land use by leasing and renting infra- and supra-structure to private firms, which perform all other port services (cargo-handling, storage, etc.). In some cases, the 'landlord' port also supplies general services as security, pilotage, etc. to the private sector. The Port of Brussels possesses all these characteristics and can be considered as a 'landlord' port.
- It is assumed that the port authority has planning responsibility. It has indeed been argued that strategic planning should be a task of the port authority, and should not be left over to individual firms, public bodies or governmental agencies (see e.g. Goss, 1990c). The Port of Brussels has five year agreements in which the regional government and the port authority agree on the responsibilities (and the resulting objectives) of the port authority. One of the explicit responsibilities is the development of a port master plan.
- The time horizon of strategic port planning in our methodology is 10 to 25 years. The master plan of the Port of Brussels has a time horizon of 2015, which exceeds the 10-year minimum horizon.

This section will consist of two main paragraphs. First, stakeholder involvement in the planning process of the master plan of the Port of Brussels will be discussed from a more general point of view, i.e. from the perspective of validation of each step of the

planning process. This can be considered as ‘soft’ involvement as a committee of different stakeholder representatives validate the long-term development strategy and implementation after the research work has taken place, and have a chance to make amendments to the proposed strategies. Second, the stakeholders also have a more ‘hard’ involvement as they have a direct impact on the process of formulation and evaluation of long-term strategic alternatives, by using results of in-depth interviews in the strategy formulation process.

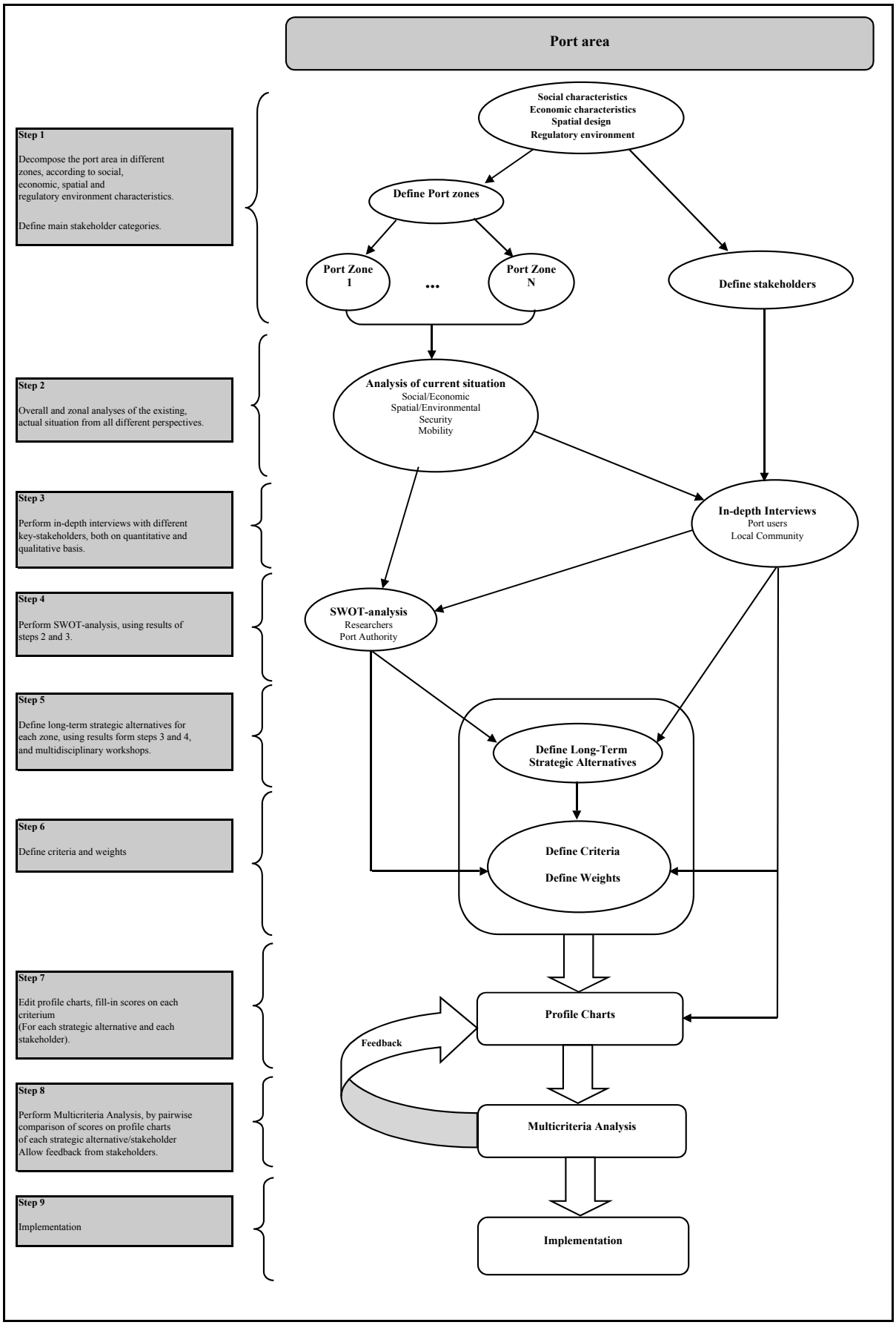


Figure 3: The port planning process for a separate port zone (Source: authors, 2003).

