

Governance to Support Multi-use Platforms at Sea: Recommendations from Discourse Analysis

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ABSTRACT

There is growing focus on multi-functional use of the marine environment. The solution presented is to combine different economic activities in 'multi-use platforms at sea' (MUPS). An expanding body of literature focusses on the economic, technical or social challenges that follow from combining these different functions at sea. Current Dutch policy sees MUPS as a promising way to make the most out of scarce space available but present rules and regulations not supportive of MUPS.

To find the right mode of governance for developing MUPS one needs a discourse coalition with a shared definition of (1) the problem tackled, (2) the solution it brings, (3) the solutions envisioned (including design and user functions) and (4) the role of various actors in bringing about these solutions. In this article we present a discourse analysis of the North Sea on the governance of MUPS.

It shows that there is no single shared discourse but that there are contesting views on what MUPS are or should be. Although some convergence of discourse takes place, the question whose problem is solved by MUPS remains unanswered: do they solve public problems such as nature conservation and spatial planning or are MUPS the solution to high Operation and Maintenance costs? This hampers the development of multi-use platforms at sea with neither public nor private actors willing to take the lead.

Key words: North Sea, discourse analysis, multifunctional use, governance, multi-use platforms at sea

1. Introduction

The oceans of the world are subjected to massive developments. Traditional ways of exploitation - such as fisheries, transportation, tourism and oil production - remain important while growth of activities such as offshore wind and wave energy generation, deep sea mining, and offshore aquaculture of fish and seaweeds is foreseen (Gross, 2014)(Douve, 2008). To deal with today's and future claims on the seas, rules and regulations press for a balance between economy, ecology and society to exploit the oceans' environment in a sustainable way (van Tatenhove et al. 2014).

The development of new maritime economic activities leads to competing claims for scarce operating space. This recognition drives interest in combining different economic activities in what are labelled 'multi-use platforms at sea' (MUPS). These MUPS can contribute to efficiency use of marine space (Buck et al. 2008; Lacroix et al. 2011). There is growing interest in the economic, technical and social opportunities and challenges of combining different functions at sea. The concept of MUPS is subject to extensive research (for example the FP7 research projects MERMAID, H2OCEAN, TROPOS) and much is expected from national and international governance regimes, to guide these innovative technological developments towards mature economic activities.

Present policies and regulations for the North Sea are not adapted to the development of MUPS. Despite visionary documents on multi-use and government-funded research on the need and potential for MUPS, rules and regulations in concessions for offshore wind parks render combinations of functions impossible. The challenge at the moment is to develop a

governance regime tailored to the development of MUPS in the North Sea. A discourse coalition is essential to develop an appropriate mode of governance (Anshelm & Hansson 2014; den Besten Arts, & Verkooijen 2014; Ertör & Ortega-Cerdà 2015; Flannery, O'Hagan, O'Mahony, Ritchie, & Twomey 2015; Hajer 1995, 2009). A discourse coalition is defined as a group of actors with a shared definition of (1) the problem that needs to be addressed, (2) the contribution of – in this case – MUPS to solving these problems, (3) the factual design of the solution and (4) the role of various actors in bringing about these solutions. The societal discourse on MUPS needs a shared views on these four aspects to develop appropriate governance.

Our research consisted of two phases. In phase 1 we investigated the present discourses on MUPS, analysing relevant documents and the analysis of three presentations given at a workshop on MUPS. In the second phase, we discussed findings with a group of experts on the North Sea to check whether they agreed with our description and to ask them how they envisioned the future mode of governance to support the development of MUPS in the North Sea.

2. Analytical framework

2.1 Governing the seas

The notion of governance has risen in popularity among scientists and policy-makers in general, and in maritime development and marine spatial planning specifically (Flannery & Ó Cinnéide 2012; van Hoof & van Tatenhove 2009). Governance is used to describe the move from traditional forms of government towards networks, pluricentric and process-oriented forms of governing (Rhodes 1997). Different modes of governance are identified, distinguished by their focal point. Hierarchical, network and market governance (Meuleman 2008) are supplemented by knowledge governance and hybrid governance.

Hierarchical governance refers to governing by power and by rulemaking. This governance style is consistent with the idea of the democratically legitimated government who – in general interest - makes laws for society and ensures that actors remain within the limits set by law.

