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**Transitioning towards sustainability:
practices and outcomes in European and West African ports**

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Summary

Ports are sources of environmental and social sustainability issues facing society, especially local communities in the often densely populated urban areas, where ports are located. Port expansion initiatives, as well as vessel and cargo handling operations, are sometimes in direct conflict with the environment and other competing local uses of the marine and coastal environments like recreation and the provision of cultural services. The port industry is therefore under increased scrutiny for compliance to legislation, while local communities are also demanding that ports (authorities) perform their social responsibility. Sustainable development has thereby become imperative for the acceptance of the port and new port development projects by regulatory and local stakeholders as well as transnational private actors in the logistic business.

The research papers contained in this thesis take a closer look at three distinct but interrelated debates on how to transition ports towards sustainability: (i) the green port concept - as it emerged in the policy discourse of international maritime organisations as a strategy to achieve sustainability at ports (ii) the idea that port managers-through-networking can design, transfer and learn from best practice to improve their environmental performance, and (iii) the notion that stakeholder participation and environmental and social impact assessments (ESIA) can help port managers address sustainability concerns of their (local) stakeholders, especially those related to port infrastructure development. Scholarship on transitioning ports towards sustainability has so far not taken into account the disparate geographical, economic and political contexts within which these issues are taking place.

The first research paper [1] explored how the 'green port' concept is understood and translated into concrete policies and programmes by port managers in European and West African contexts. Here, special attention is paid to what I call, the selective adoption of green port measures by port authorities in the two contexts and the reasons underlying their choice of measures. The second research paper [2] examined the extent to which sustainability-oriented port network(ing) brings to bear a positive influence on the environmental performance of participating ports (authorities) and facilitates environmental upgrading. In the third research paper [3], I explored stakeholders and their sustainability concerns regarding port development projects by drawing on a case study of an ongoing port expansion project at Ghana's port of Tema. In specific, I examined whether and to what extent local stakeholders' inclusion in planning the project has a substantial influence on addressing their socio-cultural sustainability concerns related to the project.

The theoretical approach is thereby informed by a combination of critical geographical concepts and theories like Castells's network theory of power as well as the concepts of policy mobilities

and sustainability fix. Methodologically, the research drew on information collected through a triangulation of qualitative research methods including: twenty-nine semi-structured interviews with port authorities in Europe and West Africa, statutory regulatory and standards institutions, coordinators of identified port environmental networks and maritime experts; Focus Group Discussions (FGD) with representatives of local stakeholder groups; participant observation in port network(ing) events; and the analysis of literature and documents.

In research paper [1], the results show that ports (authorities) in Europe and West Africa adapt the green port idea in diverse ways. The findings show that port authorities, by engaging with the green port idea, are mapping pathways for a local 'sustainability fix'. In translating the green port idea into concrete policies, environmental priorities, regulatory requirements, financial resources and the immediate areas of competence of port managers influence the measures they adopt and implement, one reason that explains the diverse greening practices in European and West African ports. In research paper [2], the findings show that the uptake of management and technological tools designed in sustainability-oriented port networks is limited to a few pioneer ports, a finding that contradicts the dominant characterisation of networks and network governance initiatives as transformative and their best practice tools as largely transferable. While the findings show that networks are important mechanisms for circulating ideas and creating awareness, their influence in terms of the ability of participating actors to adopt their policy tools to stimulate local action is rather low. Findings from research paper [3] show that although the port authority carried out an environmental and social impact study (ESIA) and engaged local stakeholders as part of the planning process, this did not translate into addressing socio-cultural sustainability concerns of local stakeholders during the project delivery. The port authority used stakeholder engagements and ESIA merely as part of a formal procedure to depoliticize the planning process. This led to conflicts in some instances that delayed the project. Here, I argue that stakeholder-inclusive mechanisms and discourses when not applied well can become post-political tools.

In conclusion, therefore, while many ports (authorities) have implemented schemes under the banner of transitioning towards sustainability, practices and related measures vary widely across regions and in specific ports. And although this study found that port authorities have made some progress with respect to addressing their environmental and social impacts, it is also clear these initiatives, and projects are as well political discourses and narratives used by ports worldwide to balance pressure from regulators and sustainability demands from local communities with the capitalist objective of port investments. This is to allow business to continue at this current time when sustainability has become a mainstream concern, and port authorities, all over the world are under increasing pressure to address their negative impacts.

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List of research papers

Paper 1: **Lawer, E.T.,** Herbeck, J., & Flitner, M. (2019). Selective Adoption: How Port Authorities in Europe and West Africa Engage with the Globalizing 'Green Port' Idea. *Sustainability*, 11(18), 5119.

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Paper 3: **Lawer, E. T.** (2019). Examining stakeholder participation and conflicts associated with large scale infrastructure projects: the case of Tema port expansion project, Ghana. *Maritime Policy & Management*, 46(6), 735-756, doi:10.1080/03088839.2019.1627013.

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Acronyms and abbreviations

AAPA	American Association of Port Authorities
APEI	African Ports Environmental Initiative
AU	African Union
EC	European Commission
EcoPort	Network of European Port Environmental Managers
ESIA	Environmental and Social Impact Assessment
ESPO	European Sea Ports Organisation
EU	European Union
FGD	Focus Group Discussion
IAPH	International Association of Ports and Harbors
IMO	International Maritime Organization
MARPOL	International Convention for the Prevention of Pollution from Ships
NGO	Non-Governmental Organisation
PENAF	Ports Environmental Network Africa
PIANC	World Association for Waterborne Transport Infrastructure
PMAWCA	Ports Management Association of West and Central Africa
Proparco	French Development Financial Institution
SAPEIPP	Strategic Assessment of Port Environmental Issues Policies and Programs
TEU	Twenty-foot Equivalent Units
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
WHO	World Health Organization
WPCI	World Ports Climate Initiative
WPSP	World Ports Sustainability Program

I. Introductory paper

1. Introduction

Ports are a backbone to the world economy and indispensable nodes in the functioning of global supply chains. This stems from the fact that about 90 percent of world trade in terms of volume is carried by sea through ports (Rodrigue et al. 2013: 165). The port sector also contributes substantially to the economic development of many countries and port cities through direct employment, tax income and the attraction of associated maritime and shipping industries. In Europe, it is estimated that the port sector is directly responsible for about 1.5 million jobs across the twenty-two EU maritime Member States (European Commission 2015) and trade through ports, remains the major link between the export-driven African economies and world markets as well as a major source of revenue for national and local governments (Proparco 2017).

While the contributions of ports towards economic development are often perceived and amplified positively, concerns about associated adverse environmental and social impacts at and around ports, marine ecosystems and local communities where ports are located are increasing. From the dredging of shipping channels and harbour basins to provide depth for the latest generation of ships, emission of greenhouse gases and other air pollutants to the handling and managing of port and ship generated waste, ports, are sources of adverse environmental and social impacts on port cities but also considered as important sites for addressing these challenges (see Acciaro et al. 2014b; Nursey-Bray 2016; Pavlic et al. 2014).

Over the past few years, ports (authorities) are therefore under increasing pressure from regulatory, maritime and local based stakeholders as well as from the media to reduce their impacts on the environment and climate and to address related sustainability concerns of local communities in which they operate (Denktas-Sakar and Karatas-Cetin 2012; Dooms 2019; Sengar et al. 2018). In this regard, many port authorities across the globe are implementing sustainable development schemes and related policies and pursuing stakeholder-inclusive growth agendas in order to safeguard their social license to operate on the one hand, and/or to comply with legal requirements or meet social and environmental performance standards of international financial organisations (Jansen et al. 2018). Aside from this, as ships spend most of their time outside of the geographical reach of national regulators, ports are being used as strategic sites for transitioning the maritime sector towards sustainability (Bergqvist and Monios 2019). Today, environmental issues at ports are not treated in isolation as they have become increasingly intertwined with that of maritime shipping. The question now is: how can ports (authorities) minimise their adverse social and environmental impacts while remaining profitable at the same time? Discussions are ongoing with regard to the approaches, strategies and measures among

scholars, maritime practitioners and norm-setting organisations (see for e.g. Barnes-Dabban et al. 2018; Bergqvist and Monios 2019; Fenton 2017; Jansen et al. 2018; Lam and Van de Voorde 2012; Lam and Yap 2019; PIANC/IAPH 2014). A major part of this debate and related discussions revolve around three distinct but interrelated issues as discussed below.

First, the emergence of the 'green port' discourse and the argument that ports (authorities) by engaging with the green port concept, can balance the pressures for environmental protection with the goal of economic growth (ESPO 2012; Lam and Li 2019; Lam and Notteboom 2014; Lam and Van de Voorde 2012; PIANC/IAPH 2014). Since its emergence unto the policy scene, literature on green ports has been limited to developing green guides for port authorities (ESPO 2012; PIANC/IAPH 2014), economic benefits associated with implementing a green port concept and related policies (Chang and Wang 2012; Moon et al. 2018; Yang 2018); and evaluating the so-called priority green port indicators (Chiu et al. 2014; Di Vaio et al. 2018; Liao et al. 2015; Lirn et al. 2013). While a few others have engaged critically with the concept by raising questions about greenwashing and social justice (De Lara 2018; Newton 2014; Szili and Rofe 2007), the ways in which port authorities in disparate contexts understand and engage with the green port idea and their associated greening practices has received little attention. In addressing this gap, research paper [1] explored how port managers in the disparate contexts of Europe and West Africa engage with the globalising green port idea. This paper builds on scholarship on policy mobilities (Behrends et al. 2014; Bok 2014; Lovell 2019; McCann 2008, 2011; Rottenburg 2009; Vicenzotti and Qviström 2018; Weisser et al. 2014) and connect this strand of literature to work that has been carried out by Martin et al. (2019), Jokinen et al. (2018) and Walker (2016) on urban 'sustainability fix' which stresses how in the wider sustainability policies and approaches of sub-national actors like cities, the "selective uptake of certain aspects of [a] sustainability discourse, policy, [and] planning" (Walker 2016: 167) could be a key strategy in the face of neoliberal globalisation and could contribute to ambivalent "sustainability fixes" in those cities. In this paper, the green port practices in European and West African ports are presented and the underlying rationalities behind the choice of measures or schemes of ports in the two contexts are linked to debates about selective adoption, which I argue forms a critical part of the translation process of a globally circulated concept and an important approach organisations use in mapping pathways for a workable local 'sustainability fix'.

Second, the argument that sustainability-oriented port network(ing) – i.e. environmentally-oriented network governance initiatives among port managers, can facilitate policy learning, enhance capacity building, and promote the diffusion of ideas, technologies and policies in a narrow sense to stimulate local action. Proponents have placed great expectations and hope on

the transformative potential that such networks can bring to bear on participating ports and have averred that through such networks, ports authorities can mobilise 'fast policy' and learn from best practice to deliver sustainable development (Barnes-Dabban et al. 2018; Fenton 2017; Notteboom et al. 2018; Nursey-Bray 2016; WPCI 2008). While these studies have shed light on the importance of networking and how it could help to improve environmental performance of ports, research about the actual influence or effects of such networks and related network governance initiatives on participating ports is lacking. In consideration of this gap, existing forms of sustainability-oriented port networks and the policy tools they create and/or promote are described and analysed in their influence on port environmental governance in research paper [2]. In this paper, I inject policy mobilities literature that is more sensitive to the notion of learning from best practices and the circulation and/or adoption of best practice - technology, concepts, ideas and policies in a narrow sense (Andersson and Cook 2019; McCann 2008; Nciri and Levenda 2019; Peck and Theodore 2010) into Castells's network theory of power (Castells 1999, 2011, 2013) which offers a framework for analysing power relations in networks and how it can affect network outcomes.

The third issue I engage with relates to recent debates on stakeholder-inclusive mechanisms for port sustainability. In this debate, it is argued that stakeholder participation and environmental and social impact assessments (ESIA) are tools which port authorities can use to harmonise social and environmental concerns of (local) stakeholders, including communities in which ports operate (Asgari et al. 2015; Dooms 2019; Dooms et al. 2013; Jansen et al. 2018; Lam and Yap 2019). While research has largely focused on the relationship between effective stakeholder management and positive port performance, little attention has been paid to the actual effects stakeholder-inclusive mechanisms actually have on addressing sustainability concerns of local stakeholders. Research paper [3] fills this gap, by drawing on a case study of a new 1.5 billion US Dollar deep-water port infrastructure expansion project in Ghana's port of Tema. In this paper, I build on literature in political geography on the disenchantments and contested nature of participatory mechanisms (Swyngedouw 2011; Swyngedouw et al. 2002; Wilson and Swyngedouw 2014) and on stakeholder theory (Freeman et al. 2018; Freeman et al. 2010; Hörisch et al. 2014).

Pursuant to these objectives, the study draws on cases from Europe and West Africa. First, the green port idea originated from European and North American ports (Krämer and von Barga 2018). For the purpose of learning and knowledge transfer, the IAPH has placed European and African ports in the so called 'Africa-Europe' maritime common area as they are connected by sea and trade (PIANC/IAPH 2014). Recently, the European network of port managers - the EcoPort Network participated in, and gave training to West Africa ports to equip them with expertise to

implement EcoPort and sustainable development tools (UNEP 2015). Various study tours have been organised for West and Central African ports to selected European ports like Bremen and Rotterdam for purposes of policy learning and knowledge transfer (Barnes-Dabban 2018). Further, since European and African countries are at different stages of economic development but also participate in similar sustainability-oriented port networks, cases from the two contexts could provide better empirical information needed to address challenges of differential power relations in networks. Given the broad context, this study adopts a relational comparison approach which focuses on networks and flows (Peck 2015; Ward 2010). Finally, an increased injection of capital into West African ports in recent years in a bid to bridge the infrastructure gap (AfDB 2011; Proparco 2017) makes African ports suitable case studies for exploring the effects that stakeholder-inclusive mechanisms and discourses actually have on sustainability practices of ports including addressing socio-cultural concerns of local communities.

The research in this thesis offers critical insights that challenges some established or conventional knowledge about green ports, sustainability-oriented port network(ing) and stakeholder-inclusive discourses in the context of port expansion projects. It also contributes to furthering and updating the debate on sustainability fix, as it shows to a large extent how strategic selectivity or selective adoption unfolds as part of the process in which organisations and cities orchestrate a local sustainability fix.

The rest of the dissertation proceeds as follows: In the next chapter, I present a literature review of environmental and social impacts or sustainability concerns associated with ports. I proceed to link priority sustainability issues being addressed in European and West African ports to major issues on the regulatory agenda of their governments. This is followed with a brief overview of the state of knowledge on the green port concept, sustainability-oriented port network(ing) and stakeholder-inclusive mechanisms for port sustainability, in a bid to further make clear the gaps in knowledge. In chapter three, the aims or rationale of the study and specific research questions are presented. Chapter four discussed the concepts and theories that underpin the research. This is followed by the methodology in chapter five. In chapter six, I present a summary of the major results, which also serves as an introduction to the three research papers. In **Part II** of this thesis, the three research papers (published and under review) crafted in line with the research questions are presented. In **part III**, I present the appendix: sample of interview guide used and the Declaration in accordance with Article 6 of Doctoral Degree Regulation.

2. Background and state of the art

2.1. Environmental and social impacts of ports

There is a large body of research on ports and their associated negative impacts on ecosystems, society and climate (see Darbra et al. 2005; Dinwoodie et al. 2012; Lam and Notteboom 2014; Ng and Song 2010; OECD 2011a; Puig et al. 2014; Puig et al. 2015; Tzannatos 2010; Zis et al. 2015). These environmental and social impacts can be grouped under four main categories: (i) problems caused by port development including dredging and port expansion works, (ii) problems associated with port and terminal activities like the handling and storage of cargo in the port area, (iii) problems caused by services provided to ships at the port/ship interface and (iv) environmental impacts associated with intermodal transportation networks that serves the port and the hinterlands (Lam and Notteboom 2014; OECD 2011a).

Under these categories, it is estimated that there are well over thirty specific impacts (Axel 2011; ESPO 2013; UNEP 2015). Key among these are: air quality problems resulting from emission of greenhouse gases (GHGs) and other air pollutants (Bailey and Solomon 2004; Kotrikla et al. 2017; Puig et al. 2014; Tzannatos 2010), use of fuels and resulting impacts on climate (Acciaro et al. 2014a; ESPO/EcoPorts 2018; Sage-Fuller 2018; Winkel et al. 2016), environmental harm caused by improper handling and disposal of port and ship generated waste - including marine or ocean pollution and mortality of marine species (Ball 1999; Barnes-Dabban et al. 2017a; Puig et al. 2014; UNEP 2005) and oil spills into port waters (Ng and Song 2010). Others include loss of nature and important bird species as a result of new port infrastructure development (Coto-Millán et al. 2010; Ramade and Roche 2006), loss of sites with cultural, traditional and spiritual significance in the limited space of the coast and the ocean (Lawer 2019; Parola and Mageri 2013; Pearson et al. 2016) and effects of dredging operations and disposal of dredged materials (Bateman 1996; Carse and Lewis 2016; Korbee et al. 2015; Vikolainen et al. 2014). Table 2.1. presents an overview of environmental impacts associated with port development, operational activities and shipping.

Table 2.1. Overview of environmental issues at ports

Type of environmental concern	Cargo handling activities	Port/ship interface	Port development	Hinterland connection
Emission of Nitrogen Oxides (NOx)	Medium	Major	Minor	Medium
Emission of Sulphur dioxide (SOx)	Medium	Major	Minor	Minor
Exhausts of Particulate Matter (PM)	Major	Medium	Minor	Medium
Energy use and emissions of CO ₂	Medium	Major	Medium	Major
Emission of other greenhouse gases	Minor	Medium	Medium	Minor
Noise	Major	-	Major	Medium
Ballast water	-	Major	-	-
Spill of oil and other toxic substances	Medium	Major	Minor	-
Disposal of ships' toxic sludge	Major	Major	-	-
Disposal of sewage	-	Major	-	-
Disposal of garbage	Minor	Major	Medium	-
Rain/snow water removal	Medium	Medium	-	-
Dust pollution	Medium	Medium	Major	-
Handling hazardous cargo	Major	Major	-	Medium
Use of antifouling paints	Major	-	-	-
Dredging	-	-	Major	-
Disposal of dredged material	-	-	Major	-
Land-use and resource depletion	-	-	Major	Medium
Harm to marine species	-	Major	Major	-
Loss of nature/effects on ecosystems	-	Minor	Major	Medium
Loss of cultural and historical sites	-	-	Major	-

Source: Adapted from OECD (2011a)

According to Smith et al. (2014: 1- 4), between 2007 and 2012, the shipping and port sector accounted for 2.8% of global greenhouse gas emissions or double the emissions produced by air travel. They argue that this is expected to further increase by between 50% to 250% by 2050 depending on future economic and energy developments and interventions. Zis et al. (2016) have estimated that shipping through ports accounts for approximately 15% of NOx and between 5%-8% of global SOx emissions annually. These are harmful gases that are linked to adverse effects on air quality, climate change and human health. For example, Bailey and Solomon (2004) found that residents of port cities and surrounding communities suffer from asthma and other respiratory and cardiovascular disease, lung cancer, and premature mortality as a result of SOx and NOx emissions (see also Corbett et al. 2007). Similarly, the World Health Organisation (WHO) also estimated that greenhouse gas emission related pollution results in about three million deaths per year globally (WHO, 2016). In Europe alone, Brandt et al. (2011) argue that emission from shipping through ports was responsible for about 50,000 premature deaths in the year 2000

alone. High energy demands of ports and their associated industrial complexes including fuel required to power cargo handling equipment and those burnt by cargo moving trucks emit harmful gases that affect air quality (Gibbs et al. 2014; Lun 2011; Winkel et al. 2016). Due to the direct links between energy or fuel consumption and air quality and climate change, transitioning from the use of fossil fuels to renewable energy has been emphasised as an important sustainability theme to be addressed by ports (see Acciaro et al. 2014a; Boile et al. 2016; Di Vaio et al. 2018; Pavlic et al. 2014; Sage-Fuller 2018; Schipper et al. 2017; Tsai et al. 2018; Winkel et al. 2016). Despite considerable efforts that are being made in this regard, the ports industry remains largely hydrocarbon dependent across the world (Winnes et al. 2015).

Recent developments in the shipping sector, including the rapid intensification of container transport and the never-ending increase in the size of container vessels means that many existing ports need to expand existing infrastructure, build new ports on greenfield sites and related infrastructure in the hinterlands. In the first two cases, the construction of quay walls, deepening and widening (dredging) of shipping channels and harbour basins are associated with undesirable effects on coastal habitats, fisheries, historic, and recreational sites and on marine species (Carse and Lewis 2016; Sage-Fuller 2018). Thus, while these development projects are usually promoted as positive, they are often also associated with various environmental and social sustainability concerns for port cities and nearby communities. Peris-Mora et al. (2005) therefore noted that handling of dredged materials and addressing local stakeholder concerns is an important theme for sustainable ports.

Another important category is the disposal and management of waste, oil spills and their effect on conserving marine and ocean resources. It is argued that improper or illegal discharge of ship waste including its oily sludge into the port waters is harmful to marine species (Bateman 1996; Butt 2007; Coto-Millán et al. 2010). Accidental oil spills from ships that berth at ports into the port waters is also detrimental to the marine ecosystems (Ng and Song 2010). Ferreira et al. (2017: 1) have estimated that spill of oil or discharge of hazardous waste by ships at berth into the port waters could lead to losses exceeding 50% of all species and biomass that come in contact with the residue. These marine pollutants are harmful to natural habitats and could lead to the damage and loss of coastal ecology and fishery resources. Empirical analysis of water pollution in the port of Rotterdam by Ng and Song (2010) for example revealed that the main sources include ballast water, fuel oil residue and waste disposal. Innovative and efficient measures for managing waste, like the provision of ship waste reception facilities to receive, collect and process ship and port generated waste have become an important theme for port managers and an important green port measure (Barnes-Dabban et al. 2017b; Pavlic et al. 2014).

Aside the points raised above, the space (land and water) around and on which ports are constructed are not only scarce resources but also places with cultural meanings and complex values (Pearson et al. 2016). Ports take lands that are meant for recreation, preservation of cultural resources and heritage (Nebot et al. 2017; Parola and Maugeri 2013). In recent years, conflicts related to port development, involving port authorities and local communities are becoming ubiquitous. New port development projects may lead to dispossessing local people of livelihoods and cultural spaces (Jansen et al. 2018; Pearson et al. 2016). Noise pollution from port operations also remains an environmental concern for port city dwellers (Schenone et al. 2016). Some scholars propose that inclusion of stakeholders and their issues in developing ports can help port authorities to avoid conflicts and deliver sustainability (Koppenol 2014; Parola and Maugeri 2013; Ravesteijn et al. 2014).

But ports are diverse. They are unique in terms of size, culture, legislation, governance, hydrology, geography, energy demand and local or national legislation (de Langen and van der Lugt 2006; Puig et al. 2015). And as they are as well located within different cultural and economic contexts, pressure from for example government or statutory regulatory agencies, environmental activists and climate change advocates for the integration of environmental concerns into their plans may vary. Further, ports by virtue of their locational and political contexts may have different priorities when it comes to environmental and social sustainability concerns. Yet, in discussing sustainability issues at ports or green ports, most scholars and practitioners tend to focus on air quality, energy and climate change mitigation, even though topics such as sustainable waste management, and addressing social and cultural concerns of local stakeholders are also important themes. Bergqvist and Monios (2019) argue that sustainability discourses at ports should not only be limited to air quality and energy, but also other environmental and social aspects (see also Dooms et al. 2015; Schipper et al. 2017). In the next sub-section, I will introduce European and West African ports, the priority environmental issues they are confronted with and the links with major issues on governments regulatory agenda.

2.2. The research context - situating the case studies

2.2.1. Background of European ports and the ports of Bremen/Bremerhaven

Europe is major maritime hub and its ports are vital gateways, linking its transport corridors to the rest of the world. These developments have historical antecedents, and can be traced to European exploration and colonisation. In terms of trade volume, it is estimated that about 74 percent of goods entering or leaving Europe move by sea through ports (European Commission 2013). In the year 2015, the total container throughput of European ports was estimated at 3.84

billion tonnes making it one of the busiest port systems in the world (PORTOPIA and ESPO 2017: 6-8). In Europe, ports are not viewed only as a capital investment for profitability, but also as part of the social infrastructure of EU countries. An overview of the top ten EU ports in terms of container throughput for the year 2016 is shown in Figure 2.1.

Figure 2.1. Overview of top ten EU container ports

Rank 2016	Rank 2015	Rank 2007	Port	2016 1000 TEU	Growth 2015/2016	Growth 2007/2016
1	1	1	Rotterdam (NL)	12,385	1.2%	14.8%
2	2	3	Antwerp (BE)	10,037	4.0%	22.7%
3	3	2	Hamburg (DE)	8,907	1.0%	-9.9%
4	4	4	Bremerhaven (DE)	5,487	-1.1%	12.2%
5	6	6	Algeciras (ES)	4,760	5.5%	39.2%
6	5	8	Valencia (ES)	4,722	2.3%	55.2%
7	7	7	Felixstowe (UK)	4,016	-0.7%	20.1%
8	8	-	Piraeus (EL)	3,675	9.4%	167.7%
9	9	12	Marsaxlokk (MT)	3,080	0.5%	62.1%
10	11	5	Gioia Tauro (IT)	2,797	9.8%	-18.8%
11	10	9	Le Havre (FR)	2,519	-1.6%	-4.5%
12	12	14	Genoa (IT)	2,298	2.5%	23.9%
13	14	10	Barcelona (ES)	2,238	14.6%	-14.3%
14	13	13	Southampton (UK)	2,037	4.2%	9.0%
15	-	-	Sines (PT)	1,513	13.8%	908.7%
TOP 15				70,471	2.6%	15.0%
TOP 3				31,329	2.0%	8.6%

Source: Notteboom (2017)

The ports of Bremen (is an umbrella name for the commercial ports in Bremen and Bremerhaven which are organised as a single entity). The Port of Bremerhaven is located in north-western Germany, at the estuary of the river Weser into the North Sea. It is the second largest port in Germany, after Hamburg and the fourth in Europe in terms of container throughput (Bremen Ports 2018a). Together, Bremen's ports have a total of 92 berths for all sea going vessels and 14 berths for mega container vessels (Bremen Department for Economic Affairs and Ports 2018: 18). Over the years, the port of Bremerhaven has positioned itself among Europe's leading centers of commerce and freight handling making Bremen/Bremerhaven a major actor in the international global economy through shipping related port city linkages and logistic networks. The port and logistics industry over the years has remained a lynchpin of Bremen's economy. A recent research by the Institute of Shipping Economics and Logistics (2017) revealed that about seventy-seven thousand (77,000) jobs in the state of Bremen were directly and indirectly created through the port and logistics industry in the year 2015 which according to the study constitutes a fifth of every job in the state of Bremen. The port authority has since 2009 adopted a new strategy for developing and managing its ports called the "greenport" strategy (Bremen Ports 2009). The Senator for Economics, Labour and Ports, for the Bremen State at a workshop in Bremerhaven in 2014 re-affirmed the commitment of their ports to continue to apply sustainable development in its operations and developments (Bremen Department for Economic Affairs and Ports 2014). As I argue in this thesis, the green port notion is the practice of a sustainability discourse that enables the port (authority) to continue with the profit motive of port investments, like to embark on new

port development projects with little or no opposition from critical stakeholders. It allows the port authority to selectively integrate ecological and social concerns of regulatory and local stakeholders as well as that of its major customers like the BMW Group who demand for sustainability (Bremen Ports 2014).

Currently, the port has adopted and is certified to ESPO EcoPorts PERS environmental management standard and is a member of several environmental sustainability-oriented networks like the IAPH's World Ports Environmental Program and the ESPO EcoPorts Network (Bremen Ports 2014). It has won various awards for its environmental 'best practice' examples (Bremen Ports 2018a) which has cemented its role as a frontrunner when it comes to sustainability issues at ports or engaging with the green port concept. For further information on Bremen ports and the city of Bremen or its climate change adaptation initiatives, see Jonas et al. (2017), Osthorst (2015), Osthorst and Mänz (2012) and Wurzel et al. (2019). Some of the issues discussed include broader issues of the green economy and governing climate change.

2.2.2. Linking environmental priorities in European ports to key issues on the regulatory agenda of the EU

European ports are at the forefront of supporting efforts by governments and maritime bodies like the International Maritime Organisation (IMO) and the International Association of Ports and Harbours (IAPH) to reduce environmental and climate impacts of ports and shipping (Fenton 2017; Sage-Fuller 2018). This is not only to guarantee a safe and sustainable environment but also to ensure that their stakeholders deep into the ocean and the hinterland continue to support the port and its new development initiatives (Puig et al. 2015).

A recent report by the European Sea Ports Organisation (ESPO) which is based on data collected from 91 ports from 20 EU maritime member states highlights the most important environmental issues that are being addressed by EU ports (ESPO/EcoPorts 2018). The report shows that air quality remains the number one environmental priority in European ports since the past decade with energy consumption following closely (ibid: 9). Another important issue that has appeared in the priority list of issues being addressed in EU ports since 2016 is climate change. Table 2.2 below compares the top ten most important environmental problems that EU ports are addressing today as against that of ten years ago in 2009. Here it is worth pointing out the temporal shifts in environmental priorities at EU ports. For example, while air quality ranked as the sixth most important environmental issue at EU ports in 2004, it became second in 2009, and subsequently became and has remained the most important environmental issue for EU ports since 2013 (ESPO/EcoPorts 2018: 9).

Table 2.2. Environmental priorities of European ports

Rank/Year	2009	2018
1	Noise	Air quality
2	Air quality	Energy consumption
3	Garbage/port waste	Noise
4	Dredging operations	Relationship with the local community
5	Dredging Disposal	Ship waste
6	Relationship with the local community	Port development (land)
7	Energy consumption	Climate change
8	Dust	Water quality
9	Port development (water)	Dredging operation
10	Port development (land)	Garbage/port waste

Source: (ESPO/EcoPorts 2018: 9)

This shift in priorities can be attributed to the emergence of strict EU air quality standards and the limits that has been placed on the Sulphur content of marine fuel that can be used in the so-called Sulphur Emission Control Areas, which includes most parts of EUs maritime seas (Bremen Ports 2018a; ESPO/EcoPorts 2016; Notteboom et al. 2010). As noted by Kern and Bulkeley (2009), in Europe, when it comes to environment and sustainable development policies, EU policies and legislative instruments have become far more important than domestic ones. Similarly, energy consumption made its first entry into the top ten environmental priorities of EU ports in 2009 at number seven. By 2013, concerns about energy consumption had gained even much more importance and have remained so up to today. Puig et al. (2015) associated this to the rising cost of energy as a result of the global recession in 2009 which continued through 2013 in some EU countries and the increased awareness of the impacts generated by burnt gases (e.g. carbon dioxide, nitrogen and sulphur oxides) in the EU. This meant that energy management became one of the important areas for port managers where the focus changed to the use of renewable energy, energy efficiency and/or the use of low energy consumption infrastructure (Acciaro et al. 2014a; Acciaro et al. 2014b).

But environmental priorities in ports also hinge on regulatory requirements from the international, regional and national or even those akin to environmental and social performance standards and schemes of transnational bodies. Internationally, the United Nations Convention on the Law of the Sea 1982 (UNCLOS) provides a broad framework for maritime law and governance across the world. Since the 1970s, specialized agencies of the United Nations (UN), mainly the International Maritime Organization (IMO) have created regulations for the security, environment, and safety of the maritime sea trade and sector. Of particular importance is the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) and its six annexes, which have remained

the most important international convention when it comes to prevention of pollution from ships, including the illegal discharge of ships oily sludge and garbage into the ocean (IMO 2018; Rahim et al. 2016). Table 2.3 presents an overview of international legislation and governance tools that affect ports globally. In Europe, the MARPOL convention and its annexes have been integrated into EU laws for the proper governance of the maritime environment and EU nations that have ratified the MARPOL convention have also integrated it into national laws.

Table 2.3. Summary of international legislation affecting ports

Legislation/Convention	Purpose
MARPOL 73/78	Convention for the prevention of pollution from ships. Introduced first in 1973. Since then, it was modified by the Protocol of 1978 and entered into force in 1983. It has six annexes covering prevention of pollution from: (i) oil and oily water; (ii) noxious liquids substances carried by ships; (iii) harmful substances carried by ships in packaged forms; (iv) sewage from ships; (v) garbage from ships; and (vi) air pollution from ships were introduced.
Basel Convention 1992	Control the transboundary movement and disposal of hazardous waste
UNCTAD Report 1993	Need for sustainable development for ports
BWM Convention 2004	Convention for the control and management of Ships' Ballast water and sediments

Source: Authors compilation

Aside from international law, several EU laws and legal instruments influence environmental governance and sustainable development initiatives or greening schemes of ports. While political authority remains vested in national governments, the European Union and its Commission has also put in place various directives to regulate port externalities. These directives are used as legislative tools to bring different national laws in-line with each other, such that failure of a member state to transpose the directives into national law could attract sanctions (Haralambides and Acciaro 2015). It is thus a 'mandatory regime' of a sort and has succeeded to a large extent at homogenising European port policy (Haralambides and Acciaro 2015). Since it will be a daunting task to explore all pieces of EU regulation and legislative instruments that raise concerns for ports in the frame of this research, a few are discussed in detail while table 2.4 presents a general overview. These legal instruments and directives can be categorised into four main groups: (i) EU legislation that influence nature conservation like the Habitats and Birds directives (European Commission 1992), (ii) EU water framework directive (iii) EU directives on air quality and clean energy (European Commission 2008a, 2018) and (iv) EU directives on climate change (e.g. European Commission 2016).

Table 2.4. Overview of EU legislation and Directives affecting ports

Regulation	Purpose
Directive 2018/410/EU	Directive on emission reduction and low carbon investments
Directive 2016/802/EC	New Sulphur Directive. It limits the Sulphur content of marine fuels to 0.1% in SECA regions
Directive 2015/575/EC	Mandatory monitoring, accounting, and reporting of CO2 emissions from maritime activities
Directive 2014/94/EC	A framework for deploying alternative fuel infrastructure in the Union to minimise dependence on heavy oils
Directive 2012/33/EU	Directive requiring ships to use marine fuels with a maximum Sulphur content of 1.5% within EU ports
Directive 2012/27/EU	Directive on Energy Efficiency as a new strategy for jobs, smart and inclusive growth
ESPO Green Guide - 2012	Guide for sustainability transitioning of EU ports. Calls for more collaboration between port authorities
Directive 2010/65/EU	Directive to harmonize administrative and reporting formalities for ships calling at EU ports
Directive 2008/50/EC	New Air Quality Standards for the EU
Directive 2005/33/EC	Identify some EU zones as Sulphur Emission Control Areas (SECA) that must meet higher standards
Directive 2004/35/EC	Directive on environmental liability to prevent environmental damage on polluter pays principle
Directive 2002/49/EC	Directive on noise pollution to curb the negative effects of noise at EU ports on human health
Directive 2001/42/EC	Strategic EIA Directive. All planned projects needed to be assessed
Directive 2000/60/EC	The new EU Water Framework Directive means that EU ports must comply with higher river basin management standards or requirements.
Directive 2000/59/EU	Required all EU ports to have in place Port Reception Facilities for receiving ship waste
Directive 92/43/EEC	Birds and Habitats Directive. A binding framework for protecting wild birds and Natura 2000 Sites

Source: Author's compilation

It can be seen from the table above that between the 1990's and early 2000s, a major focus of EU legislation was geared towards- nature conservation (Directive 92/43/EEC), providing port waste reception facilities (Directive 2000/59/EU), ocean protection (Directive 2000/60/EC), strategic EIA (Directive 2001/42/EC) and directives for noise pollutions (Directive 2002/49/EC). The introduction of such new legislations meant that port authorities needed to contend with addressing new challenges. For example, the introduction of the directive on port waste reception facilities in the year 2000 meant that port authorities needed to prioritise the handling of waste which include the provision of infrastructure needed to receive ship-generated waste from vessels that call at the port. This regulation put forth punitive measures for violators and ports became key players in its enforcement (Becker 1998). In line with EU conservation laws including Natura 2000, the Birds and the Habitats Directives, the preservation, protection, and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora, were

made an essential objective of the EU (European Commission 1992) and became obligatory for ports to address.

