Stakeholder management for port sustainability: Moving from Ad-Hoc to structural approaches

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This chapter had been included in the book:
Rickard Bergqvist and Jason Monios (Ed.). Green port: Inland and Seaside Sustainable Transportation Strategies, Elsevier

Stakeholder Management for port sustainability: moving from ad-hoc to structural approaches

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ABSTRACT

In this chapter, we critically review the stakeholder management literature applied to port(s) and port authorities, in terms of stakeholder identification and mapping. For each contribution, we discuss the main stakeholders identified, and the context(s) within which the research took place. Based on the reviewed contributions, we conclude on the generic stakeholders identified across all contributions, and highlight the rising importance of local community inclusion for port sustainability. Based on these insights, we formulate ideas for further research as well as managerial implications, and discuss structural approaches such as sustainability reporting and license to operate measurement. For stakeholder-inclusive port planning purposes, we identify and discuss six major elements for consideration in future port planning and design processes, with the aim to achieve a more sustainable port development.

Keywords: Stakeholder management, port sustainability, port planning, local community

ACKNOWLEDGEMENT

The author wishes to thank the members of the IAPH-PIANC Working Group 174 and World Ports Sustainability Program (WPSP) for their critical review of parts of the chapter, which is mainly based on the contributions of the author towards the set-up of guidelines for sustainability reporting for port managing bodies.

1. Introduction

Research in strategy and management in general has been increasingly focusing its attention on stakeholder theory following Freeman's (1984) seminal work, as more firms have become aware of the need for implementing corporate social responsibility (CSR) aspects in their planning activities. Although there have been few empirical results showing that adopting CSR-related behaviour leads to superior financial performance, it has been argued from the early stages that CSR can contribute substantially to the overall performance of a firm and to the objectives of the firm's stakeholders, including society, see Burke and Logsdon (1996). These authors have also argued that superior CSR performance can lead to the creation of strategic, business-orientated benefits. Therefore, organisations have to take into account stakeholder objectives in the planning process, and more specifically they should identify (i) the critical stakeholders who can contribute to achieving the mission and strategic objectives of the organisation and (ii) the specific strategies that can contribute to the objectives of these critical stakeholders.

The most important problem that arises is the identification of these critical stakeholders. There are many definitions of the 'stakeholder' concept, and no universally accepted definition has been accepted until now, which leads to diverse foundations of the

'stakeholder theory' and 'stakeholder management' (an in-depth discussion is provided by Donaldson and Preston, 1995; and applied to strategic port planning, in Dooms, 2010). The broadest definition of the concept is found in the work of Freeman (1984) where a *"stakeholder is by definition any individual or group of individuals that can influence or are influenced by the achievement of the organisation's objectives*". Attempts to further specify 'generic' categories of stakeholders are very difficult to achieve in practice for several reasons, largely because of ambiguity on (i) the relative importance or equality of the different stakeholders (or the 'value' and the 'stake' of each stakeholder), and (ii) the measurement of performance with regard to the objectives of different stakeholders. Furthermore, the objectives of the stakeholders are in most cases very diverse, and even conflicting. Even inside a stakeholder group, there may be conflicts between sub-groups with regard to the objectives to be pursued. This poses problems with regard to the legitimacy of the particular stakeholder group, and also makes it difficult to measure the performance of the organisation in which the group has a 'stake' has to be evaluated (Hill and Jones, 1992).

Explicit attention to stakeholder management applied to the port sector has appeared in quite limited quantities in academic research, as port activities and port development (mostly driven by port expansion programmes) experience growing resistance, in particular by local community groups opposed to the (alleged) negative externalities of port activities (such as: emissions, noise, odors, etc.). Notteboom and Winkelmans (2002) provide the first comprehensive attempt to define the port environment and have identified different categories of stakeholders: internal stakeholders (part of the port managing body organisation), and three groups of external stakeholders, namely economic/contractual external stakeholders (e.g. port companies or their representative bodies), public policy stakeholders (e.g. government agencies) and community stakeholders. Furthermore, they presented a classification of stakeholders, on the basis of their involvement in the port planning process (strong - weak), and their impact on the process (strong - weak). This led to a classification scheme, based on the work of Eden and Ackermann (1996) with four categories of stakeholders, i.e. (i) stakeholders who participate in "decision making", (ii) stakeholders who "think along", (iii) stakeholders who want to be "informed", and (iv) stakeholders who take on a "steering" role in the port planning process. It was further argued that in order to achieve sustainable port development, the stakeholder approach will become increasingly important, given the rising complexity of the port environment.