Market governance refers to those cases where the principles of the market are used to realise societal objectives. This is associated with the private sector but governments are involved in market governance too. Not only do they stimulate competitions between departments or between task oriented organisations and private organisations (Smits van Tatenhove & van Leeuwen 2014), governments also interfere in markets to direct them in the desired direction – for example through subsidies and support for R&D. Market governance stresses that private stakeholders are important in governing, also in marine developments (Pomeroy & Douvere 2008).

In the 1990s and 2000s political scientists described the emergence of *network governance* (Kickert 1997)(Sørensen & Torfing, 2009). Networks exist of relation webs constituted by governments, businesses and societal actors (Klijn Steijn & Edelenbos 2010). Actors are positioned inside these networks, which empowers them, but also limit the movement space. The move towards networks was influenced by, and at the same strengthens, decreasing capacity of states to apply top-down steering (Andersson 1991; Mann 1997; Sassen 2008). It is argued that under conditions of globalisation, sub-politics (Beck 1992) and international environmental problems there is less room for effective central steering. Recognizing their role in solving the world's problems, to improve effectiveness and legitimacy of legislation, non-state actors are increasingly involved in governance. Terms such as deliberative, communicative, argumentative or collaborative planning or governance have been used to refer to this trends and its practices (Buizer & Van Herzele 2012).

Knowledge governance often also uses networks but these networks function differently. It is focused on knowledge production, knowledge dissemination and learning which opens up new pathways for societal change (Gerritsen, Stuiver & Termeer 2013; van Buuren & Eshuis 2010). Knowledge governance can take the form of a research project or

programme, a pilot project, a learning network, etc. Knowledge governance needs a transdisciplinary form of science, needs social learning, a reflexive attitude, a reliance on self-organisation and a boundary arrangement with stakeholders not directly involved.

In policy domains such as regional development and climate change, a hybrid mode of governance is emergent (Bulkeley 2005). The need for hybrid governance is also discussed in relation to maritime governance, as it is concerned with sustainable management of a complex adaptive systems linked across multiple scales (Ruckelshaus, Klinger, Knowlton & DeMaster 2008). Ecosystem based management is the dominant hybrid mode of governance, implemented to overcome a sector-driven policy approach and integrate and planning and management from the perspective of ecosystems (Soma, van Tatenhove, & van Leeuwen, 2015).

In practice, governance will imply a mixture of these different modes of governance. For example, a mix of hierarchy and market governance is employed when governments appoint sites for a multi-use platforms at sea and provide funding for business (Jay 2010). When multi-stakeholder groups start a knowledge development and dissemination programme to promote the business case, such as the EU funded Mermaid and Maribe projects, all governance modes can be identified. (Flanagan, Uyarra, & Laranja 2011; Howlett & Rayner 2007).

2.2 Interpretive policy analysis

Following among others Arts and Buizer (Arts & Buizer 2009) we use an interpretive policy analysis approach to study discourses on MUPS. The central question for interpretive policy analysis is: how is the issue framed by the various parties to the debate? (Yanow 2000). "The role of the interpretive policy analysis is to map the architecture of debate by identifying the language and its entailments used by different interpretive communities in their framing of the issue. (Yanow 2000).

Discourses play a pivotal role here. In an abstract sense, they are defined as "a specific ensemble of ideas, concepts and categorizations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities" (Hajer 1995). Discourse analysis originates from the work of Goffman (Goffman 1974) who illustrated that humans draw on frames to understand and respond to events. "Illuminating discourses allows for a better understanding of controversies, not in terms of rational-analytical argumentation but in terms of the particular argumentative logic that people bring to a discussion" (Hajer 2009). The analysis of discourses can illustrate how organisations and institutions think about their role and the role of others, and the distribution of power, it "pushes deeper understanding about power, politics, and interests" (Creed, Langstraat & Scully 2002). Discourses influence the way societal actors look at the world around them. They have real-life effects: they influence policy- and governance making by defining problems, solutions and the role and responsibility of different actors.

Discourses are often (but not exclusively) expressed by language, laid down in artefacts. Artefacts convey the values and beliefs of stakeholders and can consist of for example written statements and policy-documents, but also songs, stories, scientific text and images. Interpretive policy analysis puts these artefacts of policy making in the centre of analysis; the documents, speeches, comments et cetera are analysed to identify how problems and solutions are defined and how roles and responsibilities are attributed to different actors. Since the act of policy-making is not confined to formal policy-makers alone, artefacts provided by both state and non-state actors are taken into account.