3.2.2. 'Soft' stakeholder involvement

'Soft' involvement of stakeholders in the planning process is oriented towards the introduction of validation committees, which represent the different stakeholder categories (government, local communities, port users), and which provide a periodical evaluation and amendment of the different steps during the research project. In the case of the port of Brussels, this validation committee was composed of:

- Representatives of the regional government council, representing the stakeholder category 'government'. More particularly in the case of the port of Brussels, representatives of the minister or secretary responsible for the regional port policy.

- Representatives of different government agencies from different functional fields (mobility, spatial and urban planning, environment,…), further representing the stakeholder category 'government';

- Representatives of different organizations which gather port users and companies, representing the stakeholder category 'port users';

- Representatives of local community councils, representing the stakeholder category 'local community'. More particularly in the case of the port of Brussels, representatives of the local municipality councils of the municipalities which are directly influenced by the presence of port activities on their territory.

On the basis of the planning framework and the experience of the Port of Brussels, a distinction can be made between three important validation/evaluation moments.

A first evaluation and validation moment is held after step 3. Step 3 consists of in-depth interviews with different stakeholder categories, with a dominance of port users. Special attention is given to the selection of the sample, as all port zones must be substantially represented in the sample in terms of port users. On the one hand, these in-depth interviews provide an insight in the present satisfaction of the port user with regard to his presence in the port and the associated port services; on the other hand, the

user provides insights of the evolution of his activities, and sets out his views on the long-term development of the port.

When the analysis of the existing situation (step 2) showed great pressure from the urban environment in a specific zone, specific in-depth interviews with local community members were conducted in order to take into account these results in further stages of the planning process (see infra, 'hard' involvement). After step 3, results of step 2 and the in-depth interviews are presented to all respondents, and to the validation committee consisting of the stakeholder representatives. This evaluation and validation moment provides the research team and the port authority with valuable qualitative information about the point of view of the different stakeholders on the actual strengths/weaknesses of the port, but also on the long-term future of the port, in particular in terms of opportunities and threats. This evaluation moment also sets forward some general investments that the port should be able to make within the time horizon of the master plan. In other words, a ranking of different investments projects that influence the whole port area, or specific zones, is defined. These investment projects can be integrated in the master plan, but generally these investments suggestions are short-term propositions in order to improve general security in the port area, create uniform road signalisation, etc., and cannot be considered as an implementation measure of the final master plan.

A second evaluation and validation moment is held after step 8, when the process of strategy formulation has come to an end. In this stage, the research team has defined and evaluated long-term alternative strategies for each port zone and has defined a tentative strategy for each zone. The validation committee gets an insight and can intervene in the process of strategy formulation (in particular with regard to the criteria and weights of the multicriteria-analysis, see infra) and can further amend certain strategies for certain zones in terms of regulatory, social-economical, technical, political or environmental feasibility.

A third evaluation and validation moment is held after the implementation scheme has been defined, which proposes concrete plans for certain port sites. The validation committee can again amend the implementation scheme in terms of regulatory, social-economical, technical, political or environmental feasibility. More particularly, the

delays of some steps in the implementation scheme can be modified, e.g. due to soil pollution of a certain area, or due to other government projects (e.g. public transport projects, residential projects) which could possibly interfere with the implementation scheme that has been proposed. The result is an implementation scheme that shows a long-term sustainability and robustness in terms of regulatory, social-economical, technical, political or environmental feasibility.

3.2.3. 'Hard' stakeholder involvement

Besides 'soft' stakeholder involvement in validation committees or task forces, which is nowadays used during the elaboration of diverse infrastructure development plans or projects in Western-Europe, and in particular for port expansion or (re)-development projects, it seems very difficult to introduce 'hard' stakeholders involvement. 'Hard' stakeholder involvement is aimed at the direct involvement of stakeholders in the planning process. In our planning methodology, the in-depth interviews with port users and members of the local community play a key role in this 'hard' involvement.

3.2.3.1. Direct involvement in the strategy formulation process: a redefinition of SWOT-analysis for port planning.

First, they constitute an important input for the SWOT (Strengths, Weaknesses, Opportunities, Threats) -analysis for each zone. The results of step 3 (analysis of the in-depth interviews) represent strengths and weaknesses primarily derived from quantitative questions and opportunities and threats provided primarily by qualitative information. It is very important to include the results of the in-depth survey in a direct way, as the elaboration of the SWOT-analysis is an important step in the port planning process. More generally, SWOT-analysis has become a fundamental element in the planning process of different organizations, as the detailed view of the internal and external environment of an organization provides an insight into the competitive position. In the case of a port zone, the SWOT-analysis provides the research team and the port authority with a detailed view on the internal and external environment of the port zone, and its competitive position. The competitive position should in this case be interpreted as the competitive position vis-à-vis some external stakeholders, in