The first elements of a stakeholder-based approach in port management can however be traced back the papers by Frankel (1989) and Goss (1990a, 1990b, 1990c). Both authors concluded that the objectives of a port managing body clearly differ from those of conventional business firms, hence the need for a case-by-case approach, depending on the nature of the organisation and its mission and objectives, as well as contextual factors (such as the degree of port competition, the country in which a port operates, etc.). Furthermore, strategy evaluation for shipping and ports would need to take into account economic objectives, market share, technological advances, service level, and environmental objectives (Frankel, 1989). One of the arguments for having port managing bodies is the control of externalities inside the port area (Goss, 1990b). It was also argued that these externalities could be positive, as when additional costs and investments are made to create parks with viewpoints, streets lined with trees, or new economic functions such as leisure and recreation. Here, well-designed ports could become more attractive locations and thus

reduce externalities such as visual pollution (Goss, 1990b). Although stakeholder management theory was not explicitly mentioned in these papers, it was implicitly acknowledged that port managing bodies should pay attention to the externalities the cluster they manage causes, in particular towards the local environment (noise, emissions, visual pollution, congestion,…). Practical evidence, e.g. litigation against port managing bodies and governments, confirms that local communities as well as "mobilizer" environmental groups (national movements, and even international movements such as Greenpeace) show continued and growing opposition to port activity and port development. Therefore, a new approach to port management was advocated, integrating economic as well as environmental objectives. For strategic port planning (in particular master planning), the academic literature has supported this point of view (Moglia and Sanguineri, 2003).

One common point in the above mentioned research, excluding the fact that none of these papers showed links with stakeholder management literature, is the focus on the port strategic planning process, and the inclusion of environmental objectives in the strategic port planning process, both during the phase of port strategy definition, as well as the socio-economic evaluation of strategy. Although this research identifies the challenges, there are no comprehensive answers in terms of methodologies and/or conceptual frameworks to be adopted to facilitate actual implementation of port planning processes, neither in terms of process issues, nor in terms of evaluation. For process issues, Notteboom and Winkelmans (2002) provide a first answer with a classification based on the involvement and influence of individual stakeholders in the planning process. Earlier literature had focused on the difference between business and government objectives in port strategic planning, concluding that both have to be taken into account in port strategic planning (Coeck et al., 1997). With regard to methodologies for port planning, approaches towards integrating stakeholder objectives in the socio-economic evaluation of a port vision and strategy have been developed and applied in practice (Dooms, 2010). This last stream of research explicitly provides linkages with the stakeholder management literature, and provides advances to stakeholder theory based on case studies. Nevertheless, the focus of this research also remains exclusively in the area of stakeholder management applied to long-term strategic port planning, with no reference to stakeholder management in daily operational activities. In sum, most research considers rather "ad-hoc" approaches when it comes to stakeholder inclusion, or provides conceptual insights.

For ports, the adoption of green management (e.g. through the implementation of Environmental Management Systems (EMS) or landlord port pricing schemes with incentives for environment friendly port users) could imply that in order to be able to develop additional port capacity in the long term (through port expansion schemes, either via commercial policy or infrastructure development, or both), substantial resources should also be dedicated to stakeholder management in daily operational activities, as well as during the various construction phases of large development projects. In other words, the introduction of stakeholders in the port planning process and strategy evaluation does not seem sufficient to guarantee the long term sustainable growth and competitiveness of an individual port. Failure to achieve support for the development of new port infrastructure, not only puts at risk the facilitation of economic growth (through cargo, trade and conventional industries) through congestion due to capacity shortages. It also increasingly hampers the development of port related projects in the context of the green economy such as Carbon Capture and Storage

(CCS), on- and offshore wind power generation, and circular economy projects, for which port areas are considered as interesting locations.

As a conclusion, the attention to stakeholder management applied in the context of the port industry, and for port managing bodies specifically, emerged in the early 2000s, following major conflicts observed around large-scale development projects, in particular in Western Europe. E.g., the Maasvlakte 2 (Rotterdam), Deurganckdok (Antwerp) and Port 2000 (Le Havre) project all suffered from substantial delays due to stakeholder conflicts, in particular regarding environmental and governance related issues. This has led to a development of mainly practice inspired scientific literature on the topic, in particular based on port development and planning processes (strategy formulation and decision-making) as well as conflict identification, with relatively less attention to actual strategy implementation and day-to-day management when it comes to managing stakeholder interests. It can thus be argued that there already exists substantial research as well as methodologies on the integration of stakeholder management into long term strategic port planning processes. With regard stakeholder management in daily operational activities as well as the implementation/construction of planned projects, we observe a lack of academic literature, whereas practice shows that port managing bodies are increasingly developing activities in the context of day-to-day stakeholder management.

The present chapter explores the practices that port managing bodies have been developing and implementing in more recent years, and deducts a number of challenges for both the research and practitioner community. After a further overview of the academic literature on stakeholder management applied to ports in section 2, and in particular the issue of stakeholder identification, we discuss a number of recently emerging practices and the associated challenges for stakeholder management in section 3. Section 4 provides recommendations for both the research and practitioner community.

2. Overview of stakeholder management techniques applied to ports

2.1. Identification of stakeholders: no ‘one size fits all’

In its broadest definition, a stakeholder is any individual or organization that is influenced by or can influence the achievement of an organization’s objectives (Freeman, 1984). However, this broad definition provides little managerial relevance, as managers in a context of limited resources need to be selective in terms of the stakeholders that actually matter, depending on the issue or strategic problem at hand, at a given point in time. Several ways of classifying stakeholders have been developed and will be shortly discussed in this chapter, with a strong reference to ports.