However, in line with its strong commitment to improving air quality in Europe, the European Union has implemented stringent laws since 2008, including Directive 2008/50/EC (European Commission 2008a). The Environment commissioner of the EU in 2008, Stavros Dimas remarked:

the European Union has today taken a decisive step in tackling a major cause of environmental and health problems. European citizens are concerned about air pollution. The new directive on air quality addresses this concern by providing ambitious but realistic standards (European Commission 2008b)

The new directive on air quality and cleaner air for Europe, Directive 2008/50/EC contained a list of limits and target values for air pollutants which have to be observed by the member states. Member States were and still required to reduce exposure to particulate matter in urban areas by an average of 20% by 2020 based on 2010 levels. After various amendments, compliance with the limit values for NO₂ has been mandatory since 2010. Compliance with the limit values for Particulate Matter (PM₁₀) has already been mandatory since 2005 while compliance with an annual average limit for smaller particulates (PM_{2.5}) has also been mandatory since 2015 (see Bremen Ports 2018a) even though countries and ports may have different capacities to address them.

Since then, a major focus of EU environmental regulation hovers around air quality, energy and climate change. These are areas where the sulphur content of marine fuels is strictly monitored and currently capped. Since 1 January 2015, the upper limit for sulphur containing marine fuels used within the so-called Sulphur Emission Control Areas was lowered from 1% to 0.1% (Psaraftis 2019). On energy and climate policy, three key targets of at least 40% cuts in greenhouse gas emissions (from 1990 levels), 32% share of renewable energy and 32.5% improvement in energy efficiency by 2030 has been proposed in the latest EU legislation on energy and climate action (European Commission 2018). These legislations became necessary for two reasons. First, this is due to increasing concerns about the adverse effects of air pollution on human health among Europeans and an increase in public demands for political action (Brandt et al. 2011). Second, many of the oceans within the EU region are part of the so-called IMO Sulphur Emission Control Areas (SECA) (Cullinane and Bergqvist 2014). Indeed, all these pieces of legislation have implications for ports and have continued to influence the environmental plans, visions and strategies of ports (authorities) as well as academic discourses and research across Europe.

Additionally, several transnational initiatives, standards and guides also emerged. The European Sea Port Organisation which represents port authorities, port associations and port

administrations in Europe has since its establishment in 1993, made efforts to influence public policy in the EU in order to achieve a safe, efficient and environmentally friendly port sector. In 1994, it published its first-ever 'Environmental Code of Practice' to regulate environmental practice of its member ports (see ESPO 1994). This was updated in 2003 (ESPO 2003) and further developed into the ESPO 'Green Guide' in 2012 which has provided best practice examples, guidelines for green transitions and encouraged cooperation among port authorities (ESPO 2012). The ESPO Green Guide also encouraged ports (authorities) to incentivise compliance to environmental laws and targets and to harmonise these guides into daily port operational activities and development planning. Also, several collaborative initiatives have been promoted by ESPO including the Self Diagnostic Method (Darbra et al. 2004) and more recently the PRISM project which encourages EU ports to monitor and report selected environmental indicators like air quality, energy consumption and carbon footprint (Puig et al. 2014).

In Germany, port development and environmental governance is subject to a number of formal and informal decisions within German Federal and administrative systems- influenced by European law. The Federal Ministry of Environment, Nature Conservation and Nature Safety (BMU), the Federal Environment Agency (UBA) and the respective Federal state ministries and agencies are responsible for environmental management. As EU member, Germany is under an obligation to consider the implementation of the Unions rules and standards. Its ports, including Bremen/Bremerhaven are obliged to enforce for example, the new EU Sulphur directives and are influenced by its directives on energy and climate action (Bremen Ports 2018a) just like other European ports like Antwerp and Rotterdam (ESPO/EcoPorts 2016).

But the factors that influence environmental priorities in EU ports are more complex. Aside from the international, regional and national laws and transnational standards, local conditions in specific ports present peculiar environmental and social sustainability challenges for port managers. For example, the location of the port of Bremerhaven at the Weser estuary has the world heritage site (Wadden Sea) directly near the port, the European Habitat sites north and west of the port and the German nature protection sites directly inside the port. This means that the ports of Bremen have to comply with comparatively higher standards when it comes to nature protection (see Bremen Ports 2018b). Being located in an urban area also meant that they need to address issues related to air quality. A recent report by the German Nature and Biodiversity Conservation Union (NABU) revealed that up to 98 percent of Europe's urban population are exposed to air pollution levels considered to be dangerous for human health and as such, the interconnected issues of air quality, energy efficiency and reducing impacts on climate change remain the most important issues for German ports (NABU 2015). And while these sustainability

challenges may as well manifest in other ports across the world including Africa, the priorities and intensity of pressure from local stakeholders and regulatory agencies vary across specific ports and regions.

2.2.3. Background of West African ports with a focus on the studied ports

The make-up of West African ports, which forms part of the so-called West and Central African ports (see Barnes-Dabban et al. 2018) has to a large extent been influenced by 'colonial exploitation' which has resulted in many ports in the region having 'poor facilities and infrastructure' (Debie 2012: 2). The region has 20 commercial maritime ports which are mainly small and medium-sized (Gohomene et al. 2015). But with limited land access to global markets and little production of high value-added goods, about 90% of international trade of West African countries is said to be carried by sea through ports (Harding et al. 2007). For many years, ports remain one of the most crucial infrastructures for West African governments as they are the main medium for exporting goods, mainly bulk primary commodities like cocoa, manganese, iron ore, bauxite, timber and agricultural produce, containerised cargo and petroleum products (Barnes-Dabban 2018). Major West African ports include the port of Lagos (Apapa) in Nigeria, the port of Tema in Ghana, and the port of Abidjan in Cote d'Ivoire, together they form the focus of this research.

To address the infrastructure gap, the past few years have witnessed port facilities in the region been expanded and upgraded with new quays and deeper channels to meet current shipping standards and to provide the much needed efficient infrastructure for port and shipping business or new ones been developed on green fields (Proparco 2017). Recent research by Gohomene et al. (2015) found that port infrastructure remains a major determinant of port attractiveness to shipping lines in the sub-region. Private sector participation has increased in the West African port sector with Bolloré and Maersk being the major international players, operating based on the Build, Operate and Transfer principle (Debie 2012; Harding et al. 2007).

Between 2007 and 2017, it is estimated that a staggering USD 50 billion has been invested by the private sector into African ports and it is expected to grow further by 7% annually (Proparco 2017: 3). The annual capacity of ships serving the region rose from 2.7 million TEUs in 2005 to 9.2 million TEUs in 2014 (ibid). Increased shipping and new investments into African ports have, however, triggered concerns about adverse impacts of port development and activities on the environment and associated social impacts on local communities or port cities (Barnes-Dabban et al. 2018).

2.2.4. Environmental priorities in West African ports

Port environmental governance in West African ports largely follows a national and international approaches. Over the years, there has been some efforts at the regional level of ECOWAS towards homogenising port environmental issues in the region but enforcement remains a challenge (Barnes-Dabban and Karlsson-Vinkhuyzen 2018). The Abidjan Convention and the Abuja MOU are two of the region's agreements for port environmental governance. In these regional frameworks, an attempt is being made to translate global environmental agreements, including that of IMO's maritime pollution regulations into regional policies, although their influence has been minimal. In recent years, transnational network arrangements involving private and intergovernmental actors have emerged in the form of voluntary cooperation to promote environmental management and sustainable development at ports (see Barnes-Dabban et al. 2018).

This is being done within the framework of the Abidjan Convention Secretariat in partnership with the Port Management Association of West and Central Africa (PMAWCA) and environmental NGOs to promote collaborative environmental projects through which ports can exchange information and learn from best practice (see Barnes-Dabban 2018). It must be stated, however, that these efforts have neither replaced existing state arrangements nor has it totally led to homogenising environmental policies and practices of West African ports. Many of these ports continue to depend on state and sub-national policies and practices because there are disharmonies between regional and national environmental policies at the level of ports. This can be attributed largely due to differences in institutions and political will. Literature on environmental and sustainability issues in West African ports is scarce (Barnes-Dabban et al. 2018; Barnes-Dabban et al. 2017a; Barnes-Dabban et al. 2017b). It is a reflection of the low priority that has been given to environmental issues in African ports in the past. My recent field work in three ports in West Africa however shows that the most important socio-environmental issues being addressed by West African port authorities are managing ship waste and toxic sludges, and handling oil spills in order to conserve ocean resources or marine species. Table 4.5. summarises the top ten environmental priorities in the three West African ports.

Table 2.5. Major environmental issues in West African ports

Rank/Year	2016
1	Port and ship generated waste and toxic sludge
2	Oil spills
3	Handling hazardous cargo
4	Port expansion and dredging
5	Relationship with the local community
6	Dust pollution
7	Greenhouse gas emission
8	Industrial effluent
9	Municipal waste
10	Land contamination

Source: Fieldwork 2016

The priority on port and ship-generated waste reflects recent domestication of IMO MARPOL 73/78 into national laws in many West African countries. Ports authorities in the region have in recent years put in place various measures, policy tools, infrastructure and technology to deliver sustainability and have begun engaging with the globalising green port idea (Barnes-Dabban et al. 2017b). New sustainability-oriented networks with a regional focus has also emerged, all in a bid to help ports (authorities) in their bid to transition to sustainability. In the next section, I present the current state of knowledge on the three interrelated approaches for transitioning ports towards sustainability.

2.3. 'Making' sustainabilities: approaches and debates on ports

2.3.1. 'Green port' - The emergence of a sustainability discourse

In the previous section, I discussed environmental and social sustainability challenges associated with ports and the major issues of priority that are being addressed by European and West African ports (authorities). In this section, I discuss the state of knowledge on green port as a concept and the various indicators and practices that has been associated with it in the literature and by practitioners.

The concept of green port has gained increased scholarly attention during the past decade. Most of the studies on green ports originate from European and North American ports (Abood 2007; Bergqvist and Egels-Zandén 2012; Davarzani et al. 2016; Di Vaio and Varriale 2018; Krämer and von Bargen 2018; Lam and Li 2019; Mercer 2007; Satır and Doğan-Sağlamtimur 2018; Wooldridge et al. 2008; Yong and Hao 2009). A few of others focus on Asian ports (Du et al. 2019; Lirn et al. 2013; Tseng and Pilcher 2019). Studies on African ports is, however, scanty (Barnes-Dabban et al.

2017b). In terms of content, the literature on green ports largely focus on modelling and determining what is termed as priority green port factors or indicators (Di Vaio et al. 2018; Liao et al. 2015; Lirn et al. 2013). Others explore the economic benefits associated with implementing a green port policy or scheme (Moon et al. 2018; Woo et al. 2018) and management tools and technologies for green ports (Lam and Notteboom 2014; Notteboom and Lam 2018; Sköld 2019). A small group of scholars have approached the study of green ports from a critical perspective by highlighting issues of social justice and greenwashing (Newton 2014; Szili and Rofe 2007).

When it comes to green port as a concept, it has been discussed differently by various scholars. The terminology first emerged in the academic literature in the early 1990s (Burdall and Williamson 1991). In their publication titled "*A green port: an engineer's view*", the authors addressed the question whether it is possible to have a green port, which they described as one that "achieves an acceptable balance of environmental impact and commercial operation" (Burdall and Williamson 1991: 249). Yet, the question that emerged is how can such an acceptable balance be determined? They explained that "an acceptable balance must be a subjective judgement based on environmental costs and economic benefits" (ibid). As engineers, they conceived a green port as a thing out there, or a final stage of a sustainable port to be reached, albeit acknowledging how subjective this may be in terms of benchmarking indicators and related labelling. In the course of the past few years however, academics have applied the term as a concept that emphasises the need to harmonise economic objectives of developing ports with environmental and social considerations (see e.g. Bremen Ports 2018b; Chang 2016; Davarzani et al. 2016; Green Efforts 2014; Lam and Van de Voorde 2012; Sage-Fuller 2018). This conceptualisation extends the 'object' of green port to include the three legs of environmental, social and economic sustainability. The IAPH working group on sustainable ports (WG 150), summarised the key issues that interlink when talking about green port, and this include:

environmental quality issues, Habitat and integrity of ecosystems, energy efficiency and energy transition from fossil fuels towards renewables, materials and waste management, climate change mitigation and adaptation, stakeholder participation and corporate social responsibility and cooperation with private [actors] and other ports. (PIANC/IAPH 2014: 9)

Over the years, although the environmental dimension has dominated research on green ports, a few scholars also address the social scope of green ports, mainly along the lines of corporate social responsibility, employment and local communities access to port areas (see Acciaro 2015; Doods 2019; Nebot et al. 2017; Shiau and Chuang 2015). Yet on the environmental dimension, green port related research and schemes of ports (authorities), especially in advanced and developed economies of Europe and North America tend to be geared towards improving air

quality, reducing greenhouse gas emission and mitigating climate change (Bergqvist and Monios 2019; Fridell 2019; Innes and Monios 2018; Winnes et al. 2015; Zis et al. 2014). Examples of measures in this regard include providing in-port electrical connections for vessels (Chang and Wang 2012; Tseng and Pilcher 2015; Zis et al. 2014). Special attention has also been given to implementation of environmental management systems and certification schemes like ISO 14001 and the Port Environmental Review System (PERS) or the adoption of tools and technologies promoted by the WPCI network like the cold ironing technology, use of LNG and the Environmental Ship Index (ESPO/EcoPorts 2018; WPCI 2017, 2018).

However, sustainable management schemes and measures for port and ship generated waste, oil spills etc. may also be important areas for green ports for some ports depending on contextual and institutional factors, all of which vary widely across regions and specific ports (IMO 2018; Ferreira et al. 2017; 2018; Ng and Song 2010; Sage-Fuller 2018). This notwithstanding, research that explores how port authorities in different contexts, specifically in developed and developing countries understand and engage with the green port concept is lacking with only a few exceptions e.g. Lam and Notteboom (2014) who enumerated management tools used by European and Asian ports. As part of this research, I explore in research paper [1] the rationalities underlying how port authorities in Europe and West Africa engage with the globalising green port concept. Rather than a standardised practice with a clearly defined set of technologies, I propose that green port should be understood as a 'travelling idea' or a rather vague vision, with a loose (but not arbitrary) ensemble of different practices and measures. I argue that green port should be seen as a political discourse that allows port managers to selectively implement particular measures and schemes to curtail stakeholder pressures and allow development to proceed. I propose to understand the notion of a green port as a strategically defined 'sustainability fix', employed by ports (authorities) to balance economic, social and environmental concerns according to interests of regulatory stakeholders and prevailing local conditions. Seen in this way, green port becomes a local practice where the globally circulated concept or idea is translated through a continuous process of sense-making. Seen in this way, the question that need to be asked should be how do ports engage with the green port idea rather than whether it is possible to achieve a green port or related priority green port indicators.

2.3.2. Sustainability-oriented port network(ing)

Sustainability-oriented cooperation among countries, private organisations and sub-national actors has been promoted by the United Nations in Goal 17 of its Sustainable Development Goals (SDGs) as an approach to enhance knowledge sharing, capacity building and help to develop, and diffuse environmentally sound technologies for sustainable development (United Nations 2015).

In the port sector, there is a growing attention to sustainability-oriented port network(ing) initiatives. Proponents argue such initiatives can help to create awareness, learn from best practice, facilitate behavioural change, promote the implementation of organisational and management tools among ports and facilitate environmental upgrading in maritime transport and global value chains in general (Fenton 2017; Hermann et al. 2016; Nursey-Bray 2016; Poulsen et al. 2018). Several sustainability-oriented port networks, operating at various levels and scales, from the local to the global and on a wide range of different issues and topics, have emerged over the past two decades (EcoPorts 1997; PIANC/IAPH 2014; UNEP 2015; WPCI 2008). These networks concern themselves with issues on policy, management and technology.

Since then, some scholars have provided insights into the potentials of such networks for a more efficient and successful implementation of sustainable development and related policies at ports. They argue that such networks are transformative and the best practice tools they create and circulate are transformative and largely transferable (Barnes-Dabban et al. 2018; Fenton 2017; Nursey-Bray 2016). Others argue that sustainability related port network(ing) provide a level playing field for building consensus on some of the most controversial sustainability issues, facing ports and the maritime sector like sustainable transport systems, size of ships etc. (Geerlings et al. 2018). This has come to confirm Notteboom and Winkelmanns (2001) prediction over a decade ago that port networking would become the most important role of port authorities in the 21st Century due to changing dynamics in port devolution and governance. In their study on Taiwan ports, Lu et al. (2016) conclude that collaboration between port authorities was associated with positive effects on ports' internal sustainability management. In the UK, Chang (2011) found that cooperation between ports in the South-West of England led to improved economic performance for all ports. Nursey-Bray (2016) thereby argue that port networks can generate governance flows which other governance mechanisms cannot.

The literature on sustainability-oriented port network(ing) is yet to take account of the challenges and limitations that may characterise this approach. Knowledge on such networks has been one-sided. Besides, a comprehensive list of existing sustainability-oriented port networks or what I also refer to as 'transnational port environmental networks' (TPENs) is lacking. Furthermore, research that engages critically with such networks and examines whether they offer any revolutionary solutions or have any positive influence on participating ports is lacking. Research paper [2] seeks to fill this gap. Here, I do not only aim to describe existing port networks for sustainability or the policy tools they create and circulate but also explore the conditions that may affect their transformative potential or their effects on participating ports (authorities).

2.3.3. Stakeholder-inclusive mechanisms for sustainable ports

Stakeholder management has gained increased importance for port sustainability, especially in developing new greenfield projects or expanding existing port infrastructure (Notteboom and Winkelmanns 2003). This rests on arguments that it can and does help planners and port authorities to re-align capitalists' ambitions with broader-based social and environmental concerns of a diverse range of stakeholders across the land and deep into the sea (Denktas-Sakar and Karatas-Cetin 2012; Hörisch et al. 2014). It is argued for example that the inclusion of stakeholder and their concerns in port infrastructure planning and development projects provides space for co-creation of values and can facilitate meaningful decision making (Dooms 2010, 2019). Thus stakeholder engagement and participation is expected to provide quality decisions that can help to mitigate unexpected negative outcomes or/and to harness positive aspects. In the context of ports, the stakeholder approach gained prominence in the early 2000's due conflicts that emerged around large scale infrastructure projects, particularly in Europe which caused delays (De Langen 2006; Koppenol 2014; Parola and Maugeri 2013). This led to the integration of stakeholder management into long-term strategic port planning processes (Dooms 2019).

One of the first scholars who theorised distinct categories of stakeholders of a port is Notteboom and Winkelmanns (2002). They identified four groups of stakeholders namely: internal stakeholders (e.g. port workers), and three groups of external stakeholders namely: community stakeholders, contractual stakeholders (e.g., port operating companies) and public policy stakeholders (e.g., government institutions and regulatory agencies). All these stakeholders have unique claims, interests, values and concerns when it comes to port sustainability, and in particular new port expansion projects. Some scholars have proposed the conduct of environmental and social impact assessment studies to solicit stakeholder concerns and priorities (Dooms et al. 2015; Dooms et al. 2013). Others have called for stakeholder engagement and inclusion in planning and executing new port projects (Jansen et al. 2018). It is said that this would and does help to avoid conflicts and deliver sustainable development (de Boer et al. 2018; Parola and Maugeri 2013; Slinger et al. 2017).

Studies on stakeholder management and the inclusion of stakeholder concerns have however focussed largely on environmental aspects. Socio-cultural concerns especially that of local stakeholders has received clearly less attention. Aside from this, some scholars have questioned the assumed benefits of stakeholder participation for infrastructure development in general arguing that such benefits are yet to be adequately confirmed (Flannery et al. 2018; Swyngedouw 2011; Swyngedouw et al. 2002; Wilson and Swyngedouw 2014). Critics point to underlying issues of power and politics. Swyngedouw et al. (2002) argue that stakeholder participation mechanisms

may not be respected and that participation may be applied in politicised ways in that, only occasionally do local communities manage to turn the course of events in their favour. It is also reported that in some cases, extensive input may be sought in participatory engagement forums, only to have all of it ignored in the actual project execution (Tafon 2017; The Co-intelligence Institute 2008). This according to Wilson and Swyngedouw (2014) is because often, the neoliberal consensus (e.g. decisions about a port expansion project) is predetermined and fixed and those participatory forums may be created to make participants feel that they are valued and part of the project (Lawer 2019). While local communities might be interested in keeping the coastal and ocean space where ports are installed for cultural and recreation activities, port companies, multinational organisations, and governments may want to use these spaces to develop a port. This makes the ocean and coastal spaces where ports are installed prone to conflicts. Research paper [3] thereby examines the effects of stakeholder inclusion on addressing the socio-cultural sustainability concerns of local stakeholders.

3. Aim of dissertation and research questions

The research contained in this dissertation seeks to contribute to scholarship on transitioning ports towards sustainability (Asgari et al. 2015; Bergqvist and Monios 2019; Bjerkan and Seter 2019; Schipper et al. 2017). First, I explored how ports (authorities) in disparate contexts engage with and produce the globalising green port concept. Second, I examined the influence of sustainability-oriented port network(ing) on participating ports. And lastly, I examined the extent to which the inclusion of (local) stakeholders in planning 'sustainable' port infrastructure leads to addressing their sustainability concerns regarding such projects. Specifically, the following questions are asked, which are then addressed in three research papers contained in this dissertation:

Research question 1: How do port authorities in Europe and West Africa understand and engage with the globalising 'green port' idea?

Research question 2: How and to what extent (if at all) do sustainability oriented port network(ing) bring to bear positive influence on the environmental practices of participating ports (authorities)?

Research question 3: To what extent (if at all) does participation of local communities in planning port infrastructure projects ensure that their socio-cultural sustainability concerns are addressed during the project execution?

The research contained in this dissertation makes both empirical and theoretical contributions to

the field of development and critical geography as well to the emerging field of sustainability science. The first research paper offers valuable insights into conditions, processes of translation and re-interpretation of circulated ideas, and policies in the context of sustainable ports. It provides insights into how the selective adoption of certain aspects of sustainability discourse, tools and technologies can be used as a strategy for a local 'sustainability fix'. The second research paper provides new insights into how networks and network governance initiatives may privilege powerful interests. It highlights the conditions that constrain (or enable) the transformative potential of sustainability-oriented port networks and the wider challenges of learning from best practice. The third research paper provides insights into the practices of a west African port with regards to the inclusion of local stakeholders and their sustainability concerns in a port expansion project. It revealed the unfulfilled expectations and outcomes of stakeholder-inclusive mechanisms where, ESIA and stakeholder engagements were rather done as part of a bureaucratic process to meet regulatory requirements and depoliticise the planning process than to allow (local) stakeholders influence decision making. In the next section, I present the theories and concepts used in motivating and framing the research contained in this thesis.

4. Conceptual approaches

The concepts and theories that underpin my research are manifold and have different sources. Taken together, they speak to the question of how organisations and cities position themselves advantageously on the local and global scenes, particularly in a time of globalisation and neoliberalism, where the modes of environmental governance and sustainability-oriented policy-making and/or transfer and the justifications behind them are constantly changing. First, I build on the concept of policy mobilities to understand the ways in which policy lessons are selectively mobilised by port authorities and the factors that may constrain adoption or how mobile policies, concepts and ideas may change form as they travel between disparate contexts. Second, I also build on the concept of 'sustainability fix' to understand and explain the underlying motives behind the adoption of certain 'green port' measures or why ports (authorities) may integrate particular environmental goals into their management and operational procedures. This theoretical formulation enables me to analyse the diverse sustainability practices and contested outcomes in European and West African ports. Finally, I build on power based-network theories and related literature to understand the processes and conditions that constrain (or facilitate) learning and policy mobilities in regional and global sustainability-oriented port networks.

The aim of this section is to discuss the most important aspects of my theoretical approach regarding the diverse practices and contested outcomes in sustainable development discourses

and mechanisms mobilised by port authorities, rather than a comprehensive discussion. As some of the key issues are already discussed in the context of the three research papers contained in this thesis. Before I discuss these concepts and theories, I will briefly discuss sustainable development and green growth as two important development discourses which have normative underpinnings for my research.

4.1. Sustainable Development

Since its introduction by the Brundtland Commission in 1987, the concept of Sustainable Development (SD) has been embraced in both developed and developing countries and has occupied a prominent position in local, national and international policy agendas. SD begins with the argument that there is a seeming inverse relationship between economic development and environmental resources and that some ameliorative and/or revolutionary measures needed to be taken to ensure that:

[development] meets the needs of the present without compromising the ability of future generations to meet their own needs. (WCED 1987: 45)

This initial conceptualisation of SD was later expanded to include “the interdependent and mutually reinforcing three pillars of environmental, social and economic development” at the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg (WSSD 2002: 1). The goal of sustainable development is thus, to reconcile economic growth with environmental protection and social equity (Kim 2009). In pursuing this goal, world leaders had recently committed themselves to the seventeen sustainable development goals which provides a blueprint for developments that are sustainable across the globe and have also called for action from private and non-state actors (see United Nations 2015).

However, as the SD discourse meant that environmental protection became a new topic for discussion from the view point of a ‘problem’ and governments came up with political solutions, like the tightening of legislations (Ekins 2002; OECD 2011b), it is argued that SD have not achieved the radical changes that were expected of it as powerful actors who strive for development saw it as a constraint for growth (OECD 2011b; Sneddon et al. 2006). Taking the port sector as an example, ports needed to receive even larger ships which require deepening water channels and building new port infrastructure (Carse and Lewis 2016; Lam and Notteboom 2014). There was the need for a new development discourse, one that does not necessarily challenge the capitalist economic system, but rather makes a good business case for integrating environmental or ecological measures (Rosol et al. 2017). This dilemma has constrained the effectiveness of reconciling of economic, environment, and social interest in the development process globally.

4.2. Green Growth

Since the Rio Summit in 1992 and in particular, the Copenhagen Summit in December 2009, the concept of Green Growth (GG) has gained traction and occupied a prominent position in the policy discourse of international development institutions and governments (see OECD 2011b; Wanner 2015; World Bank 2012, 2018) as well as maritime organisations (ESPO 2012; PIANC/IAPH 2014). GG is a concept that seeks to harmonise environmental pressures emanating from various arenas with economic interests. The OECD (2010) have outlined two main factors that underpin the rationale for green growth. First, they argue that it emanates from a growing concern that economic growth has come at the cost of ecological resources which has caused damages at a scale that threatens human wellbeing and the prospects for future growth. Second, a realisation that “the environment and economy can no longer be considered in isolation” (OECD 2010: 13). It became clear that only a new growth discourse that promotes “economic growth that is environmentally sustainable” (World Bank 2012: 24) could serve the interest of global capitalism. In the voice of green growth’s chief spokespersons, the opposition between development and the environment can be reconciled through innovation, technological progress, partnerships and use of market-based tools in governing environmental issues and resources (Jacobs 2012; World Bank 2012). In the context of cities, Rosol et al. (2017: 1711) explains that this led to the emergence of a “new environmental regime”, one that is characterised by an increased use of eco-technologies and the diffusion of what they call “neo-managerial instruments of control (indicators, standards, rating systems, etc.) and rewards (rankings, labels, awards etc.)”. These instruments have also become the new modalities of competitiveness.

To achieve the vision of green growth, the OECD has for example called for the removal of trade barriers in clean technologies and a close cooperation among countries and sub-national actors on technology, innovation and policy learning (OECD 2010: 10). In line with the above, green growth came to be seen as a new engine for growth than something to limit it. It came with a win-win promise or discourse which does not only insist that environmental protection and growth can be compatible, but also, that protecting the environment can actually yield better growth (Wanner 2015). Seen in this way, green growth emerged as a strategy to achieve the broader goal of sustainable development rather than an entirely new concept. In practice however, it remains unclear if this can work in all parts of the world.

The transportation sector is one of the sectors and key arenas where it is assumed the green growth ‘vision’, ‘concept’, ‘strategy’ or ‘idea’ can be translated into reality (OECD 2011b: 3). According to the World Bank, the transportation sector, which includes shipping through ports

has generated a multiplicity of serious environmental, social, and economic costs that needs to be addressed (World Bank 2018). It is a sector that is mostly fossil fuel driven; with ships that connect distant places not only in terms of logistics and trade; but also waste, ballast water, and invasive species. The green growth vision has, therefore, been embraced in the maritime sector, and been associated with the green port discourse (Lam and Van de Voorde 2012; Pavlic et al. 2014). Sage-Fuller (2018) explained that ports have therefore become key players for the implementation of the global policy of sustainable development or green growth since they are important spatial constellations for shipping and for trade. In effect, what this logic seems to promote is when 'green' initiatives of ports are scaled-up, then it also means 'greening' the planet. But the question is: does this happens, and in which context?

Proponents of green growth have been criticized for what critics say are the "inherent conflicts and contradictions such as the myth of decoupling growth from the environment, pollution generation and resource consumption" (Wanner 2015: 21). Wanner criticised green growth for being obsessed with techno-fix solutions to environmental problems; and the normalisation of capitalist ideals into sustainability discourse. He argued that green growth leads to the:

neoliberalising of nature, [...] [where the] privatisation, marketization and commodification of nature continues and intensifies with green growth strategies [and that a green growth discourse helps to] divert attention from the social and political dimensions of sustainability and issues of social and international justice (Wanner 2015: 21).

Proponents of green growth have also been criticised for neglecting the politics inscribed in green technologies (Hamilton 2016; Kern 2013). Some scholars believe that green technologies which are often capital intensive, and/or designed based on the institutions, experiences, beliefs, practices, interests and futuristic visions of rich industrialised (developed) countries and organisations may not necessarily be practically realistic or applicable in other contexts, especially in developing country contexts (Bäckstrand and Kronsell 2015; Kim 2009; Scoones 2016). Earlier, Harvey (1996) in his book *'Justice, Nature and the Geography of Difference'* shared a similar view when he asserted that demanding 'high-tech' solutions to environmental problems promised not only a competitive advantage to western industries and companies, but also a strong export market and a great deal of profit to be made for the so-called superior or environmentally friendly technologies.

To understand how nations and non-state actors implemented or engage with the green port idea in practice therefore also requires engaging with concepts like transnational governance, policy mobilities and sustainability fix. These concepts help in understanding the diverse greening practices associated with ports in disparate contexts.

4.3. Transnationalising environmental governance

There has been a steady increase in the regulatory repertoire and the range of actors and institutions involved in environmental policy-making and governance over the past decades (Jänicke and Jörgens 2006). The traditional state-centric approach for environmental policy-making and governance - whereby multi-lateral environmental agreements are developed and implemented primarily by national governments, has been criticised as ineffective for solving contemporary environmental problems (Biermann and Pattberg 2012; Bulkeley 2005). Critics argue that whereas the nation-state remains an important actor, it is necessary for it to be supplemented by initiatives of sub-national and private actors (Andonova et al. 2009; Andonova and Tuta 2014; Bulkeley et al. 2012). The state is embedded in global and local discourses, intuitions and practices. As a theoretical perspective therefore, transnational environmental governance emerged as a reaction to these perceived or alleged inefficiencies of the state-centric approach and has become an umbrella term used to describe, analyse and explain the changing ways, institutions and processes through which governance of the environment and environmental issues is organised or performed (Betsill and Bulkeley 2004).

In the context of cities greening initiatives, Rosol et al. (2017) found that governance is being performed transnationally through the diffusion of new instruments of coordination such as best practice, standards, indicators and benchmarks as well as the use of various instruments of reward like certification to influence the behaviour of multiple actors at various levels and scales. Transnational networks are said to be one of the main channels through which governance of all forms can be performed (Bulkeley 2005; Bulkeley et al. 2003; Castells 1996).

In my research, I build on previous studies that have been conducted on transnational city networks for sustainability (Barbi and De Macedo 2019; Bouteligier 2013b; Keiner and Kim 2007; Kern and Bulkeley 2009). These strand of literature sets out and discusses the defining characteristics of transnational networks and the strategies and instruments networks use to stimulate local action and influence behaviour. I proceed further to interrogate claims of their efficacy, influence or transformative potential (Davies and Spicer 2015). I argue that power-based approaches that place power relations and actor interests at the centre of network analysis could provide a better insight into understanding network dynamics and conditions that can constrain (or enhance) the transformative potential of networks and network governance initiatives.

4.3.1. Transnational networks

Networks have been increasingly recognised as important value-adding governance mechanisms in contemporary governance theory (Bulkeley 2012; Provan and Kenis 2008; Rhodes 1997). A network could be defined as “a set of interconnected nodes” characterised by a “purposeful, repetitive [...] sequence of exchange and interaction between physically disjointed [...] social actors” (Castells 1996: 442, 470). According to Castells, what a node is, in concrete terms, depends on the kind of network that one speaks of (ibid) and the interactions and exchanges could take the form of infrastructure and material flows or interactions between societal actors - whereby the coordinating standards bind networks’ components together or guide action and behaviour (Castells 1999: 295). Flows can stimulate local action among network actors who are located at distant geographical locations. The central argument of the network approach according to Brass et al. (2004: 795) is that “actors are embedded in networks of interconnected social relationships that offer opportunities for and constraints on behaviour”. Networks are transnational, when at least one actor is a non-state actor (Risse-Kappen 1995: 3). The typology of networks now extends to professional, business, trade, policy, advocacy and knowledge as well as epistemic communities. I will not resume the typology debate here, since it has been provided elsewhere (see e.g. Holton 2005; Rhodes 1990; Watts 2004). Rather, I will focus on the rationale of networks or the network logic, particularly those related to sustainability related education, learning and diffusion of policies and technologies.

In the face of perceived or actual inefficiencies of the international regime, network theorists argue that networks are created to perform regulatory coordination at different levels and scales (Barbi and De Macedo 2019; Betsill and Bulkeley 2004). Kern and Bulkeley (2009: 311) link network governance initiatives to broader process of multi-level governance - whereby globalisation processes have led to “shifting competencies between local, national and supranational governmental institutions [or] the entire range of actions and institutions which provide order (including public-private partnerships, nonstate actors and so on)”. Governance initiatives between state and non-state actors like city officials or port authorities on a range of topics or issues and for the purpose of learning from best practice and related diffusion of ideas, concepts and the like have been conceptualised as transnational networks (Bulkeley 2006; Keiner and Kim 2007; Pattberg and Widerberg 2016). The network approach, therefore, could be used to understand and explain how policy actors learn from their peers or influence behaviour. In this thesis, I approach network governance initiatives among port authorities as transnational networks - in and through which port authorities design policy measures, facilitate policy learning to improve their environmental performance and deliver sustainable development, either at port

level or upgrading along the value chain.

Kern and Bulkeley (2009: 309-310) identified three defining characteristics of transnational networks: (i) their actors (individuals, organisations and/or governments) can freely join or leave a network of interest based on the rules of inclusion and exclusion; (ii) they are often characterised as a form of self-governance because they appear to be horizontal; and (iii) it is expected that decisions that are made in network; the standards that are reached and the policy measures, tools and technologies that are designed would be adopted or implemented by the participating actors to cause change. Much of the literature on networks assert the position that networks could and actually do apply their capacities to facilitate the implementation of network standards, protocols, programs and targets and can provide expertise to their members (Jordana 2017; Oosterveer 2018). Bulkeley and Newell (2015) argue that networks contribute to shaping behaviour and ensuring compliance with particular targets, goals and norms. Similarly, Gustavsson et al. (2009) conclude that transnational networks provide opportunities for participating cities to collaborate, share knowledge and learn from best practice policies and ideas. Networks may thus play crucial role in educating and helping participating actors learn from their peers (Bulkeley 2006; Dolowitz and Marsh 2000; Dunlop 2009; Ochoa et al. 2018). Learning is understood here following Dunlop (2009) as a knowledge acquisition process. And network events such as conferences, study tours may be used for capacity building and disseminating a wide array of best practice examples (Andersson and Cook 2019). In this sense, a major role attributed to transnational networks is that they act as channels for knowledge transfer within and between organisations and/or states (Clegg et al. 2016).

Kern and Bulkeley (2009: 319) identified three internal governance strategies of networks namely: (i) information sharing and communication; (ii) project funding and cooperation; and (iii) recognition, benchmarking and certification. First, they explain that transnational networks may act as a conduit for the flow of information and best practices. Networks develop data bases of best practice examples and/or provide their members with a dedicated website and monthly newsletters (Andersson and Cook 2019). It is expected that this can contribute to capacity building and encourage or stimulate local action, usually through adoption (Anttiroiko 2015). Second, Kern and Bulkeley (2009) explained that through transnational networks, actors may jointly work together on a particular project, organised often around working groups. This allows for closer collaboration between actors as they tend to work more closely together on particular themes or topics. An example could be the project ports and working groups in the WPCI network where particular ports work closely together on technologies and policy tools like the ESI, Onshore Power Supply and Sustainable Lease Agreement (Fenton 2017). Third, transnational networks create

award schemes to reward good doers and punish laggards. It is argued that this can serve as peer pressure on members participating in a network and can influence behaviour, especially of the laggards (Rosol et al. 2017). Through benchmarking, it is expected that actors can compare their performance against others or can be guided by a network's defined standard and codes of conduct. Aside this, a network may develop certification schemes to distinguish or label actors according to their performance- usually based on the adoption or implementation of the network's coordinating tools and standards, either as frontrunners or laggards (Ochoa et al. 2018; Stead 2012).