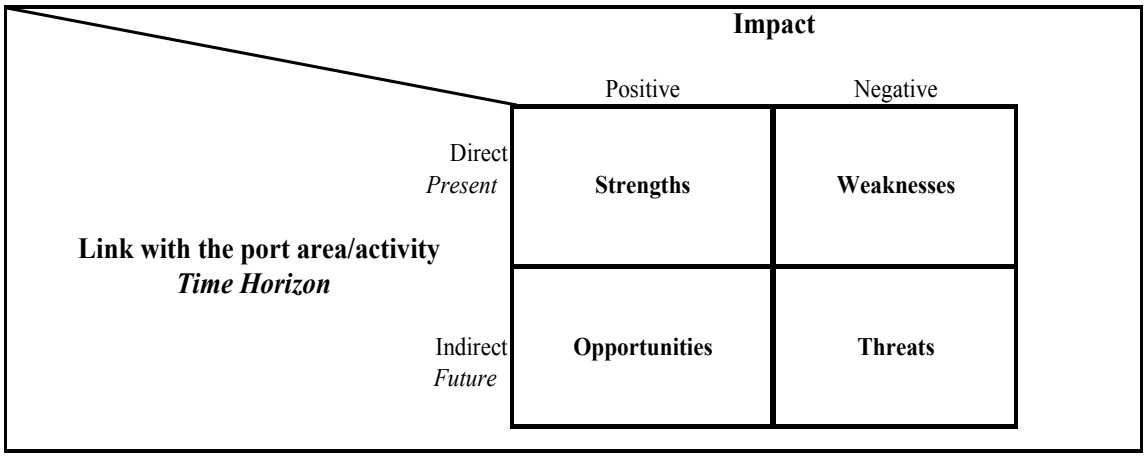
particular those who question the presence or the development of port activities in this zone. The SWOT-technique is very useful, as it is a very simple method and provides the important internal and external factors, which influence the port zone under consideration.

However, the application of the SWOT-technique led to a redefinition of the framework when applied to a long-term port planning process. Traditionally, strengths and weaknesses are the elements that influence the organization from the internal environment and opportunities and threats are the elements that influence the organization from the external environment. This conventional framework of the SWOT-analysis has to be revised with regard to port planning, in particular the characteristics of the principal elements (strengths, weaknesses, opportunities, threats), and with regard to the role of the organization, which is the subject of the planning process (in this case the port authority).

The principal elements of the SWOT-analysis are adjudicated to the four principal elements taking into account these three dimensions:

- The link with the port area (direct or indirect), i.e. does it concern the execution of port activities (e.g. accessibility) or does it have an indirect influence (e.g. the presence of a large residential housing project);
- The time horizon of the element (present – future);
- The impact of the element (positive – negative).

Figure 4 shows how the elements of a traditional SWOT-analysis must be adjudicated from a port planning perspective. This framework is the result of 10 SWOT analyses that were conducted in iterative way (see infra) during the port planning process of the



master plan for the Port of Brussels.

Figure 4: Redefinition of the SWOT-analysis in the port planning process (Source: authors).

Figure 4 shows that the critical elements which have a direct link with the port area/activity and which have an influence in the present must be considered as strengths or weaknesses, depending on their impact. The identified critical elements which have an indirect link with the port area/activity, have in most cases a potential influence in the future and must be considered as opportunities and threats, depending on their impact.

In practice, SWOT-analyses are performed during multidisciplinary workshops between research teams, integrating the results of the in-depth surveys and the analysis of the existing situation from different functional perspectives. In a second phase, these SWOT-analyses are presented to the port authority, creating an iterative process, which provides a sustainable SWOT-analysis. This collaborative approach also eliminates the weaknesses of this strategic analysis framework, which are the unclear definition of factors, the lack of prioritization of factors and subjectivity as factors are generated (see e.g. Pickton and Wright, 1998).

These iterative SWOT-analysis thus provides a robust and sustainable basis for the definition of the long-term strategic alternatives as during the whole SWOT-process, three stakeholder categories had a direct input (or 'hard' involvement) via either surveys (port users and local community) or via an iterative process (port authority). The government representatives did not have a direct input in the case of the Port of Brussels, but this can easily be done, e.g. by involving government representatives in the iterative process. However, as the SWOT-analyses always treat a separate zone, their contribution is in most cases limited as opposed to port users, local community stakeholders or the port authority, as they can provide knowledge for each particular zone, whereas government representatives in most cases only possess a regional point of view on the port area.

After this step, multidisciplinary workshops are held in order to define long-term strategic alternatives for each zone. The results of these workshops are again presented to the port authority in separate workshops, which makes it possible to further specify the content and the objectives of the strategic alternatives. This collaborative approach provides sustainable long-term strategic alternatives as contributions of external stakeholders are taken into account in a direct way via the results provided by the in-depth interviews of step 3; which provide the input of the SWOT-analysis, which in turn are the starting point of the definition of the long-term strategies for each zone. The results of all workshops with the port authority are then presented to a mixed committee of the port authority and government representatives, in order to define and validate the long-term alternative strategies for each zone.