In general, the main generic stakeholder categories for an organization are the following. Here, we make a distinction between internal and external stakeholders.

Internal:
- Shareholders
- Board members
- Management

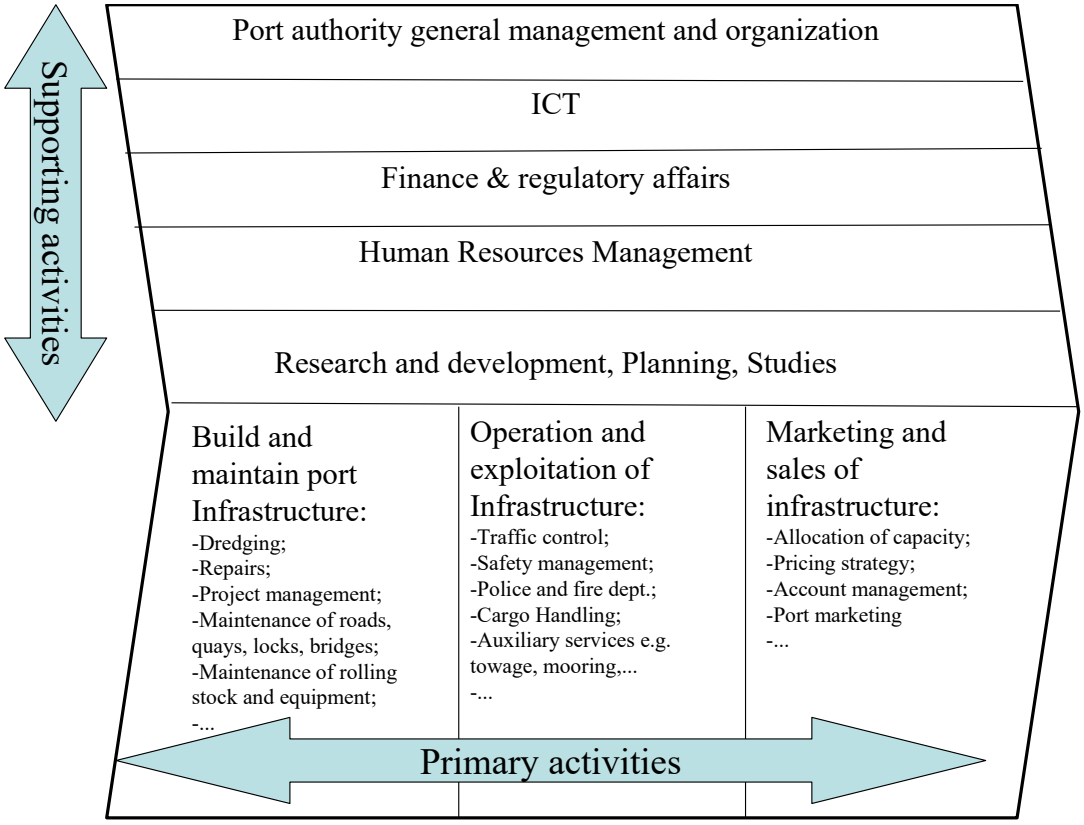
- Employees

External:
- Customers
- Suppliers
- Local communities
- Governments and regulatory agencies (local, regional, national, supranational)
- Trade associations
- Press and media
- NGOs

Depending on the type of organization (private, public, hybrid; industry type; …), both internal and external stakeholders can differ a lot. In the context of port managing bodies, the ownership and governance structure strongly determines how the individual stakeholder map is structured. Non-corporatized fully government-owned port managing bodies might not have a board of directors and sometimes report directly to one or more governmental departments. This is the case in a number of emerging or development countries. In a fully privately owned port managing body, the management traditionally responds to a Board of Directors, representing the shareholders. Some port managing bodies in the United Kingdom, Australia, New-Zealand and Turkey belong to this category. Some port managing bodies have a more hybrid nature (van der Lugt et al, 2013), i.e. being government owned but acting as a separate, autonomous legal entity, functioning along the principles of corporatized entities (with a Board of Directors, appointed by the governmental stakeholders, controlling the management). For example, the ports of Rotterdam and Antwerp belong to this type of category.

Based on the value chain of a port managing body depicted below (see figure 1), some further examples of difference in stakeholder identification for the purposes of shorter term strategy on a functional level can be deducted.