Effectiveness of a network is understood as its "capacity to solve problems and deliver better [practical] outcomes" (Daugbjerg and Fawcett 2017: 3). Castells, relates influence and effectiveness of a network to what he calls the power of the network - which can be determined based on the number of participating actors that use the network's coordinating standards and tools (Castells 2011). Some scholars also argue that transnational networks do exert external influence, mostly in the form of lobbying nation-state and intergovernmental institutions on issues of interest to their members, like policy and legislation (Kahler 2015). But do networks actually do or achieve what the literature says about them in practice? In the next sub-section, I discuss the disconnect between the rhetoric underlying network logic or discourse and reality.

4.3.2. Critique and limitations of networks

Scholarship on networks has been criticised for what critics noted is, its, myopic and one-sided view on the efficacy and transformative potential of networks and network governance initiatives (Davies and Spicer 2015). Chief among this critique is the lack of theorising power relations and actor interest in networks and how networks could be used in pursuing interests of powerful actors (Smith 2012; Stalder 2006; Zhen et al. 2019). It is argued that network processes and projects may be driven by interests of powerful actors and that unequal power relations among actors will not offer every actor the same level of benefit (Davies 2007). Davies and Spicer (2012) describe the disconnect between network rhetoric and practice as hypocritical. They argue that empirically, rarely can one observe the positive benefit claims that are often ascribed to networks and network governance initiatives.

Lee (2013) in his work on climate change mitigation initiatives among city officials noted that not all city officials who participate in such collaborative initiatives are able to influence decisions, cooperate in real terms with each other or even implement coordinating standards and policy measures expected to stimulate local action. Davies (2012) noted that rather than a mechanism for cooperation, networks have become key elements in the hegemonic projects of neoliberalism.

Similarly, Kern and Bulkeley (2009: 309) argued earlier that networks “appear to be primarily networks of pioneers for pioneers” as they tend to privilege pioneering, influential and active members more often than other participating actors. In this sense, networks may be perpetuating exclusions, contrary to the claim that network(ing) facilitates cooperation and can bring positive effects on participating actors.

Writing on the notion of learning from best practice for example, Bulkeley (2006) argues that practices that are promoted as the ‘best’ are often based on the political rationalities of powerful actors and this provides little guarantee that other actors may adopt them. Similarly, Kern and Bulkeley (2009) assert that collaboration in a real sense is very often limited within networks to very influential actors since they have the needed funds and expertise, and tend to work more closely. This suggests that even within the same network, one may observe core-periphery dynamics when it comes to relations between social actors. Thus, rather than a mechanism for transforming behaviour, networks may be used by powerful actors to further establish their legitimacy (Davies and Spicer 2015). It maybe siphoning ingenuity among less powerful and resourceful members of the network. Further, Kern and Bulkeley (2009) argue that benchmarks, standards and certification, which are usually mentioned as internal governance tools in networks are in reality difficult to implement as networks lack the coercive authority and cannot impose sanctions. Certification may thereby be confined to the most active and influential actors such that the transformative potential of networks on perceived laggards or inactive actors may be low.

Since the capacity of actors with regard to e.g. supporting network activities and projects may vary, Saz-Carranza and Ospina (2010) are of the view that power relations and actor interest cannot be taken for granted in analysing network outcomes or the influence that networks and network governance initiatives may bring to bear on participating actors. The transformative potential of a network becomes a relational effect that can be enhanced or constrained by how power and actor interests play out in network processes, including for example deciding which issues are placed high on a network’s agenda or which standards and interventionist technologies are prescribed. A network approach that pays attention to power dynamics could thereby be very useful for analysing the extent to which sustainability oriented port network(ing) may bring to bear positive influence on the sustainability practices or environmental performance of participating ports (authorities). This is further discussed below.

4.3.3. Network theory of power

In the last decade, a framework that pays attention to power relations and actor interests in networks and how this may shape network outcomes emerged in Castells’s (2011) ‘network theory

of power'. It is part of a broad effort to cure the challenges of network theory. In this work, I build on Castells understanding of power as a "relational capacity that enables a social actor to influence asymmetrically the decisions of other social actor(s) in ways that favour the empowered actor's will, interests and values" (Castells 2013: 10). Following criticisms that were levelled against Castells' for overlooking power and actor interests in networks, as well as who holds it and how it may influence network processes and outcomes (Holton 2005; Stalder 2006), Castells turned his focus to theorising power and social relations in networks. He relates contemporary manifestations in a networked society to power relationships embedded in the fabric of networks (Smith 2012). First he identified two ways through which power could be exercised in networks. These are (i) by means of coercion or the possibility of it and (ii) by the "construction of meaning on the basis of the discourses through which social actors guide action" (Castells 2013: 10).

Based on this, Castells (2011: 773) categorised four types of power that can be observed in networks namely: 'network-making power', 'networked power', 'network power', and 'networking power'. He described network-making power as the power possessed by some actors to exercise control over others by virtue of their ability to constitute a network, set its agenda and be able to recruit or convince other actors to join. This Castells argue may allow a privileged few to create networks around their interests and priorities. His second type of power, the 'networked power' refers to the influence which certain actors have over others in the network. It refers to the relational power that is diffused through networks, being realised at the point where specific interactions occur (Smith 2012). It can be expected that those who initiated the network, or played a role in setting its agenda or those with financial resources to support network activities and projects may wield this power (Bouteligier 2013a). Castells's third type of power which he calls the 'network power' refers to the power of the network itself over the participating actors – which is seen in terms of the number of actors that actually implement its standards or use its policy tools (best practice) to guide and stimulate local action. The forth type of power, which Castells called the 'networking power' refers to the power that actors participating in a particular network may have over those who are excluded from it.

Rather than a static analysis of networks based on aims and objectives, the categories identified by Castells can help researchers analyse how power relations and actor may play out in a network and how this could affect outcomes. For example, whereas sustainability-oriented port network(ing) is often perceived to be non-hierarchical and apolitical, and their policy tools transformative and largely transferable, analysis from a Castellian network theory of power perspective can help researchers deconstruct how interests of powerful actors' influence network process and the tools, technologies and coordinating standards that emerge. From this

perspective, one can explain the conditions that enhance or constrain the transformative potential of a network - seen in terms ability of a greater number of participating actors to use the networks coordinating standards.

While Castells network theory of power may be a useful framework for understanding power dynamics and how this could enhance or constrain network potential, it need critical injection from literature or a concept that is more sensitive to the notion or phenomenon of learning from best practice or the circulation and adoption of policies, ideas, concepts and technologies, which is the central issue addressed by scholars of policy mobilities.

4.4. Policy mobilities

Policy Mobilities (PM) as a concept has both theoretical and methodological relevance for my research. This stems from PM paying attention to transnational network(ing) processes and adopts a critical perspective to analysing the global circulation of policies, concepts and ideas. A decade has passed since the concept of policy mobilities emerged and took off within human geography and critical policy studies (McCann 2008). As a concept, PM seeks to make sense of travelling policies and explore how ideas from elsewhere shape local policy debates and practice at another place (McCann and Ward 2012; Peck and Theodore 2010; Temenos and McCann 2013). As Wood (2015b: 393) neatly puts it, the interest of PM is analysis of the “physical, social and [/or] theoretical movement of ideas, concepts, objects, people and places”. In contrast to a focus on government-government policy learning and transfer that has dominated political science scholarship, PM focuses on transnational knowledge networks and how they initiate and facilitate the circulation policy ideas, knowledge, practices and programs across space. According to Peck (2011), the PM approach is more geographically sensitive and engages with the problematic of policy transfer. It questions orthodox notions of smooth transfer and adoption of best practices that work elsewhere and argues that the process of learning from networks or diffusion of policies and ideas “is much more complex, [and] selective” (McCann 2011: 111). In critiquing the underlying argument of policy transfer scholars, McCann strongly makes the point that:

policies, models, and ideas are not moved around like gifts at a birthday party [or fully formed and off-the-shelf products], or like jars on shelves, where the mobilization does not change the character and content of the mobilized objects (McCann 2011: 111)

PM therefore adopts a relational approach that focus on the relationships of assemblages and policy learning and links sites of innovation with sites of emulation, implementation, and/or contestation (Ward 2010; Wood 2015b). For Jamie Peck, the PM approach deals with more than just policy transfer but rather the “relational interpenetration of policy making sites and activities”

(Peck 2011: 14). In recent years, attention is also being directed at immobility of policies, ideas and concepts (Lovell 2019) and how path-dependent elements may constrain their transferability or adoption. This is because policies and practices that are promoted as 'best practice' are often "creatures of dominant interests traveling from centers of authority along politically constructed and ideologically lubricated channels" (Peck and Theodore 2012: 170). From a post-colonial perspective, Silva (2015) for example, documented the contestations that occur when African countries are directly or indirectly coerced into taking up hegemonic (urban) planning concepts of European countries.

As a theoretical approach, PM places emphasis on processes of translation, to understand the mutation of policies and ideas as they travel (Andersson and Cook 2019; Bok 2014; McCann 2008, 2011; McFarlane 2010; Peck and Theodore 2010; Wood 2015a, 2019). Originally associated with Actor-Network Theory (Callon 1984), the concept of translation has become increasingly relevant for understanding how policy actors make-sense of, and selectively adopt or implement elements of particular policies and technologies or engage with particular ideas or discourses (Behrends et al. 2014; Bok 2014; Vicenzotti and Qviström 2018; Weisser et al. 2014). Behrends et al. (2014: 3) conceptualise translation as a sum total of the "process of transfer, adaptation and appropriation" of a policy or idea. They argue that as policy models are de-territorialized from their original setting and re-territorialized in new settings, there is often some "embodied knowledge that does not travel with the [...] model" and that it "needs to be re-invented at the new sites through experimental practice and experience" (ibid: 2). In other words, when circulating policies or sustainability ideas like the green port idea is encountered or taken up at distant locations, it is local conditions and people that will shape its implementation into forms that can help them address demands for sustainability. It can take a new form and engineer new practices that may be different from the initial idea. It is translated in the new setting. Vicenzotti and Qviström (2018) relates this to economic geography ideas of codified and tacit knowledge. For example, in my research, the green port concept originated from Europe and North American contexts and has been associated with particular practices and technologies (Gonzalez Aregall et al. 2018; Krämer and von Bargen 2018). But as West African ports encounter this idea through their participation in sustainability-oriented port networks and networking events, and begin to engage with this idea (Barnes-Dabban et al. 2017b), they may adopt or implement measures that fit the material, political and institutional contexts of their ports. Hein (2011) for example, demonstrates that while global forces and circulated ideas may influence transformations that may take place in ports and port cities, it is local interests and values that shape their form and that (port) city officials, as entrepreneurs, will follow their own needs and interests without necessarily respecting the original

designs and plans that were circulated.

Similarly, Kim (2009: 28) argues that translation is influenced by interest and culture. Conceiving greening as a “process whereby a sustainable development-related set of norms [are] internalized and mainstreamed through institutional learning”, she argued that northern countries have their own experiences- particularly those related to environmental pollution and that their ‘green’ plans and practices are influenced by this tradition. Kim problematised the phenomenon where poor countries from the Global South are required to implement these ideals, often using development aid or related schemes of control as an instrument. She argues that this is nothing but a veil to further the interests of Japan and its western partners, their development interests, sustainability visions and the capital-intensive environmental technologies that are provided by their companies. This may come across as a form of governmentality- a phenomenon “which goes on whenever individuals or groups seek to shape their own conduct or the conduct of others” (Walters 2012: 11).

Policy Mobilities also pays attention to power relations in knowledge, advocacy and policy networks. McCann (2008: 12) argued that networking events are spaces where “actors simultaneously teach about their own practice and learn about practices of others”. Thus, policy actors may join global networks for varied goals or objectives. It could be to learn and adopt measures and tools that work elsewhere and which they believe will fit in their own contexts, or to insert and legitimise their practices or story into network conversations and make their local versions of sustainability the definitive one. Some actors may as well also join particular networks to score political points at the local level, as they can show their membership of sustainability-oriented networks to stakeholders who demand for sustainability. This makes networks and networking events not only spaces of innovation but also places of competition or improving competitiveness. It can be expected that those with the power to insert their stories and practices may shape what becomes accepted or perceived as desirable, a situation where e.g. some ports may be described as green, clean or dirty depending on their adoption or non-adoption of certain technologies and green tools respectively.

The above discussions on policy mobilities offer analytical tools for analysis of learning from best practice in sustainability-oriented port networks as well as analysing how globally circulated concepts or ideas, like the globalising green port idea are translated in disparate contexts. It provides analytical tools to draw linkages between spatially diverse but yet conceptually similar phenomena, and the selective adoption of certain sustainability measures by port authorities in different contexts based on local conditions, a theme that is also the crux of the concept of sustainability fix.

4.5. Sustainability fix

To understand and analyse how profit making objectives of ports and requirements or demands for sustainability such as addressing socio-environmental concerns of local and regulatory stakeholders play out, or how port authorities resolve the political tensions between development and demands for environmental protection, I build on urban geography literature on sustainability fix (see Bina 2013; Jokinen et al. 2018; Martin et al. 2019; Nciri and Levenda 2019; Temenos and McCann 2012; Walker 2016; While et al. 2004). The concept of 'sustainability fix' was introduced by While et al. (2004) building on Harvey's (1981) 'spatial, temporal and spatio-temporal fix' thesis. Aidan While and his colleagues defined a sustainability fix as "the selective incorporation of ecological goals in the greening of urban governance" (While et al. 2004: 551) that promote the notion of harmonising economic growth with social development and ecological protection. According to Jokinen et al. (2018: 551), it is a "political discourse and decision making through which cities [and organisations] use a selective promotion of sustainability targets, in order to accommodate both profit-making in global economic competition and environmental concerns in their development agendas". The concept, thus re-directs attention to recent waves of policy interventions and experimentation of cities and organisations which seek to harmonise the contradictory motives of capitalist production with demands for sustainability.

While et al. (2004: 551) emphasise that sustainability fix as a concept "does not deny the progress or improvement that are made on environmental issues, but draws attention to the selective incorporation of ecological goals in the greening of urban governance [...] and to the dilemmas urban regimes in different cities [...] face in balancing economic, social and environmental demands". They explained that key among the pressures which organisations have to address include increased regulatory requirements, demands from local communities or pressure from activist groups and environmental advocates (Steger et al. 2007). The concept has since been adopted and applied to the study of sustainable urban agriculture (Walker 2016), sustainable planning (Jokinen et al. 2018) and policy (im)mobilities (Nciri and Levenda 2019; Temenos and McCann 2012). Drawing on Jessop (1990) and his understanding of 'strategic selectivity', Martin et al. (2016: 167) for example, argued that in the wider sustainability policies and approaches of cities, "the selective uptake of certain aspects of sustainability discourse, policy and planning" can be a key strategy adopted by those cities in the face of neoliberal globalisation that can contribute to ambivalent "sustainability fixes" (see also Jokinen et al. 2018; Nciri and Levenda 2019; Walker 2016). For Long (2016), the ambiguous and diverse goals of sustainable development that have left room for interpretation has allowed a diverse set of policy actions to be labelled under the popular discursive banner of 'sustainability'. And since cities and organisations differ in terms of

institutional and regulatory pressures, policy actors may selectively and strategically integrate particular policy actions and measures that can enable them to reduce the political tensions between development and environmental protection in their contexts (Temenos and McCann 2012). Relating this to sustainability-oriented port networking for example, one can argue that while powerful actors (financially, politically or discursively) may legitimise specific versions of sustainability along particular sets of indicators and best practice, selective adoption become inevitable as all other actors map up pathways to orchestrate a local sustainability fix (Temenos and McCann 2012). Other powerful or emerging powers can develop alternative or parallel measures or strategies.

So far, little has been said about how this selectivity unfolds. Lawer et al. (2019) using the example of the globalising green port discourse seek to show how this selectivity unfolds in European and West African ports. Here, I argue that ports (authorities) in different contexts will adopt measures that fit both institutional and the material contexts of their ports. The bundle of measures from a possible ensemble of policy tools that are adopted by port authorities may be determined by two interrelated factors: (i) the pressure for incorporating environmental or sustainability goals such as legislation, historical or recent environmental incidences, level of local advocacy for climate change mitigation or even requirements from customers in the logistic chain; and (ii) internal factors in the organisation including local economy, level of development and the financial and technical capacity to implement certain green measures and technologies. In this way, implementing a green port policy for example becomes a local practice, whereby port authorities translate or make-sense of globally circulated concepts and ideas and integrate measures in relation to their competencies, pressures, constraints and incentives in their bid to remain competitive. In the port sector for example, Giuliano and Linder (2013) showed how the ports of Los Angeles and Long Beach (United States of America) introduced the so-called Clean Air Action Plan due to increasing local pressures while Santos et al. (2016) showed how European ports have to undertake environmental reporting in fulfilment of institutional requirements.

Engaging with the concept of sustainability fix can therefore help to explain disparities in green or sustainability schemes and practices of ports in European and West African regions and the rationalities underlying them. Here I argue that, by engaging with the green port idea, port authorities are primarily pursuing a workable local sustainability fix. This theoretical formulation can help us to move beyond a lateral understanding of green port rhetoric toward a more nuanced and critical analysis of the phenomenon whereby port authorities selectively promote and implement green measures and agendas in their management plans and operational structures and procedures. By using While et al.'s (2004) sustainability fix as a conceptual

framework, I aim at demonstrating how port authorities employ a strategically defined 'sustainability fix' to balance their economic, social and environmental concerns according to local pressures and the ports own economic interests. Such a fix may be more political than technical (or both), and may be geared towards managing "ecological dissent", and/or or pursuing more "accumulation strategies" (While et al. 2004: 554).

4.6. Combining the approaches

How meaningful are the above discussions to the topic of transitioning ports towards sustainability and analysing practices and outcomes in European and West African ports? First, by building on recent discussions on policy mobilities and sustainability fix, I am able to explain the ways a globally circulated idea unfold locally under demands for sustainability at ports in disparate contexts. These theoretical starting point provide the foundation to analyse how ports (authorities) in Europe and West Africa translate the globalising green port idea into concrete practices. This theoretical formulation helps to unravel how selectivity unfolds - with regard to the underlying rationalities behind particular choice of practices and measures of ports (authorities) in engaging with the green port idea. A critical reflection on stakeholder-inclusive mechanisms help to unravel and deconstruct the politicised ways in which port authorities use certain sustainability discourses or narratives to depoliticise planning processes or curtail pressure from stakeholders rather than to co-create mutual sustainability values with local stakeholders. Second, by taking a critical approach to the study of networks – one that pays attention to issues of power and actor interests, and by building on the literature on policy mobilities, I interrogate the excessive claim about the efficacy of networks and network governance initiatives. Thus, it enables me to analyse the effects or transformative potential of networks, and specifically, the influence that sustainability-oriented port network(ing) or transnational port environmental networks (TPENs) bring to bear on participating ports (authorities). Taking network theories and sustainability fix together also bring attention the fact that local sustainability or green schemes and initiatives are crucially translocal (Lang and Rothenberg 2017). By far, this theoretical formulation brings to the fore the relational factors that may underpin the adoption of certain technologies and the transformative potential of network(ing) initiatives.

A common thread that run through these approaches is that they all help in challenging conventional knowledge about green ports and its associated practices and labelling as well as stakeholder inclusive discourses and network governance initiatives. Having discussed the theories and concepts that underpin this study, the next chapter presents the methodological aspects of my research.

5. Research methods

In this chapter, I outline and describe the methodological considerations for this research. These include: the methodological approach, how information (data) needed for the research was gathered from a large range of actors and sources and how the data was organised and analysed.

5.1. Methodological approach

Methodology refers to how (social) "reality" is conceptualised and studied (Crang and Cook 2007). According to Zeegers and Barron (2015: 61), methodology can be understood as "the reasoning that informs particular ways of doing research, or the principles that inform the organization of research activity". The choice of a methodology, therefore, depends very much on the objectives of the inquiry and the information that is needed to achieve these objectives (Clifford et al. 2010; Saunders 2003). In this research, I deal with three interrelated approaches of transitioning ports towards sustainability. Specifically, I examined the effects of sustainability-oriented port network(ing) on the environmental performance of participating ports (authorities), how port authorities in Europe and West Africa understand and engage with the globalising green port idea, and finally the extent to which stakeholder-inclusive mechanisms and discourses employed by ports (authorities) help to co-create value and address the sustainability concerns of (local) stakeholders in a port extension project.

To achieve these objectives, the qualitative research approach was deemed more appropriate (Flick 2014; Hay 2005; Limb and Dwyer 2001). Qualitative research resonates with the interpretive paradigm, which analyse social reality as multifaceted. It is suitable for capturing the nuances of people' experiences as well as their opinions, values, practices and perceptions about a social phenomenon within context (Bryman 2001). The qualitative research approach is more suitable for my research also because: (i) two aspects of my research follows a policy mobilities approach and relies on stories, conversations and experiences of those involved in sustainability-oriented port network(ing) and framing port sustainability discourses or orchestrating a workable local sustainability fix. This requires a method that can unravel the rationalities behind certain sustainability discourses. (ii) one aspect of my research deals with experiences of stakeholders in stakeholder-inclusive processes that are expected to deliver sustainable infrastructure development, which also requires methodologies that can bring out subjectivities.

To have a comprehensive understanding, explanation and presentation of the issues outlined, I drew on data from (i) literature and document analysis to gain insights into sustainability issues and practices as well as sustainability oriented network initiatives of ports, and (ii) engagements

with port authorities, terminal operators, network coordinators, maritime experts, and representatives of local stakeholder groups in selected ports and port cities. Wood (2015b) provides a set of procedures for researchers interested in analysing traveling ideas, best practice and transnational networks that frame, legitimise and circulate policies and ideas. According to Wood, since policy flows are not quantifiable but are “part of an uneven movement of ideas and experiences that involves power and personalities [...], and the exchanges taking place between actors and localities [may] rarely lead directly to uptake” scholars can: (i) follow the people (actors) to learn about “their understandings of mobile policies”, (ii) follow the materials that travel, what he calls an “experiment with a Latourian approach to materiality” and/or (iii) follow the meetings, i.e. the conferences, workshops and seminars which are the places where policy actors and material converge (Wood 2015b: 391).

A content analysis (Bryman 2001; Bryman and Burgess 2002; Guest et al. 2011; Nowell et al. 2017) was then carried out on the data that was generated in-line with the research objectives and relevant theories and concepts that informs the research. In the next sections, I explain how and from where or whom data was collected, organised and analysed. I follow this with a discussion of the challenges that were encountered during the research process and how rigor and credibility of the material was enhanced and achieved (Miles et al. 2014).

5.2. Analysis of literature and documents

The first stage of this research involved searching port websites, journal articles and all possible sources for information on sustainability oriented port networks and the greening schemes and initiatives of ports. I searched for sustainability-oriented network initiatives involving port (authorities) and also terminal operators, environmental NGOs and academics or scientists that have policy learning, benchmarking best practice, designing ‘green port’ measures and tools, exchanging experiences, building consensus on sustainable port systems, policy circulation and helping ports to implement the global policy of sustainable development in a broad sense as their objective or reason of being. McFarlane (2011) notes that journal articles and reports of conferences, workshops and study tours can be important sources of information on mobile policies and networks.

I began first by scanning official websites of ports in Europe and West Africa to identify which sustainability or environmentally oriented networks exist. This led me to compile an extensive list of existing networks for the greening of ports. Once this was done, I turned my attention to retrieving publicly available (policy) documents and reports from the websites of identified networks with information on their objectives, their actors and the best practice coordinating tools

they design and/or circulate. The most important documents that were analysed include: (i) green port strategy document of the port of Bremen (see Bremen Ports 2009), (ii) sustainability reports of the ports of Bremen for 2014 and 2016 (see Bremen Ports 2014, 2016b), (iii) environmental report of the ports of Bremen for 2015 and 2018 (Bremen Ports 2016a, 2018a), (iv) official documents of various port environmental networks (ESPO/EcoPorts 2016, 2018; IAPH 2007; WPCI 2008; 2018), (v) European Sea Port Organisation (ESPO)'s Green guide for its ports (ESPO 2012), (vi) green port document for West and Central African ports (UNEP 2015), (vii) legislation that affect ports in European and West African contexts (e.g. European Commission 2008a; 2016, 2018; IMO 1997), and (viii) the environmental and social impact assessment report of the Tema Port Expansion Project (GPHA 2015).

Analysing these documents helped me to understand the reasons behind the sustainability discourse employed by ports (authorities) in disparate contexts as well as why and how they pursue a local sustainability fix (Research paper 2). It also facilitated the selection of the three major sustainability-oriented port networks from the compiled list for detailed analysis of the influence they bring to bear on participating ports (Research paper 2). Networks were selected based on their geographical coverage and the availability of information about the coordinating policy tools or measures they design and circulate. The selected networks include the World Ports Climate Initiative (a global network), the EcoPorts Network (network of European port environmental managers), and the African Ports Environment Initiative (network of West African port environmental managers). Document analysis also helped me to reconcile the sustainability rhetoric of ports e.g. in ESIA reports with what they actually do on the ground (Research paper 3). The importance of literature and document analysis for social scientific research has been documented in the literature (Bowen 2009; Miles et al. 2014; Silverman 2015). As noted by Neuman (2003: 310), document analysis as a research technique is suitable for gathering, reviewing and analysing the content of a document. Bowen (2009: 30-31) argued that it provides background and context information, and serve as a means of 'tracking and verifying findings' from other data sources. Document and literature analysis thus help researchers to contextualise their own work within a broader field and provides important information which a study otherwise could not have gathered empirically. Document analysis also provided a basis for identifying the particular types of networks and the specific ports (authorities) to follow or study (Bouteligier 2013a) and has also helped in improving the trustworthiness of my findings and to connect 'reality' with theory (Eisenhardt 1989; Gerring 2006; Yin 2013).

5.3. Collecting primary data

Primary information was collected using in-depth semi-structured interviews, focus group discussion and participant observation with actors involved in policy mobilities as well as local and regulatory stakeholders who make sustainability demands from ports (authorities). For my inquiry into how port authorities in Europe and West Africa engage with the globalising green port idea, empirical information was collected from places of pioneership (ports) and places of emulation (Peck and Theodore 2012). For my research on sustainability oriented port network(ing), empirical information was collected from selected ports in Europe (Bremen/Bremerhaven) and West Africa (Tema, Abidjan and Lagos) that are participating in the three sustainability-oriented port networks that were selected for this study, as well as from coordinators of these networks and experts (academics) in the field. For stakeholder participation and addressing local sustainability concerns, a single case study, involving interviews and focus groups with stakeholders involved in the port expansion project was done. These are further discussed below.

5.3.1. Semi-structured in-depth interviews

A total of twenty-nine (29) in-depth interviews were conducted with key informants - port authorities, terminal operators, environmental NGOs, representatives of local stakeholder groups, port environmental service companies and national environmental regulatory and standards institutions in Germany, Ghana, Nigeria and Cote d'Ivoire (see table 5.1 for details). Semi-structured interview guide was used for the data collection. According to Clifford et al. (2010), interviews involve talking with people in ways that are self-conscious, orderly and partially structured. It allows the researcher to listen to what the researched have to say without being judgmental (Kvale and Brinkmann 2009). It is, thus, a relational process that can reveal the how an adopted policy or concept has been translated into practice, or how port networks are used by powerful actors for experimentation or even how port authorities' sense-making processes of a global idea or similarly circulated concepts and objects (Wood 2015b). An in-depth interview is one in which the interviewer with the help of a checklist of topics asks questions on the issue under inquiry and gets the interviewee to talk in detail in their own terms, thereby allowing individual perspectives, experiences, values and themes to emerge (Creswell 2009). In this context, the focus of the interview tends to be on the depth of the information rather than the number informants that are interviewed (Baxter and Jack 2008). The interviews were conducted between May 2016 and July 2018 in a total of three different field trips.

The semi-structured interview guides were designed to provide a framework for the interviews

while allowing the flexibility to adapt, depending on newly emerging information. This helped me to understand particularly: (i) how port authorities in disparate geographical, political and economic contexts understand and adapt the green port idea, (ii) the environmental priorities of European and West African ports, (iii) the green port practices of ports and the reasons behind their decision to take-up certain green port tools and technologies and not others, (iv) port authorities' experiences in port environmental networks, (v) the influence that such networks bring to bear on participating ports, seen in terms of their ability to learn, adopt and/or implement policy tools that are circulated in such assemblages and the factors that affect uptake or adoption of measures, tools and technologies that are promoted as the 'best' (vi) the socio-cultural sustainability concerns of local stakeholders regarding a new port extension project and (vii) whether the inclusion of stakeholders in planning port expansion projects does ensure that their concerns are addressed. Respondents preferred to be anonymous for some comments and particular revelations that they made and their anonymity is respected in the data presentation. References to quotations are thereby made using roles or functions like a port environmental officer, a network coordinator, etc. in those instances.

Table 5.1. Summary of interviews

Number of interviewees	Category
9	Port environmental managers
3	Terminal operators
3	Network coordinators
1	Ports environmental service companies
1	Regional port association officers
8	Environmental regulatory and standards institutions
3	Representatives of local community stakeholder groups
1	Maritime experts
29	Total

5.3.2. Focus Group Discussion (FGD)

To understand how and to what extent stakeholder-inclusive port development discourses does address local stakeholders' sustainability concerns, an ongoing 1.5 billion US Dollars deep sea port expansion project in Ghana's port of Tema, which has been described by many as the most ambitious port expansion project ever on the West Coast of Africa was selected as a case study. The rationale is to examine the extent to which stakeholder views, concerns, and priorities are accommodated during the project execution. In-line with the above, a Focus Group Discussion (FGD) involving 15 people - comprising the chief of Sakumono fishing community, opinion leaders, fishmongers, the chief fisherman and ordinary community members was held. Focus

group is “a form of group interview that capitalises on communication between research participants in order to generate data” (Kitzinger 1995: 299). The discussions centred on the major socio-cultural sustainability concerns of this local fishing community with regard to the proposed port expansion project and the reasons underlying reasons. Topics for discussions included their involvement in the planning process, the conduct of the environment and social impact assessment, and factors that constrain stakeholder consensus. FGD’s are important sources of information, as they allow specific groups of people under inquiry to discuss an issue in their own terms by exchanging anecdotes and commenting on each other’s experiences and point of view. Through this method, shared and common knowledge, and their feelings about the port authority’s stakeholder management practices emerged. The underlying reasons behind their sustainability concerns with regard to the port infrastructure expansion project was discovered and clarified. FGD is an appropriate method for this purpose because it offers a natural fit for studying culture and heritage (Carey and Asbury 2016) and in this context, its relationship with sustainability.

5.3.3. Participant Observation

Taking part in activities of a group of policy actors or practitioners, whom one is studying provides important insights that interviews and FGDs may not be able to capture. This process is known as participant observation (Clifford et al. 2010). At the green port congress (conference) held in Venice, Italy from the 12-14 October 2016, I spent hours with my notebook taking notes of the often taken-for-granted features of conferences -i.e. as mediums through which best practice on port sustainability are presented and ordained as transformative and largely transferable. McCann (2011: 123) argues that participant observation in networking events can be used as a complementary method to understand the social process of learning and policy diffusion and the embedded power relations within and among communities of practitioners and or scientists. McCann further argued that participant observation can help researchers to identify key actors that seem to be central to discussions about what is desirable, what issues are more important to address, and which policy tools and measures should be adopted by participating actors.

During this event, I observed how networking activities “shape and are shaped by institutional, spatial and scalar dynamics” (Andersson and Cook 2019:1). The conference, which was attended by mainly port authorities from Africa, Europe, America, Asia, academics, technology companies, regional port organisations, and government officials was a medium to discuss major breakthroughs in technology for greening ports, and the new port sustainability discourses, that can help ports address socio-environmental concerns without compromising growth. Leading ports in Europe and America dominated discussions as they were given the platform to present

their best practice projects and to give an update on for e.g. the level of implementation of policy tools and measures that are designed and promoted via the World Ports Climate Initiative (WPCI) like the cold ironing technology and the Environmental Ship Index (ESI). This demonstrates how certain voices or less powerful actors might have their discourses lost in most important debates. Technology companies also gave presentations that beckoned port authorities' attention to the 'urgent' need to address climate change and transition to the use of renewable energy.

The conference was, thus, situated in, and shaped by, wider social and institutional contexts of these very large range of actors. I saw how some port authorities asked questions about how to implement certain technologies and how they also explained the constraints about taking up others. Further, I observed how several presentations from port authorities in Europe about measures and schemes they have implemented in accordance to the globalising green port idea and how these were seemingly made to look like 'obligatory passage points' for all ports to be considered or labelled green ports. There is first sight opportunity to observe, the argument that networks and networking events like conferences are 'informational infrastructures' (McCann 2008, 2011) where port managers get educated on sustainable development and green port policy. Aside this, I was also scheduled to take part in a study tour that was organised by the Ports Environmental Network Africa (PENAf), coordinators of the African Ports Environment Initiative (APEI) for West African ports to the ports of Bremen, Germany (in October 2017), and later to the port of Rotterdam and even though I could not participate. The reports were nonetheless made available to me and provided a great deal of vital information.

5.4. Analysing the data

Organising and analysing data forms a major part of the research process. In qualitative research, data analysis is not entirely a separate process from data collection (Miles et al. 2014; Nowell et al. 2017). It is an iterative process whereby the researcher does informal analysis right from the period of data collection, which then further informs the subsequent data collection process (Brodsky et al. 2016). Data analysis is an ongoing process from research idea conception, setting objectives, methods, actual data collection and analysis and final writing of the report. It is a back-and-forth endeavour throughout the research project. In fact, I began this research only with the issue of sustainability-oriented port network(ing) among port managers, but initial interpretations I made from the data collection process shaped the focus of the research and the subsequent data collection process.

Once the data collection process was over, I began an in-depth and detailed analysis of the data. First, I transcribed all interview data verbatim. Second, a qualitative content analysis was

performed on the data (Krippendorff 2019). Content analysis is a systematic process of ordering (coding and building themes or categories) from interview transcripts, notes from participatory observations and focus group discussions, documents, and reports (Silverman 2015). According to Silverman (2013), coding and building themes can be done either empirically or theoretically. Whereas empirical theme building is about allowing themes to emerge inductively from the empirical data, theoretical coding relates to developing themes and categories from existing literature (reviews) and theories. This study used both methods.

For research paper [1], the major themes that were used include: Pressure for incorporating sustainability goals, major issues on the regulatory agenda where ports are located, environmental priorities of ports, technical and financial capacity among others. In research paper [2], existing themes and variables used in analysing networks in the literature and those that emerged empirically from the research were used. These include: learning from best practice, consensus building, uptake or the adoption of policy measures, improving environmental performance and how power and actor interest play out in network processes. For research paper [3], the themes that were used are: stakeholder engagements, environmental and social impact assessments, socio-cultural considerations, neglect of stakeholder concerns during project implementation and lack of good faith stakeholder engagements.

These themes were then analysed in-line with the research questions and key variable identified from the respective theories and concepts that underpin the research. To do this, I repeatedly read through the transcripts and documents as I interpret the themes to ensure that my interpretations are in agreement with the textual data. Quotations were used to emphasise certain statements, experiences and conceptualisations of the respondents.

5.5. Ethical considerations, positionality and reflexivity

Privacy, informed consent and confidentiality are important ethical considerations for qualitative research (Dowling 2000; Silverman 2013). In this study, environmental issues play an important role in port competitiveness. Research has shown that a port that addresses or appear to be addressing social and environmental concerns associated with its development and operations is likely to be more competitive (Lam and Notteboom 2014). This requires that I conduct myself in an appropriate manner and fulfil my obligations towards protecting the confidentiality of my informants. I began all my interviews with explaining the rationale of the research to my informants, explaining to them that the study is voluntary and they can decide whether or not to participate in the interview. I assure them that the inquiry was purely for academic purposes and that all information they will provide me with will be treated confidential. Once consent has been

given, I proceed by informing them that they can withdraw from the interviews at any point in time should it happen that they are no longer comfortable with the interview. These are important aspects I used to obtain informed consent from all my respondents and to make sure that they take part on their own volition. Both written and oral consent were used depending on who is involved.

While some respondents had no problems with attributing direct quotes to them, others asked not to be directly quoted for certain statements they have made or information they have provided. In such cases, I use anonymous terms like "interview with a port environmental officer", or "interview with a network coordinator" etc. in my research papers in situations where I use quotes or extracts from the interview transcripts without specifying their real names or ports.