3.2.3.2. Direct involvement in the strategy evaluating process

A second direct involvement of the different stakeholders is found when designing the profile charts, which provide the input for the multicriteria-analysis (see infra). Each profile chart consists of a number of criteria (and their weights), representing for each stakeholder the important objectives that have to be taken into account when comparing long-term alternative strategies against each other for a separate zone. For each port zone, the criteria (and weights) are defined taking into account the specific characteristics of each zone, and taking into account the results of the in-depth surveys (port users, local communities) of step 3. The criteria of government are deducted from

regional policy documents, e.g. the different existing regional development plans. For the Brussels Capital Region, a new regional development plan was approved in 2001, setting out a detailed policy in different functional areas for the region as a whole, but also focussing on the canal area where port activity takes place. Finally, the criteria of the port authority are defined and validated in meetings with port authority managers and key staff members. The weights are defined using the in-depth surveys, and are complemented by expert information. Furthermore, the applied multicriteria-analysis method allows sensitivity analysis (see infra).

After completing these process steps, all criteria and weights are summarized on profile charts, for each zone and for each stakeholder category. Figure 5 shows the general outline of a profile chart:

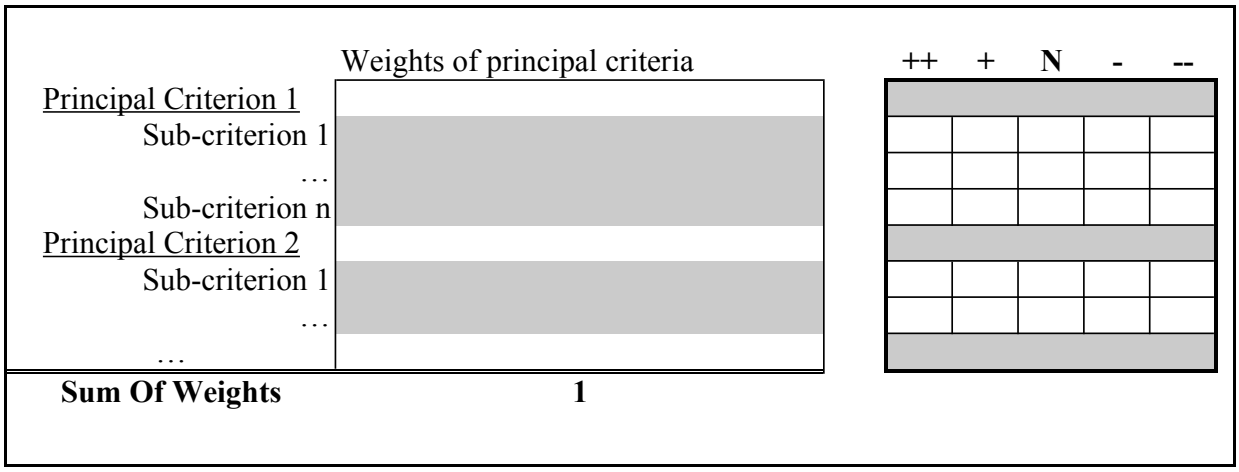


Figure 5: General outline of a profile chart (source: authors)

The general outline of a profile chart shows a hierarchical structure. This hierarchical structure has the advantage that principal criteria can be decomposed in sub-criteria. For the port authority, the contribution of a alternative strategy to the waterborne cargo throughput objectives are an important criterion. However, in the case of the Port of Brussels, this criterion had to be unbundled in a certain zones in 'contribution to short-sea shipping traffics' and 'contribution to container traffic' as the specific zone (which is characterised by the presence of maritime quays and a container terminal) offers future potential to attract maritime traffic and container traffics, diversifying the traffic

structure of the port as a whole. Another example is the economic criterion of the stakeholder 'government', as it can consist of two sub-criteria i.e. 'contribution to regional employment' and 'contribution to regional value added'.

This hierarchical structure can also be used to decompose a stakeholder category in separate categories. The characteristics of zone sometimes impose this decomposition. In practice, this decomposition was done several times for the local community stakeholder category, as this category can consist of several sub-categories with different objectives. In those specific cases, the local community stakeholder was decomposed in 'residents', 'neighbouring non-port enterprises' and 'leisure seekers'. This decomposition was very appropriate for port zones in the centre of the urban region, where port activities must cohabitate with housing, offices and leisure infrastructure (e.g. restaurants, cycle lanes). Each of these activities can be linked to a specific group of individuals with different objectives, hence the need to decompose the 'generic' category in order to get a correct insight into the contribution of the alternative strategies to the objectives of these separate groups.

The criteria on each profile chart are then rated on a (--) to (++) scale, whereby a neutral score (N) is given if a criterion is not relevant for a specific stakeholder (this depends on the content of the alternative strategy under consideration). The ratings represent the contribution of that specific criterion if the alternative strategy under consideration would be adopted. For the port authority, ratings on the profile charts are based on the results of previous steps, expert information, and can be modified during interactive meetings with representatives of the port authority. For government criteria, ratings are based on government policy documents, which provide insights to the strategic objectives of the government; in other words, ratings are based on the contribution that each alternative strategy could represent in order to realise strategic government objectives, and are validated by government representatives.