Figure 1: the Value Chain of a Port managing body (Dooms and Verbeke, 2007)



The Value Chain of an organization is a concept developed by Porter (1985) and depicts the firm as a number of separate functional activities, which each provide value to the firm's output and are each responsible to contribute to the value-creating processes (and creating the profit margin). A distinction is made between primary activities (typically the core business) and supporting activities (more generic activities supporting the primary activities). In the case of port managing bodies, depending on their operational model, some value activities will not be present, hence the stakeholders associated to these activities might be less important. We provide three examples (for an in-depth discussion, we refer to Dooms and Verbeke, 2007)

Example 1: pricing

In some countries, port managing bodies do not have any autonomy in price setting, and as such the "pricing" activity will not be present in the value chain. Given the external nature of this activity, the port, instead of having its own unit, will probably need to set up a lobbying process with external stakeholders such as the regulatory authority to influence price setting. In other countries, the pricing strategy of the port managing body is not determined by, but subject to the control and sometimes even formal approval of a specific regulatory agency (which implies an additional stakeholder to manage relations with). In other countries, no specific regulatory agency has been set up as it is considered that price setting in ports does not need any specific control from a regulatory agency (and falls under the general rule of e.g. the Competition Authority, which is then the relevant stakeholder).

Example 2: Cargo handling

Various port exploitation models exist, moving from a pure infrastructure manager and developer (landlord port, where the port only provides infrastructure) to a partially or fully integrated operation (tool and service ports) where the port managing body also provides the cargo handling services. In the case of the latter, the port managing body will have more direct contact with e.g. dock labour unions, whereas in the case of the former, the private cargo handling operators, with a concession or lease from the port authority, will need to manage this stakeholder relation more directly, and the landlord port managing body will only indirectly be involved (e.g. only in the case of long lasting conflicts).

Example 3: **Maintenance dredging**

Some port managing bodies have large in-house engineering and maintenance departments, e.g. for maintenance dredging inside the port area, whereas other port managing bodies have mostly outsourced these activities to private suppliers. This has implications on the type of stakeholder relation to manage. In the former, an internal relation needs to be managed (personnel of the department): in the latter, an external stakeholder needs to be managed, i.e. the supplier of maintenance dredging. In the case of government owned companies, this might further complicate stakeholder relations involved, as these contracts need to be awarded along public procurement rules and thus regulatory stakeholders also might be involved.

As a result, a high amount of complexity and variety of stakeholder relations can be observed, depending on the ownership, governance structure, and exploitation model of a port authority. In the following parts, more insight will be provided in both practical models that can be applied to identify and classify stakeholders. Furthermore, a number of concrete examples from practice-based academic research will be presented.

2.2. Mapping of stakeholders: the increase of and need for structural approaches

Stakeholder mapping concepts exist in many types and forms. There is no prevailing or dominant concept, which is used in practice. In general, these generic concepts and the dimensions used need to be considered as supporting frameworks to support discussions within or between various layers of management in the organization about the relative importance of individual stakeholders as well as the strategy to be implemented towards these stakeholders. More elaborated and sophisticated frameworks for the purposes of stakeholder identification, selectivity and the implications towards managerial attention have been developed by Mitchell et al (1997), Rowley (1997) and Frooman (1999).

On the port specific level, we refer to the application of ‘Strategic Environment Management’ (Strategisch Omgevingsmanagement or SOM in Dutch), which is and has been actively applied by the port of Rotterdam in the case of solving multiple stakeholder conflicts in the Maasvlakte 2 project, a large port expansion project. At one point, the port managing body was confronted with more than 200 lawsuits from various stakeholders against the project. The basic concept used to avoid the litigation was the so-called “Mutual Gains Approach (MGA)” developed at Harvard-MIT, with the following principles (based on Susskind and Field, 1996):

- Acquaintance with the objectives of the other parties or stakeholders;
- Stimulate joint fact finding;
- Minimize environmental impacts and if not possible, compensate;
- Take responsibility, admit mistakes and share power;
- Credibility at all times;
- Focus on strong, long-term sustainable relations with stakeholders.

The particular case has been published as a handbook with recommendations on how to apply the approach of Strategic Environment Management. The main ideas, complementary to the MGA principles are (Wesselink, 2010), and based on the Maasvlakte 2 project are:

- The importance of sound preparatory analysis of situations, issues, and stakeholders;
- First define the issues, then the stakeholders associated to the issue;
- Define transparent trade-offs and share them early in the process;
- Dedicate time to the most important stakeholders;
- Differentiate between constructive negotiations and conflict resolution;
- Jointly monitor the results of the joint agreements / strategies.

Following the end of litigation against the project, the Port managing body of Rotterdam has extended the MGA approach to an elaborate permanent monitoring scheme of stakeholder issues and salience, by adopting an IT-based knowledge management system that captures information on the positions, objectives and ongoing issues of about 75 stakeholders, also based and constantly updated based on the day-to-day meetings of representatives of the various departments and management layers of the port managing body with these stakeholders.

2.3. Discussion of existing frameworks: the rise of the local community

Notteboom and Winkelmans (2002) developed the first comprehensive and generic stakeholder landscape using several dimensions to classify port managing body stakeholders:

- The distinction between internal and external stakeholders
- Different groupings of external stakeholders
- A spatial dimension (sea – port – hinterland)
- The introduction of what is externally perceived as the ‘port community’

Within the context of port strategy formulation and broader inclusive exercises (such as e.g. sustainability reporting), this framework is particularly useful to translate towards the specific economic, geographic, institutional and social context within which the port managing bodyworks. However, this descriptive framework does not provide insights into the issues of selectivity when it comes to concrete management processes.