Power, positionality and subjectivity are other important issues for consideration in any qualitative research. In my work, I am aware that "knowledge is partial, situated, [...] socially constructed and contested" (Limb and Dwyer 2001: 8). During the research process, I constantly scrutinised my role as a researcher, particularly with regard to the social relations that were emerging. Most of my interviewees were elites, who are generally perceived to be less vulnerable, are vocal and cannot be unduly influenced against their will (Petkov and Kaoullas 2016). In instances where respondents are local community representatives, I ensured that I did not unduly influence the choice of responses given by my respondents. Most of the questions asked are topics that allowed them to speak more broadly about the issue and thereby allow new themes to emerge. I am however also aware that respondents may modify aspects of their experiences or practices and therefore a triangulation of different methods and data (interviews, FGD, observations and content analysis) helped to ensure data validity.

5.6. Challenges and limitations

I encountered a number of challenges in the course of the research. I started this research with a very ambitious plan. This was to focus on transnational 'networks' for the greening of ports from a political ecology perspective. This focus was expanded when the empirical research began due to the emerging themes and difficulties in obtaining enough information. This led me to modify my initial research approach. Unintentionally, this might have affected the research in some ways. Aside this, my research on sustainability-oriented port networks was primarily based on the analysis of three networks. Some port authorities in Europe declined participation while others did not respond to the request at all. This together with time and logistic constraints limited my empirical research in Europe to the ports of Bremen. As to be expected, this may have in some ways affected the results. To make up for this, I drew on documents and reports to integrate

experiences and practices of other European ports like Rotterdam, Hamburg and Antwerp in my analysis. It must be noted however that, the focus of this research is not about discovering general patterns per se, but about generating knowledge based on subjective realities and experiences of ports in disparate contexts. As such, this situation may not necessarily have any significant effect on the research. Further, some of my interviews in Cote d'Ivoire were conducted in the French language with the help of a translator (research assistant). Although efforts were put in place to avoid any form of miscommunication, one cannot fully rule out the possibility that this could also have affected the quality of the information gathered in some ways. In all these instances, there are some weaknesses in the methodological approach as might be expected, however, I do not see them as cardinal, neither do I believe they represent any crucial objection to the soundness or trustworthiness of the material. As mentioned earlier, the triangulation of different methods and data sources also contributed to improving the validity of the results.

6. Summary of results and introduction to the research papers

In this chapter, I briefly summarise some of the results that speak directly to the title - transitioning towards sustainability: diverse practices and contested outcomes in European and West African ports. The detailed research results, discussions and related linkages with existing literature and are contained in three peer-reviewed published articles that are presented in the next part (**part II**) of this dissertation and as such, they are not repeated here. Rather, I will attempt to provide some insights in my findings on the diverse green practices and contested outcomes in sustainability initiatives and discourses of European and West African ports.

6.1. Diverse greening practices in European and West African ports

As part of my research, I explored how selected European and West African ports engage with the globalising green port idea. The case study ports include the port of Bremen/Bremerhaven in Europe and the ports of Tema, Abidjan and Lagos in West Africa. The results show that ports in European and West African contexts have diverse practices when it comes to green port measures. First, whereas green port measures, schemes and strategies in Bremen/Bremerhaven are geared mainly towards nature conservation, improving air quality and climate change mitigation, those of West African ports are geared mainly towards sustainable management of port and ship generated waste, oil-spill prevention and control and handling hazardous waste. Second, whereas the ports of Bremen have a comparably strong focus on technical infrastructures such as the provision of shore-side clean energy for inland barges, greenhouse gas emission inventories

among others, the integrated management approach appears more prevalent in the west African ports.

The study found that the green port practices of the ports of Bremen and other European ports are influenced by tight EU air quality standards (European Commission 2008a), EU policy on Energy and Climate Change (European Commission 2014, 2018) and designation of parts of EU maritime space and waters as Sulphur Emission Control Areas (SECA). These local conditions places specific pressures on port authorities, which they need to strategically address in order to allow business to proceed. Thus, EU ports needed to comply with relatively higher standards regarding these issues discussed above compared to the West African counterparts. For example, while there is a global sulphur limit of 0.5 percent by 2020, currently the EU has introduced legislation to place a Sulphur cap on all vessels that call at EU ports for longer than two hours at 0.1 percent. Aside this, since January 2018, the EU introduced a compulsory requirement for port authorities to monitor the emission of carbon dioxide emitted by vessels that call at EU ports as the EU white paper on transport seeks to cut carbon emissions from transport by sixty percent by 2050 (see European Commission 2011), while EU directive 2014/94 requires all EU ports to provide ships with shore power from clean energy sources (European Commission 2014). The ports of Bremen are, therefore, concerned with the above issues and have implemented schemes and measures that are geared towards reducing carbon emissions, reduce vessel emissions, improve air quality and contribute to addressing the problem of climate change. The port of Bremerhaven, through its involvement in the WPCI network has contributed to the development and promotion of the Environmental Ship Index (ESI) as a tool to reduce vessel emissions beyond regulatory requirements and had put in place various incentive schemes to implement and encourage vessels to use cleaner fuels. Currently, the port also provides inland vessels with shore power to reduce greenhouse gas emissions. The port (authority) has also implemented nature and wildlife conservation and restoration schemes to meet the high standards that come with being located within a very sensitive EU nature protection area.

The West African ports considered in these study have on the other hand implemented measures to control and manage both port and ship-generated waste in a sustainable manner. All three ports have concessioned port area and port-ship interface waste collection and management to environmental service companies with the requisite personnel and infrastructure to sustainably collect and recycle waste. In Ghana's port of Tema, this is done under the 'waste segregation policy'. At the port of Lagos, African Circles Limited handles all port and ship-generated waste. According to these port authorities, these have helped to substantially reduce waste to landfill cost, pollution of water bodies, harm to coastal and marine species and toxic waste contamination

and have described this measures as a prime example of a green port policy that brings economic, environmental and social benefits. Since the famous 2006 Probo Koala dumping of toxic waste incidence in Abidjan (see Fraser 2010), the issue of port and ship waste has become a major issue for ports to address. All three ports have currently implemented port waste reception facilities as required by MARPOL 73/78 and the UNEP Abidjan Convention Secretariat in conjunction with the Port Management Association of West and Central Africa (PMAWCA). At the same time, however, West African ports have limited initiatives for reducing greenhouse gas emissions. Their schemes in this regard are limited to the use of electric powered Rubber tyred gantry cranes. Port authorities whom I interviewed cited the lack of financial and infrastructural capacity to provide cold ironing facilities at their ports. As one port manager remarked, they tap energy directly from the national grid which is often a combination of power produced from different sources and which they have no control over. Port officials also stated that at the moment, they lack the technical capacity for developing carbon footprint inventories.

It became evident that context-specific factors, particularly, environmental priorities, regulatory requirements, financial resources and the immediate areas of competence of port authorities influence their green port measures. This therefor suggests that, rather than a standard practice, port authorities engage with the green port idea through a process of translation and sense-making. They adopt measures and technologies that fit both material and institutional contexts of their ports. This finding thereby suggest that the situation whereby some particular ports in Europe and North America acquire or use the green port label, based on their implementation of some so-called priority green port indicators cannot be sustained. The studied European and West African ports are first of all at different stages of economic development. They are confronted with unique local challenges and priorities. Consequently, they selectively implement measures or adopt certain aspects of a sustainability discourse that will help them to orchestrate a local sustainability fix- i.e. measures that will allow development to proceed and curtail sustainability requirements and pressure from regulatory and critical stakeholders- deep into the ocean and across the hinterland. These pressures vary widely across space. Details in research paper [1] in part II of this dissertation.

6.2. Contested outcomes in port networks and stakeholder-inclusive port initiatives

My research found clear contradictions and contested outcomes pertaining to stakeholder-inclusive port development mechanisms used by port authorities to supposedly address local stakeholders' (socio-cultural) sustainability concerns on the one hand, and the positive characterisation of sustainability-oriented port network(ing) with regard to the influence they bring to bear on environmental practices or performance of participating ports.

First, research paper [3] provides insights into the practices of a port authority (Ghana Ports and Harbours Authority) concerning the inclusion of local stakeholders and their sustainability concerns in a 1.5 billion-dollar deep-water port expansion project, currently ongoing at Ghana's largest port of Tema. Extensive analysis of the main tools used by the port (authority) to supposedly capture and address stakeholders' concerns, i.e. the Environmental and Social Impact Assessment (ESIA) and stakeholder engagement showed that the port authority used these tools merely as part of a fulfilling a bureaucratic procedure or requirement than to allow local stakeholders influence the project. Thus, while the port authority mobilised in inclusive-port development discourse, concerns of local stakeholders' that were gathered during the ESIA as well as through wider stakeholder engagements which took place as part of the planning process were side-lined during the project execution. The port authority for example did not place 'value' on the 'Meridian Rock' - a site with religious and traditional significance to the local community within the project footprint, which the local people consider as a cultural resource heritage that is sacrosanct and cannot be expressed in monetary terms. Aside this, a lack of good faith engagement with local stakeholders led to conflicts in some cases, particularly over land acquisition and resettlement related issues. This triggered a court action, that consequently caused delays and additional cost for the port (authority). Based on this finding, I argue that the port authority used a discourse of stakeholder-inclusive port development mainly to depoliticise the planning process, rather than to address stakeholder's sustainability concerns. In instances whereby the port authority did implement concerns, they were mainly environmental concerns that were raised by regulatory stakeholders like the Environmental Protection Agency. Thus, even with regard to the inclusion of stakeholders and their concerns, the port authority implemented only a selected number of concerns that were raised during the stakeholder engagements and ESIA. While the inclusive growth discourse or narrative of the port with regard to the port expansion project met its economic desires for growth or expansion, its success in terms of the ecological dimension and particularly social leg of sustainability is contested. The findings show that stakeholder-inclusive mechanisms, if not applied well, could become a 'post-political' tool.

Similarly, results from my research on sustainability-oriented port networks provides evidence that contests dominant claims by some practitioners and in the scientific literature on transnational networks and network theory in general. As mentioned earlier, the approach I used critically examine perceived benefits associated with networks and networking including: learning from best practice, consensus building about sustainable port systems, policy learning, behavioural change and the transfer of 'fast policy'. The findings suggest that while sustainability oriented networking among port authorities has become ubiquitous in recent years (see Table 2 in research paper [2] for a comprehensive list of existing transnational port environmental networks, the actors and their flagship green or sustainable port tools and technologies they design and circulate), the identified networks considered in this study do not provide any revolutionary solutions, at least to a greater majority of participating port authorities. Most ports authorities participating these networks have not translated policy tools, guidelines and code of conducts into concrete plans at the port level. For example, of all the port authorities taking part in the WPCI network, only twenty-five (25) ports globally have currently implemented the cold ironing (OPS) technology while only 30 ports have implemented the ESI, which are the flagship tools and technologies designed and promoted by the network. A similar situation has been observed for the Ecoport and APEI regionally focused sustainability-oriented port networks. In the global WPCI network, it became obvious that environmental issues or topics that are prioritised and placed high on the agenda and related policy tools and measures that are promoted are created along the interests and priorities of a few pioneer ports. In-line with this finding, I argue that the positive characterisation of networks or networking – that it can help port authorities to learn from best practice or adopt measures to stimulate local action is not only one-sided and misleading, but also a political narrative used by influential actors to gain more legitimacy. In-line with Kern and Bulkeley's (2009: 329) finding on climate change mitigation city networks, I argue that that sustainability-oriented port networks could best be described as "networks of pioneers for pioneers". Perceived corporation is limited to influential, resourceful and pioneer ports (authorities) through the so-called projects or case-study ports. These pioneer ports use networks to map pathways for their own sustainability fix. Thus within for e.g. the WPCI network, one can distinguish between a so called frontrunners (few ports) and laggards (majority of the participating ports). This is also in agreement with a Fenton's (2017) conclusion that networks outcomes and processes reflects a core-periphery dynamic, as action seem to be limited to a few ports in particular geographic clusters of Europe and North America.

Thus, the network governance initiatives considered in this study can be said to have achieved mixed results. If one takes influence to mean raising awareness and the diffusion of ideas and

concepts, then sustainability oriented port networks could be said to have considerable influence. The many port authorities whom I interviewed acclaimed networks to have been very helpful in raising awareness. Through these networks and networking activities, the green port idea has now become a global phenomenon. Networks are therefore important mechanisms for the diffusion of concepts and ideas like the green port idea. Yet, if effectiveness or influence is considered or understood as the adoption of technological tools that are promoted as best practice, then the transformative potential of these networks is rather limited to a few pioneer ports. In this study, Castells network theory of power, which clearly theorised four types of power that may influence social relations in networks is useful in understanding how interest and power relations may influence network outcomes and processes.

Research paper [2] provides interesting insights that underscore how these forms of power relations in networks can influence processes and outcomes. Yet again, going by Castells's (2011) argument that the influence of a network is a direct function of the number of actors that use its coordinating tools and standards, then aside awareness creation, sustainability-oriented port networks have a limited influence on actual environmental practices of participating ports. This is because majority of port authorities participating do not (or are unable to) adopt the coordinating tools to stimulate local action. The networks considered in this study could thereby be said to have achieved mixed results.

As a conclusion, it is worth pointing out that the three approaches discussed in my research pertaining to transitioning ports towards sustainability – i.e. engaging with the green port idea, sustainability-oriented port network(ing), and the inclusion of stakeholders and their sustainability concerns in port development planning and processes do not happen in isolation as I have discussed them here. They are taking place as part of efforts and initiatives port authorities are putting in place for ecological improvements and reducing adverse social impacts of ports on local communities, but also to allow business to proceed and to curtail all forms of pressures emanating from various arenas.

6.3. Theoretical contribution and reflections

The study contributes to the concepts of policy mobilities and sustainability fix. It provides valuable insights into conditions as well as processes of translation and re-interpretation of circulated ideas, concepts and policies in the context of sustainable (green) ports. It offers insights into how the selective adoption of certain aspects of a sustainability discourse and associated measures or technologies unfolds, something that has been largely missing in the literature on policy mobilities and sustainability fix. My research demonstrates that port authorities, by

engaging with the green port discourse, are orchestrating pathways for a local sustainability fix. By this, we can understand and establish links between conceptually similar but spatially diverse activities, as in the case of the diverse green port practices observed in European and West African contexts.

In terms of networks, my research shows how power-based network approaches can benefit from the concept of policy mobilities. While Castells's network theory of power offers analytical tools for deconstructing interests of powerful actors in global networks and how power and actor interests plays out in network governance initiatives, it says little about processes of learning and adoption. The injection of policy mobilities literature that is critical of processes of educating and learning and the circulation of policies and technologies proved useful. It helped to understand conditions that constrain adoption or transferability of best practice tools. In global sustainability-oriented networks, powerful actors, seen as knowledge brokers, set agendas (attempt to create convergence around particular environmental issues, standards and according measures and technologies). But with tool implementation complexities, differences in environmental priorities, as well as technical and financial capacity, their uptake by a greater number of ports (authorities) remain low and their prospect for environmental upgrading along the value chain is limited.

The question then is who actually stands to benefit from such network(ing) initiatives? The pioneers and economically resourceful ports, who, define agendas and drive the network discourse or the perceived laggards, who, are expected to learn for behavioural change? Like Davies (2012) who argue that rather than mechanisms for cooperation, networks have become key elements in hegemonic projects of neoliberalism, I argue, that sustainability-oriented port networks are likely to deepen existing inequalities. First, the implementation of coordinating tools designed and promoted via such networks remain limited to the pioneers and influential ports, a situation that could accord them certain privileges like access to climate funds. Second, since transnational networks lack coercive authority and cannot impose sanctions (Kern and Bulkeley 2009), a greater majority of ports will not adopt tools and technologies that do not address their immediate environmental priorities or those which they do not have the technical and financial capacity to implement them. This makes them appear as laggards. Earlier, Davies (2007) argued that network processes and projects may be driven by interests of powerful actors and that unequal power relations among actors will not offer every actor the same level of benefit (Davies 2007). Such political processes in networks hinder their potential for environmental upgrading.

In conclusion, the concepts of policy mobilities, sustainability fix and Castells's network theory of power has helped to explain the diverse green (sustainability) practices in European and West African ports and the rationalities behind the choice of measures and have provided evidence that

challenge conventional knowledge on sustainability-oriented port networks and stakeholder-inclusive mechanisms or discourses for port sustainability. The research contained in this thesis transforms extant views on green ports, and redirects research focus towards how port authorities construct the narrative of the 'green port' sustainability fix.

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II. Research Papers

Research paper 1

Lawer, E.T., Herbeck, J., & Flitner, M. (2019). Selective Adoption: How Port Authorities in Europe and West Africa Engage with the Globalizing 'Green Port' Idea. *Sustainability*, 11(18), 5119.

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Article

Selective Adoption: How Port Authorities in Europe and West Africa Engage with the Globalizing ‘Green Port’ Idea

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Abstract: The scholarly debate on ‘green ports’ since it emerged in the policy discourse of international maritime organizations has largely focused on exploring the economic benefits associated with implementing related policies and developing green guides and codes of conduct for port authorities. In contrast, it has received little attention how the green port idea and according measures are taken up and what role is played by contextual factors in places of such uptake. By engaging with the expanding literature on policy mobilities and drawing on empirical information collected through interviews with port officials from four ports in Europe and West Africa, we argue that context-specific factors strongly influence what we call the selective adoption of green port tools and measures for transitioning ports towards sustainability. They include environmental priorities, regulatory requirements, financial resources and the immediate areas of competence of port authorities, which all vary widely across regions and specific ports.

Keywords: sustainable ports; policy mobilities; translation; sustainability fix; port infrastructure

1. Introduction

While ports are regarded as critical national infrastructures and important for economic development, port authorities are experiencing increased pressure to address the negative environmental and social impacts associated with port operations and development [1,2]. Recently the green port concept emerged in the policy discourse of international maritime organizations as a way to address environmental and social sustainability concerns related to ports (see [3,4]).

Since then, various norm setting maritime organizations and port environmental networks have created and promoted green technologies, guides and different management tools to enable ports’ transition towards sustainability [5–10]. In Europe, the European Sea Ports Organisation (ESPO) has developed green guides and codes of conduct for its ports [11]. In North America, the Association of American Port Authorities (AAPA) provides a sustainability guide for its ports [12], and in West Africa, a joint initiative between the regional port association (PMAWCA), the regional secretariat of United Nations Environment Programme (UNEP) and the non-governmental Ports Environmental Network Africa (PENAf) has recently initiated an ambitious effort to devise a common environmental or ‘green port’ policy for the region [13]. Aside from these, a new transnational body, the GreenPort network, with support from technology companies such as Siemens, Kalmar and academic institutions has emerged, devising and circulating various environmental best practices and market based tools and technologies for the greening of ports [6].

Consequently, in the course of the last few years, many ports across the globe have either implemented a green port policy or adopted ideas akin to the concept, with the ports of Bremen being

among the first ports globally to implement a green port strategy in 2009 [14,15]. Some ports in Europe and North America have since been either certified, labeled or conceived as green ports [16–19]. Being conceived as a green port or acquiring a green port status or label is said to be positively linked with higher port performance and economic benefits, and has the potential of attracting climate and green funds and trading partners [3,20,21].

The green port idea as we refer to it in this paper has as such attracted a lot of attention from scholars, particularly from maritime economists, engineers, social scientists and others from interdisciplinary backgrounds. The scientific literature on green ports has thereby largely focused on evaluating the benefits associated with implementing a green port policy [22–25]; identifying managerial and policy tools for the greening of ports [3,17,26–32]; determining priority green port tools and indicators for evaluating the green performance of ports [20,33–35] and transnational networks or initiatives of ports and port cities for improving environmental performance, both at ports and along the value chain [36–38]. Few authors have engaged critically with the green port concept, especially referring to concerns about greenwashing and the social justice of green transformations at ports [39–42].

We argue that the strong economic focus of research on green ports so far has not yet taken adequate account of the disparate economic and political contexts in which port authorities engage with or adapt the green port idea. Hence in this article, we aim at exploring how port authorities in Europe and West Africa engage with the green port idea. Specifically, we provide insights into how contextual factors lead to what we call the selective adoption of green port tools and measures. We argue that the green port concept is adapted in ways that are meaningful in specific political, regulatory and social contexts. To do this, we draw on insights from a policy mobilities scholarship in human geography to structure and interpret our empirical research.

As general background to this development, it should be noted that the role and governance of port management has become more diverse within and across regions over the last two decades [43]. This is also true for the regions we will look at. Akin to the Asian model, West African ports have seen some degree of involvement of private actors (e.g. global terminal operators); nevertheless, some port authorities like the Ghana Ports and Harbors Authority do not follow a strict landlord model and are also involved in providing operational services [44]. They have thus fused two management systems in a hybrid form differing from most European ports (like the ports of Bremen), which are organized in accordance with the landlord model [15]. While the new governance arrangements are not the focus of this paper, it is important to bear in mind that, in all instances, port authorities have re-positioned themselves and are playing a managerial role in environmental and sustainability issues related to all aspects of port operations and activities. In the studied West African and European ports, port authorities implement green port policies both individually and in collaboration with private terminal operators. They also play a role as landlords and regulators.

The paper proceeds as follows: In Section 2, we briefly introduce green port as a concept and a label and we outline tools and technologies for green ports based on reviews of the existing literature. In Section 3, we present the theoretical background we used in framing the paper and we follow this with the research methodology in Section 4. In Section 5, the results and discussion are presented with the final discussion and concluding remarks in Section 6.

2. Background and Rationale

2.1. Green Port as a Concept and a Label

Although ports are the backbone to the global economy; increased shipping through ports, new port infrastructure development projects and functional activities at ports can be associated with adverse environmental and social impacts on coastal locations and neighboring communities [2,45–47]. Consequently, stricter environmental legislations as well as social and environmental performance standards and requirements have emerged from various quarters in recent years [48–50]. Ports have therefore become important entry points for addressing the environmental and social externalities

caused by maritime activities and are important nodes for improving the sustainability performance of global value chains.

According to Pavlic et al. [4], the term 'green port' evolved from joint research activities between academia and industry related to sustainability in the maritime sector. The term green port and the concept underlying it has been used since the early 1990s (see [51]). Between the 1990s and the late 2000s, it was perceived as a "new ideology to realize sustainable development (at ports) through coordinating the balance between environmental effect and economic benefit" [52] (p. 1873; see also [53]). The label 'green port' was consequently used loosely in referring to ports that are proactive in addressing their negative environmental externalities. Wooldridge et al. [54] noted that in the early periods, priority environmental issues that were being addressed by European and North American ports included water quality, dredging and noise. Wooldridge and his colleagues, therefore, argue that port managers may use existing laws that apply to them as a baseline in devising their green strategies.

Since 2010, while the green port concept is applied as a new paradigm that seeks to harmonize port activities with environmental and social considerations without jeopardizing economic growth, and has as such become synonymous with sustainable ports [5], the label 'green port' has been largely associated with ports that have implemented projects and initiatives that address air quality, climate change and/or those that use renewable energy or clean fuels for port operations [17,18].

However, it has been little studied so far how political, economic and institutional conditions may shape how port authorities engage with the green port idea and the tools, technologies or measures that they may adopt. Davarzani et al.'s [39] comprehensive review on green ports found that knowledge on green ports has been dominated by research on European and North American ports. This does not come as a surprise as the green port idea originated from European and North American contexts [19]. Pioneering ports in Europe including Bremen (Bremerhaven), Rotterdam and Antwerp are already labeled or conceived as green ports based on the implementation of measures geared mainly towards low carbon operations or improving air quality [1,9,55–57], energy efficiency or the use of renewable energy and eco-friendly mobility at ports [8,17,29,58,59] or reducing impacts on climate change [5,60], which are considered to be priority green port measures. It is in this regard that Di Vaio et al. [61] (p. 229) for example remarked that "(today) those ports that tend to assume (. . .) energy efficient behaviours (. . .) have been broadly defined as green ports". To the best of our knowledge however, there is no formal institution that certifies or confers the label 'green port' on ports, except for ESPO's EcoPort network, which confers the 'EcoPorts' label on ports that have gone through the certification process for its Ports Environmental Review System (PERS) standard or ports that are certified to the ISO 14001 standard. Many ports that use the label 'green port' therefore either registered it as a trademark on their own and promote it in the form of a green marketing strategy or are conceived as such by scholars based on some so-called priority green port indicators for ports sustainability [20,34,35].

However, taking green ports along its environmental sustainability leg, addressing environmental issues such as dredging, port and ship-generated waste are equally important areas for green ports [27,62–64] especially as ports may have varying environmental priorities. While the port of Hamburg for example, is considered a green port due to its initiatives in energy management and climate change mitigation [17,18,65], controversies about the dredging of the Elbe river remain [66,67]. On the other hand, ports that have created innovative approaches for waste management, e.g., in West Africa, are rarely considered to be green ports even as they engage with the globalizing green port idea [63]. However, as ports differ in size, energy demand, legislation and environmental priorities and are located in countries at different levels of economic development [2,68] it may be impossible for one port to adopt all green port tools or measures at the same time. By turning towards the differing ways in which port authorities in disparate contexts engage with the green port idea, we argue in this paper that in engaging with the globalizing green port idea, port authorities are likely to select tools or measures that make sense in the disparate geographical, political and economic contexts within which ports are located. We argue that, rather than a standardized practice with a clearly defined set of technologies, a green port is better understood as a 'travelling idea' or a rather vague vision, with a

loose (but not arbitrary) ensemble of different practices and measures aimed at transitioning ports towards sustainability. Seen in this way, engaging with the green port idea becomes a local practice that is embedded in specific times and places.

2.2. Green Port Tools, Technologies and Measures

As outlined above, there are multiple measures that have been discussed under the term green ports. Over recent years, the focus of debates has shifted substantially: While in the early 2000s, a strong emphasis has been put on relatively narrow fields such as waste management, water quality or noise reduction, the focus currently is on broader mainstreaming tools like management protocols, etc. The main approaches that have been discussed over the years can broadly be grouped under three categories: (1) Technical infrastructures; (2) pricing and access and (3) integrated management approaches.

First, a number of technical infrastructures have been proposed that often deal with specific problem areas such as air quality, ship waste or energy efficiency and transitions.

Cold ironing: Otherwise also known as onshore power supply (OPS), cold ironing is a land-to-ship technology that provides shore-side electricity connection derived mainly from renewable sources like wind, hydro and solar so that ships can switch off their on-board diesel-powered generators and auxiliary engines while they are docked at the port [59]. Several reviews of case studies and meta-analyses summarize the empirical research on cold ironing and its benefits [30,31,58,59,69,70], which ports are more likely to implement this tool based on prevailing political and economic conditions [58,59,71] and the challenges associated with adopting cold ironing [31,72]. Its main objective is to help port authorities to remove greenhouse gas emissions from ships in port areas [32] and to contribute to reducing the impacts of port activities and shipping on climate [36].

Waste reception infrastructure: Marine litter and pollution is a major environmental problem and as such the provision of a port reception facility has been identified as a green port measure [1,73,74]. The development of a port waste reception facility enables port operators to receive or collect all forms of ship waste, including garbage, its oily sludge and all other forms of waste generated on board the ship so that it does not end up in the oceans and seas as has been the case for centuries. It also allows port authorities to collect ship wastewater (ballast water) so that ports do not directly discharge it into the port waters with the risk of the introduction of invasive species.

Cargo handling and transport: Measures involve switching or converting from carriers, hybrid vehicles, trailers, tractors and forklift trucks and cranes that use diesel fuels to those that use bio-fuels or are powered by electricity generated from renewable sources. This can also include a shift towards automation and paperless systems of port operation and management. Port authorities like in Rotterdam set a strict standard for cargo handling trucks. In other ports, trucks and vehicles are required to meet sulphur fuel limits in order to reduce emissions and ports procure only sustainable logistics [29]. Under this category also is the use of a more sustainable modal split as a green port measure. In order to lower the dependence on trucks for conveying goods from the port to the hinterlands and its associated emissions and traffic congestions, many ports, especially in Europe are going towards intermodal solutions that are based on a combination between barges and trucks or rail transport and trucks [29].

Greenhouse gas emission inventory: This tool requires the development of a structured inventory of energy and fuel use and other activities that produce greenhouse gas emissions at the port. It is argued that by monitoring and measuring, an emission inventory can help port authorities to identify trends and areas for further improvements, in the form of energy efficiency or improved port operations [9,55,75,76]. Poulsen et al. [77] however noted that many ports would probably not develop a greenhouse gas inventory because of what they call the 'complexity of tool implementation'—to wit the fact that implementing these tools requires specialized skills. Port authorities need existing baseline data, which are non-existent in most ports. Aside from this, identifying the geographic boundaries or scope e.g., of emissions caused by direct and indirect port activities or emissions from port tenants and determining the emission categories to be covered requires highly skilled personnel [77]. It is,

however, to be noted that a greenhouse gas emission inventory in itself does not reduce environmental impacts but is only a means of developing reduction measures and monitoring their effects and may be used mainly as a tool in supporting political claims of port authorities.

Second, a number of tools for pricing and access have been proposed, mainly geared towards the access of ships and shipping lines to port terminals, and companies operating at the port.

Environmental shipping index (ESI): It is a market based tool that was originally designed by port authorities in the so-called 'World Port Climate Initiative' network including the ports of Le Havre, Antwerp, Rotterdam, Bremerhaven and Hamburg to help improve the environmental performance of seagoing vessels visiting ports [7,78,79]. ESI is a web-based tool that asks ports to lay out their incentives for ships with lower air emissions while asking ship owners for their fuel receipts. It is argued that this could help ports and ships to reduce their greenhouse gas emissions [78].

Concession agreements [29,80]: Here, environmental sustainability is made a requirement for granting concessions to companies that want to operate at the port. Concession agreement as a tool can be used to address various issues ranging from the issue of waste and energy to emission reduction [29,63]. Notteboom and Lam [29] suggests when port authorities impose for example, a cap on CO₂ emissions during terminal lease agreements, it can encourage terminal operators to embrace innovation and to meet the environmental objectives of the port authority.

Port dues: As ships, trucks and carriers pay several fees for using port infrastructure, port dues involve the use of incentives and punitive measures to promote environmental protection following the polluter pays principle [17,18,77,81–83]. Sustainability is used as a condition to gain access to certain services or to determine the fees to pay for using a port infrastructure or service [84]. Port authorities use either "penalty pricing as the 'stick' approach or incentive pricing as 'carrot' or both approaches to reduce pollution and improve the environmental performance of port users and developers" [81] (p. 175). Port authorities issue surcharges on docking fees and fines on oil and waste spills. The aim of this tool is thus to facilitate the conservation, protection, efficient use of resources and promote sustainability using incentives or punitive measures in the form of fees or port charges [85].

Third, a number of tools can be classified as integrated management approaches. For example, environmental management systems (EMS) based on an internationally recognized environmental management standard have been promoted as a priority green port tool [53,81,86,87]. With this tool, port authorities prepare a plan that details their environmental policy objectives, environmental aspects of their operations, legal requirements that regulate their operations and their mitigating programs and initiatives [88]. It is thus a systematic plan for port authorities to manage their environmental programs for pollution prevention, protection and control. The Ports Environmental Review System (PERS) of ESPOS's EcoPorts network, ISO 14001 EMS and the Eco-Management and Audit Scheme (EMAS) are examples of environmental standards that are used by ports to guide effective and systematic environmental management.

Another integrated management tool is the creation of nature compensatory mitigation sites in the port or at another location to give to nature what has been taken elsewhere in the case of unavoidable impacts of port construction [11]. These sites are designed to compensate for lost ecosystems and accommodating flora and fauna. As such they serve as a 'green infrastructure' for biotopes [15], enabling port authorities to counterbalance negative environmental impacts of port developments by contributing towards nature conservation, and not against it [89].

Other management tools include the establishment of a department responsible for handling environmental issues, skills training for staff to equip them with the capacity to handle new trends in environmental management, and adopting collaborative mechanisms with port stakeholders in implementing environmental policy [15]. Di Vaio and Varriale [90] argued that a major challenge facing the implementation of environmental policy at ports is the lack of technical capacity of the staff and the non-involvement of relevant stakeholders such as transport operators, terminal operators and shippers in adopting policies that respect the environment. In this regard, a designated department with a well skilled staff is an important measure for the greening ports.

Given this broad range of measures, instruments, tools and programs, it is hardly surprising that the ways ports implement green port policies are also diverging substantially, geographically and in time. For instance, fifteen years ago, port waste (garbage) and dredging were seen as the most important environmental challenges for EU ports—today port waste (garbage) is rated as the least important problem, the top three environmental priorities of EU ports being air quality, energy consumption and climate impacts [91]. West African ports, on the other hand, are currently prioritizing measures for efficient handling of hazardous or port and ship generated waste and reducing ocean litter or pollution from waste and ballast water [63]. This suggests that, among other things, the bundle of measures that may be adopted by ports changes as environmental priorities change. Today, green port measures such as providing ships with renewable energy at ports, ESI and carbon foot printing have been particularly promoted by maritime organization including the International Association of Ports and Harbors, ESPO and port environmental networks like the World Ports Climate Initiative [7–9,11,92], and these measures are now also primarily associated with green ports. As ports operate within unique business, political, environmental and social contexts, green practices of ports may be diverse, reflecting for example, the different economic contexts, the major issues on the country's regulatory agenda, availability of financial resources, and major environmental priorities. The definition of common criteria for labeling or describing a port as a green port is therefore a highly political and sensitive task, which can maintain or establish new hierarchies between ports, creating disadvantages for the latecomers despite their endeavors.

3. Theoretical Framework: Green Ports as a Travelling Idea

For analyzing the circulation of ideas, best practices, concepts and policies in a narrower sense, the literature on policy mobilities (PM) offers valuable insights into conditions, actor networks, processes of translation and re-interpretation of circulated ideas and policies, and other aspects of such circulations. Building upon earlier accounts on the transfer of policies, mainly arising from research in political sciences, the PM approach has been adopted in various disciplines and has also been widely cited and co-produced in human geography.

In face of an observed extension and acceleration of the mobility of policies in the contexts of growing neoliberal globalization, Lovell [93] has identified three recent lines of debate within the broad research field of policy mobilities. First, the traditional focus on government-to-government policy transfer is increasingly replaced by recognition of the role of non-state actors (especially the private sector) in mobilizing policies, which also means a turn towards urban and transnational actors rather than nation state institutions. Second, the introduction of assemblage theory has given rise to the relevance of heterogeneous networks that comprise actors and technologies alike, and to relational geographies of policy mobilities. Finally, a focus on the materiality of the policies that are mobilized has also reinforced the interest in “how policies change or mutate as they move” [93] (p. 48).

This third focus has been applied to the study of models [94,95], ideas [96], concepts [97] and technology [98] by particularly focusing on what happens in the process of transfer and/or adaptation, also allowing for the understanding of mobile policies and ideas as being “socially produced and circulated forms of knowledge (. . .) that develop in, are conditioned by, travel through, connect, and shape various spatial scales, networks, policy communities, and institutional contexts” [99] (p. 109). This approach can help in understanding the links between spatially diverse but yet conceptually similar activities.

Behrends et al. [94] writing on travelling models for example, argue that, as a model travels from one place to another, some embodied knowledge, institutions and conventions associated with the objectivized model do stay immobile and hence need to be re-invented at the sites where the model arrives through practice and experience. Defining a model as “an analytical representation of particular aspects of reality, created as an apparatus or protocol for interventions in order to shape reality for certain purposes” [94] (p. 2), they explain why certain issues that are important at one place may be

taken up in another while others may not. It is then important to consider and treat the process of the travel, adaptation or appropriation as a process of 'translation'.

In this paper, we argued that this focus on the processes of translation of a model, an idea or a concept also brings up the question of selectivity: Here, we connected the PM literature to work that has, for example, been carried out by Martin et al. [100], Jokinen et al. [101] or Walker [102] who stress how in wider sustainability policies and approaches of cities, the "selective uptake of certain aspects of sustainability discourse, policy and planning" [102] (p. 167) can be a key strategy of cities in the face of neoliberal globalization and contribute to ambivalent "sustainability fixes" in those cities. Drawing on Jessop [103] and his understanding of "strategic selectivity" of local governments, Walker demonstrates how sustainability policies are employed to "position cities favorably in competitive place-marketing and to address the material political economic circumstances structuring urban development" [102] (p. 165). So far, little has been said about how the selectivity unfolds. As we will show, the example of the green ports discourse offers a way of understanding how selectivity plays important roles in two ways: First, selectivity plays a key role in the dynamic definition of a globally circulated idea or model, by way of deciding which tools, technologies and practices are part of the agenda and which ones are not. These decisions are largely made by the frontrunning actors in global networks. Second, during the implementation of the globally circulated models and ideas, local actors strategically select practices and tools that fit both, the institutional as well as material contexts of their ports. Selectivity thus becomes a decisive part of translation, revealing a close relationship between the two, influencing each other in the continuous process of sense-making and in the wider practice of sustainability fixes.