The last step in the evaluation process of the alternative long-term strategies for each zone is the execution of a multicriteria-decision-analysis (MCDA), using the profile charts as input. The MCDA method used to assess the alternative strategies is the Analytical Hierarchical Process (AHP), see Saaty (1982, 1988). The use of MCDA in the case of stakeholder based strategic port planning is almost imperative, as the ratings

of the majority of the criteria cannot be expressed in quantitative or monetary terms (given the long planning term of 10 to 25 years, and the importance of several qualitative variables, such as environmental and urban planning variables. The AHP-method also allows the development of a clear causal and hierarchical structure, transparent for decision makers.

The basis of the Saaty Method is the pairwise comparison of the strategic alternatives on the level of the criteria. The analysis of the separate strategic alternatives on the profile charts is translated into a multicriteria analysis where the several strategic alternatives are confronted with each other. This leads eventually to a classification of the proposed strategic alternatives. The applied method allows an iterative process, as feedback from different stakeholders categories can easily be introduced via modifications on the profile charts**.** The main advantage of this profile charts approach is that decision makers and research teams can make separate and more independent judgements on the profile charts for each alternative strategy, whereas the direct adjudication of relative importance on the Saaty scale would be more difficult, given the broad content of some strategic alternatives as long-term planning needs a more visionary approach.

With regard to the evaluation method that is used, i.e. the AHP-method, it must be pointed out that the ranking of different alternatives must certainly not always be followed when decisions are taken. The multicriteria analysis allows to reveal the critical stakeholders and their critical criteria, but does not provide a fundamental assessment of the alternative strategies (in terms of monetary or other quantifiable terms). Multicriteria analysis provides a comparison of different alternative strategies, and supports the decision-maker in making his final decision by pointing out for each stakeholder which elements have a clearly positive or a clearly negative impact on the sustainability of the considered alternative strategy.

Stakeholders have a direct impact on the evaluating process, as they can intervene on the level of the scores on the profile charts, but also on the level of the weights of criteria as the method allows sensitivity analyses. In other words, if a certain stakeholder category is not convinced about the adjudicated weight(s), a sensitivity analysis could bring an insight to which extent the modification of the weights would

change the preference of the alternative strategies for this particular stakeholder. Finally, definitive strategies are defined for each port zone.

3.2.3.3. Direct involvement in the process of the elaboration of implementation scheme

The final stage of the planning process is the elaboration of an implementation scheme, which provides the port authority with an execution procedure until the end of the planning horizon that was put forward. In the case of the Port of Brussels, an implementation scheme was developed, which consisted of two interrelated components:

- For each particular port site, an evaluation of the present activity with regard to the long-term strategy which was adopted for the port zone to which the site belongs. This site-by-site evaluation leads to specific measures to be taken for each port site, within the horizon of the master plan and from the perspective of different functional areas. Special attention must go to sites where the expiry date of the lease falls within the planning horizon of master plan, as the master plan should provide the port authority with the particular options that could be taken at expiry date (relocation of the activity within or outside the port area, attraction of another activity, decrease the surface area, etc.).
- In each specific port zone, a number of short-term (to be realized within 5 years, and within the existing port area) well-defined projects and suggestions for long-term projects (to be realized after 10 years, and often aimed at port expansion), which can be complemented by cost-benefit analysis in the case of well-defined short-term projects. In any case, descriptions of the projects are made, and for each project a separate implementation scheme is elaborated. The short-term projects result from sites that are not occupied or can easily be liberated as the leases are near the expiry date. Nevertheless, the realisation of these projects also necessitates in most cases measures for leases, of which the expiry date lies in the long term (sometimes even beyond the horizon of the master plan). In that case, the master plan implementation scheme should take into account the

relocation of these firms within the port area. Furthermore, the elaboration of a communication plan for each port user subject to a potential relocation operation is a necessity, in order to convince these firms to relocate.

The direct involvement of the stakeholders in this stage is realized in two ways. First, key staff of the port authority plays an important role, in particular the staff responsible for the evaluation and prolongation of the leases. Their profound knowledge of the nature and characteristics of the activities performed by each separate port user, and the particular strategies of the different port users is very useful and complementary information when developing the implementation scheme. Second, the in-depth surveys of step 3 also contain questions with regard to the willingness of the firms to relocate, and the willingness to increase/decrease the occupied area. For individual port users who are subject to a potential relocation, the answers on these questions provide a complementary input when elaborating the implementation scheme.

3.2.4. Conclusion

The example of the Port of Brussels shows that a direct involvement of stakeholders in the planning process can enrich the port planning process when developing a port master plan. In order to optimise this stakeholder involvement, an approach where the port area is decomposed in different port zones seems appropriate to fully integrate stakeholder objectives into the planning process. Although the direct involvement of stakeholders is a time-consuming activity and demands lots of resources of the port authority and the research teams commissioned to assist the port authority, this cost is compensated by a greater societal acceptance of the strategy for each zone, and the implementation scheme that has to be validated and executed. Furthermore, this direct or 'hard' involvement has important implications on the 'soft' involvement in validation committees and other task forces, as these committees only have to fine-tune the strategies and the implementation scheme, as they have been directly involved in the process. This accelerates the execution of the planning process itself, as well as the adoption and execution of the implementation scheme. If only 'soft' involvement is chosen, there exists substantial risk that the process of the execution op the planning process is delayed, as disagreement of stakeholders with regard to the propositions is

more likely, as there is no bottom-up involvement and stakeholders have the feeling (and often are) confronted with accomplished facts.