Alternative classifications have been developed in recent research on conflict identification and management in seaports (De Langen, 2007; Parola and Maugeri, 2013), but mostly confirm the previously discussed stakeholder map provided by Notteboom and Winkelmans (2002). Finally, the particularity of seaports is that they mostly operate in a public/private

context leading to particular forms of conflict. In particular, a more extended definition of port community, extending the port community as suggested by Notteboom and Winkelmans (2002) with civil society, territory and environment (Parola and Maugeri, 2013).

Further insights, based on practical examples from both sea- and inland ports, have been developed following the rise of more stakeholder-inclusive processes (resulting from the stakeholder conflict surrounding large-scale port expansion as outlined before). These insights, obtained from Dooms (2010), both refer to stakeholder identification, as well as the strategic objectives that different stakeholder categories tend to strive for when it comes to assessing port development and activities, this in its turn giving way to linking stakeholder interests to performance indicators.

Furthermore, the insights generated in this multiple case-study research lead to the identification of two important elements:

- The need to introduce a spatial dimension to stakeholder management, not only from a perspective foreland – port – hinterland but also from an internal perspective, i.e. the changing nature of port stakeholders and their interest within the port area;

- The need to take into account dynamic aspects, i.e. changing types and categories stakeholders, changing objectives, and changing orders of magnitude of impacts which influence stakeholder group importance and attitudes towards port development in the future.

A final piece of empirical research is presented through a content analysis of the annual reports of the Port of Rotterdam between 2008 and 2012 (Satta et al, 2014; Notteboom et al, 2015). This research is conceptually based on previous work (inter alia, Notteboom and Winkelmans, 2002; Dooms, 2013), but provides interesting conclusions on the communication side, as the evolution shows a growing importance of the local community as a salient stakeholder within port official communication. These conclusions are in line with the observations of Moglia and Sanguineri (2003), De Langen (2006) and Dooms (2010). However, there is no discussion on actual practices in how to manage relationships and/or develop strategies towards this stakeholder category within daily port management as most studies refer to (longer-term) port planning.

Table 1 provides an overview of the most significant contributions of stakeholder management applied to ports, since the initial framework of Notteboom and Winkelmans (2002). The table summarizes (1) the main stakeholder categories identified in each contribution (2) the research context (empirical, conceptual, policy), scope (in terms of the port strategy issue at hand) and main insight, as well as (3) the explicit or implicit presence of a spatial dimension.

Table 1: Overview of stakeholder management literature applied to ports, with a focus on stakeholder identification

Source	Main stakeholder categories considered / identified	Research context	Spatial dimension
Notteboom and Winkelmans (2002)	Internal stakeholders of the port authority External stakeholders of the port authority: - Economic/contractual stakeholders - Legislation and public policy stakeholders - Community stakeholders	Conceptual paper including a case study of an institutional arrangement leading to stakeholder inclusion in port policy making on the regional level (Flemish Port Commission)	Yes
Moglia and Sanguineri (2003)	Port Managing Body Local communities 'Global Players' (private companies) Government	Policy oriented paper discussing port planning and pressures on port managing bodies due to deregulation and globalisation Highlights the port-city interface and its integration in longer-term port planning	Yes
De Langen (2007)	Transport firms (incl. terminal operators) Port labour Local port related manufacturing End users of ports Local environmental groups Local residents Local and regional government National Government	Conceptual paper with the Port Managing Body as focal stakeholder, based on conflicts in port clusters, supported by a case study of the Port of Rotterdam Highlights the growing importance of local stakeholders	Implicit
Dooms (2010); Dooms et al. (2013)	Governmental agencies Port authority Port users (tenants) Local community	Long – term port strategic planning ; Development of port planning case studies through action research and participant observation, with a focus on stakeholder inclusion Highlights the growing importance and variety of objectives of local communities in port planning, and the need for appropriate stakeholder-inclusive mechanisms, including the need for governance changes reflecting the dynamic nature of power and interest of stakeholders	Yes

Denktas-Sakar and Karatas-Cetin (2012	Port Service Providers Port managing body Terminal operator Local communities / Special Interest groups Governmental agencies Supply Chain Stakeholders	Conceptual framework showing the influence of supply chain stakeholders on port sustainability Considers local communities, civil society and governments as a major source of pressure towards port sustainability, and the need to develop strategies integrating these stakeholder's objectives	Implicit
Parola and Maugeri (2013)	Public institutions (incl. Port Authority) Judiciary Private companies Civil Society, territory and environment	Conceptual framework classifying types of conflicts in seaports based on regulations, interests and values. Explicit attention to civil society, territory and environment as a source of conflict (and managerial attention)	Yes
Satta et al (2014); Notteboom et al (2015)	Shareholders Financial community Employees and Labour Unions Concessionaires Port users Carriers Passengers Port Service Providers Local communities and Interest Groups Regulators	Content analysis of the annual reports of the Port of Rotterdam (2008-2012) Highlights the growing importance of the local community when it concerns communication within annual reports	No

2.4. Conclusion

Based on the existing literature, both from a scientific and practice point of view, a number of generic stakeholders, both conceptually and empirically, surfaces from the viewpoint of the port managing body (or port managing body) as a focal stakeholder, in particular when port strategy is formulated, evaluated and implemented.