The green port concept originated from European contexts and is associated with particular practices and technologies, often framed around particular environmental issues [31,58,81] but has now become a global phenomenon and been implemented worldwide including at West African ports [63]. Yet, as we will see in more detail below, the material technologies, tools, infrastructures and practices ascribed to 'green ports' are diverse. Selectivity in both, setting the agenda of greening ports and adopting measures and technologies out of a larger bundle of potential solutions for greening ports, plays out in highly specific constellations at particular ports. They are shaped, among other things, by the competencies and capacities to implement certain technologies, by the priorities on the agenda of governments, as well as the needs and pressure of national and international private actors.

4. Research Methodology

The research presented in this paper was part of a larger research endeavor to explore the sustainability transitioning of ports in Europe and West Africa. In this paper, we combined data collected from 29 in-depth key informant interviews with port environmental officers, terminal operators and related maritime stakeholders from four ports in Europe and West Africa with information gathered through literature reviews and document analysis. The ports included in this study are: Tema (Ghana), Lagos (Nigeria), Abidjan (Côte d'Ivoire) in West Africa and the twin ports of Bremen/Bremerhaven (Germany). This enabled us to learn between disparate sites and practices [104]. We used a semi-structured interview guide in conducting all our interviews. A semi-structured interview allows for some degree of flexibility in terms of questioning [105]. Thus, while the main topics and questions we asked were the same in all interview cases, semi-structured interviews allowed us to ask follow-up questions where necessary, to clarify certain issues, which also allows new themes to emerge. Through this method, we were able to obtain an overall picture of how the studied ports (authorities) engage with the globalizing green port idea and the rationalities underlying their choice of measures, tools and technologies. The interviews were conducted between May 2016 and July 2018 with experts of different status that are responsible for environmental and sustainability issues at ports. Relevant data to analyze the influence of contextual factors on the selective adoption of green port measures were collected from journal articles and policy documents available on the websites of the ports.

A content analysis was performed on the data to identify common and divergent themes [106,107]. Content analysis is a systematic process of ordering (coding and building themes) from interview

transcripts, notes from participatory observations, focus group discussions, documents and reports [108]. We repeatedly read through the interview transcripts together with the recorded audio-visual tapes to get a sense of the data and identify major themes. These themes were then analyzed in light of key variables identified in our theoretical framework. This allowed us to situate our finding in the frame of existing literature on green ports and to draw overarching conclusions. Triangulation of methods and data sources was used to enhance the credibility and validity of the results.

5. Results and Discussion

In this section, we present the greening practices of the studied ports, showing how context specific factors shape or influence the measures and tools that port authorities adopt over time.

5.1. The Ports of Bremen

The ports of Bremen are located in Bremen and Bremerhaven. They are managed by Bremenports GmbH and Co. KG on behalf of the Free Hanseatic City of Bremen as a single entity (twin-ports). Whereas Bremerhaven is closer to the open sea (North Sea) and specializes in handling container ships, car carriers and specialized ships, the terminals in Bremen are 60 kilometers further south and handles mainly general cargo and bulk commodities [109]. The port authority is active in taking initiatives and implementing programs to protect the environment, improve public health and reduce impacts of its operations and development on climate change [15].

5.1.1. Engaging with the Green Port Idea at the Ports of Bremen and Bremerhaven

As one of the pioneering ports globally to have implemented a green port policy, the ports of Bremen's case provides insights into how it both co-sets the pace when it comes to green port practices, but also how its choice of tools or measures at different time periods from a (potential) ensemble of tools available for port authorities to transition towards sustainability reflects some form of selectivity. The measures they adopt, we argue, are influenced by contextual factors including the priority environmental aspects of the port and major issues on the regulatory agenda of the EU and the German state.

In 2008, the port authority established the office of environment and sustainability affairs, ascribing the office and its director a key role on the management board of the port. Since 2009, the port authority developed and published what it calls its "greenports" sustainability strategy aimed at implementing the green port idea. The adoption of this strategy marked the first time that sustainability issues associated with Bremen's ports were being looked at in a comprehensive way, linking economic, ecological and social concerns:

"(. . .) We started with environmental topics in 1991 but since 2009, it was necessary to change this view to open it to all kinds of sustainability topics. So it was a strategic change to design and own a sustainability strategy to work it out and to follow it.". (Interview (hereafter: Iv), Bremerhaven, 25.08.16)

While a green port may mean different things to port managers in other contexts, for the ports of Bremen, it means cementing into their policies, management plans and into the fabric of new port investment plans the philosophy that operating and developing ports can be done sustainably in a win-win manner. In developing its green port strategy, the port aimed at not only delivering sustainable development, but also improving the competitive position of the port and the entire port region by combining the implementation of green programs with green marketing:

"(. . .) when we wanted to develop and own a sustainability strategy, it was clear that we must have and own a trade mark protected by law (. . .). The trademark is for the port and we sell it to the local maritime companies who believe it is a good label and now (. . .) the politicians accept it to be a good strategy for the region (. . .). We want to focus on

managing the port well and to be a front runner not only in Germany because it is a field of international competition (...). By implementing the greenports strategy, we wish to promote sustainability both in port management and in the port area, and, if possible, also in the port industry and logistics.” (Iv, Bremerhaven, 25.08.16)

The port authority linked the green port idea to the concept of sustainable development and produced this idea as a business strategy by registering its “greenport” label at the European Consortium for Trademarks in Belgium. This allowed the port authority not only to have an official green port sustainability strategy, but also to sell it as a global brand to companies that want to use similar tools and technologies to promote sustainability upgrading in the logistic chain. Other than a proper certification scheme, this trademark label has up to date not been connected to transparent conditions and clear standards, or external evaluations.

It is important to point out that the port authority developed its green port strategy in line with the main operational activities of the port that required regulation, either at the level of the EU, federal government or at the state and local level, as well as the key issues that were connected to the political aims of the port. From the beginning, the ‘greenport’ strategy of the port focused on nature conservation and improving water quality:

“When you look through the port, then we have the world heritage area (Wadden Sea) directly near the port, north and west of the port, we have the European Habitat sites (...) directly inside the port and we have German nature protection sites in the port so for us, biodiversity is so important as (for) no other port in Germany (...). This means that we needed to comply with comparatively high standards in this respect (...). When you look at other European ports like Antwerp and Le Havre, then there are some similar conditions.” (Iv Bremerhaven, 25.08.16)

The port authority was consequently more concerned with nature protection and managing waste and dredged materials to prevent marine pollution at the initial stages, but soon energy efficiency developed into an important issue. Between 2009 and 2014, the port authority declared its intention of operating a carbon neutral port infrastructure in-line with the increasing and new stringent legislation on air quality, energy and sulphur content of fuels for ports in the European Union:

“At the time (2009), we had no view of becoming a CO₂ neutral port. (...) (When) the environmental situation became characterised by society challenges in connection with climate change and protection, climate protection became one of the biggest topics we had to address at the port.” (Iv Bremerhaven, 25.08.16)

Implementing the green port idea at the ports of Bremen was therefore done in line with addressing its major environmental priorities and meeting the high standards expected of the port with respect to nature protection (by virtue of its sensitive location) and air quality requirements of the EU [14,110–113]. In the following, we present the measures or tools the port implemented over the years.

5.1.2. Green Port Practices at the Ports of Bremen and Bremerhaven

Pursuant to the objective of transitioning towards sustainability, Bremen ports have implemented various policies, technologies and measures, and have provided several green services to ships calling at its ports. The port authority has strategically developed measures and incorporated environmental goals into its planning and operational structures. We outline this below:

Technical Infrastructures: In line with a EU Directive on ship waste i.e., Directive 2000/59/EU [114], the port in the early 2000s has put in place the needed waste reception infrastructure to receive and process all kinds of waste from ships and vessels that call at the port under Bremen law on port reception facilities for ship waste and cargo residue (BremHSLG) dated 19 November 2002 [15]. Since 2010, the port authority has implemented measures to reduce air emissions, improve air quality, improve energy efficiency and reduce impacts on climate change. The port has provided electricity

generated from renewable sources for inland vessels that berth at the port and related port operations. A total of 18 shore power connectors have been installed to ensure that inland vessels berthed at the port are powered by clean energy, which allows them to shut down their auxiliary engines that would have run on diesel generators, while on-shore power supply options for maritime shipping are currently being evaluated [115] (p. 50).

Since 2012, the port has doubled the percentage of energy it draws from renewable sources and has the objective of introducing new technologies like green hydrogen by the year 2024 [109]; this is in line with the broader greenhouse gas reduction efforts on European and national levels, as well as growing air quality regulations [88,113]. Recently, EU directive 2014/94 on the deployment of alternative fuels infrastructure further required all EU ports to prioritize the use of renewable energy, cold ironing and Liquefied natural gas [116], which has placed pressure on EU ports to implement measures in this regard. Aside from the above, Bremerhaven together with other German ports like Hamburg have also moved towards the use of rail shuttles for moving goods to the hinterlands in order to reduce emissions and congestion of traffic flows in and around the ports, whereas Rotterdam, Antwerp and Amsterdam are said to heavily rely on barges to reach hinterland regions [29]. In 2012, the Bremen port authority conducted the first carbon footprint analysis for its ports, which has since helped to monitor their effects on climate and air quality and to devise measures for further improvement [15].

Pricing and access: Since 2012, the port authority has implemented the environmental ship index (ESI) tool and has announced its bonus scheme for seagoing vessels that uses low sulphur fuels. Since the beginning of the year 2016, 25 vessels with the best ESI scores greater than or equal to 40 points are granted a 15% discount on each call at the port every quarter. This formula is also applied to LNG-powered ships. This serves as an incentive for behavioral change of vessel owners to reduce their emissions further than what is legally required and is said to have culminated in a reduction in greenhouse gas emission in the port areas in the course of the past few years. For example, carbon dioxide (CO₂) emission at Bremen's ports is said to have dropped from 7000 tonnes in 2011 to 2065 tonnes in 2016 [109]. It is estimated that since the year 2012, the number of ship arrivals with ESI score in relation to the total number of ship arrivals has increased from about 10% in 2012 to nearly 40% in 2017 [109]. In 2017, 101 ships that have called at the ports of Bremen about 185 times are said to have benefited from the ESI port (dues) discount [109] (p. 41). The use of the ESI as an incentive pricing green port tool has also been observed in other European ports like Rotterdam and Antwerp [81].

Aside from ESI, the ports of Bremen have also enforced the sulphur cap EU legislation (see [117]), which obliges ships and vessels to use fuels with a maximum sulphur content of 0.1% in the so-called sulphur emission control areas (SECA) since 2016. As the ports of Bremen are located in the North Sea range, which is part of the so-called SECA regions, they had to put in place measures that would enforce the cap placed on the use of sulphur fuels [117]. It is estimated that particulate matter emitted by all vessels calling at Bremerhaven reduced from about 180 mg/BRZ in 2012 to 21 mg/BRZ in 2015 while SO_x has reduced from 1.74 g/BRZ to 0.22 g/BRZ during the same period [109].

Integrated management approaches: Given the major port expansion works in the period up to 2010, the port authority knew that only ambitious and persuasive compensation measures can get the local community and regulatory stakeholders to support the port and its new projects. The EU Habitats Directive, a binding legal framework for protecting flora and fauna [112] sets the general background for according measures. In-line with this, the port authority from the early stage of engaging with the green port idea, created so-called compensation sites in situations where the adverse impacts of port development and operational activities on nature became unavoidable. Nearly 50 such compensation sites have been created since then, with the 'Luneplate' located in the Weser estuary south of Bremerhaven as the flagship nature compensation site for the ports of Bremen. Covering an area of about 1.400 hectares, it provides a habitat for various bird species, plants and wildlife and has been declared a national nature reserve. In November 2016, the European Sea Port Organization (ESPO) gave the port an award in recognition of the benefits of the Luneplate to safeguarding ecosystems in the port area and have declared the Luneplate a best practice example for

other ports to emulate for demonstrating that “biodiversity and the realization of port infrastructure do not need to contradict” [89] (p. 17). The port authority can now use the (legally binding) creation of nature compensation sites as a tool to advertise sustainable port development.

In the field of integrated management tools, the ports of Bremen have also been certified to the European Sea Ports Organization’s EcoPorts Ports Environmental Review System (PERS) [109].

The results so far suggest that over time the ports of Bremen have implemented a combination of tools and measures to green its operations. In the early stages, they used measures like the provision of port waste reception facilities and creation of nature compensation sites. In recent years they have prioritized measures geared towards improving air quality, energy conservation and reducing their impacts on climate change with tools such as the ESI and use of renewable energy for port operations. The bundle of measures the port has adopted in recent years can be linked to new and tight legislation by the EU especially the comprehensive Directive 2008/50/EC on ambient air quality and cleaner air for Europe where the several Member States have already either been brought to the European Court of Justice or have been convicted for violating air quality levels [11]. According to ESPO, the European Commission has given priority to the implementation and enforcement of European air quality and climate-related legislation and non-compliance to these legislations could attract negative publicity and could be injurious to the image of ports.

Being among the first ports worldwide to implement a greening strategy, and owning the trademark “green port”, the Bremen port authorities have been in a position that the successive shifts and the selective prioritizing of certain measures at different points in time have had impacts on the global development of the discourse. Together with other European ports, Bremen ports have actively contributed to the institutional design of the global green port initiatives, as well as on the contents that have been successively prioritized in those institutions. Being selective in the kinds of measures to be taken under their own sustainability strategy has therefore had wider impacts on what bundles of measures have been prioritized at different times.

5.2. *The Ports of Abidjan, Lagos and Tema*

The ports of Tema, Lagos and Abidjan are the most important ports in the West African sub-region, accounting for nearly half of the region’s total maritime trade in terms of volume [118]. The increasing recognition of transboundary environmental issues has led to increased and strict legislation in recent years in the West and Central African sub-region [44,119], also affecting the development and operation of port facilities. In the next sub-section, we discuss how these ports are engaging with the globalizing green port idea and their associated greening practices.

5.2.1. Engaging with the Green Port Idea at West African Ports

Although not all ports have a concrete green port policy, some have started implementing tools akin to the green port idea. In general terms, the studied ports understand a green port as a catchphrase that promotes the idea of developing and operating ports with environmental and social considerations. In the absence of a clearly defined green port policy for some ports, officials of the understudied ports nonetheless stated that they are engaging with the green port idea, which according to them is of European origins:

“When I took over the position (head of the environment department) of the port (. . .), I wanted to know what other ports in Europe do for environmental protection. I saw it (green ports) on the internet and by just typing the request I saw links that gave me names of some people working in leading ports in Europe. When I contacted them, they told me about green ports (. . .) and then I started following them and try to learn also what they do.”. (Iv Abidjan, 9.02.17)

“The (idea of) green port I believe is to reduce the environmental impacts that emerge from port operations. Talking about waste reduction, greenhouse gases reduction and making

sure your port becomes compliant to national and international law. (...). In order to go green, we have made every effort to reduce waste generated from port operations (...). Furthermore, facilities have been provided in the port for the reception and treatment of ship waste.”. (Iv Tema, 10.01.17)

“It (green port) is an idea that re-echoes the possibility to develop and manage a port and do business without damaging the environment.”. (Iv Lagos, 23.11.16)

The above extracts reveal how the West African ports considered in this study encounter, understand and engage with the travelling green port idea: A first encounter with the green port idea often happened through the internet, with subsequent contacts to European port authorities and to coordinators of port networks during networking events [13]. It became also clear from all the interviews with port officials in West Africa that the green port idea was also encountered following efforts by national governments to mainstream principles of green economy and sustainable development goals in different sectors of their economies as being promoted by international development institutions. In Ghana, for example, efforts are being made to mainstream elements and principles of green economy and green growth into medium-term development plans of district, municipal and metropolitan assemblies and in different sectors of the economy including at ports [120]. The studied West African ports have since then been engaging with this idea and have adopted measures, tools and technologies to address their most pressing environmental aspects, meet legal requirements and improve their competitiveness amidst their unique constraints as further discussed below.

5.2.2. Green Port Practices of the Studied West African Ports

Officials from all three ports considered in the study have indicated that during the past few years, environmental issues have become important to them and they have introduced several measures and programs to protect the environment, thereby not following a standard recipe or a coherent policy. Rather, its elements have been implemented over time, the choice often influenced by environmental priorities, financial capacity and the level of expertise of port authorities.

Technical infrastructures: All three ports have put in place the infrastructure needed to receive and process the waste generated on-board of ships that call at their ports. The port of Tema, for example, has concessioned environmental service companies to receive ship waste and process it in an environmentally friendly manner in compliance with Annexes 1 and 5 of MARPOL 73/78. After processing of the ships’ oily waste, the by-product is sold as fuel for industrial and manufacturing companies in the industrial enclave. This has led to efficient handling of ship waste, which at the same time brings direct economic benefits to the port authority and the companies:

“(. . .) the port is required to develop a port reception facility so that ships that come can discharge their waste at the port, to avoid the ship from dumping waste at sea or offshore on the high sea. We have concessioned this business to a number of companies who come around whenever a vessel has landed here to collect their waste. We have shared it among five companies based on percentages that they can handle. We make sure no ship goes away with the waste it comes with and you know we have an environmental fee which the vessel has to pay whether you discharge the waste or not. So this is to make sure that they deposit it before they leave.”. (Iv Tema, 12.05.16)

Similarly, the Nigerian Port Authority (NPA) has a public-private partnership agreement with African Circles Ltd., an environmental service provider that manages its ship waste. It has also an agreement with Sea View Properties Ltd., which manages its port generated waste (personal communication, port of Lagos, Apapa). The port of Abidjan has also put in place the needed port reception facilities in compliance with Annexes 1 and 5 of MARPOL 73/78 to receive and process ship waste (Personal communication, Port of Abidjan). In Ghana, the Ghana Ports and Harbors Authority (GPHA) and Meridian Ports Services (MPS)—the main container terminal operator at the port—have

also implemented a waste management policy called the ‘waste segregation policy’ based on the principle of the 3-R’s (reduce, recycle and reuse). This is one of the major tools the port authority has implemented with regards to its objective of ‘going green’, where they see no waste, but only resources. Based on this flagship green port initiative, differently colored and well-labeled waste bins have been procured and placed at designated points at the port to segregate different types of waste while punitive measures have been outlined. According to the port, it has received enormous economic and environmental benefits since then:

“The biggest challenge we have here is waste. Therefore, in order to green the port, we have ensured that there is an effective segregation of waste. (. . .) We segregate waste and make sure the right waste goes to the right place where it can be reused or recycled. We also try to reduce waste generated in general. (We) have paper, plastic, wood, domestic waste etc. My own analysis shows that at first in a month, we pay a truck twice a week to convey our waste. Twice a week means that it comes eight to ten times in a month. It was cost. But now with the segregation, people come to pick specific wastes as resources and even pay us something back. In the bigger picture too, you will see that we have cut down the cost. Since the truck now comes fewer times, it also means it will burn less fuel. So this single initiative even has linkages to the intermodal and it is a very sustainable practice. It gives us economic benefits as well as helps to reduce pollution.”. (Iv MPS, Tema, 17.02.17)

In another course of action, the port of Tema in a bid to boost the efficiency, reduce port-generated waste, reduce waiting time of vessels and congestion has introduced the paperless port policy as a green port tool since September 2017. Fraught with some initial agitations from a section of port workers (especially the revenue collection unit) who feared that this policy initiative could make them redundant, the initiative has taken shape after authorities allayed their fears. According to the GPHA, this has helped to reduce the amount of waste generated and resource use and has also led to an improvement in revenue collection. They argue that it is a policy that has both economic and environmental goals (personal communication, port of Tema, 05.06.18). Aside from this, all three ports use electrified rubber-tired gantry cranes (ERTG) for terminal operations to reduce emissions.

Pricing and access: The study shows that all three ports use indirect fees (port dues) as well as fines to promote environmental consciousness and improve the environmental performance of terminal operators, concessionaires, truckers, logistics providers and vessels.

All three ports have instituted heavy fines based on the polluter pays principle for marine oil spills and other forms of pollution in the port area. This serves as a punitive measure and seeks to discourage pollution of any kind by companies operating in the port area. All three ports have also put in place indirect fees to discourage the disposal of waste at sea. At the port of Tema, the estate and environment department have implemented a compulsory fee for the discharge of waste at the ports reception facilities for all vessels regardless of whether the vessel has any waste to discharge or not. In Abidjan, the port authority through the environment department has instituted a ship waste fee, which serves as an economic incentive for controlling pollution from ships that call at the port. Aside from this, port managers at these three ports have inserted environmental clauses into concession agreements. At the port of Tema, it is currently impossible for concessionaires to operate without first presenting an environmental permit from the Environmental Protection Agency (EPA) detailing the potential impacts of the company’s activities on the environment and how these issues would be addressed through a detailed environmental impact assessment:

“We have deliberately included environmental components in lease agreements. By law, no company can start operations on the port lands without an environmental permit from the EPA. So these environmental permits, environmental statements indicating the possible impacts of your operation and measures that you are going to adopt to prevent or reduce them, we make sure you implement it or sometimes not allowed to operate at all if the environmental impacts are too grave. So environmental issues and permit plays a major role.

This department is the eye of the port. We look at your environmental permits before we allocate land to you.”. (Iv Tema, 12.05.16)

Integrated management approaches: All three ports have designated officers in charge of environmental management. The port of Abidjan created its environment department in 2004 and has since been responsible for developing yearly environmental targets and management procedures although the head of the environment department remains a junior management portfolio and at times faces challenges with getting its initiatives and programs approved. At the port of Tema, an environmental department has been established since 2002 and is responsible for managing environmental issues at the port. In the last five years in specific, the department has become very influential in decision-making regarding new port extension projects, land use and port operations. Similarly, the port of Lagos, Apapa has a designated department for handling environmental issues. This marked the first attempt to make the care of the environment a normal process in port development, operations and management at these ports.

In another step, two of the ports have adopted and are certified to international environmental management systems (EMS) as their environmental management standard. The ports of Tema and Abidjan are currently certified to ISO 14001 EMS. This standard is used as a guide and provides the framework for a systematic environmental management at the ports, according to their respective environmental objectives, environmental aspects and legal requirements. While they have both developed a comprehensive approach to care for the environment in the space of the port lands and port waters with measures mainly geared towards sustainable management of waste in the port and ship interface, water pollution, oil spills, effluent discharges from the port and the city and preventing the dumping of hazardous waste (mainly electronic waste) through the ports, little measures have been taken towards improving air quality or reducing impacts on climate change. The quote below from one port manager, which resonates with all the other port officials that were interviewed, provides insights into the reasons behind this selectivity in adopting or implementing green port measures:

“If I have to be frank, we have not developed the consciousness in investigating the type of energy that we or the terminal operators use. We have not developed to that height yet. We still depend on the national grid and fossil based fuels even though we have been considering various options and we have been receiving proposals from companies regarding the development of solar energy but we have not yet implemented them. They remain plans and proposals that are still under discussion. We hear about the need to use renewable energy from European based ports in line with becoming a green port, but here in Tema, we don’t even have the space, the resources and the capacity to implement such infrastructure.”. (Iv Tema, 12.05.16)

The ports in the first place lack the capacity and equipment to monitor energy-related emissions. Thus, the tools and technologies they adopt in engaging with the green port idea are influenced by their environmental priorities, availability of financial resources and their immediate areas of competence. For example, in-port electrical connections (cold ironing) require reliable electrical supply, which is often not available. In general, access to clean and affordable energy remains poor and irregular in Africa [121] and efforts towards reducing impacts on climate change are constrained by technical and financial factors [122,123]. On the other hand, since a major incident with the dumping of toxic waste in Probo Koala, Côte d’Ivoire in 2006, sustainable waste management has become a topical issue for ports in the sub-region to address. The analyzed West African ports hence do not consider implementing emission reduction technologies or providing cold ironing technology as an immediate priority in the face of the law, financial capacity and or an issue that falls under their immediate area of competence.

While it has become clear that the analyzed West African ports to a certain extent have taken over some of the basic assumptions and main arguments of the debates around greening of port operations and infrastructures, a general focus on ‘softer’ policies and initiatives can be noted. Whereas many European ports (like the ports in Bremen and Bremerhaven) have started investing in alternative power

sources and providing vessels with an on-shore power supply, the ports in Ghana, Cote d'Ivoire and Nigeria show only few signs of larger technical innovations. Instead, their 'greening' stories mainly rely on the introduction of integrated management tools like the creation of environmental management offices or ISO certifications. Disregarding the construction of waste management facilities, all three ports have not reported larger investments in technical infrastructures. Additionally, a major difference has been observed how ports in West Africa implement pricing and access regulations: While the ports of Bremen mainly rely on incentive pricing for attracting vessels with reduced emissions, the analyzed West African ports use punitive measures. All three ports have not adopted the ESI index for differentiated pricing, also with regards to the relative high entry costs for participating in the global system for access regulation.

6. Final Discussion and Conclusions

The paper investigated how port authorities in Europe and West Africa engage with the green port idea highlighting how contextual factors shape the adoption of green port measures. This explains the varied green port practices of ports in European and West African contexts. Although green ports have received considerable attention from scholars [3,27,51,81], very little attention has been given to understanding the role contextual factors may play in the adoption of green port measures from a potential bundle of tools and technologies. This is particularly important in appreciating the measures that are taken by port authorities in African countries, where resource and infrastructure constraints pose enormous challenges to the transition towards sustainability. The findings also put into question the fact that some ports in Europe use the label 'green ports', which most West African ports do not have.

Our findings show that whereas the ports of Bremen in Europe have implemented measures that are geared mainly towards addressing air quality, energy and climate change mitigation, the West African ports adopt measures that are geared mainly towards sustainable waste management, oil spills and ballast water management. It is also evident that port authorities adopt different combinations of measures at different time periods based on their environmental priorities, major issues on the regulatory agenda of governments, financial capacity and immediate area of competence of port authorities. Whereas the twin ports of Bremen have a comparably strong focus on technical infrastructures, integrated management approaches are more prevalent in West African ports.

In a broad perspective, the findings corroborate a report by PIANC [5] (p. 4), which noted that "in a green growth strategy, sustainability is an economic choice based on a proactive long-term vision". How ports engage with the green port idea and translate it into a business reality, the tools, technologies and measures they adopt from a potential bundle of measures available only make sense in time and place. This finding concurs with Barnes-Dabban et al.'s [63] general argument that environmental reforms relating to the green port idea are influenced by institutional and situational factors and are implemented through processes of sense-making. It also supports Wooldridge et al. [54] and Acciario et al.'s [18] view that existing legislation and financial capacity may influence green port strategies. Our results further confirm Innes and Monios's [31] more specific assertion that contextual factors such as financial capacity and total energy requirement levels of ports influence the decision to adopt the cold ironing technology and Poulsen et al.'s [77] finding that complexity of a green tool implementation may constrain implementation and upgrade along the value chain.

Theoretically, our study shows that as ideas and concepts move across space, they are translated based on local conditions, priorities and interests. During their implementation, port managers strategically select or adopt measures and practices that fit both institutional and material contexts of the ports and the countries or the regions in which they are installed [99]. Thus the issue of selective adoption unfolds as part of the translation process and is embedded in specific socio-political contexts. Seen in this way, selective adoption becomes an important strategy ports use to pursue a local sustainability fix [102,124]. For further research on the decision-making processes, the application of a method or framework that deals with complex decision-making processes, like the analytic hierarchy

process (AHP), may also contribute to the topic, as it has been applied to sustainable urban transport in general (see [125,126]).

For West African ports to implement measures towards improving air quality or energy transitioning, for example, may be challenging in terms of funding and technical support. The selective adoption of green port measures or tools is further conditioned by the international debates on sustainable development in which air quality, energy and climate change are the key concerns that, currently, receive the most attention by the media, funding agencies and governments, especially in industrialized countries. West African ports, with limited financial capacities and relatively little public pressure regarding climate change mitigation, are strategically adopting certain tools that address their priority environmental issues like waste management; their choices may also be influenced by requests of transnational private actors in the logistics business. The definition of the globally circulated ideas of green port, especially with regards to the tools, measures and technologies that become standard parts of the agenda, is still largely shaped by a few influential ports in Europe and North America. The question which measures and tools are made a pre-requisite for labeling or certifying a port as a green port, remains an important and a highly political one. Agendas developed in a global setting, that are at the same time competitive and oligopolistic, are likely to deepen existing economic inequalities. Their environmental effects await further investigation.

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Research paper 2

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Transnational networks for the 'greening' of ports: Learning from best practice?

Eric Tamatey Lawer¹

Abstract

Port environmental 'networks' are collaborative initiatives, in and through which port authorities design an array of policy measures and tools and facilitate policy learning to improve their environmental performance, promote environmental upgrading and deliver sustainable development. Drawing on document analysis, participant observation and information collected through interviews with port managers, network coordinators, and maritime experts in Europe and West Africa, existing forms of sustainability-oriented port networks, their actors and best practice coordinating tools are described and analysed in their influence on environmental upgrading. The theoretical perspective is thereby informed by Castells's network theory of power, complemented by insights from the literature on policy mobilities - a geographical concept for analysing the global circulation of best practice - ideas, concepts, technologies and policies and the conditions that constrain or enhance their adoption. The study shows that uptake or adoption of best practice tools is limited to a few pioneer ports; a finding that contradicts the dominant conceptualisation of transnational governance networks as transformative and their best practice tools as largely transferable. One reason for this limited uptake is seen in the fact that the networks are created around the political interests of a few powerful actors.

Keywords: Port environmental networks, Best practice, Network theory of power, Policy mobilities, Environmental governance, Environmental upgrading

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1. Introduction

Ports are important gateways for international trade as about 90 percent of global trade tonnage move by ship through ports (Rodrigue et al. 2013). Being locations where trade, logistics, and production converge; connecting various points of production and consumption, ports are indispensable nodes in global supply chains (Geerlings et al. 2018). Research has however also shown that increasing shipping, which often requires expanding existing port infrastructure with new quays and deeper channels and the handling of increased volumes of cargo can be associated with adverse environmental externalities. These include effects on air quality, water quality, biodiversity, emission of greenhouse gases and problems associated with hazardous ship and port generated waste, oil spills and ballast water discharge (for details, see Coto-Milla'n et al. 2010; OECD 2011). Consequently, ports all over the world are under pressure from both local and international arenas to protect the environment, maintain public health and reduce their impacts on climate change (see Fenton 2017; Smith et al. 2014).

It is generally acknowledged that achieving (environmental) sustainability including at seaports and along the maritime value chain requires effective policy, management and governance systems (Acciaro et al. 2014). Traditionally, the environmental governance of ports followed a centralized nation-state system where national institutions set and enforce rules or pollution limits and require environmental improvements and compliance from port authorities (Ng and Pallis 2010; Wooldridge et al. 1999). In recent years, however, non-state and sub-national actors including port authorities, port cities, terminal operators, and environmental NGOs are taking up environmental responsibilities and positioning themselves as key actors with agency in environmental governance and policy making through various collaborative environmental initiatives and projects, especially those that are directly related to shipping and are transboundary in nature (Barnes-Dabban et al. 2018; Fenton 2017; Kura et al. 2014; Nursey-Bray 2016).

In policy and academic debates, one strand of literature has extolled the influence or effect of transnational co-operation among port authorities and related maritime actors for 'norm' formation, consensus and capacity building, or for the designing and diffusion of best practice tools - green guides, technologies, or policies in a narrower sense for addressing environmental and social sustainability issues at ports (see Barnes-Dabban et al. 2018; Fenton 2017; Nursey-Bray 2016; OECD 2013; PIANC/IAPH 2014; WPCI 2008) as well as for environmental upgrading along the maritime value chain (Poulsen et al. 2018). These scholars argue that state and multilateral environmental governance mechanisms alone are inadequate and/or ineffective for solving multi-local, transboundary or global environmental problems related to ports and that collaborative initiatives among port managers and related industry players can produce positive outcomes and effects (Becker et al. 2012; Nebot et al. 2017; Hermann et al. 2016). It is

in this regard that Florini and Pauli (2018) remarked in general terms that collaborative initiatives among non-state actors have become important for the goal of achieving sustainable development.

In recent years, rich accounts have emerged with respect to ports and/or port city collaborations and networks. Nursey-Bray et al. (2013) argued that port networks are important governance mechanisms for solving environmental and climate-related problems in the maritime sector because ports are interactive infrastructure hubs that generate flows in environmental governance which are not usually enabled through state decision-making processes. Similarly, Becker et al. (2012) opined that networking is essential for ports in their search for environmental and climate-related policy solutions to stimulate local action as state mechanisms are too static to cope with current and evolving environmental problems at ports. In the same vein, Anders and Robin (2015) argued that port city networks are important spaces for negotiating perceived risks and opportunities of environmental and climate change as they can facilitate the exchange of information and knowledge and learning from best practice to build capacity and address sustainability problems at the local level. In the quest for sustainable development at ports, several networks of diverse actors have been formed including: Rotterdam's led World Ports Climate Initiative (WPCI), now known as the World Ports Sustainability Program, the EcoPorts network, the African Ports Environment Initiative, and the GoGreen marine terminals network. They are transnational in the sense that these networks connect port authorities across regions and the globe and the major actors that create norms, voluntary standards and circulate best practice are sub-national or non-state (Betsill and Bulkeley 2004).

Recently, however, another body of scholarship is questioning whether transnational collaborations in general, are 'paying off' for all actors, or privileging powerful interests (Bouteligier 2013b; Daugherty et al. 2006; Schwab 2013; Pattberg and Widerberg 2016). In geography, an expanding body of literature on policy mobilities (Lovel 2019; McCann 2011; McCann and Ward 2015; McCann and Ward 2011; Nciri and Levenda 2019) have also raised concerns about the lack of theorising power and understanding policy failures or immobility as a relational effect of the policy making and network(ing) process and have raised doubts in how far actors are able to adopt and implement best practice (see also Bulkeley 2006; Ochoa et al. 2018; Stead 2012; Moore 2013). As networks are mediums through which norms and voluntary standards are created, best practice is ordained, and actors are expected to learn and mobilise best practice to stimulate local action, research must interrogate not just whether a particular network is good or bad e.g. with respect to aims and objectives, but more importantly the extent to which a greater number of participating actors are able to adopt or implement the networks' coordinating tools and standards. It must address what Bulkeley (2005: 877) refers to as the "politics of networks" and delve into network(ing) conditions and/or processes that may influence outcomes.

So far, research on network governance initiative among port authorities, what I refer to in this paper as transnational port environmental networks (hereafter TPENs) or sustainability-oriented port network(ing) has paid less attention to for e.g. how power relations and actor interest may influence outcomes - seen in terms of the ability of a greater number of participating ports to adopt tools and measures designed and promoted via the network. This paper address this gap by asking the following questions: (1) What are the existing transnational networks for the greening of ports and what best practice tools have they created and/or promoted over the years? (2) To what extent (if at all) do these networks bring to bear positive influence on the environmental performance of participating ports? (3) how does power relations and actor interest influence network outcomes? To do this, I integrate Castells's network theory of power (Castells 2011) with insights from the expanding literature on policy mobilities (Peck and Theodore 2010; Lovel 2019; McCann 2011; Nciri and Levenda 2019). The paper is divided into five sections: In the next section, I conceptualise port environmental networks and elaborate my theoretical framework for the study. In section three, I present the methodology for the research, followed by the results and analysis in section four. In section five, the final discussion and conclusion is presented.

2. Conceptual framework

To understand and analyse the influence that transnational network(ing) of port authorities can bring to bear on participating ports and how power relations and actor interest may affect network outcomes requires engaging with theories of network governance and policy mobilities. To do this, I build on Castells's (2011) network theory of power and ideas from the literature on policy mobilities (Lovel 2019; McCann 2011; McCann and Ward 2015; Nciri and Levenda 2019). Before this, I will first elaborate my conceptualisation of collaborative initiatives among port authorities as transnational networks.

2.1. Conceptualising port environmental networks

Environmental governance scholars have traditionally viewed statutory regulations and multilateral agreements as the central mechanisms for global environmental governance (Bulkeley et al. 2012; Biermann and Pattberg 2012). In the maritime sector, the International Maritime Organization (IMO) have since the 1970s created international regulations to foster sustainable maritime development including the Convention for the Prevention of Pollution from Ships (MARPOL73/78) which covers areas such as ship waste and toxic sludges, ballast water and air pollution (IMO 2018). Nation-States whose governments have ratified the convention are expected to enact it into national laws and in the context of their national politics and institutions, develop and implement policies to address environmental pollution from shipping and ports. However, as concerns about perceived inefficiencies of the state-

centric or inter- governmental approach are growing, transnational collaborative initiatives of sub-national and non- state actors are said to have become prominent in fixing what bad governments fail to do or in complementing their efforts (Betsill and Bulkeley 2004; Biermann and Pattberg 2012; Bouteligier 2013a; Kern and Bulkeley 2009; Nwozor 2019). It is in this regard that Biermann and Pattberg (2012) argued that over the past decade, transnational governance networks of private actors, experts and companies have emerged to steer environmental issues and contribute towards achieving global sustainability goals. Bulkeley and Newell (2015: 55) referred to these new governance constellation as “transnational governance networks”. They connect actors at different levels and scales, facilitate policy learning and can exert influence on their members - e.g. with regard to complying with national and international environmental legislation or voluntary standards (Andonova et al. 2009).