4. SUMMARY OF EMPIRICAL RESULTS GATHERED DURING THE APPLICATION OF THE PLANNING METHODOLOGY

4.1. Introduction

This section consists of a summary of empirical results, which were obtained during the application of the planning methodology as shown in figure 3 (see supra, section 3.1.). The planning methodology was finally applied seven times (i.e. for seven different zones). General insights concerning the changing nature of stakeholders and their criteria will be described, depending on the different characteristics of the zones. A more extensive discussion of the use and nature of separate criteria goes beyond the scope of this paper and will form the subject of future papers on this topic.

4.2. The decomposition in zones

Figure 6 shows the decomposition of the port area in six zones, and the spatial ruptures. The research team originally started from 11 zones (see 1, 2, 3, 4a, 4b, 5, 6a, 6b, 7a, 7b, 8) for the analysis of the existing situation, i.e. each of these 11 zones was analyzed separately. These 11 zones formed an already existing decomposition that was used in the past to analyze characteristics of the port area. During the execution of the planning steps 2 to 4 (analysis of the existing situation, in-depth survey and SWOT-analysis), these eleven zones were brought back to six zones:

- Zone ‘avant-port / voorhaven’;
- Zone ‘marché matinal / vroegmarkt’;
- Zone ‘vergote – BILC – TIR’;
- Zone ‘béco’;
- Zone ‘centre / centrum’;
- Zone ‘sud – zuiden’.

During the execution of the SWOT-analyses for the 11 zones, the research team discovered a large number of similarities between different adjacent zones, i.e. they had an important overlap of SWOT-analysis elements. These zones and their SWOT-analyses were merged to one zone with one SWOT-analysis, which provided the input for the definition of the different long-term strategic alternatives.