These stakeholder groups are:

- Governmental agencies on different geographic (local, regional, national, international) and competence levels (economy, environment, …)
- Port users, be it shipping lines, lease and concession holders (including cargo handling, industry, and logistics services) and port service providers
- Local community stakeholders and civil society at large, which are residents, tourists or non-port companies

Other stakeholders include (non-exhaustive): shareholders (if not government-owned), investors, banks, shippers, press and media, NGOs, and knowledge institutions such as universities.

Based on practical examples, the stakeholder map might be different from port cluster to port cluster, depending on the governance framework and mission of the port managing body. Therefore, the development of a stakeholder map seems a logical first step to jointly define the port cluster community for each port.

Finally, important attention needs to be paid to local communities (in particular residents), and how they are represented towards the port management body. Here, should there be no legitimatized organization representing the objectives (or stakes) of local communities, it is worthwhile, from a community manager perspective, that the Port managing body facilitates the creation of a local community interest group, given the growing impact of local communities on strategic decision-making and subsequent implementation.

3. Structural approaches towards stakeholder management in ports: the underdeveloped case of the local community.

3.1. Introduction

The previous sections have highlighted a number of important evolutions in the context of stakeholder management in ports:

- The growing importance of local community and civil society stakeholders (at large) as sources of stakeholder conflict, and the resulting need of continuous managerial attention;

- The need to design and operate stakeholder-inclusive processes, across all strategy levels (tactical, business and longer-term strategy), and across geographies;
- The emerging existence of ICT supported permanent stakeholder monitoring tools, as exhibited by e.g. the Port of Rotterdam.

In this section, we first discuss two emerging practices which could contribute to an improvement of relations with local communities and civil society at large. It concerns the practice of sustainability reporting on the one hand, and the measurement of the 'social license to operate' on the other hand. Finally, we discuss the new meaning of inclusive stakeholder management in the context of strategic port planning.

3.2. Sustainability reporting

The practice of sustainability reporting (based on different standards such as e.g. the Global Reporting Initiative (GRI) guidelines) is widely applied in various sectors of the economy by large corporations, as a complement or even a substitute for the annual report, and considered as a major element of both stakeholder relations management and stakeholder engagement (as compliance with standards such as GRI or AA1000 SES explicitly require stakeholder inclusive processes) (Kolk, 2003; Kolk and Perego, 2010). Sustainability reporting is based on a number of indicators reflecting the overall 'sustainability reality score' of a port cluster (and the organisation managing). Currenty, only a limited number of port managing bodies currently produce a full or partial sustainability or 'integrated' report, and the practice is mainly present in developed economies: e.g. Antwerp, Rotterdam, Hamburg, Bremen, Valencia, Ferrol, Göteborg, Vancouver, Los Angeles, Porto Nave.

An analysis of 10 sustainability reports has pointed out, despite the application of standards such as GRI, that there exists a lack of harmonization of both general approaches, as well as individual indicator calculation (see Geerts and Dooms, 2017). The main problems identified were:

- Although all ten reports comply with GRI guidelines, the in-depth analysis showed that full comparison between the reports is not entirely possible as some indicators were not implemented by some port managing bodies or were defined differently, which made drawing conclusions not self-evident.

- All sustainability reports that are based on the GRI principles are obliged to report about the boundaries of the report. Yet, this seems not a guarantee to fully understand the boundaries of the different indicators reported. In other words, the definition and applied scope of the boundaries seems to be an element of difference between the reports, e.g. some ports use a geographical approach, others a supply chain approach or an organizational approach based on the scope of activities, etc. In particular beyond the organizational boundary of the port managing body and in the domain of investments and economic value added, the approaches of the calculation of these indicators differed substantially.

- Some indicators such as direct employment are characterized by multiple boundaries, i.e. were calculated for the different levels of boundaries (port authority, port cluster, port region, national economy), which can potentially lead to a certain confusion and misinterpretation by stakeholders in terms of impacts.

- Finally, the analysis unveiled some indicator areas that were underdeveloped/non-existing such as supply chain performance and also unveiled the important influence of the management model of the port on the approach towards defining the boundaries of a sustainability report.

One other important limitation of the currently published sustainability reports is that, while they are an important management and communication tool on sustainable port development on the level of the port cluster authority, they provide little input as regards the actual strength of the social license to operate of the port cluster through the eyes of various stakeholder groups, in particular local communities within the often dense populated urban and city regions where ports are located. Furthermore, (limited) individual evidence gathered by port managing bodies through perception based studies has pointed to results showing potential mismatches between strategy and actions on the level of sustainability and the way these strategies, and even the port development company (and its associated economic stakeholders) as a whole, are perceived and deemed as relevant and legitimate by the stakeholder ecosystem in the surrounding social and economic environment (Dooms, 2015).