The theoretical underpinnings of networks are many and varied. In this paper, it is understood following Castells’s (1996) conceptualisation of a networks as a set of interconnected nodes, representing patterns of connections and interactions between parts of a system. Taking world ports as a system, connected by seas and ships, the nodes are the ports (authorities) and the patterns of connections and interactions are the collaborative initiatives among them. In this study, such collaborative initiatives are aimed at addressing environmental and social sustainability issues, especially those that are connected to shipping like ship-waste and toxic sludges, ballast water, and greenhouse gas emissions. In a governance perspective, such a network could provide opportunities for information sharing, capacity building, policy advice and exchange of best practice (Blatter 2004; Biermann and Pattberg 2012; Andonova et al. 2009). Decision making in the network is assumed to be based on consensus-building; while compliance is ensured through trust and standards imposed by being a member (Bouteligier 2013a; Biermann and Pattberg 2012; Castells 2011; Kern and Bulkeley 2009).

Through networks and networking events, multiple actors can build consensus on some of the most controversial issues or problems facing them (Martinez-Diaz and Woods 2009). In the context of TPENs, this could be making informal decisions or ‘building norms’ about whether large or small ships are more sustainable, what should be the most sustainable maritime transport system for ports in a particular region, which environmental issues should be prioritised by ports, which organisational and technological tools, measures or policies are the ‘best’ to address these challenges or even what ‘green ports’ actually mean. This is because such networks are generally perceived to be horizontal (Kern and Bulkeley 2009). Believed to be constituted around shared imaginations of risks and opportunities, they provide opportunities for putting port authorities in contact with each other or with technology companies and experts in environmental management and may help in increasing capacity to implement environmental agreements, develop cleaner technologies or inspire policy change through adhering to

common norms and policy adoption (Barnes-Dabban et al. 2018; Lister et al. 2015; Hermann et al. 2016; WPCI 2008).

In the context of this paper, a port environmental network refers to a collaborative initiative or partnership between port managers and related industry players, created to facilitate the exchange of information, enhance capacity building, and promote the diffusion of best practice to stimulate local action and help participating ports improve their environmental performance, transition towards sustainability or towards developing a sustainable maritime system more broadly. Seen in this way, best practice becomes a de-facto synonym for policy learning (Bulkeley 2006) and transnational network(ing) events and activities such as conferences, meetings, round tables, and internet websites become important mediums through which best practices are created, anointed and presented as “transferable and transformative” (Andersson and Cook 2019, p. 1; see also Nagorny-Koring 2018). In this contexts, best practice is understood following Moore’s (2013) understanding as a social construction whose creation involves the promotion of certain projects, policy issues, problem definitions and places over others. Adoption or uptake of best practice may be coerced, voluntary or even unintentional (Dolowitz and Marsh 2000). Since influence of a particular network cannot be measured directly, it is understood here in terms of the number of actors (ports) that use or adopt the networks policy tools or use its coordinating standards following Castells (2011) and the conditions that enhance or constrain their adoption (Innes and Monios 2018; Lovell 2019; McCann and Ward 2011).

2.2. Castells’s network theory of power

A concept for analysing influence that a network can have on its members and for that matter network outcomes is provided by Castells (2011) in his network theory of power. Castells argued that the ability of certain actors to constitute a network, set its agenda and define the problem or issues that are prioritised by the network is another means powerful actors use to exercise control over others. Castells identified two sources of power that could influence networks interactions and outcomes namely: the power of coercion and the power of construction of meaning. Based on this, Castells categorised four types of power that exist and/or may play out in networks and networked initiatives namely: “networked power, network power, network-making power, and networking power” (Castells 2011: 773-777).

‘Networked power’ according to Castells refers to the power that certain actors may have over other actors in a network. In her work on city networks for climate governance, Bouteligier (2013a, b) argued that it can be expected that the initiators of the network, the economically resourceful actors who support the network’s initiatives and those who have the privileged opportunity to develop its programs or influence its standards will possess this type of power. In the context of TPENs, this could be power that the so-called project ports - who are directly involved in designing the network’s policy tools as

pilot projects may have over those who are expected to emulate them or that which the pioneers of the network may possess in-line with their ability to set the network agenda. This may also relate to power plays that may manifest at round table discussions e.g. with regard to building consensus on certain controversial issues such as the form sustainable maritime transport systems for a region should take. This may be aligned to the political interests of powerful actors. 'Network power' according to Castells (2011) refers to the power or influence of a network itself over its actors. It is a function of the number of participating actors that adopt or use the network's coordinating standards, or coordinating tools and technologies. Castells therefore argue that a network become influential when a greater number of actors use or adopt its standards and coordinating tools. 'Networking power' according to Castells is that which the actors included in a network may have over those who are not. This relates to benefits that participating port authorities may enjoy by virtue of their membership of a particular network over those who are not. Finally, Network-making power, according to Castells refers to power wielded by some actors by virtue of their ability to constitute a network, determine its goals and framework for action and recruit or influence others to join (Castells 2011). Powerful actors may create particular networks and set the agenda along their environmental priorities, desired futures or environmental issues that rank high on the regulatory agendas of their local and regional governments (Bouteligier 2013a). This is where actor interest and politics sets in. In this sense, best practice may be underpinned by deeper and highly situated constructions of aligned interest, which could affect their adoption, one of the main issues addressed by scholarship on policy mobilities.

2.3. Policy Mobilities

At its core, the concept of policy mobilities (PM) examines issues of broadly defined forms of teaching and learning in transnational mechanisms; as well as the circulation, adoption and processes of translation of best practice ideas, concepts, technologies and policies (Andersson and Cook 2019; McCann 2008, 2011; Nciri and Levenda 2019). Unlike orthodox political science research on policy transfer which has a strong focus on government-government transfers, PM has a general interest in the role of non-state and sub-national actors like cities and organisations in mobilising best practice and the actor-networks through which policies and technologies are ordained and diffused (Lovell 2019). The PM approach thus pays particular attention to the mediums and processes through which policies and technologies or coordinating tools are designed and the ideas, norms and discourses they help to spread (McCann 2011). The concept also places emphasis on and draws attention to the changes that may occur to policies, technologies and ideas as they are transferred and adapted in new contexts (Wood 2019; Lawer et al. 2019). Aside the above, literature on PM draws attention to policy failures or conditions that may constrain the adoption or transferability of best practice (Lovel 2019; McCann and Ward 2015; Nciri and Levenda 2019).

While some scholars of PM amplify issues of power (relations) and actor interest and how they play out in policy making in a narrow sense and network(ing) processes in general by paying attention to the relational underpinnings of power and actor interest in the policy making process (McCann and Ward 2011; Nagorny-Koring 2018), others draw attention to local institutional and material contexts and conditions that may constrain or enhance adoption of best practice (Lawer et al. 2019; Moore 2013; Nciri and Levenda 2019). This is one feature of PM that this paper draws on. Writing on the politics of policy mobility, Temenos and McCann (2012) argued that in searching for policy solutions, powerful actors may direct attention to certain definitions of problems and legitimise or promote specific forms of solutions, mostly those that will help them in achieving their political aim of a sustainability fix. In the context of this paper, port authorities participating in particular networks may strive for solutions and policy measures that fit their local institutional, economic and regulatory contexts, which are necessary for a workable local sustainability fix. In her work on cities learning from best practice, Bulkeley (2006: 1029) argued that “best practice [are] enmeshed in the particularities of places from which they are derived and in the political struggles [over issues at the places] where best practice is deployed”. This is relevant to TPENs. As environmental priorities and regulatory requirements of ports differ across time and space (Puig et al. 2015), port authorities participating in TPENs may promote organisational and technological tools and measures that would help them to address their priority environmental needs and curtail pressure from local stakeholders.

Taking this as an entry point, actor interest and politics become inevitable in for e.g. setting a network’s agenda or the organisational and technological tools that are promoted as the ‘best’. This makes networks political spaces (Bulkeley 2006). In network(ing) initiatives, there could be what Hajer (1995) referred to as competing frames and discourses about problems and their concomitant solutions. Network(ing) activities including round table discussions, meetings or conferences for creating norms, or benchmarking best practice may be subtly political and deeply entangled with competing rationalities (see Andersson and Cook 2019; Bulkeley 2006; Gallus and Frey 2017; Gray et al. 2016; Moore 2013). To this end, actors are likely adopt only measures and tools that will help address their immediate, environmental priorities or those which they have the requisite knowledge and technical capacity to implement (Innes and Monios 2018).

Actors who are able to implement the tools and technologies that are promoted as best practice, usually the powerful actor may however in the process acquire the image of ‘frontrunners’ (Poulsen et al. 2018; Gallus and Frey 2017) while those that are unable will be tagged as ‘laggards’ (Wurzel et al. 2019). But since perceived frontrunners are likely to gain advantages over laggards in various regards, e.g. in access to green funds (Ciplet et al. 2012), the creation of networks and designing of its coordinating tools or setting its standards around the political interest of initiators and influential ports could as well be seen

as a strategy powerful actors use to maintain their position as frontrunners and to remain competitive. Collaborative initiatives may not provide a level playing field for all actors and this may affect the overall transformative potential of the network - seen in terms of the number of participating actors in the network that uses its standards (Castells 2011) and the extent to which this promotes environmental upgrading (Poulsen et al. 2018). Table 1 presents a synoptic overview of the conceptual formulation for the study. It is within these theoretical frame that the TPENs or sustainability-oriented port networks considered in this study are analysed.

Table 1. A synoptic overview of the conceptual formulation for the study

Type of power	How/What	Who
Network-making power	Ability to create a network and set its agenda according to the interest and values of the initiators	Initiators, financially resourceful ports, coordinators
Networked power	The power of some actors over other actors in a network e.g. in designing policy tools towards particular environmental issues or setting standards based on interest	Initiators, coordinators, financially resourceful ports
Networking power	Power that actors included in a network have over over those who are not. It can also be the power to include or exclude certain actors	Initiators, coordinators, potentially all ports
Network power	Imposition of standards and enforcing the uptake Or adoption of policy tools and measures. This is the power or influence of the network itself.	Coordinators, case study or best practice ports

Source: After Castells (2011), with insights from the literature on policy mobilities: Lovell 2019, McCann 2011, McCann and Ward 2011, and Temenos and McCann 2012

Through this theoretical formulation, we can understand and explain network outcomes and the adoption or non-adoption of best practice tools that are promoted as transformative and largely transferable in TPENs. This also enables us to expand the relationship between networks, policy mobilisation and power and to understand the rationalities behind the promotion of certain discourses and material technologies or the setting of certain agendas in global networks.

3. Research methods

The paper draws on information collected through a triangulation of four qualitative research methods: searching the internet and website of ports, literature and document analysis, semi structured interviews and participant observation, done in two separate stages. The first stage involved searching the internet, port websites and journal articles to compile a list of existing TPENs. In parallel, documents and literature containing programs, action plans, best practice organisational and technological tools and environmental reports of ports and TPENs were gathered for analysis. Stage two involved collecting empirical information through in-depth interviews with twelve informants – port authorities, network

coordinators and maritime experts in Europe and West Africa between May 2016 and July 2018 as part of a larger study on transitioning European and West African ports towards sustainability. Aside these, my role as a participant observant at the Greenport congress held in Venice, Italy in October 2016 provided invaluable insights into the informal processes at play in/at network(ing) events and how port authorities, technology companies engage in practices of showcasing best practices and the diffusion of knowledge. Interviewees were guaranteed anonymity and therefore their responses are identified by their role as port environmental manager, network coordinator or maritime expert without the names of the ports or the network except for information that was gathered from online documents. A content analysis was then performed on the data to identify common and divergent themes (Silverman 2015).

The study focussed on European and West African ports due to the following reasons: First, the International Association of Ports and Harbors (IAPH) for the purpose of policy learning and knowledge transfer have placed European and African ports in the so called 'Africa-Europe' maritime common area as they are connected not only by trade but also by sea (PIANC/IAPH 2014). Recently, representatives of the European network of port environmental managers - the EcoPort Network participated in, and gave training to West Africa ports through the African Port Environmental Initiative to equip them with the technical capacity to implement green port tools (UNEP 2015). Second, several study tours have been organised for West African ports to selected ports in Europe like Bremen and Rotterdam for the purpose of policy learning and knowledge transfer by the ENGO, Ports Environmental Network Africa (PENAF) as part of the African Ports Environmental Initiative (Barnes-Dabban et al. 2018). Aside this, since European and West African countries are at different stages of economic development but port authorities from the two contexts participate in similar environmental-oriented collaborative initiatives (e.g. the WPCI), cases from the two contexts provide better empirical information needed to interrogate how power relations and actor interest play out in network(ing) initiatives and influence outcomes.

4. Results and discussion

4.1. Existing networks for the 'greening' of ports

The study found several transnational initiatives among port authorities that are geared towards steering environmental governance at ports through mobilising best practice. Non-state and sub-national actors including port authorities, terminal operators and environmental NGOs have established collaborative environmental initiatives at various levels and scales. These sustainability-oriented network(ing) initiatives among port authorities is similar in nature to transnational municipal (city) networks (see Barbi and De Macedo 2019; Kern and Bulkeley 2009) and transnational partnerships or collaborations for sustainable development (Florini and Pauli 2018; Pattberg and Widerberg 2016). They are created in line

with the notion of coordinating social action based on the logic of the flows and they “straddle the boundaries between state/non-state [and] public/private authority (Bulkeley and Schroeder 2011: 752). They range from informal to formal and cover a wide range of environmental sustainability, corporate social responsibility, climate change mitigation and adaptation, and broader topics related to sustainable maritime transport systems and developing and managing sustainable ports.

Some TPENs have offices (a secretariat), consolidated membership and formalized procedures. Others simply have websites (informational infrastructure or data base) and send newsletters with no formal membership. Yet others are also simply assumed, as if they were, but exist only by name and objectives without clearly identifiable programs, projects or coordinating tools. The oldest of these is the network of European port environmental managers (EcoPorts) established in 1997 and the most recent is the World Ports Climate Action Program established in 2018. In all, TPENs operate on the notion of learning from peers, policy convergence and the uptake or adoption of best practice tools to improve environmental performance of participating ports and developing sustainable maritime transport systems. Table 2 below summarises existing TPENs, the actors, objectives, best practice or policy tools and geographic coverage.

The TPENs enumerated in **table 2** below are created or constituted around a set of goals and perceived shared imaginations of risks and opportunities. A goal shared by all these networks is the objective to harmonise environmental policies and steer environmental governance at ports through common protocols, programs, technologies and ideas and to enable participating actors to learn from their peers or take up best practices. This constellation can be likened to the phenomenon of drawing inspiration from best practice, policy learning or the transfer of practice (Bulkeley 2005; Gray et al. 2016; Stead 2012; Biermann and Pattberg 2012) to stimulate environmental action at ports and promote environmental upgrading along the maritime value chain (Blatter 2004; Castells 1999). Respondents largely agreed that TPENs have helped in creating awareness for routinized environmental port processes and practices that are more sustainable. However, as discussed below, the promise of transfer of best practice to improve environmental performance or promote environmental upgrading is contested. Getting access to information and experiences of other ports through conferences, workshops, direct contacts, or websites emerged as the most important benefit port authorities gained from being members of these networks. Three of these networks are discussed in detail to illustrate the main arguments of this paper. The criterion for selection was based on geographical coverage - including one global and two regional port networks in Europe and West Africa. They provide insights into power dynamics and subtle power plays particularly in the context of developed and developing countries.

Table 2. Existing transnational networks for the greening of ports (Sustainability-oriented port networks)

Name of Network	Abb.	Actors	Objectives and policy tools	Level
EcoPorts	EcoPorts	Port Environmental managers from about 112 EU ports. Now also include ports outside the EU through the ECOSLC network	Created in 1997 to enable European ports exchange information and best practice in environmental terms. Major coordinating tools include the Self Diagnosis Method (SDM) and the Ports Environmental Review System (PERS) standard.	Regional/ Global
World Ports Climate Initiative	WPCI	Port managers across the globe. Major actors include the ports of Rotterdam, Bremen, Long Beach and Antwerp.	Collaborate to improve the environmental performance of member ports, reduce greenhouse gas emission at ports through the exchange of knowledge, innovation and the transfer of best practice. Major policy tools created and/or promoted include: The Environmental Ship Index (ESI), Onshore Power Supply (i.e. the Cold Ironing technology), the Greenhouse Gas Emission Inventory and the Sustainable Lease Agreement tools.	Global
<i>Now... World Ports Sustainability Program</i>	<i>WPSP Group</i>	Others include the ports of Abidjan and Lagos. Other actors are the IAPH and The C40 Cities group or network		
African Ports Environment Initiative	APEI	A network of port managers in West and Central Africa including ports of Tema, Abidjan, Lagos, Douala etc. Others actors Include: UNEP Abidjan Convention Secretariat and coordinated or steered By PENAf, an Environmental NGO	Provide a platform and a system of relations through which ports can cooperate in order to create awareness and build synergies to confront the challenge of environmental sustainability through the exchange of best practice. Other objectives are to standardise environmental management practices among African ports. Major programs include guides for waste management, implementation of port waste reception infrastructure, handling hazardous and E-Waste and preventing oil spills. Major activities include organising study visits and field trips for ports as well as annual conferences where technology companies, EU ports are invited to share experience. Major objective is to help African ports comply with MARPOL 73/78 requirements.	Regional
Go-Green Marine Terminals Network	GoGreen	A network of global terminal operators including: APM Terminals, DP World, PSA, DHL International, SIPG Group and Hutchison Port Holdings	First ever global network of terminal operators aimed at tackling environmental concerns associated with ports. Strategy: Subsidiaries are expected to implement projects based on the networks themes: Reuse and Recycling, Climate Change, Social Responsibility and biodiversity. Annual GoGreen weeks are observed at different port locations every year where sustainable projects are implemented.	Global

Name of Network	Abb.	Actors	Objectives and Policy tools	Level
Mercator Media's Greenport Network	Greenport	Mercator Media Ltd, port managers across the globe including ports of Rotterdam, Abidjan, Tema, Lagos, Bremen, and technology and environmental Service companies like Siemens	Organised mainly along Conferences where ports exchange knowledge on recent trends and technologies in maritime environmental management. New technologies are ordained and disseminated at such events. The coordinating actor, Mercator Media sends out quarterly magazines, weekly e-newsletters and provide online services (informational infrastructure) to ports.	Global
Mediterranean Ports Network for Climate Change Mitigation	Climeport	Port of Valencia, Koper, Piraeus, Algeciras Bay, Livorno and Grand Port Maritime de Marseille. Others are research institutes such as: ITE (Electrical Tech. Institute), AVEN (Regional Agency of Energy) and GOLEA (Goriska Local Energy Agency).	A network of port managers who cooperate to tackle climate change and reduce their greenhouse gas emissions and promote the use of renewable energy at ports. The network was awarded with bronze in the category of energy and climate change in the 2013 edition of IAPH's Port Environmental Award.	Regional
PIANC/IAPH Working Group on Sustainable Ports	PIANC/IAPH WG 150	PIANC, IAPH, ESPO and CEDA, Bremenports, Nigerian Ports Authority, and few other ports mainly from Europe. Others are scientists'	This initiative is to provide information and recommendations on good sustainable practices for the port sector. It is also to create 'awareness about the benefits associated with implementing a green port philosophy and provide ports with tools, guides and technologies. It seeks to change the way ports think about the environment and to promote port development based on stakeholder participation or or an inclusive growth paradigm which draws on stakeholder value creation	Europe/ Africa
World Ports Climate Action Program	WPCAP	Ports of Hamburg, Barcelona, Antwerp Los Angeles, Long Beach, Vancouver and Rotterdam	Promote Climate Change mitigation and adaptation and provide member ports with sustainable solutions. Member ports commit to operate ports on the principle of Working with Nature. It has been described by its members as 'a coalition of the willing' to advance de-carbonation	Northern ports

Source: Authors Research

The WPCI network is a collaborative initiative among port authorities across the world. In 2008, 55 ports under the leadership of the IAPH and C40 Cities Group signed the World Port Climate Declaration to commit them to reduce their greenhouse gas emissions, encourage environmental information sharing among member ports and help member ports to implement and operate sustainable ports. Later, other ports including the ports of Abidjan and Lagos joined this network. A few European and North American ports perceived as frontrunners (see Poulsen et al. 2018) with the needed financial resources to fund pilot projects were selected as the so-called 'project ports'. They initiated, designed, financed and developed policy tools and measures for sustainable port operations and the other port authorities in the network were expected to replicate these projects or adopt these tools at their own ports. These policy tools have become the de-facto best practice associated with 'green ports'. They include the Environmental Ship Index (ESI), Onshore Power Supply also known as the cold-ironing technology and carbon footprint tools to calculate their SO_x, NO_x, PM, CO₂, emissions and develop greenhouse gas emissions inventories. Project ports included the ports of Rotterdam, Bremerhaven, New York and Los Angeles among others (see WPCI 2010). Other projects such as the sustainable lease guidance tool received less attention (Fenton 2017). Currently, only thirty ports have implemented the ESI worldwide (See WPSP 2018a). Similarly, only about twenty-five ports globally have implemented the cold ironing (OPS) tool. The reasons for the low uptake are addressed under section 4.2 and 4.3 below.

The second initiative, the EcoPorts is a network of European port environmental managers. It was formed in 1997 to promote sustainable and green ports in Europe. Membership is open to all EU ports but now also to ports outside the EU who have compulsorily gone through the SDM through the Eco Sustainable Logistic Chain (ECOSLC). Starting with few ports in 1997 including the ports of Rotterdam as initiators, it now has about 112 ports (see EcoPorts 2018a). Its objectives include providing a platform to create awareness; share knowledge and best practice among port authorities to help them improve environmental management and deliver compliance with legislation (EcoPorts 1997). EcoPorts has established its own standards and coordinating tools for measuring performance or guiding environmental management. Two of its main tools are the Self Diagnosis Method (SDM) and the Ports Environmental Review System (PERS) (see EcoPorts 2018a; Puig et al. 2015). The PERS standard is an environmental standard designed by EcoPort ports themselves (by the so-called environmental committees) and is to be used to guide environmental management in a systematic way which is then independently verified and certified by Lloyd's Register in order to attain EcoPort status (Darbra et al. 2004). The SDM tool however only allows a port to compare its current environmental situation with that of previous years and does not in itself lead to environmental improvements. Till date, uptake or adoption of the PERS environmental management standard has been low. Currently only thirty-five ports out of about 112 member ports in Europe and one port in Asia i.e. Taiwan port have attained PERS

certification. A few years ago, African ports were given training by EcoPorts in order for them to implement EcoPorts tools and standards (UNEP 2015). Yet, no African port has implemented any EcoPorts tool since then.

In West Africa, the African Ports Environment Initiative (APEI) was established as a network of port environmental managers in July 2009. It is organised within the frame of the regional port associations i.e. the Port Management Association of West and Central Africa (PMAWCA) under the coordinating leadership of an environmental NGO called the Ports Environmental Network-Africa (PENAF). In this network, sub-national actors particularly port environmental managers, have by-passed state led environmental policy making arrangements and are collaborating to share environmental information and experiences to improve their environmental performance. The aim is to provide a platform for environmental co-operation among African ports through training, information and technology support and exchange of best practice among ports. Key to this aim is to promote a common environmental policy among West and Central African ports (see Barnes-Dabban et al. 2018). Major projects include devising a standardised way for handling and prevention of pollution from ships, in line with MARPOL 73/78, handling port and ship waste and toxic sludges and the detection and handling of hazardous waste. In short, APEI focuses on devising measures for governing the transboundary movement of waste and hazardous substances. PENAF, the coordinating actor of the network organises annual working conferences and capacity building workshops and trainings for its members. For example, in 2017, they organised a MARPOL study visit to the ports of Antwerp and Rotterdam in Europe for capacity building on adequate port reception facilities for its members. Earlier in 2015, they also collaborated with the UNEP Abidjan Convention Secretariat and PMAWCA to organise the first panel of experts' meeting on the Strategic Assessment of Port Environmental Issues, Policies and Programmes (SAPEIPP) for the regions ports which saw the participation of international bodies including EcoPorts (see UNEP 2015). At this event, knowledge about the green port concept for example was shared with the African ports.

Since then, a second (local or port level) network constellation has emerged within individual ports. In Nigeria, the Nigerian ports authority (NPA) has developed a port-level network at the port of Apapa, Lagos. The NPA has ensured that all terminals and companies operating within the port area collaborate in a so called 'Port Health, Safety and Environment network' (HSE network). Under the leadership of the general manager of environment of the NPA, international terminal operating companies such as the APMT bring to bear their experiences to the local based terminals. A port environmental director cited the transformation of NIPCO terminal (An oil and Gas terminal at the port of Apapa) which has become one of the 'greenest' terminals operating in the port area as a result of this port-level collaboration. A similar constellation was observed at the port of Tema in Ghana where the so called 'Port Environmental and Safety Network' (PESN) has been created to bring together stakeholders from both state and non-

state arenas to deliberate on and address environmental and safety issues. According to an environment officer at the port, this has contributed to improving its environmental management. This constellation was however not observed at the port of Abidjan. Thus contrary to the global and regional level networks, the local level collaborative initiatives between the port stakeholders can thus be described as effective for the port authorities.

4.2. Influence of TPENs on the environmental performance of participating ports

First it must be stated that as influence of TPENs on participating ports cannot be measured directly, I analyse this based on the ability of participating ports to adopt or implement a network's best practice tools or use its coordinating standards. First, raising awareness about the need to harmonise port operations with socio-environmental considerations and acquiring new policy ideas about how to improve environmental practices of ports was acclaimed (by all interviewees) as the most important influence or effect their participation in network initiatives have had on their environmental performance. This is because TPENs are mediums through which environmental protection, climate change mitigation and adaptation and the concept of sustainable development are normalised as issues that need to be addressed by port authorities and/or in partnership with other state or non-state actors. Most of the port authorities that were interviewed indicated that their participation in such networks have made them more environmentally conscious and to accept in principle that, they can no longer continue with the business as usual approach. It was evident from the interviewees and document analysis that TPENs are mechanisms through which policy ideas, guides and technologies on maritime environmental protection and sustainability are designed by port authorities themselves for ports. These policies or coordinating tools and technologies are then promoted as transformative and largely transferable by all ports on the basis that ports face similar problems. Respondents also revealed that through such collaborative initiatives, they have learned that environmental protection can as well stimulate economic benefits. The following quotes aptly summarise these issues:

We have found the network very helpful in providing a platform for ports to discuss environmental issues and larger issues of port sustainability and to share best practices [...]. This has really helped to raise our awareness of becoming more environmentally conscious. We also get new ideas about sustainable port policies. (Interview [hereafter Iv.] with a port environmental manager, 10 January 2017).

At the least, our network has made ports aware of the standards they need to reach, the questions they need to ask and that there are other ports out there facing similar issues and ports can learn from each other. (Iv. with a TPEN coordinator, 7 July 2017).

The initial objectives were quite simple. These were first and foremost to set up a network of ports who could share information and best practice. Linked to this was a more 'political' aim, which was to demonstrate to legislators that the port sector could look after itself, could self-regulate, and that new legislation on top of what we already had would be unnecessary. (lv. with David Whitehead, one of the initiators of the EcoPorts Network, published on the EcoPorts website, cf. EcoPorts 2018b).

These findings support earlier claims that transnational governance networks may enhance capacity building and have become important governance constellations and experiments (Howlett and Joshi-Koop 2011; Martinez-Diaz and Woods 2009; Bulkeley and Newell 2015). It also supports the idea that networks and networking events are important mediums through which policy knowledge, and ideas on a range of sustainability issues are circulated (Andersson and Cook 2019). As mentioned earlier, the ESI, cold ironing technology and the PERS standard are examples of policy tools that are promoted as best practice in the WPCI and EcoPort Networks respectively (WPCI 2018; EcoPorts 1997). This notwithstanding, there are also concerns with regard to the number of participating port authorities that are able to adopt or implement these technologies at their ports. Evidence gathered through document analysis and interviews suggests that the adoption or implementation of the ESI and cold ironing technologies- the flagship policy tools that are by far promoted via the WPCI network is rather low. So far only twenty-five ports worldwide have implemented the cold ironing technology (see WPCI 2018). A port environmental officer provided some explanation:

They [networks] help in raising awareness. We hear good ideas from these meetings but it remains unimplemented at the port. Taking into account environmental issues need money and the main idea of the port director is how to make money. For example, at one of our meetings, there were discussions about best practice in the form of providing clean onshore power for ships and vessels. They told us that major ports in Europe like Rotterdam generate a lot of energy by wind and solar and this helps to provide onshore energy for ships that call at the port. They told us if we want to operate sustainable and green ports, then this is the way to go. We said we don't even have the space and resources to develop this infrastructure so they said, just get the message and work out what works for you. (lv. with a port environmental officer, 9 February 2017).

This view is shared by many of other port authorities who were interviewed. These technologies including the cold ironing technology has not been implemented by many ports because of institutional, financial

and infrastructural constraints. Innes and Monios (2018) explained that only big and economically resourceful ports with huge energy demand would probably take up the OPS or cold ironing technology. Elsewhere, scholars have argued that, many ports may not take up the cold ironing technology because its implementation is complex (Fenton 2017; Zis et al. 2014). Similarly, Poulsen et al. (2018) argued many ports have not implemented the carbon footprint inventory tool (another policy tool of the WPCI) because of implementation complexities, particularly with regard to determining geographical boundaries and emission scopes and the lack of officers with the technical capacity to implement these technologies. Aside these, not every port has the abetting greenhouse gas emission as an immediate environmental priority. All respondents from West African ports for example indicated that the most important environmental issue for them at the moment is waste management at the port/ship interface (port and ship generated waste and toxic sludges). The views expressed below capture these claims:

The biggest challenge we have here is waste. Our major problem has to do with implementation of the [network] action plans and tools. [...] they don't fit for us and also we lack the resources from top management to implement them. (lv. with a port environmental officer, 9 February 2017).

[...] most of the ports don't implement them [networks policy or coordinating tools] and we also lack funds to follow up and motivate them to implement them. (lv. with a network coordinator, 29 December 2016).

[...] all I want to say is that, working together is a process that it doesn't just take a snap like this. It takes time and the challenge has also been that if this person comes to this meeting this year, next year is another person, so you don't have continuity and you don't have institutional memory to facilitate implementation of the good practices and programs and that is one major challenge. (lv. with a network coordinator, 7 July 2017).

From the extracts above, aside the lack of funds, port authorities especially from Africa are unable to take up policy tools promoted via TPENs because they do not address their immediate environmental needs. Both the ESI and cold ironing technologies are geared towards improving air quality and abetting greenhouse gas emissions which happen to be the major environmental issues on the regulatory agenda of European ports (see ESPO/EcoPorts 2018). The lack of institutional memory also means that technical capacity and the motivation to take up some of these tools is low. Thus while TPENs may create awareness and are mediums through which policy ideas and knowledge may be circulated, uptake of best practice technologies remains low. Yet, when network coordinators were asked their opinion concerning the influence of TPENs on participating ports, a rather surprising position was asserted:

We measure the success of the network based on the number of our members. This is how we measure success [...]. It is about the numbers. The certification to the standard [adoption of best practice tools] is not how we measure our success. (lv. with a network coordinator, 7 July 2017).

Another coordinator opined that even when there is no adoption of network tools, ports will still maintain their membership and continue to invest into TPEN projects:

They [ports that invest in experimental projects and share good practice] have a lot to benefit [even when there is no transfer or exchange taking place]. The fact that they can show that we are sharing our knowledge [...] we have developed this [...] or we are helping these people to also do it right, that alone is a benefit for them [...]. They are building capacity. It is an ethical thing [...]. It makes them visible and presents them as leaders. (lv. with a network coordinator, 7 July 2017).

From the views expressed above, while TPENs can help in circulating ideas and concepts, the uptake of technologies and policy models can be low. Yet, their influence, from the perspective of network coordinators is seen merely in terms of the number of ports that join the network and the continuous injection of funds into the network or the number of best practice tools the network can showcase to the outside world as its 'products' rather than ensuring their uptake and usage by a greater number of port authorities in the network. This finding contradicts Castells's (2011: 773) view that powerful actors in the network or the coordinators will strive to enforce the network's standards or ensure that a greater number of actors use its policy tools as a network becomes influential only 'when a greater number of actors use its coordinating standards' or policy tools. On the contrary, powerful actors may also design and promote particular tools, technologies or indicators that a greater majority of actors may not be able to adopt for various reasons. This may include the lack of technical and financial capacity or due to the fact that those tools do not address immediate or priority environmental needs in their ports. But as these tools are 'anointed' in TPENs, they become the defacto best practice, e.g. that become associated with green ports. Seen in this way, a limited adoption, or the use of a network's policy tools by a few powerful ports may also make them more visible, credible and help to maintain their legitimacy as leaders of environmental and climate policy. The next section provides further insights into how power relations and actor interests may influence norms or standards or even the scope of environmental issues that are prioritised on the agenda of TPENs and the associated policy tools that are designed and promoted.

4.3. How power relations and actor interest affect TPEN outcomes

The case studies provide insights into how consensus on some controversial issues related to sustainable maritime transport systems and shipping standards are reached in TPENs and how these are linked to the interests of powerful actors. It provides further insights into how an array of organisational and technological tools including ESI and cold ironing technology (OPS) promoted via TPENs are constructed around priority environmental issues of ports in Europe and North America.

To begin, among port authorities in the so-called Hamburg-Le Havre range, a number of intensively competing ports which are also part of the EcoPorts network as well as the WPCI, in an informal manner, a decision or consensus was to be built on the issue of the most sustainable transport system and route for ships coming from Asia through the Mediterranean heading towards Scandinavia. It was to be discussed whether ships should go directly to where the goods are needed or to have few ports as hubs where ships from Asia may call to offload goods for further redistributed through the Scandria corridor. There were also debates about whether large or small ships are the most sustainable. The smaller ports preferred ships to go to the final destination ports where the goods are needed while the bigger ports like Rotterdam preferred redistribution via hub ports. Rotterdam managed to sanction a so-called research report where the researchers provided "technical knowledge" to back its claim on what should be the most sustainable route or transport system. Narrating the incidence, a port environmental officer stated:

We are convinced it is better to keep the load on the ship and go round to as near as possible to the location where the goods are going. Here, we had a big difference to the view of Rotterdam. Rotterdam said we need global transport systems where we have global hubs and that we need few big hubs with many small ports. But of course, Rotterdam knows this will inure to its benefit [...]. So is the question about growing sizes of ships. Do we need a system to support these hubs or do we need a system with something different? Our point is the load is best to go as near as possible to the places where goods are needed so you need a transport system or chain that supports both big and smaller ships. When you look at the so called report [presented by Rotterdam], the most sustainable system is the one that uses the biggest ships [laughing]. But usually that is not true. (lv. with a port environmental manager, 25 August 2016).

This provides a good insight into the political nature of decision making in TPENs. This is where power becomes visible in constructing 'best practice' or 'sustainable standards'. Here there are counter views concerning the controversial issue of what should constitute a sustainable maritime transport system for the ports in a region. The above finding does not support the claim that controversial issues can be resolved more easily in transnational networks (Martinez-Diaz and Woods 2009; WPCI 2008). Rather, it

supports the claim that best practice is a discursive process in which the nature and interpretation of policy problems and their solutions are political (Hajer 1995; Bulkeley 2006). First, transshipment through hub ports will inure to the benefit of hub ports like Rotterdam that have the infrastructure to support mega ships and by effect promotes its commercial interest. On the contrary, there is empirical evidence that suggests that when goods travel directly to where they are needed, more reductions can be achieved in carbon emissions. In the UK, Rigot-Muller et al. (2013) found that carbon emissions can be reduced by 16-21 percent through direct delivery of goods to the UK ports as opposed to transshipment via a continental European port. The same port officer further criticised the methodology used by Rotterdam and the research they presented to back their claim that bigger ships were more sustainable arguing that the method is flawed:

[...] they only internalise cost related to air emission and externalised all other costs. External cost of larger ships affects biodiversity, structural effects on river course etc. but they only considered air pollution. (lv. with a port environmental manager, 25 August 2016).