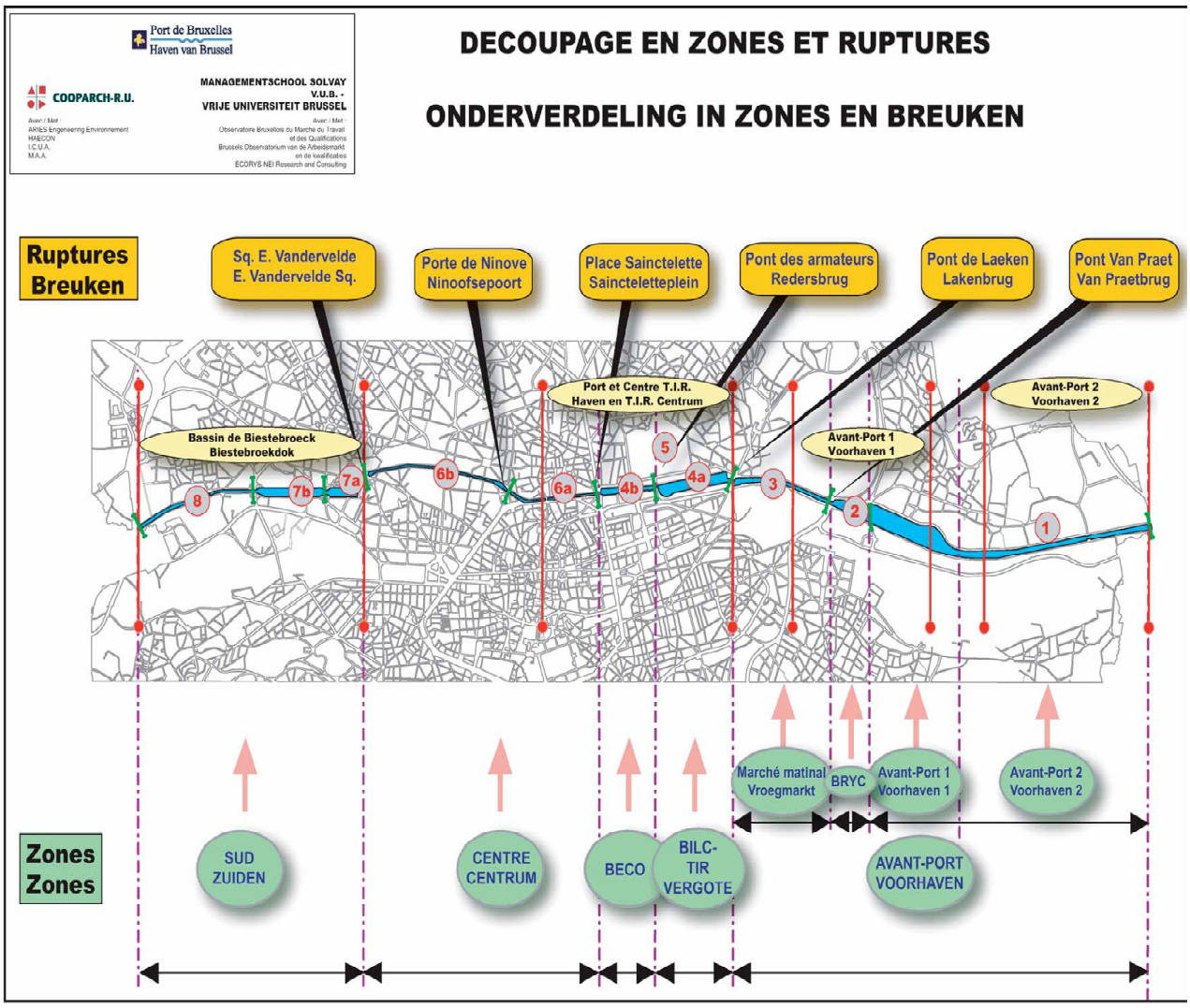


Figure 6: Decomposition in zones of the port area of the Port of Brussels (Source: VUB, Cooparch, 2003)

Starting from figure 6, it is possible to almost intuitively distinct the characteristics of several zones. Zones 'avant-port/voorhaven' and 'marché matinal/vroegmarkt' seem to show less pressure from local community stakeholders, as they are not directly adjacent to resident neighbourhoods. This is also the zone (in particular the zone 'avant-

port/voorhaven'), which has maritime quays, allowing coasters up to 4500 tons. This zone clearly has a strong maritime and port vocation . However, as these zones are not directly adjacent to resident neighbourhoods, it cannot be assumed that there is less pressure of local community stakeholders. On the contrary, the analysis of the existing situation shows that there are strong NIMBY (Not In My Back Yard) feelings towards the port activities and port development has to take into account the criteria of the inhabitants.

The zones 'vergote-BILC-TIR' and 'Béco' are located in the centre of the urban region, and are characterized by the direct proximity of residential neighbourhoods, offices and leisure infrastructure. These other functions exercise an important environmental pressure on the port activities in this zone, which consists primarily of the metropolitan distribution of construction materials (sand, concrete, bricks,…), and the presence of the TIR-centre, which consists of 160 000m2 of storage space. Spatial functional analysis showed a large degree of multi-functionality in each of these central zones.

The zone 'centre-centrum' is devoid of all port activities and is adjacent to residential neighbourhoods. The zone 'sud-zuiden' has a double face. On the left bank of the canal, there is a dominant presence of residential neighbourhoods and leisure infrastructure. On the right bank, there is a clear economical vocation with the – limited – presence of port activities, other activities (storage and distribution) which turn their back to the waterway, and growing pressure from property developers under the form of offices. The right bank is also characterized by the presence of one of the biggest European factories of Volkswagen, the German car manufacturer, contributing to the industrial landscape of the right bank.

4.3. Impact of the characteristics of each zone on the number and nature of stakeholders and criteria

During the planning process steps that defined the stakeholders and their criteria for each zone, the following observations were made:

First, the criteria of the port authority are relatively stable throughout the whole port area. For the port authority, this can be considered as normal, as the port authority as a stakeholder is univocal in all zones and has a global strategic intent for the development of the port area. However, a distinction has to be made between zones where port activities play an important role, and zones, which are actually devoid of port activities. In the case of 'active' zones, some criteria must be 'tailor-made' for a separate zone, such as the contribution to the waterborne traffic, which can be decomposed in several specific sub-criteria, depending on the characterictics of the zone. This was the case for the zone 'avant-port/voorhaven' as the presence of a container terminal and maritime quays necessitated this decomposition in a 'contribution to short-sea shipping traffic' and a 'contribution to container traffic'. Other 'variable' criteria can include 'contribution to potential synergies with neighbouring activities', e.g. the rail operators on the right bank in the zone 'avant-port/voorhaven' or specific firms e.g. Volkswagen in the zone 'sud-zuiden' on the right bank. Fixed criteria are in most cases 'contribution to profitability' (in terms of optimising revenue from leases, quays and infra- and supra-structure), 'contribution to the creation of value added services', 'contribution to the integration in the TEN-networks', 'contribution to the integration of port and city' and 'contribution to synergies with other activities within the port area'. In the case of 'passive' zones, which are devoid of port activity, the port authority can still have important interests. This was the case of the Port of Brussels, as the canal is perceived as making part of the port activities, which could negatively influence the image of the port vis-à-vis external stakeholders if the canal causes environmental harms (e.g. waste on the water surface). On the other hand, urban valorisation of the canal, bridges and locks can contribute to the port-city integration and have a positive influence on the port image, and as a consequence, on the acceptance of port activity in other zones of the region.

Second, criteria of the port user also show great stability throughout the whole port area, even more than the port authority criteria. In fact, there are limited possibilities for a degree of variability in criteria, as the port users are mostly private companies. Criteria thus consist of more traditional criteria of private firms with regard to alternative strategies as 'contribution to profitability', 'contribution to multimodal accessibility', 'contribution to the proximity to the market', 'contribution of institutional factors' (e.g.

grants or subsidies for certain activities'), 'contribution to the local employment market' (i.e. the possibility to attract qualified labour forces).
In the case of 'passive' zones, which are devoid of port activity, the port user is omitted as a stakeholder in the analysis. In the case of the Port of Brussels, this was the case for the zone 'centre-centrum'.