3.3. (Social) License to Operate Measurement

The practice of measuring the social license to operate refers to the development of indicators relating to the perception that local and regional port stakeholders have of the reputation/image of the port as a legitimate and responsible societal actor. Such measurements, mostly by survey instruments, reflect the 'sustainability perception score' of a port cluster (and the organisation managing) within various domains of 'port experience' (such as: economy, environment, governance, ethics, transparency). Here, given the cost and the methodological challenges, we observe that even larger ports have recently not engaged structurally into the gathering of these data and the related intelligence for improved stakeholder management (the Port of Rotterdam performs a reputation survey ca. every 5 years, see inter alia De Langen (2007), Antwerp once, Hamburg once, following diverse methodologies, and with results not always fully available in the public domain). Other measurement methods, indicative of the strength of the license to operate, relate to indicators measuring the number of citizen complaints (e.g. on noise, on odors), formal litigation cases, as well as indicators reflecting the quantity of interaction a port managing body organises with citizens.

3.4. Towards an improved intelligence build-up on local community concerns

The real value towards providing more strategic insight into potential stakeholder risk and mitigating strategies is located in the combination of the information provided by both previously discussed perspectives (reality, as provided by sustainability reports versus perception, as provided by social license to operate measurement) as it provides strategic

decision-makers a better and more objective view on the critical areas of sustainability were the port cluster shows severe vulnerability (e.g. where stakeholder perception is low, and performance is low). However, other situations where real performance is not in line with subjective perception also constitute important degrees of risk for the overall social license to operate of a port cluster, and hence, the ease at which important investments aiming at more sustainable operations (e.g. a rail link improving modal split, a waste treatment facility, etc.), as well as innovations can be brought to fruition in and around the port area (see Dooms, 2015, for an in-depth discussion). Therefore, from both a practical and scientific point of view, it is recommended to develop a strong and efficient technology-driven solution permitting the capturing of detailed data and insights regarding the strength of the social license to operate of port clusters, and linking these insights to sustainability reporting results. This would allow the key stakeholders responsible for the management and development of the cluster (mainly infrastructure development) to better align various sustainability strategies, actions and performance towards the elements that confer actual societal legitimacy for the port cluster, and provide the necessary basis for sustainable growth (which involves, inter alia, the development of new port assets).

3.5. Challenges for stakeholder inclusivity in port planning and design: a research agenda

Longer-term port strategic planning remains an important activity of the port managing body and is increasingly requested by stakeholders in order to have a view on both the shorter and longer term impacts of the port cluster, as well as the provision of a framework for private investors and operators inside the port area. However, finding agreement with and support from stakeholders remains an important challenge. Below we provide a number of elements contributing to more stakeholder-inclusive or 'stakeholder-proof' planning processes. These elements could be considered as a new toolbox for strategic port planning, although limited practical evidence and/or empirical research is available on how these elements are currently implemented or should be implemented. These elements result from a 'World Café' (Carson, 2011) supported dialogue with around 40 global port stakeholders and experts held in Antwerp in March 2018. As such, these elements could be considered as a research agenda to achieve more resilience in port planning and design from a stakeholder perspective.

- **From an ad-hoc approach towards continuous stakeholder inclusion**. Ad-hoc approaches, i.e. organizing stakeholder inclusion during longer-term planning processes (taking place every 5 to 10 years) or for large expansion projects (in the context of legally foreseen procedures of spatial planning) seems insufficient to achieve the continuous support of stakeholders during the implementation phase of master plans and resulting projects. Therefore, an intensive and continuous dialogue with port stakeholders, including local communities, is advised. This continuous dialogue could be supported by intelligence generated from sustainability reports as well as social license to operate measurement.

- **From a node-based planning boundary to integrative planning across the supply chain.** Most long-term port masterplans and visions take the boundary of the port cluster or area (as a node in the supply chain) as a basis for planning and design. This often leads to the ignorance of bottlenecks both on the maritime and land leg

connecting the port area (e.g. infrastructure capacity shortage for rail, inland waterways and road), resulting in reduced stakeholder support in the broader port region as bottlenecks are created outside the port area. Improved integration of stakeholder objectives and information from a supply chain perspective could provide more robust and supported strategic planning outputs towards the local community. Furthermore, as port areas are considered increasingly as suitable locations for the development of large-scale projects in the context of the green economy (e.g. CCS, large-scale renewable energy generation, circular economy), the claims on port land become even more complex given this changing nature of port activities, and the need to integrate more economic functions within and near the port area. The importance of these activities for ports is e.g. highlighted in the 2017 sustainability report of the Port of Antwerp, where specific indicators on the growth of the green and circular economy in the port are now monitored, and are seen as an important objective in their own right (Port of Antwerp, 2017).

- **Expanding the life cycle cost assessment (LCA) of port infrastructure development.** LCA approaches are currently mainly based on the use of construction techniques limiting maintenance costs and increasing resilience of port infrastructure towards external shocks such as climate change (e.g. rising sea levels). However, from a local community perspective, integration of retrofitting policies as well as decommissioning of port infrastructure and the potential restitution of port assets after their economic lifetime are increasingly considered as elements to be integrated in sustainable port planning and design. Retrofitting policies extend the lifetime of infrastructure assets in a sustainable way, limiting the environmental impact of decommissioning and reducing further the environmental footprint of infrastructure over the lifetime.