Elsewhere, Carse and Lewis (2016) argued that although dredging and deepening water channels allow access to larger ships and have often been presented as beneficial, they are actually environmentally disruptive. The accounts above confirm Bulkeley's (2006) assertion that best practices are political rationalities. It can be likened to Castells's (2011) notion of networked power where powerful actors have more influence on decision making with regard to network standards than other actors. When asked if every port have a voice at the round table and if his port has ever been chosen as part of the so-called project ports that created best practice policy tools in the WPCI, a port environmental officer from West Africa stated:

European ports are more powerful when it comes to decision making. We just go there to receive information and advice on how to manage our environmental issues [...]. They cannot force us to do what we don't want to do, but they certainly influence how we act in the long term. Sometimes [...] some of the programs and policies do not apply for us so we either do not implement it or we modify it. (lv. with a port environmental officer, 9 February 2017).

This officers position epitomises the views shared by most of the port environmental officers from West African ports. Earlier, Lam and Notteboom (2014) found that port authorities of Antwerp and Rotterdam (European ports) have a higher stake on influencing green port' policy than those in Asia. This finding therefore do not support the conventional view that decision making in networks is a flat process that takes into consideration actors' divergent interests (Cash et al., 2003; Börzel, 2011). Rather, networks and the best practice tools they design and promote are constructed around the priority environmental

issues of powerful ports. Like Kern and Bulkeley's (2009: 309) assertion about city networks, TPENs can be described as "networks of pioneers for pioneers". Interviews with port authorities, document analysis and participant observation at the 2016 green port congress in Venice revealed that, ports that initiate a network, those with the financial muscle to support its programs or implement pilot projects have network-making power and networked power, which can help them to constitute a network, set its goals and programs and design measures around their political interests and values. In the WPCI for example, green port technologies are designed by the so-called project ports and working groups (see WPCI 2010, 2017, 2018), usually made up of economically resourceful ports or initiators of the network. They create programs first as pilot projects which other actors are to emulate as the quote below illustrate:

WPCI addresses our topics, our daily topics and we come together in WPCI to develop very new things. For example, the Environmental Shipping Index, the WPCI say it is necessary to make shipping cleaner. [...] then there was a big question of how to develop a system that can be accepted by the market and there was necessary to develop it from the experts and it was a very good idea to do it in a competing port cluster. So the competing ports in the Hamburg-Le-Havre range Cluster were asked by WPCI to develop the ESI for the rest of the world. And we as a port financed the development as well. We wanted to develop something that can be used by all of us partners. (lv. with a port environmental officer, 25 August 2016).

The phenomenon whereby some ports by virtue of resources or their location are selected as project ports to design policy tools, from which others may draw inspiration, emulate or assess its potential for transferability in itself accords the project ports some form of power to influence network standards and tools around their political interests. Rotterdam, Bremerhaven and few other selected European ports developed the ESI mainly in-line with priority environmental issues on the regulatory agenda of the EU, including strict air quality requirements, energy efficiency and greenhouse gas mitigation (for details, see European Commission 2008, 2018). There is currently the "EU Sulphur Content Directive which limits the amount of sulphur content of marine fuel that can be used at European ports (see Notteboom et al., 2010). These are priority environmental issues of EU ports (see ESPO/EcoPorts 2018). A port environmental officer explained that his port implemented the ESI technology because of its strategic vision of becoming a CO2 neutral port:

We want to be as fast as possible, a CO2 neutral port. And maybe it's interesting as you see, we can already be proud of reductions of 50 percent yearly [...]. What we want to reach is we want to show the industry that it is important to be CO2 neutral. We want to show leadership. We want to be the frontrunner. (lv. with a port environmental officer, 25 August 2016).

What is clear here is that at ports where de-carbonisation is not an immediate environmental priority, port authorities will feel reluctant to take up the ESI technology. So far, just about 30 ports have implemented the ESI and they are mostly from Europe and North America with none at all from Africa (see WPSP 2018a). The ports of Abidjan and Lagos for example have not implemented any of WPCI's projects, from the ESI to the cold ironing technologies because it does not address their immediate environmental priorities. Here one could argue that an (un)intended consequence of TPENs is that, they could exacerbate the inequalities of power already present with the conventional system (other formalised forums) by giving the most powerful actors another vehicle to exert their influence.

However, if the ESI is to yield the needed results in terms of environmental upgrading, then more ports and more ships must be able to implement it else the reductions made by the few ports will make an insignificant global contribution (Poulsen et al. 2018). It has not come as a surprise that the IAPH have decided to expand the WPCI to extend its scope to a full range of sustainable port development challenges that the maritime industry is facing through the newly constituted World Ports Sustainability Project (see WPSP 2018b). As it were, the WPCI was useful mostly to ports in Europe and North America where there are stringent laws on air quality and abetting Climate Change. Earlier Fenton (2017) observed that the WPCI appeared to have focussed more on programs geared towards addressing air quality and CO₂ emissions than sustainable lease agreement or other equally important measures. Similarly, Innes and Monios (2018) argued that small and medium ports encounter challenges in installing the cold ironing technology as compared to larger ports which have a higher and more concentrated power demand. They argued that larger ports are more likely to implement the cold ironing technology because they are sure of shorter payback time as they are likely to experience higher reductions. But ports are diverse and located within different socio-political contexts at different stages of economic development as well as varied environmental priorities and financial clout. These issues may also likely constrain the uptake of these technologies and limit its use to only a few ports. An expert of maritime geography and port networks stated:

[...] each port is unique. In culture, legislation, hydrology, geography and local legislation and yet we are all seeking a unique international standard. Will such standards serve the interest of all? (lv. with a maritime expert, 31 May 2017).

The port of Abidjan apparently joined the WPCI on the back of pressure it was facing from the general public following the famous 2006 Probo Koala dumping of toxic waste in Ivory Coast. The port needed to do something to show to the public that it is 'committed' to environmental protection. Its immediate needs in the WPCI network was for ideas and policy measures for sustainable management of waste and toxic sludges from shipping. This was however not prioritised on the agenda of the network by actors

that set and/or can switch its agenda- i.e. those with network-making power (Castells 2011). The results provide insights into how power and actor interest can influence network outcomes and why some port authorities may adopt particular tools or measures while others may not.

5. Final discussion and conclusion

This paper has examined the extent to which sustainability or environmentally oriented port network(ing) bring to bear positive influence on the environmental performance of participating ports to promote environmental upgrading and the factors that constrain the adoption of best practice (i.e. the organisational and technological tools) or coordinating standards that are designed and/or promoted in these networks by participating ports. The paper thus contributes to understanding outcomes of collaborative initiatives for sustainability among port authorities and other maritime actors (Barnes-Dabban et al. 2018; Fenton 2017; Hermann et al. 2016; Nursey-Bray 2016).

The study found that several TPENs have emerged over the past decade. They serve as mediums through which port authorities cooperate to design a vast array of organisational and technological tools and facilitate policy learning to improve their environmental performance and promote environmental upgrading along the value chain. The notable TPENs for European and West African ports being the WPCI (now World Ports Sustainability Program) (see Fenton 2017; WPCI 2008), the EcoPorts network (EcoPorts 1997; Darbra et al. 2004; Puig et al. 2015) and the African Ports Environment Initiative (Barnes-Dabban et al. 2018; UNEP 2015). Some of the flagship policy tools they have designed and/ or promoted over the years include the ESI, cold ironing technology (Onshore Power Supply) and the Carbon Footprint Inventory tool of the WPCI (Fenton 2017; WPCI 2010, 2018; WSPS 2018a) and the PERS and SDM environmental management tools of the EcoPorts Network (EcoPorts 2018a).

However, the results presented in this paper also shows that adoption of these best practice tools and technologies is low among a greater number of participating ports. Till date, only 25 ports globally have adopted the cold ironing technology (see WPCI 2018; Fenton 2017) while only 30 ports have implemented the ESI (see WPCI 2017). Of these, the implementation of the cold ironing and ESI has been limited to a few ports in particular geographic clusters mainly Europe and North America including Bremerhaven (Bremen), Rotterdam and Long Beach (Poulsen et al. 2018; Fenton 2017; Innes and Monios 2018). But these ports also happen to have played a major role in the formation of the WPCI network and setting its agenda and scope of operation. Part of the reasons why European ports like Rotterdam and Bremen promote and have implemented tools and measures geared towards climate change mitigation and air quality improvement is because they are key issues on the regulatory agenda of the EU and demands for climate action by local communities and environmental activists is pervasive (see ESPO/EcoPorts 2018; European Commission 2008).

In the context of Castells's (2011) network theory of power as well as from a policy (im)mobilities perspective (Lovell 2019; McCann and Ward 2011, 2015), one reason for the low adoption by a greater number of participating ports including those from West Africa could be attributed to the fact that the networks and the best practice tools they design and/or promote are framed around the political interests of the pioneering and influential ports. These coordinating tools are thereby enmeshed in the institutional and political particularities of powerful actors (Bulkeley 2006). Inness and Monios (2018) for example explained that only few ports (authorities) may probably adopt the cold ironing technology because of differences in environmental priorities and energy demand while Poulsen et al. (2018) cited high tool implementation complexity as a possible reason for the low adoption of WPCI promoted technologies like ESI, cold ironing and greenhouse gas emission inventory tools.

This finding contradicts the dominant narrative that TPENs are transformative and the best practice tools they design and/or promote are largely transferrable (McLaughlin and Fearon 2013; Barnes-Dabban et al. 2018; OECD 2013; PIANC/IAPH 2014; WPCI 2008). Rather, the finding shows that actors who possess network-making power and networked power may have more influence in determining the environmental issues around which a network is created (agenda setting), as well as on driving the discourse or influencing coordinating tools and policy measures that are promoted as best practice (Bulkeley 2006; McCann, 2011). In-line with Castells's (2011) network-making power and networked power, these actors have more influence in shaping a network's coordinating tools along their environmental priorities and interests (Castells 2011). As shown, no African port has implemented the ESI and cold ironing technologies or the PERS environmental management system. It is in this regard that Fenton (2017) asserted that network processes and the implementation of WPCI policy tools depict some core-periphery dynamics, both in terms of representation, activity and scope of the network.

Thus if influence is understood with regard to raising awareness and disseminating ideas to build capacity of participating port authorities, then the findings suggest that TPENs exert considerable influence on participating port authorities. They serve as 'informational infrastructures' (McCann 2011: 114) as they create awareness with regard to the need for sustainable port operations and showcase an array of best practice at conferences and via dedicated website resources. In the same vein, if influence is taken or understood along the political reasons for creating these networks, then it can be said that TPENs help powerful actors to maintain their legitimacy as frontrunners or leaders of environmental and climate protection, which can give them advantages in accessing green funds or attracting green investments (Ciplet et al. 2012; Lam and Notteboom 2014; Wurzel et al. 2019). However, if influence is understood in-line with Castells (2011) as being determined by the number of participating actors that use the networks standards and best practice tools to stimulate local action, then the influence of TPENs is rather low as a greater number of participating ports do not adopt or implement these tools. Seen in

this way, the paper concludes that at best, TPENs may be described as “networks of pioneers for pioneers” (Kern and Bulkeley 2009: 309). This is because they tend to benefit pioneering ports in Europe and North America more than those from other regions. Their potential for environmental upgrading along the value chain thereby remain low.

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No potential conflict of interest was reported by the author.

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Research paper 3

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Examining stakeholder participation and conflicts associated with large scale infrastructure projects, the case of tema port expansion project, Ghana

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Abstract

Balancing economic activities with socio-environmental considerations has become a global standard for the development of large scale infrastructure projects, including ports. In this discourse, stakeholder participation and environmental and social impact assessment (ESIA) have been stressed as important tools that can help port managers to co-create values, avoid conflicts and promote inclusive growth. Drawing on qualitative research tools and stakeholder theory, this paper explores whether and to what extent local stakeholders' inclusion has substantial influence on addressing their socio-cultural concerns and interest. This is illustrated with a case study of an ongoing port expansion project at Ghana's largest port of Tema. The findings suggest that although the port authority conducted an ESIA and engaged local stakeholders as part of the planning process, this did not translate into preventing the loss of valuable cultural resources of the local communities. The port authority did not place 'value' on cultural resources of the local communities that cannot be expressed in monetary terms. Further, lack of good faith engagement with local stakeholders led to conflicts in some cases that triggered a court action and delays. The paper concludes that stakeholder participation if not applied well, can become a 'post-political' tool.

Keywords: Port expansion, Local stakeholder participation, Co-create value, Sociocultural concerns, Conflicts, Post-political tool

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1. Introduction

African ports have an infrastructure deficit and the last few years have seen an increasing investment into the African ports sector (AfDB 2011). Between 2007 and 2017, an estimated fifty billion US Dollars is said to have been invested into constructing new ports or expanding and upgrading existing ones (Proparco 2017). This is to provide African ports the much needed capacity to accommodate bigger ships in concordance with the increasing trade volumes of these economies (OECD 2012).

Yet, the coastal and ocean spaces around which ports are constructed all over the world are not only scarce resources, but also places with cultural meanings, complex values and competing interests (Pearson et al. 2016). Thus, the increasing competition for space for port development on the one hand and other objectives including recreation and the provision of cultural services amidst growing concerns about the social and environmental consequences of these projects on local communities have made port infrastructure projects prone to conflicts (Wiegmans and Louw 2011; Ravesteijn, He, and Chen 2014). There are concerns about who is harmed and/or benefited. by port infrastructure development projects and whether port managers are taking full responsibility towards local communities and individuals who can affect or can be affected by these projects.

Globally, port managers are adopting inclusive port development approaches to achieve sustainable development (Jansen, van Tulder, and Afrianto 2018). Similarly, major financial institutions including the International Finance Corporation (IFC) have mainstreamed managing stakeholder interests around social and environmental issues into infrastructure project finance lending whereby environmental and social impact assessment and mitigation plans (ESIA) have become a major requirement (IFC 2012; van Zyl 2015). Over the past few years, several studies have noted the benefits of stakeholder inclusion in planning port infrastructure projects for creating mutual sustainability interests or realising shared values (Dooms 2019; Dooms, Verbeke, and Haezendonck 2013; Parola and Maugeri 2013).

Yet, much of the mainstream literature on inclusive port development and port authorities alike have placed greater emphasis on environmental issues rather than the inclusion of social concerns of stakeholders into port management and development plans (Jansen, van Tulder, and Afrianto 2018). It has been explained that the emphasis on environmental issues is expected because of the increasing regulations on environmental issues backed by reports that improving environment performance is more closely associated with financial gains (Lam and Van de Voorde 2012). However, evidence has also emerged in recent years that stakeholder inclusion and participatory mechanisms have been applied merely as part of a formal procedure in project and infrastructure planning processes to conform to regulatory requirements or to make corporations appear more legitimate (Swyngedouw 2011; Wilson and Swyngedouw 2014; Vanclay 2014).

In June 2015, the Ghana Ports and Harbours Authority (GPHA) in a public-private partnership deal with APM Terminals of the Netherlands and Bolloré Logistics of France under the corporate label 'Meridian Port Service Holdings' (MPS) signed a 1.5-billion-US Dollar agreement to expand the country's largest port of Tema to a capacity that can accommodate the world's largest container ships and to fulfil government's intention to make the port the hub in the West African region (GPHA 2015). It is estimated that this will add about 3.5million TEUs in the annual throughput capacity of the port (MPS 2015). An environmental and social impact study (ESIA) was prepared and stakeholders were engaged as part of the planning process to identify and capture their concerns, ensure inclusive growth and avoid causing harm or destroying 'things of value' to the local communities and all relevant stakeholders (GPHA 2015). This paper takes a closer look at the Tema port expansion project in Ghana. It explores the effect of local stakeholders' participation- enacted through ESIA and stakeholder engagements on decision making concerning the port expansion project. Specifically, the research was guided by the following questions: first, to what extent (if at all) has participation of the local communities in the port expansion project ensured that their socio-cultural concerns, interests and values were addressed during the project execution? Secondly, what are the emerging conflicts (if any)? The article contributes to the ongoing scholarly debate on stakeholder theory which holds that managers or project proponents have a moral and ethical obligation to fulfil the interests and expectations of groups and individuals who can affect or can be affected by their decisions, actions or (inevitable) development projects so as not to cause them any harm (Freeman et al. 2010, 7; Freeman 1984). It provides valuable insights into how stakeholder inclusion mechanisms in a port expansion project enacted through stakeholder engagements and ESIA were used merely as part of a formal or bureaucratic procedure.

The rest of the paper proceeds as follows: In section two, a literature review under the heading background and rationale is conducted on conflicts at ports, stakeholder participation and environmental and social risks identification and management. Section three presents the theoretical and analytical framework for the study. In section four, the methods used for the research are presented. Section five presents the results followed by the discussion and conclusion in sections six and seven respectively.

2. Background and rationale

2.1. Conflicts at ports

Port infrastructure projects, however necessary they are, are often associated with multiple and conflicting values and interests (Ravesteijn, He, and Chen 2014). While ports are generally considered as catalysts for economic growth (Rodrigue, Comtois, and Slack 2017), research has also shown that port

development and operational activities are associated with adverse impacts on neighbouring communities that could trigger protests and conflicts (see OECD 2011; van Den Houten 2017; Koppenol 2014; De Langen 2006; Parola and Maugeri 2013; Pearson et al. 2016; Galvao, Wang, and Mileski 2016; Ravesteijn, He, and Chen 2014).

As noted by Parola and Maugeri (2013), ports are locations where public and private interests manifest and are often intertwined with conflicts. In Europe, the largest ports in the Hamburg-Le-Havre range encountered public resistance from local environmental pressure groups during periods of port expansion, resulting in conflicts and delays (Koppenol 2014; DW2017). The port of Hamburg for example, encountered protests from local interest groups with regard to environmental concerns associated with the construction of the container terminal Altenwerder between the 1990s and early 2000's and the deepening of the Elbe over the years (Netzband, Reincke, and Bergemann 2002; DW 2017). In China, there have been increasing confrontation between local fishermen and big companies during the development of Shatian port in Guangzhou (Ravesteijn, He, and Chen 2014). Similarly, in the year 2016, a court in South Africa quashed an intended port expansion project in Durban and the project was to be delayed until 2032 because of concerns raised by local stakeholders about the potential displacement of farmers, and the retention of the 'community space' as a residential zone (groundWork 2017). Writing on the taxonomy of conflicts in seaports, Parola and Maugeri (2013) identified three main types of conflicts at ports. These are: (a) conflicts relating to governance rules (regulation) and port management companies, (b) conflicts occurring between companies operating at the port like terminal operators, forwarders, dockworkers etc. and (c) territorial issues relating to social and environmental conflicts with host communities and local stakeholders, a category under which this paper falls.

To overcome these challenges, De Langen (2006) proposed the 'concept of accommodation', whereby stakeholders with divergent interests, values and priorities would settle their differences through effective and good faith stakeholder engagements. In today's era of the sustainable development goals, many port authorities and regional port associations around the world are adopting inclusive growth agendas in port infrastructure planning and development (Jansen, van Tulder, and Afrianto 2018) based on a paradigm of proactive port management rather than the age old reactive approach (PIANC/IAPH 2014). Debates about the inclusion of stakeholders' concerns into port management and plans have however been limited to environmental issues (see for e.g. Lam and Notteboom 2014) while socio-cultural concerns particularly of local communities have received little attention (Rothenberg 2017; Jansen, van Tulder, and Afrianto 2018).

In Africa and the global south, existing studies (see e.g. Sonak, Sonak, and Giriyan 2008; Barnes-Dabban, Van Koppen, and Mol 2017) have missed out on socio-cultural concerns of local stakeholders and how far port authorities are giving priority to addressing social and cultural concerns of local stakeholders. In

their work on 'exploring the conditions for inclusive port development', Jansen, van Tulder, and Afrianto (2018) made a clarion call for more scholarly research to identify the social issues for inclusive port development in order to augment the already extensive researched environmental issues. This paper explores how a port authority in Ghana managed the underlying socio-cultural concerns of local stakeholders. In this case study, stakeholders were engaged as part of the planning process and an ESIA was sanctioned as a mechanism to capture, manage and bridge stakeholders' concerns and values with that of the port managers concerning the proposed port expansion project (GPHA 2015). In the next sub-section, the stakeholder debate, particularly stakeholder participation (inclusion) and the management of stakeholder issues in the context of port development is discussed.

2.2. Stakeholder participation and inclusive port development

Research in port management and strategy has acknowledged the potential benefits of stakeholder participation or the inclusion of stakeholders' concerns into planning, building and managing ports (Jansen, van Tulder, and Afrianto 2018; Dooms 2019). The stakeholder discourse holds that there is the need for port managers to consider and integrate the concerns and interests of their stakeholders into their business plans (Dooms, Verbeke, and Haezendonck 2013). Attention to stakeholder management in the port sector emerged in the early 2000s, following protests and conflicts around port development projects as discussed earlier, particularly in Europe and mostly driven around environmental issues (Dooms 2019). In this sense, stakeholder participation or the inclusion of stakeholders and their issues in infrastructure planning became very necessary and refers to various mechanisms by which port managers create space for their stakeholders to express their opinion, interests and motives regarding port projects so as to ideally exert influence and to offer port managers an opportunity to bridge these concerns and values with that of the port.

Notteboom and Winkelmanns (2002) classified four groups of port stakeholders: The first group is the port workers and employees who are considered as internal stakeholders. The remaining three who are all considered external stakeholders are: local or community based stakeholders mainly local communities and direct project affected persons; legislative stakeholders mainly government agencies responsible for port governance issues and maritime support companies. Scholars have argued that incorporating the concerns and inputs of these stakeholders into planning activities can help port authorities to avoid conflicts (Notteboom and Winkelmanns 2002; Dooms, Verbeke, and Haezendonck 2013; Parola and Maugeri 2013) and to gain the support of local communities (Ravesteijn, He, and Chen 2014). Dooms (2010, 23) aptly summarised these issues when he remarked that port "planners who ignore the concerns and interests of stakeholders' risk implementation delays and at times protracted legal battles". Similarly, Slinger, Taneja, and Vellinga (2017) argued that involving local stakeholders in

planning port projects can enable port authorities to co-create value i.e. create mutual interests and shared values that will ensure a sustainable future for the port and the surrounding communities. Making a case for port authorities to move from an ad-hoc towards a more structural approach of stakeholder management, Dooms (2019) argued that effective management of stakeholders and their issues would enhance the legitimacy of port projects and create strategic value for port managers.

Other benefit claims are that prioritising stakeholders' views, concerns and values can help new project related technologies to be better adapted to the local, socio-cultural and environmental context (Reed 2007). Dooms, Verbeke, and Haezendonck (2013) explained the reasons why stakeholder inclusion and management are crucial for port authorities. They argued that, as trade volumes increase and ports grow in size, they expand further away from their original location towards locations that are populated with different stakeholders, usually pursuing different interests, values and objectives. Consequently, to avoid conflicts and gain their support and co-operation, port managers must pay attention to the spatial and temporal (historical) dynamics of their stakeholders.

Over the years however, some scholars have identified conditions that constrain effective stakeholder participation in infrastructure projects or disable and curtails the empowering effect of participatory mechanisms (Enns 2019; Dooms 2019; Otsuki, Read, and Zoomers 2016; Swyngedouw, Moulaert, and Rodriguez 2002) while others have questioned the assumed benefits of stakeholder participation in general arguing that such benefits are yet to be adequately confirmed (Wilson and Swyngedouw 2014; Flannery, Healy, and Luna 2018). Swyngedouw, Moulaert, and Rodriguez (2002) argued that in some instances, inputs of stakeholders are either not respected or ignored during the course of the project execution and that only occasionally do stakeholders (such as local communities) manage to turn the course of events in their favour. Some have also cited the reluctance of managers to attach importance to critical concerns raised by some stakeholders or for excluding some in the participatory process (Flannery, Healy, and Luna 2018). In some instances, it has been observed that stakeholder participation has been applied as a means to legitimise predetermined decisions (Macleod and Johnstone 2011). This according to Wilson and Swyngedouw (2014) is because often, the neoliberal consensus (e.g. plan to expand a port) is predetermined and fixed and that stakeholder inclusion mechanisms may be created merely as part of fulfilling procedural requirements and contractual obligations. In this context, the general critique is that stakeholder participation or inclusion mechanisms have become a 'post-political tool' applied mainly to depoliticise planning processes or to defuse tensions (Swyngedouw 2011; Wilson and Swyngedouw 2014).

This critical literature is helpful in exploring the extent to which socio-cultural concerns of (local) stakeholders which has remained under-studied in the context of ports were addressed during the execution of the port expansion project. Increasing trade volumes and a continued injection of capital

into the African ports sector in recent years render the stakeholder debate particularly urgent in the context of African ports. In the next section, ESIA, another tool that has been promoted and used to manage stakeholder issues in (port) infrastructure projects is discussed.

2.3. Environmental and social impact assessment and mitigation plan (ESIA)

Scholars, practitioners and financial institutions have promoted environmental and social impact studies and mitigation plans (ESIA) as an important tool to promote sustainable infrastructure development including ports (IFC 2012; GPHA 2015; van Zyl 2015). This stems from its ability to, through participatory processes that engages relevant stakeholders, identify and capture potential environmental and social concerns and motives of all relevant stakeholders as part of the planning processes for port infrastructure projects (van Zyl 2015; Le 2016; IFC 2012; Slinger, Taneja, and Vellinga 2017; Coutinho et al. 2019).

It has become an important criterion for accessing funds for projects (IFC 2012) and many financial institutions have gone a step further to develop a framework based on what they call the 'equator principle', a standard for ensuring due diligence on the part of managers in order to avoid adverse risks on society and the environment (Conley and Williams 2011; van Zyl 2015). The social impact assessment (SIA) component of ESIA for e.g. is said to have developed as an element of environmental impact assessments (EIA) with roots in social justice concerns across the world (Vanclay 2014) and aimed at protecting vulnerable groups and people against infrastructural, extractive and developmental projects.

Yet, Le (2016) as well as Vanclay (2014) have noted that research has not adequately paid attention to analysing whether concerns of stakeholders (particularly local communities) captured during ESIA are prioritised and if project proponents keep track with the commitments they make in ESIA's. Vanclay and his colleagues further observed that often when SIA is done as part of an EIA, very little emphasis is placed on socio-cultural issues that concern people including the risk of "the loss of cultural heritage" (Vanclay et al. 2015, 2). It is therefore important to understand if ESIA helped to integrate concerns of local stakeholders into the execution of the Tema port expansion project.

3. Theoretical approach

The stakeholder theory which forms the base of this study is elaborated in this section. An analytical framework that combines core elements of the stakeholder theory in the context of inclusive port development is then presented to guide the analysis.

3.1. Stakeholder theory

Stakeholder theory is a theory of business-society relations which at its core, seeks to "address the problem of the ethics of capitalism" (Freeman et al. 2010, 195). It postulates that business is not only

about managers increasing value for investors but also about putting stakeholders' needs and expectations at the centre of their plans so as to create value for both the firm and its stakeholders based on the "integration and responsibility principle" (Freeman et al. 2010, 9; Freeman 1984). The theory thus advocates the need to weave into the fabric of neoliberal practices the principles of responsibility and ethics.

The broadest definition of stakeholders is found in the seminal work of Freeman (1984, 25; Freeman et al. 2010, 9) where stakeholders are 'those groups and individuals who can affect or be affected' by the actions or decisions of a firm. The stakeholder theory is therefore interested in addressing the concerns of stakeholders such as communities in which companies operate. In this case study, the decision of a port authority to expand its existing port infrastructure to provide depth for larger ships needs to incorporate concerns of various (local) stakeholders for creating mutual interests and shared values so as not to cause them any harm. In this sense, value is understood as "a sense of purpose that goes beyond profitability" (Freeman et al. 2010, 196). It could be a cleaner environment, improvement in the quality of life or ensuring that port development is done in a manner that is not detrimental to local communities. On the notion that stakeholders matter, Boatright (1994) problematized the conventional idea that an organisation only has a binding fiduciary to increase value for its shareholders. Similarly, Donaldson and Preston argued that "the interests of all stakeholders are of intrinsic value [and that each stakeholder] merits consideration for its own sake and not merely because of its ability to further the interests of [. . .] shareowners" (Donaldson and Preston 1995, 67).

From a theoretical point of view, Donaldson and Preston (1995) identified three ways in which scholars can apply the stakeholder theory. First, it can be applied to analyse how managers actually deal with stakeholders. Second, it can be used to conceptualise the relationship between stakeholder management and positive firm performance and third, it can be used as a predictive tool. While this paper does not necessarily position itself in any of these binaries, its focus is on the outcomes of the inclusion of local stakeholders in a port infrastructure expansion project, i.e. whether the social and cultural concerns of local stakeholders were addressed in a way that they are not harmed as a result of the project.

In the port and shipping sector, scholars have applied the stakeholder theory mainly to conceptualise the relationship between positive firm performance and stakeholder management. In this regard, evidence has emerged that addressing stakeholder interests can generate additional value for maritime companies and can promote sustainability (Yuen and Thai 2017; Yuen et al. 2017; Dooms 2010, 2019; Acciaro 2015). However, research concerning how managers actually deal with stakeholders has revealed that aside managers encountering challenges with identifying the relative importance or 'stake' of each stakeholder, very little is also known about their performance with regard to the motives, interests and

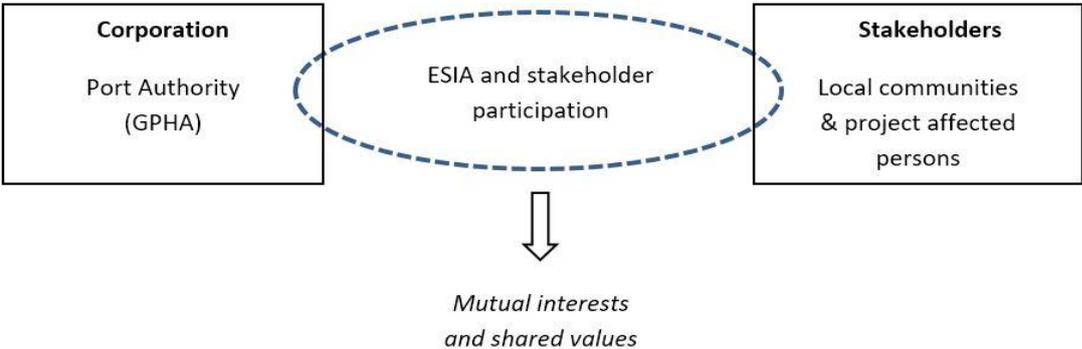
expectations of stakeholders (Dooms 2019). In some cases, stakeholder inclusion mechanisms are said to have been used merely as part of a formal process geared towards legitimising pre-determined decisions than for mutual value creation (Flannery, Healy, and Luna 2018; Wilson and Swyngedouw 2014).

As noted by Parola and Maugeri (2013) conflicts arise not simply because there are divergent views and values but mostly as a result of failure or inability to prioritise stakeholders concerns in the plans and decisions of port managers. They argued further that scholarship on conflicts at ports must focus not only on economic issues but also other issues of importance or value to stakeholders. Earlier, Lerro (2011) presented four stakeholder value dimensions: economic value, socio-cultural value, environmental value, and knowledge value. Yet as noted earlier, very little attention has been given to socio-cultural concerns of stakeholders in the literature on ports. In sum, while stakeholder inclusion mechanisms have been promoted as a necessary strategy for companies to meet social and environmental responsibilities, there is the need for more empirical research from different contexts to explore the practices of companies concerning the inclusion of stakeholders and their concerns in the growth agendas of ports.

3.2. Analytical framework

An analytical framework that has the stakeholder theory as its base and draws on its major elements in the context of port development, i.e. stakeholder participation and ESIA which are tools used by port authorities to co-create value or to harmonise their growth agendas with concerns and interest of their stakeholders is presented (Figure 1). Given the complexity of the ocean and coastal spaces around which ports are built, engagement of local communities and project affected persons and ESIA were supposedly used by the Ghana Ports and Harbours Authority (GPHA) to create mutual project related values and interests so as not to cause harm to the local communities and project affected persons as well as to avoid conflicts.

Figure 1. Analytical framework



Source: Author’s construct

4. Research methods

To explore the extent to which local stakeholders' (Notteboom and Winkelmanns 2002) inclusion in planning a port expansion project ensured that their socio-cultural concerns were incorporated into the project, a qualitative case study approach was followed (Gerring 2006; Hay 2000). This is based on the ability of qualitative case studies to explore a phenomenon within its context (Baxter and Jack 2008). A qualitative research is "an enquiry process of understanding a social problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants and conducted in a natural setting" (Creswell 1994, 2). The main tools used were key informant interviews with local stakeholders, focus group discussion (FGD), document analysis and literature review.

Using a purposive sampling technique, five key stakeholders who can speak directly to the research questions were interviewed, including one representative each from the Tema traditional council (TTC), Nungua traditional council (NTC), Ghana Ports and Harbours Authority (GPHA), Meridian Ports Services (MPS), and Ave Maria Resort (Ave Maria) between 2017 and 2018. Aside officials of GPHA and MPS, the others are all critical local stakeholders as they were potential project-affected persons (see GPHA 2015, xiv-xx). The few interviewees allowed the researcher to focus in depth on a small sample of "knowledgeable" respondents for the study (Yin 2013). In addition, a FGD involving fifteen people following the ideal size proposed by Hay (2000) was held with the Sakumono fishing community under the TTC. Relevant information contained in official reports on the port expansion project and on port websites were also analysed. The ESIA report for the Tema port expansion project (see GPHA 2015) was the most important document that was analysed.

Data generated from all these sources were analysed following the thematic content analysis approach (see Guest, MacQueen, and Namey 2011). This approach involves repeatedly reading through the interview transcripts together with the recorded audio-visual tapes to ensure the reliability and validity of the data. This helps the researcher to get a sense of the data and to identify major themes. The major themes that emerged from the data generated include: neglect of local communities' views during project execution; failure to place value on cultural resources that cannot be expressed in monetary terms; over concentration of ESIA on environmental issues at the expense of socio-cultural issues; and lack of good faith engagement with managers of Ave Maria Resort. These themes were then analysed in line with the research questions and theoretical framework. A list of respondents and key sources of data are summarised in Table 1.

Table 1. List of interviewees and key sources of data

Method	Key Stakeholders
1. Focus Group Discussion	Sakumono Fishing Community (15 participants)
2. In-depth Interview	Tema Traditional Council Representative
3. In-depth Interview	Nungua Traditional Council Representative
4. In-depth Interview	Ave Maria Resort- General Manager
5. In-depth Interview	Ghana Ports and Harbours Authority- Est. & Env. Manager
6. In-depth Interview	Meridian Ports Service (MPS)- HSE Manager
7. Document Analysis	ESIA Report (GPHA 2015), Tema Port Expansion Project

5. Results and case analysis

The results provide valuable insights into practices of the port authority concerning the inclusion of stakeholders and their concerns in the port expansion project. In revealing the unfulfilled expectations and outcomes of stakeholder inclusion mechanisms, the study makes an important contribution to scholarship on the stakeholder theory. The following sub-sections present and analyse the results.

5.1. The Tema port expansion project

The port of Tema, constructed in 1962 is the larger of Ghana's two main seaports and handles about 85 percent of the country's exports and imports (GPHA 2015). Situated in the city of Tema, in the Gulf of Guinea, it serves both Ghana and the land-locked countries of Burkina Faso, Mali and Niger. A recent research by Gamassa and Yan (2017) rates the port as the most efficient in the sub-region. It hosts a wide range of industrial and commercial companies and has become the industrial hub of Ghana as was envisaged many years ago by Hilling (1970). The existing port has twelve berths with draughts between 8 m to 12 m. With an increasing involvement of global port terminal operating companies since the 1980s, GPHA (a government body) largely acts as a landlord of the port, although it operates ten multipurpose berths and also allocates stevedoring companies and directs cargo handling. GPHA also has a joint venture with Meridian Port Services (MPS—container terminal) for the two larger berths (Tema port, personal communication, 2016).

As the second largest economy in West Africa experiencing increasing flows of goods, the existing container terminal is reaching its maximum capacity and lacks the necessary infrastructure to accommodate deep-water cargo ships (GPHA 2015). Between 2003 and 2017, total cargo traffic through the port increased from 7.5 million to 13.5 million tons with traffic expected to further increase (GPHA 2017). A recent research by Gohomene et al. (2015) showed that the port of Abidjan, a major competitor of the port of Tema is the most attractive in the sub-region because of its infrastructure capacity. Closing the infrastructure gap therefore remains an important pillar of Ghana's development agenda. In line with the above and the desire to become the maritime hub of the region; the port authority is currently embarking on a US\$1.5 billion infrastructure expansion.