Third, criteria of local community stakeholders vary a lot from zone to zone. This is due to the fact that local community stakeholders are less univocal throughout the port area. In some cases, this generic category has to be decomposed in sub-categories of stakeholder groups, e.g. inhabitants, firms not performing port activity (e.g. offices) and leisure seekers. All these stakeholder groups have their own criteria. In the case of the residents, criteria can be split into two categories: economic criteria and environmental criteria. Economic criteria consist primarily of the 'contribution to local employment' (i.e. the extent to which port activities create jobs for the local community), environmental criteria consist of the contribution to environmental criteria such as 'noise', 'vibrations', 'air pollution', 'visual/architectural quality', 'local congestion', 'safety and security' etc. In the case of firms not performing port activities (e.g. the offices of one of Belgium largest banking groups adjacent to the zone 'béco'), criteria will consist of the 'contribution to the working environment', 'contribution to personnel accessibility'. etc.. In the case of residents, criteria consist of 'contribution to interoperability with other leisure networks in the city', 'contribution to visual quality', 'contribution to internal accessibility' (i.e. the extent to which the leisure activities are coherently linked within the port zone) and 'contribution to external accessibility (i.e. the extent to which the leisure zone can easily be reached from outside the region). In the case of the Port of Brussels, differences between zones were observed with regard to the extent all these stakeholder views had to be included in the planning process. In the zone 'avant-port/voorhaven', which is clearly dominated by port activities and where the degree of multi-functionality in terms of presence of office, residential and leisure function is very low, the local community is limited to the presence of inhabitants on the left bank of the canal, and their criteria as set out above. In the zones 'vergote-BILC-TIR', 'béco' and 'sud-zuiden', the port environment is characterized by a great degree of multi-functionality (or diversity of activities and functions), and the presence and pressure of a large number of different stakeholder groups. In those cases, the local

community stakeholders are decomposed in order to make a more sustainable judgement of the contribution of alternative strategies to their objectives.

Fourth, criteria of government are relatively stable throughout the port area, but should be interpreted very carefully, as they may not interfere with criteria of the local community stakeholders. The criteria of government represent the contribution to the strategic objectives of the government with regard to port activities. Here again, these criteria can be split into two categories: economic criteria and environmental criteria. The economic criteria consist of the 'contribution to regional employment' and the 'contribution to regional value added'. The important distinction with the local community is that the contribution of an alternative strategy to regional employment is measured in more global terms (i.e. the contribution on a regional level), and also consists of the compatibility of the alternative strategy with the local employment market. The environmental criteria consist of the 'contribution to ecology' (i.e. in terms of a reduction of external costs of transport), 'contribution to regional mobility' and 'contribution to sustainable spatial development of the region'. In some cases, specific criteria can be allowed. For example, as the zone 'centre-centrum' is characterized by a large number of traders in second hand automobiles, this zone has a bad image and is becoming a sort of economic ghetto in the middle of the city. In this case, a specific criterion 'contribution to economic diversity' was added to the criteria of the government. In any case, criteria of government should always be judged on the basis of the overall government strategy with regard to the long-term development of the environment of a port zone.

5. CONCLUSION

This paper has given an outline of a general approach to port planning, taking into account the different objectives of different stakeholders involved in and influenced by port development. In the case of the elaboration of a port master plan, with a time horizon of minimum ten years, stakeholder involvement can contribute substantially to the acceptance of the definitive strategies and the implementation scheme that will be executed. Although this process of direct stakeholder involvement can be time consuming, it also provides a broader societal basis and acceptance of the planning process from the start.

However, there are still some points of attention, which will need further research. First, the applied bottom-up approach apparently does not take into account external factors such as globalisation, technical developments in waterborne transportation, and interaction with other transport modes. In other words, external factors from the macro- (e.g. globalisation) and even micro-environment (technical developments in fluvial transport) of the port activity are not treated in a separate analysis that is linked to the planning process. In a next stage of the research, this analysis of external factors will be integrated into the planning process. Second, the planning process was applied to an inland port (the Port of Brussels). Further research has to be done to what extent elements of this planning process can be generalized to seaports, given the existence of a number of important differences between seaports and inland ports (Dooms, Macharis, Verbeke, 2003; Dooms and Haezendonck, 2004). Third, the implementation scheme of a master plan will need periodical reassessments, as some long-term evolutions (in particular the economical and political environment) are very difficult to control and/or predict within the time horizon of the master plan, as this horizon goes beyond a 10-year planning horizon. Further research has to be done to integrate a periodical reassessment methodology.

Finally, the empirical evidence from the Port of Brussels shows that a each port has its specific characteristics with regard to social and economical, urban planning, regulatory and environmental characteristics. Hence, the use of specific criteria cannot be re-applied in a direct way to planning processes of other ports. Each port will have to execute the long-term planning exercise on its own. However, experiences of other ports, which already accomplished the proposed planning methodology, can contribute to a further enhancement of the quality of the port planning process, and improve the long-term sustainability and acceptance of port activities in several port regions in the world.

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