- **Integration of adaptability and flexibility of port infrastructure development in port planning and the need for new business models.** Shorter business cycles, technological disruption and economic volatility leading to trade flow shifts lead to the need for integration of adaptability and flexibility principles in port planning and design, to mitigate the risk of idle or non-used port assets. However, this evolution seems at conflict with the current business model of a large amount of port managing bodies, based on long-term concessions or leases to private operators. Adaptable or flexible basic infrastructure also would require larger investments by the port managing bodies, which seems difficult to support under the current framework of value distribution between stakeholders (where terminal operators seem to benefit the most, and port managing bodies have a limited financial/revenue base based on port dues and concession fees). Therefore, reflections are needed on the current framework of value creation and value distribution in port areas, should principles of adaptability and flexibility be integrated in port planning and design, permitting more efficient use of port assets (see also Taneja et al., 2010). More flexibility and adaptability leads to a more efficient use of natural (or created) resources such as port land. A number of ports, such as the port of Rotterdam, have started to publicly report spatial use and productivity parameters, including ambitious target setting, showing their willingness to local communities to more carefully consider land use (Port of Rotterdam, 2016).

- **Integration of business continuity principles in port planning and design, from a broader geographical perspective**. In this case, port planning and design should extend its scope beyond the port area boundaries, to integrate sources of external risk and disruption in the planning process. As an example, while port managing bodies can develop policies against disruption based on climate change (e.g. flooding), they should also integrate the challenges of e.g. the urban areas surrounding the port, which could likewise disrupt the port activities if their policies are inadequate against external risks posed by climate change (or other sources of shorter-term disruption such as high levels of air pollution pushing city government to limit transport movements). Therefore, port planning and design needs to integrate a dialogue with stakeholders from the wider area around the port on how to jointly address the business continuity around the port area in the context of both shorter- and longer term environmental challenges.

- **Stronger integration of technological developments in port planning and design**. Finally, it has been shown that technological developments often are underestimated in port planning and design, in particular the underestimation of design capacity of port assets against actual capacity use (in particular in the container sector), which in turn has fuelled stakeholder opposition when new expansion projects are proposed. Other evolutions such as autonomous or unmanned ships also provoke questions from various stakeholders on the future needs and principles of port operations, and their impact on infrastructure needs and developments. On the other hand, these technological developments could significantly decrease the environmental footprint of port activities (e.g. through better planning and scheduling, limiting empty voyages of ships and trucks, etc.). Therefore, port planning and design processes should explicitly include a stakeholder-inclusive dialogue on the impact of new technologies on (future) port infrastructure needs, and the associated environmental footprint.

4. Conclusions and recommendations

This chapter discussed the state of stakeholder management in the academic literature since Notteboom and Winkelmans's (2002) contribution, and provided a number of new elements, rooted in practice, to shape a research agenda to improve the quality of stakeholder inclusion when it comes to the sustainable management and development of port areas.

By means of examples, we have shown that on the level of day-to-day management, a wide variety of interactions between port managing bodies and their stakeholders exists on a broad array of issues. The literature however focusses on both business and longer term planning of port development. But also in day-to-day management, a port managing body needs to coordinate its internal functional domains (engineering, operations, sales and marketing, support functions) and keep track of the various interactions it has with stakeholders, in order to communicate a consistent image. Towards that end, some ports have implemented ICT and Knowledge Management Systems to build stronger stakeholder management capabilities and awareness of the social, economic and environmental issues affecting their image on a daily basis. Many port issues also require a cross-functional approach, e.g. environmentally differentiated pricing schemes, hence the need to internally coordinate management actions towards stakeholder issues.

Against a background of increasing opposition against port development projects on a global scale (the port of Vancouver in Canada see e.g. http://www.againstportexpansion.org; the Panama Canal port-related developments see e.g. http://panamasos.com ,…), the industry's stakeholders remain however in need of a new toolbox of managerial practices leading to increased societal support. The literature review in this chapter has highlighted the rise of both the power and interest of local communities as a definitive stakeholder for port managing bodies, which are considered as the focal stakeholder for coordinating the management and development of the port area. An important element to consider by port managing bodies is the increase of claims on port areas as a location for large-scale projects in the green economy (such as CCS, renewable energy generation and the circular economy). Such projects, while directly relevant towards sustainability objectives, and increasing the green profile of a port, could in their turn potentially suffer from the lack of support of local communities for the port activities as a whole. Therefore, an extension and revision of port planning and design tools, and the mechanisms of stakeholder inclusion, are advised.

The implementation of this research agenda, besides the vast human, financial and technological resources (such as IT systems), also requires organizational and cultural change within port managing bodies in terms of the principle that stakeholders, such as local communities, provide opportunities, and are not to be seen as a mere threat to port development.

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