In November 2016, the then president of Ghana cut sod for construction works to begin following an earlier joint venture deal signed between GPHA on behalf of the government of Ghana and APMT and Bolloré Africa Logistics. It entails hauling up to 3.5 million cubic meters of various rocks and boulders and placing them on the sea bed to form a 3,850-meter -long breakwater. The entrance channel and harbour basin are being dredged to remove about 7 million cubic meters of sand to allow access for vessels with 16-meter draft or more. It is expected that the current throughput of the port will be tripled from 1 million to 3.5 million Twenty-foot Equivalent Units (TEU) when the project is completed (GPHA 2015). The first phase of the project is expected to be completed by the 4th quarter of 2019. The new port, when completed, is expected to provide an internationally competitive harbour infrastructure. To develop a sustainable port based on the philosophy of inclusive growth, the GPHA carried out ESIA and enabled stakeholder inclusion mechanisms (GPHA 2015). These are discussed below.

5.1.1. The environmental and social impact assessment and mitigation plan (ESIA) of the Tema port infrastructure development project

The GPHA between 2014 and 2015 contracted SAL Consult Ltd to conduct an ESIA study related to the planned port infrastructure development at the port of Tema as required by the laws of the Republic of Ghana. The laws in this regard are the EPA Act 1994, (Act 490) and the Environmental Assessment Regulations 1999, LI 1652 (see EPA 1995). In compliance with the law, GPHA registered the proposed project with the EPA. The EPA after assessing the proposal concluded that it could result in a significant impact on the environment and requested the project proponent (GPHA) to consult with affected stakeholders and prepare a scoping report. Following the outcome of the scoping report, the GPHA were asked to prepare a full scale Environmental Impact Statement detailing potential environmental impacts and mitigation or harmonisation measures. The extract below from the ESIA report captures this:

The EPA's review comments on the scoping report [...] requested the GPHA to prepare two separate EIAs for the proposed project covering the following components: Port expansion infrastructure including: construction of breakwaters, dredging and reclamation, construction of quay walls, cargo handling and berthing furniture at all the respective berths cargo handling and operations terminal [...] and upgrading of ports' access roads and development of other new dedicated access roads to the port (GPHA 2015, ix)

Right from the beginning, it is important to take note of the silence of the legal framework and the EPA on the inclusion of socio-cultural concerns (aspects) of local stakeholders although the final report was labelled 'Environmental and Social Impact Assessment Study' (see GPHA 2015). The ESIA was sanctioned using the following methods:

The methodology for the study involved field visits/inspection, environmental sampling and analysis, land use studies, socio-economic studies, stakeholder consultation, review of available literature and data analysis and reporting (GPHA 2015, 16).

To be able to identify and capture the underlying social and environmental interests, concerns and values of (local) stakeholders and potential areas of conflicts so as to create value for both GPHA and its stakeholders, various stakeholders were engaged:

Stakeholder consultations have been held with the following stakeholders as part of information gathering process on environmental and socio-economic issues by means of one-on-one interviews and [...] meetings: project proponent [GPHA]; project contractors [...]; local government authorities [...]; regulatory institutions [...]; and [local] stakeholders including Ave Maria Resort, Sakumono Fishing Community, Tema Traditional Council, and Tema Community 3 Site A and Site B Residents Association (GPHA 2015, 17).

Major issues of concern and potential conflict triggers were identified during the stakeholder engagements (see GPHA 2015, xii-xx, 104). The underlying social and cultural concerns of local stakeholders that came up included potential loss of a cultural resource heritage of the local community (i.e. the Meridian rock), the displacement of Ave Maria Resort, a recreational facility and disturbance of fishing activities for the Sakumono fishing community (GPHA 2015, xiv, 104). Writing on how these issues would be resolved, GPHA stated:

The Tema Traditional Council will be consulted prior to the commencement of work to ensure that all the necessary customary rites are performed and required royalties paid to the stool to ensure peaceful coexistence. As much as possible, the traditional authorities will be permitted [granted access to the place] to carry out their annual rites (GPHA 2015, 104).

Ave Maria will be consulted extensively on the terms of resettlement and compensation. GPHA will ensure that appropriate government of Ghana compensation methods and procedures are followed to ensure they are well catered for (GPHA 2015, 104).

While the above provisions gave an impression that, cultural resources of the local communities will be protected and Ave Maria will be further engaged and their concerns properly managed, the ESIA fell short of providing any detailed plan on how these were going to be done. The overarching focus of the ESIA was largely on environmental issues. A possible reason for this is that while there is a specific legal framework for conducting environmental impact assessments for projects in Ghana, there is no clear

legal framework for social impact assessments (see GPHA 2015, x), which enumerates all the legal frameworks within which the ESIA was conducted.

The project which required an 'environmental permit' was done to include some socio-cultural considerations. The underlying social and cultural concerns of local stakeholders were therefore muscled by environmental issues mostly raised by regulatory agencies (stakeholders). Analysis of the motives behind the socio-cultural concerns that were raised by the local communities and which could have potentially helped to map out alternative plans that will create value for both GPHA and the local communities was fragmented and vague in focus while the responsibility for implementation were not clear. Although the label 'ESIA' was used, the study and report largely focused on environmental issues. Even where social issues were discussed in detail, it was mainly about quantifiable variables such as employment and road expansion (see GPHA 2015, xii, 45, 46, 90, 91, 95).

Further, while the ESIA drew linkages between integrating environmental aspects and the sustainability of the project, there were no references to the linkages between socio-cultural aspects and sustainability (see GPHA 2015, xx). The risk with such an approach is that, the value that local communities place on cultural resources as well as the implications of losing them or the potential benefits and added value their protection will create for the expanded port were not adequately explored. It is also important to note that some possible reasons why the label 'ESIA' was used despite the main focus of the ESIA geared at environmental issues include the fact that GPHA and its partners sought for funds from the international arena mainly the IFC of the World Bank group (see GPHA 2015, 3) which required that the ESIA operationalise and maintain both social and environmental standards. The ESIA report specifically made reference to performance standards 8 and 5 on cultural resources, land acquisition and involuntary resettlement which were potentially triggered by the project (GPHA 2015, 4–5). In this regard, one could argue that the ESIA was designed and framed more towards meeting regulatory requirements needed as part of a formal procedure than providing (local) stakeholders an avenue to influence the project. Going by the notion of co-creating values akin to the stakeholder approach, it is quite clear that the ESIA failed to clearly provide a plan on how the social and cultural concerns of local stakeholders would be accommodated. A provision was however made for monitoring (and harmonising) environmental issues at a cost of GH¢171,000.00, roughly US\$ 34, 000.00 (GPHA 2015, 111) though the composition of the monitoring team included only GPHA officers without local stakeholder (see GPHA 2015, 111). This makes the project non-participatory. The implication of such a practice is that local stakeholders concerns which do not make 'sense' to the GPHA based on the ethics of capitalism (Freeman et al. 2010) were side-lined during the project execution and the commitments made in the ESIA were not adhered to (Flannery, Healy, and Luna 2018; Swyngedouw, Moulaert, and Rodriguez 2002).

5.1.2. Local stakeholders' concerns about the proposed port expansion project

The major concerns (with specific focus on socio-cultural issues) that were raised during the planning process and how they were addressed are summarised in Table 2.

5.2. Effects of stakeholders' participation on decision-making: the case of protecting local communities' cultural resources

As mentioned earlier, relevant stakeholders including the local communities were engaged by the ESIA team and the GPHA to identify their concerns with regard to the proposed port expansion project and identify ways to address or accommodate them so as to create strategic value for the port. These consultations took place between 2014 and 2015 mainly in the form of meetings. The major issues of concern raised by the local communities through their chiefs (TCs) are summarised below:

[That] the 'Meridian Rock', located in the sea close to the proposed site, is regarded as sacred; and annual rituals are performed at its nearby shore by the Tema Traditional Council [. . .] [and that] any disturbance of the rock during construction [...] could lead to agitations and unrest (GPHA 2015, 92)

The rock [Meridian Rock] also symbolises the line of the Greenwich Meridian, the world's prime meridian for longitude and time. It thus serves as a tourist attraction site in Tema (GPHA 2015, 92).

The extracts above from the ESIA report shows clearly that, meetings were held with the traditional authorities who were considered as critical local stakeholders, during which they raised concern about the need to protect or preserve their cultural resource heritage, i.e. a rock with cultural and religious significance within the project footprint which is highly valuable to the local communities. The GPHA assured the local communities that measures would be put in place to protect and ensure that all known cultural resources and artefacts are preserved in order to ensure a peaceful co-existence with the local community and to build a sustainable port. Interviews with traditional leaders of Tema and Nungua revealed that the 'Meridian Rock' is a deity or a 'fetish' rock for the Ga-Dangme people and it is sacrosanct. It is a place where cultural rituals are performed and traditional chiefs are installed.

Table 2. Local stakeholders' concerns and summary of conflicts

Conflict	Description	Key Receptors	Resolution/Commitment
Meridian Rock	Historical site (cultural resource heritage) of local communities	Tema and Nungua communities	Agreed to preserve rock and allow communities access when Rock necessary but the rock has been submerged during the project execution. This historical site is sacrosanct, and cannot be expressed in monetary terms
Ave Maria	A recreational resort within the project footprint. A source of livelihood for several people	Managing director and workers	Management of the resort was initially told the resort will be integrated into the new port as a cruise station. They later heard a rumour that GPHA intended to demolish the facility. After official enquiries confirmed the rumour, managers of Ave Maria took the case to court which led to a protracted dispute. This illustrate a case of bad faith engagement
Fishing	Fishing disturbances	Sakumono fishing Community	Mutually agreed that fishing will not be disturbed as the proposed site for the reclamation and dredging is rocky and therefore fishing activities are not carried out there by fishermen
Sakumo Lagoon	Habitat loss and pollution	Tema TC & Environmental Protection Agency (EPA)	An environmental management plan was prepared and followed to ensure the protection of birds, habitats and marine species
Traffic Congestion	Environmental & Social Impacts	Public/EPA	A new road expansion project has started to ease traffic congestion
Employment	Local vs expatriate	TMA, TTC	About 70% of employees are said to have been employed From the local arena

Source: Author's research

Although GPHA held meetings with traditional authorities- a mechanism supposedly meant to capture their concerns and make all necessary accommodations in line with creating mutual interests and shared values; and the protection of the rock which the local communities consider as a cultural heritage was singled out to them, the study found that currently the rock has been submerged and lost as the following statements made during the interviews summarise:

[...] There are two traditional councils within the catchment area [...] so they [GPHA] met with the Tema TC and also Nungua TC [...]. We had discussions especially with regards to our deities and shrines [...]. Amgmu rock is public knowledge. That it is our deity (Interview with NTC, 26 November 2017).

They told us that the Meridian Rock could be affected. We resisted it outright. We resisted any attempt for the rock to be submerged. We sounded a clear caution to them that the rock is unbreakable and a lot of repercussions will follow if they attempted. They promised they were going to fence it [...] because they want to develop a port that is at peace with the local people. But now they have done contrary to our agreement. We cannot tell what went on and why they did this. The rock is currently no more. It is gone (Interview TTC, 24 November 2017).

We have heard that they have covered the rock and they said they are going to erect a monument there. How can you destroy the deity and then tell us you will construct a monument [...]? Are we wiser than the gods? [...]. We are waiting for the paramount chief whom the laws mandate to take action or the people themselves will rise up (Interview NTC, 26 November 2017).

Interviews and focus group discussions revealed that the Meridian rock also known as 'Amgmu' is a black 'fetish' rock worshipped originally by the families of the 'Mantse We' of Nungua community who happen to be the first settlers on the coast of Accra. During and after the annual Kpleedzoo (a festival of the gods during which both the gods and the Ga people are purified), the chief priest performs rituals at the site to ask for the blessings of the gods for the people and this exhibits the true tradition and culture of the Ga people. A respondent from NTC remarked:

[...] Amgmu gives us prosperity, fortifies us against our enemies especially in the past during the time of wars, and blesses our fishermen with bountiful harvest (Interview with NTC, 26 November 2017).

Coincidentally, the rock is also located on the Greenwich meridian and hence has been christened the 'Meridian Rock'. These Ga communities place a lot of value on this cultural resource heritage which cannot be expressed in monetary terms while the GPHA does not in the practical sense because it did

not make an economic sense to them. Smith (2006) argued that the value placed on cultural resource heritage vary in terms of reason, culture, time and place. To the local communities in this case study, this cultural resource heritage gives them a sense of place and identity, and has value on its own which cannot be expressed in monetary terms. Thus, protecting it could have created added value for both the port and local communities. Zazu (2011) noted the intrinsic connectedness between heritage, culture and sustainability arguing that preserving heritage is a necessary condition for sustainability. Similarly, the IFC has included the protection of cultural resources as part of its core social performance standards (IFC 2012). During the focus group discussions, participants highlighted why it was so important to preserve these cultural resources:

[...] The TTC informed the project team that they should protect our shrines and deities located in the project area. This is what gives us our identity as Ga-Dangme people and has been preserved and passed down from generations to generations. It must not end during our time (FGD, Sakumono, 1 February 2017).

The GPHA and its partners on the contrary hold the view that they have done adequate stakeholder engagements except that some local stakeholders do not want to budge. They argue that the port expansion must go on anyway. An official stated:

[...] I can tell you that a lot has been done. All due diligence has been done. A lot of back and forth, lots of consultations, even with parliament before the agreement was passed. At parliament it even looked like it won't come on until jaw-jawing with majority and minority [...]. Some people will have one reason or another why they think we could have done something in another way, but to the best of my knowledge, everything was done in line with international best practices (Interview with MPS, 17 February 2017).

Similarly, an official of the GPHA explained that, they have implemented corporate social responsibility (CSR) projects in the area in order to make sure that the port expansion will not adversely affect the local community, including addressing the issue of congestion and to demonstrate that they are a responsible entity:

[...] we are investing as much as GH¢28 million into the expansion of the Tema motorway, what we call the Tema Motorway Roundabout Improvement Project. It involves the construction of four by-passes to reduce the number of vehicles approaching the roundabout, construction of an additional third lane to widen the roundabout. (Interview with GPHA, 17 February 2017).

It is important to state here that some respondents were of the view that although the expansion of the motorway is laudable, one cannot deny the fact that it is mainly to facilitate the easy movement of goods from the port. Also, such CSR projects cannot in any way be compared to the value that they place on the Meridian Rock.

These findings reverberate with recent debates that stakeholder engagements if not used with the intention of allowing stakeholders to have actual influence on decisions could become a post-political tool. Despite the inclusion of local stakeholders in the planning process, the underlying social and cultural concerns were not prioritised during the project execution. This corroborate Murray, Fagan, and McCusker's (2009) argument that often, stakeholders end up getting disappointed and frustrated because their anticipation that their participation or inclusion in the planning process would have a meaningful effect on decisions is not achieved. As this case has shown, local stakeholders' inclusion did not have any substantial influence on the project. Their inputs were side-lined during the project execution because it did not make an economic sense for the GPHA. This finding agrees with de Boer et al. (2018, 10) argument about the Tema port expansion project that "the decision making process for the port expansion is primarily informed by economic reasons [...] and not on ecosystem based considerations". The discussions so far give credence to earlier findings that stakeholder participation could be used in deceitful ways, or merely to conform to regulatory requirement or to legitimise pre-determined decisions (Swyngedouw, Moulaert, and Rodriguez 2002; Wilson and Swyngedouw 2014) as the community's valued cultural resource heritage has been lost. The cultural resource 'conflict space' is visualized in Figure 2 and Figure 3.

5.3. Lack of good faith engagements and emerging conflicts: the case of Ave Maria resort vs. Ghana Ports and Harbours Authority (GPHA)

The Ave Maria case described below provides insights into a full blown stakeholder conflict triggered as a result of poor stakeholder management by GPHA and its lack of good faith engagements with the management of Ave Maria, - a beach resort located within the project footprint which is a source of livelihood for several people in the local community but was at risk of being affected by the project. The poor handling of the issue attracted media attention. A mental image about the confusion and anarchy that characterised the situation between GPHA and managers of Ave Maria resort can be described by a cursory glance at the major news headlines in Ghana since the year 2017: *GPHA security bulldozes portions of Ave Maria resort (Citi Fm 2017a)*; *GPHA has been intimidating us since 2015 - Ave Maria resort (Citi Fm 2017b)*; *GPHA to pay US\$140,000 for delaying port expansion contractors (Peace Fm 2017)*; *Ave Maria resort to be demolished January ending—GPHA Boss (Citi Fm 2018a)*; *GPHA boss lied; no deal reached for demolition—Ave Maria Resort (Citi Fm 2018b)*.

Figure 2. Map of the port of Tema before expansion showing historical (cultural) and recreational spaces

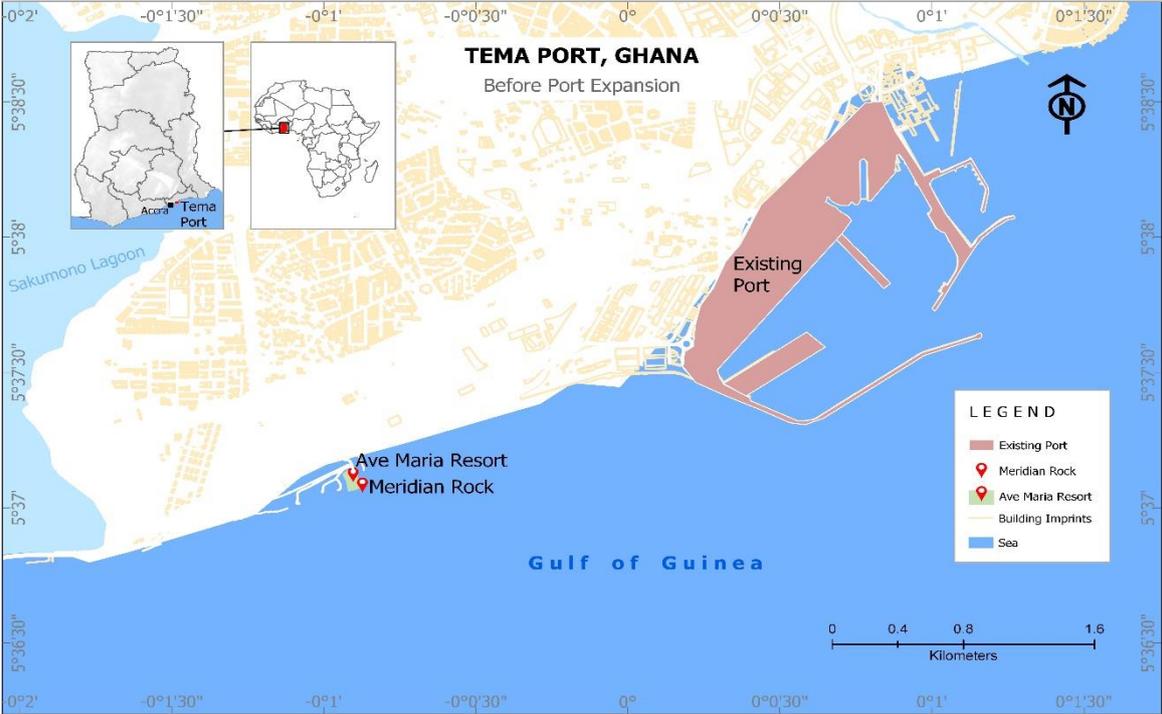
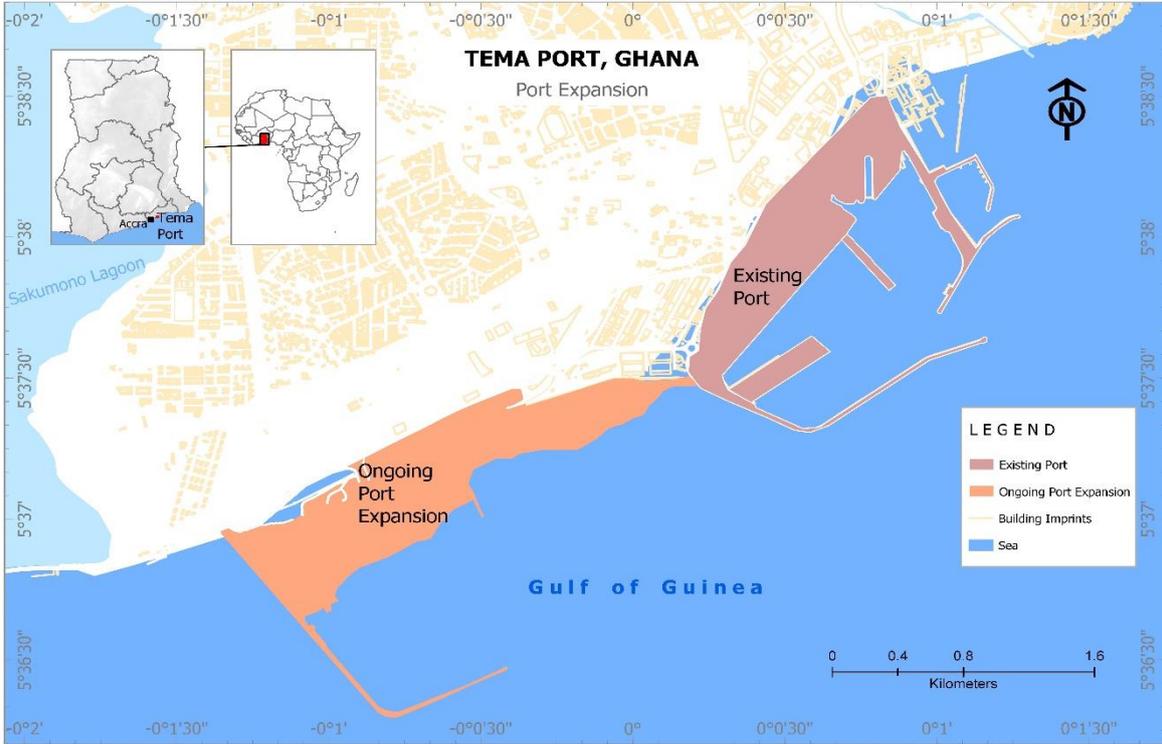


Figure 3. Ongoing port expansion. Cultural and recreational spaces taken over by new port expansion



The news headlines enumerated above give a quick idea of the lack of good faith engagement between GPHA and Ave Maria over the issue of 'competing for space' along the coast (i.e. recreation vs port expansion). The case, as further discussed below, reveals how GPHA underestimated the 'stake' or relative importance of managers of Ave Maria as critical stakeholders to the success of the project and how their opposition could be detrimental to the success or public perception of the project.

Tema beach Club, later developed into Ave Maria beach resort by a private developer, was built by Parkinson Hayward, a member of Halcrow and partners, the general port plan and constructors of Tema port in 1954. It served as a leisure centre for the construction workers until they left it after the completion of the port. The facility has since been the property of the government. In January 2002, GPHA leased the facility to a private resource developer to further develop the infrastructure and manage it an initial period of twenty-five years. The newly developed beach resort had about 15 hotel rooms, a tennis court and squash court, a gym and a spa and runs a twenty-four hours daily service. In furtherance of GPHA's intention to expand the existing port, it started to engage the management of Ave Maria Resort. According a respondent from Ave Maria, the initial communication from GPHA to them was that the facility will not be affected by the port expansion project and that they should further upgrade the place to an international standard as GPHA intended integrating it into the newly port project and to use it as a cruise or passenger station:

From the beginning we were told that the port expansion will not affect us. That we will be incorporated into the newly expanded port and that they will use it as a cruise or passenger station. We were asked to start to renovate to international level. We started rearranging things here and there, adding green scenery and artificial grass to beautify the place. In the middle of all this, we heard a rumour; I mean somebody hinted us, not even GPHA themselves that plans have changed. We quickly went back to GPHA and they confirmed that those who are financing the project said they don't want any other physical project around. They want a core functioning harbour (Interview, Ave Maria Resort, 26 November 2017).

The account above does not point to a good faith engagement between managers GPHA as project proponents and Ave Maria as a stakeholder that may be potentially affected by the project. According to the research, management of Ave Maria heard about GPHA's decision to demolish the facility for the first time as a 'rumour' which was only confirmed after they re-contacted GPHA months after the initial communication to them that the facility was not going to be adversely affected by the project. Yet, upon GPHA's admittance that plans had changed, they gave management of Ave Maria only two months to vacate the place as preparations were far advanced for construction works to proceed. It must be noted

that this was just after fourteen years out of a total period of twenty-five years that the place was leased to the resort. A respondent from Ave Maria stated:

They gave us two months to pack and go. We feel this was very unfair because their environmental consultant told us that he finished his report before he was asked to add Ave Maria. Our question was why? Is it because the foreign companies don't want us here? So we went to consult a legal team and they wrote to GPHA that what they were doing was unlawful [...]. This was in August 2015. GPHA didn't bother. They wrote to us that they wanted us out by September 2015. So we were here one day when they came and blocked the road leading to our premises so my lawyers took the matter to court. The Tema High court placed an injunction on the project and asked them to hold on with any further development until the final determination of the case. This was around October 2015. For two years, we have been going in and out of the court (Interview, Ave Maria resort, 26 November 2017).

Apparently this back and forth led to delays in executing the project. The accounts above are a clear indication of the lack of a 'genuine stakeholder engagement' with the intention to create value for both stakeholders. Failure of GPHA to either incorporate the resort into the expanded port as planned earlier or adopt measures to adequately compensate and relocate them was largely responsible for this conflict. This cost the GPHA not only time but also as indicated in the news items enumerated earlier, money as they were to pay an amount of US\$140,000 to project contractors for delaying work because of the long raging court action. The conflict remained in full swing as the following quote indicates:

The court gave its ruling about two months ago that it was illegal for GPHA to come back and claim what it had given out for 25 years. But that since this is a government project and we have seen that they have actually started the project; we should be paid a compensation and move within 30 days. So my lawyers said if the court agrees that GPHA are wrong, then why are we being punished? So we went back to the same court for them to reconsider their ruling and they didn't. So we have now gone to the Appeal's Court in October 2017 and the case is yet to be called. Just about a month ago while the case is still in the court, they came again. They came and dug a big trench in front of our facility. They locked up our security men in the room and seized their phones (Interview, Ave Maria resort, 26 November 2017).

The case was still in the court, and the GPHA and management of Ave Maria were waging the media 'war', with press interviews that the resort will be pulled down and counter interviews that there is no agreement for such to happen until around May 2018 that the facility was finally brought down even as the compensation and relocation issues remain yet to be resolved.

6. Overall discussion

The rationale for this article was to explore the effect of local stakeholders' participation in a port expansion project in Ghana. Existing studies on managing stakeholders' interests at ports have largely focused on environmental issues (Lam and Van de Voorde 2012; Barnes-Dabban, Van. Koppen, and Mol 2017; de Boer et al. 2018). Consequently, this paper focuses on the extent to which the inclusion of local stakeholders ensured that their socio-cultural concerns were addressed during the project execution and the emerging conflicts (if any). There is a growing recognition by scholars that port development without stakeholders' participation may be ineffective. Integrating stakeholders concerns into port infrastructure projects has become a necessary condition for developing sustainable ports (Jansen, van Tulder, and Afrianto 2018; Dooms 2019). According to Ravesteijn, Liu, and Yan (2015) effective stakeholder management constitutes a form of responsible innovation in today's age of sustainable development. Addressing socio-cultural concerns of local stakeholders constitutes an important component of facilitating the social leg of sustainability (Nebot et al., 2017; Jansen, van Tulder, and Afrianto 2018). Thus, when port managers and administrators prioritise stakeholders concerns in their plans and decisions, it can help them to make quality decisions and to avoid social and environmental conflicts (Dooms, Verbeke, and Haezendonck 2013; Parola and Maugeri 2013).

Despite the potential benefits associated with stakeholder inclusion in planning infrastructure projects, some scholars have bewailed the reluctance and/or failure of administrators and managers to fully incorporate stakeholder concerns into actual plans and projects, arguing that stakeholder participatory processes are increasingly enacted merely as part of formal procedures and are used chiefly to depoliticise planning processes (Wilson and Swyngedouw 2014; Vanclay 2014; Flannery, Healy, and Luna 2018). The evidence presented in this article testifies to the contested nature of stakeholder inclusion in port infrastructure development. It shows that the port authority used stakeholder participation and ESIA as post-political tools, to 'inform' and to fulfil regulatory requirements rather than to allow (local) stakeholders to influence decisions about the port expansion project. This situation led to the loss of valuable cultural resources of the local communities in one instance and a court action that delayed the project in another.

Four main reasons explain why stakeholder participation and ESIA applied by the port authority and their partners did not yield meaningful results for local stakeholders: First, protecting the Meridian Rock, a valuable cultural resource to the local communities did not make economic sense for the port authorities in practice. As such, despite the commitments they made in the ESIA and the assurances they gave to local communities during the engagement process, the concerns and views raised by the local communities were side-lined during the project execution. Earlier de Boer et al. (2018) also noted that the decision making process for Tema port expansion project was driven by economic reasoning without

socio-environmental considerations. Secondly, as demonstrated by the Ave Maria case, there was clearly lack of good faith engagement between the port authority and managers of Ave Maria. The importance or stake of Ave Maria towards a successful project delivery—in terms of a timely completion and as cost effective as possible, was underrated. This is in agreement with Dooms (2019) argument that port managers are often confronted with the challenge of identifying the relative importance of stakeholders towards the success of port projects. This situation is largely responsible for the ensuing court action. Third, given that GPHA is a government body, they took integrating some of these concerns for granted as the project had the backing and support of government and regulatory agencies. Dooms (2019) noted that the type of port ownership (whether private or public) can influence stakeholder relationships. Forth, the ESIA focused largely on environmental issues while socio-cultural issues received little attention. The motives behind certain sociocultural concerns of local stakeholders were not fully captured and statements with regard to how they will be managed were vague and lacking in focus although the problem of traffic congestion and employment were addressed.

In general, the results support earlier findings that stakeholder participation may be applied merely as part of a formal procedure to depoliticise planning processes than to enable stakeholders to influence decisions (Macleod and Johnstone 2011; Wilson and Swyngedouw 2014). It confirms Swyngedouw, Moulaert, and Rodriguez (2002) argument that often, the 'capitalist consensus' (e.g. plan to expand the port) is predetermined and fixed and that participatory mechanisms are usually not respected. In this way, inputs of local stakeholders do not have any real or significant influence on actual decisions. Thus contrary to the expectations that inclusive port development will help to create value for all stakeholders (Ravesteijn, He, and Chen 2014; Dooms 2010), avoid conflicts (Koppenol 2014; Pearson et al. 2016; Ravesteijn, He, and Chen 2014; Parola and Maugeri 2013) and build a sustainable future for all stakeholders (Freeman, Harrison, and Zyglidopoulos 2018; Hörisch, Freeman, and Schaltegger 2014), local communities were harmed as they lost valuable cultural resources that cannot be expressed in monetary terms.

The findings underscore the need for managers to put stakeholders' concerns at the beginning of every action in practice (Freeman et al. 2010) as "the interests of all stakeholders [can be] of intrinsic value" (Donaldson and Preston 1995, 67). This will however require that port managers will not merely create participatory mechanisms or space simply to hear or solicit stakeholder views about a project, but more importantly to incorporate these concerns into their plans and decisions as much as possible, so that local communities will not be harmed in the process of creating value for the port. In this way, the port and the host communities can co-exist and grow together.

7. Conclusion

The study concludes that despite the potential benefits of stakeholder participation in planning port infrastructure, practical integration of stakeholder concerns into port planning processes remains difficult. While stakeholder management principles were applied by the port authority in the port expansion project, it was applied rather as part of a formal procedure than to allow local stakeholders to exert influence on the project. This is responsible for the loss of valuable cultural resources of the local community and a conflict that delayed the project. While a recent directive by the Appeal court requiring the port authority and managers of Ave Maria to negotiate a compensation package offers a window of opportunity to finally resolve this long-standing conflict, the situation could have been avoided in the first place if managers of the port had paid more attention to local stakeholder needs and were committed to developing a port that is 'culturally appropriate' or that does not 'destabilise the socio-cultural balance' of the surrounding communities. The study concludes that stakeholder participation if not used well can become a post-political tool.

The study recommends that aside environmental issues; managers must pay more attention to socio-cultural concerns of local stakeholders'. For stakeholder consensus and avoidance of conflicts, port managers and administrators must ensure that stakeholder engagement and ESIA are done in good faith. A good faith engagement is one that is geared towards mutual gains and not simply providing space for stakeholders to express their views as part of a formal process. Also, port managers and administrators must ensure that they capture and understand the motives behind social, cultural and environmental concerns, interests and values of their stakeholders and must make an effort to make room for their accommodation, given specific boundaries so as to create value and a sustainable future for all stakeholders and not merely restricting decisions to economic considerations of the port. As with the loss of valuable cultural resources of the local communities, the port authority did not understand its value at stake in the practical sense. Lastly, port managers must build trust in their relationship with their stakeholders, especially during engagements and ESIA. As with the Ave Maria case, the lack of trust was a factor contributing to the conflict. The focus of this study was on local stakeholders. While this was deliberate to capture the insights and to tell the stories of these very important but yet often 'taken for granted' stakeholders, further studies may include maritime support stakeholders, regulatory agencies and port workers using quantitative methods.

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III. Appendix

Sample of an interview guide

A. The green port phenomenon

1. Could you tell me about the current environmental situation at this port? (Get a general idea about the various environmental aspects associated with port development and activities and demands made by stakeholders).
2. What do you see as the biggest challenge in environmental terms facing the port? (probe to know whether this major challenge(s) were the same ten years ago or have evolved and why?).
3. Have you heard about the green port idea? From where and when?
4. How do you understand the term green port? (*Take note of different views that may be expressed by different port authorities*). Do you have a concrete green port policy?
5. Have you implemented any measures and schemes at the port following the green port principle? (Probe more, get details about every organisational, technological tools that have been implemented).
6. Why have you implemented these measures and not others? Probe more about the answers given. (Pay particular attention to legislation, historical environmental incidences at the port or in the region and other institutional factors)
7. Do you use the label green port? (Probe to know the reason for the answer and how the label was acquired).

B. Sustainability-oriented port network(ing)

1. Is your organization part of any environmentally-oriented joint cooperative and collaborative initiative, with other port authorities? (Probe for names of networks, *participating actors, how to become a member and reasons for joining*).
2. What can you say are some of the benefits you have derived from being a member of this network? (*Probe to know reasons for the answer. Take note of behavioural change, knowledge transfers etc.*).
3. Who are the pioneers and main actors in this network? (Probe to know dominant actors).
4. So far, what are the flagship policy tools, measures and technologies that have been created and circulated via this network? (Probe details about best practice organisational and technological tools, concepts etc.).

5. Have you adopted and implemented any of these measures in your port? (Probe to know why for the answer given. Ask what needs to be done to promote adoption. Probe whether the tools they have adopted actually lead to environmental improvements).
6. How will you describe decision making processes in the network (probe issues regarding setting the network agenda, environmental issues that are prioritised and the standards that are reached)
7. Do you attend meetings, conferences etc.? (*Probe to know how the network operates*)
8. When you meet at the roundtable would you say discussions and deliberations go through a smooth process or some big players set the standards?
9. Are you able to fully participate and cooperate with other port authorities in a real sense in the network? Why and how?
10. Based on your participation and experiences in this network, what opportunities and constraints do you see as enabling or constraining the adoption of measures and facilitating environmental upgrading along the maritime value chain?

C. Stakeholder-inclusive mechanisms and discourses

1. Do you consider sustainability concerns of your stakeholders in planning and executing new port infrastructure development or expansion projects? (*Probe to know drivers, e.g. regulatory requirement, acceptability of the project etc.*).
2. Which stakeholder's demands do you accord the most urgent and accord the most importance? (Probe as regards regulatory stakeholders, local communities and whether environmental, social or economic sustainability issue).
3. What tools do you employ to capture and address stakeholder concerns and demands?
4. To what extent do you think you are able to address environmental and socio-cultural sustainability demands of local stakeholders during for e.g. port extension projects? (*Probe to see the weight they put on environmental and socio-cultural aspects, and the rationale behind the reasons why they address certain concerns and neglect others*).
5. How do stakeholder management schemes help the port to get its projects accepted?

D. For local community stakeholders

1. Were you engaged as part of the (ongoing) port expansion project? (Probe to know mechanisms and mediums of engagement, whether they were actually involved in planning or they were just engaged to seek their opinion).

2. What were the major environmental and social concerns you tabled before the port authority and their partners concerning the proposed project during the engagement process (*Probe to understand the reasons behind those concerns?*).
3. Did you encounter any challenges in the course of your participation in the processes leading to the planning and execution of the port expansion project?
4. Were your concerns addressed during the project execution? (If no what do you think are the reasons why they have not been addressed and what do you intend to do about it?).
5. In your opinion, what can port authorities do to achieve stakeholder consensus?

Declaration in accordance with Article 6 (6) of Doctoral Degree Regulation

Herewith, I declare that:

- (1) This doctoral dissertation is my own work. It was conducted without unauthorised assistance.
- (2) Only the referenced sources and aids were used.
- (3) Due reference has been made to all works either quoted or used as the basis for ideas.
- (4) A software-based plagiarism assessment is permitted.

Bremen, 1 October 2019

(Eric Tamatey Lawer)