This alignment between artefacts on problem definition, the approach required and the roles and responsibilities of actors involved facilitates the establishment of discourse coalitions as it brings together different actors with shared story-lines and practices that conform to these stories (Hajer 2009; van den Burg & Bogaardt 2014).

3. Materials and Methods

A first important source of information are the documents on MUPS in the North Sea published in the last ten years. These documents are used to identify discourses on MUPS. A

first investigation was carried out to identify relevant documents for the North Sea, both from a scientific, societal and policy point of view. In total, 14 written documents were selected by a snowball method for further investigation. These were selected because they tackle the emerging debate on MUPS in the North Sea the last ten years. A second important source of information was a panel discussion on MUPS, organised at the IPA conference in Wageningen, The Netherlands, July 2014. In this panel discussion, representatives from policy (policy-makers and enforcers), civil society organisations and science gathered to discuss MUPS in the North Sea. Business representatives were invited but did not attend. Three representatives gave an introduction on MUPS. Their presentations were transcribed and included in the analysis. An overview of the studied artefacts is included in Table 1.

Tab. 1: Artefacts used in discourse analysis

No.	Authors	Title	year	
D1	Buck & Buchholz	The offshore ring: A new design for the ocean aquaculture of macroalgae	2004	(B. Buck & Buchholz, 2004)
D2	Reith et al.	Bio-offshore. Grootschalige teelt van zeevieren in combinatie met offshore windparken in de Noordzee	2005	http://www.ecn.nl/docs/library/report/2005/c05008.pdf [last accessed 24-3-2015]
D3	Ministry of Transport, Public Works and Water Management, Ministry of Agriculture, Nature and Food Quality Ministry of Housing, Spatial Planning and the Environment Ministry of Economic Affairs	Integrated Management Plan for the North Sea 2015	2005	https://zoek.officielebekendmakingen.nl/stcrt-2011-20771.pdf [last accessed 24-3-2015]
D4	Van Beek & Florentinus	Marine Parks [Mariene Parken]	2008	http://www.innovatienetwerk.org/sitemanager/downloadattachment.php?id=1ZZlbqoyr4dvRGfyGvB90C [last accessed 24-3-2015]
D5	European Commission	FP7-OCEAN-2011 call	2010	http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/fp7/calls/fp7-ocean-2011.html [last accessed 24-3-2015]
D6	Christensen et al.	MERMAID description and work packages	2011	http://www.mermaidproject.eu/ [last accessed 24-3-2015]
D7	Lindeboom et al.	Short-term ecological effects on an offshore wind farm in the Dutch coastal zone; a compilation	2011	(Lindeboom et al., 2011)
D8	Van den Akker et al.	Report session "Sustainable co-use of offshore wind parks" at North Sea Days	2012	[not publicly available]
D9	Buck & Krause	Short expertise on the potential combination of aquaculture with marine-based renewable energy systems	2013	http://epic.awi.de/33953/ [last accessed 24-3-2015]
D10	Van den Burg et al.	A triple P review of the feasibility of sustainable	2013	https://www.wageningenur.nl/upload_mm/8/a/d/d69d82b9-

		offshore seaweed production in the North Sea		904f-4bf1-9844-c24bd5d39346_Rapport%2013-077%20vdBurg_DEF_WEB.pdf [last accessed 24-3-2015]
D11	Ursa Major Services BV	Vissen voor de Wind	2013	http://www.blueportal.nl/projectenparade/192/vissen_voor_de_wind [last accessed 24-3-2015]
D12	Lagerveld et al.	Combining offshore wind energy and large-scale mussel farming: background & technical, ecological and economic considerations	2014	http://www.maritimecampus.nl/sites/default/files/C056%2014%20Report-Blauwdruk-SL-MS-lcs.pdf [last accessed 24-3-2015]
D13	Ministry of Infrastructure and Environment, in cooperation with Ministry of Economic Affairs	Noordzee 2050 Gebiedsagenda. Verslag van een gezamenlijk onderzoek naar de potentie van de zee en kustgebieden op lange termijn, vertaald in een visie, ambities, kansen en opgaven, en in kaarten.	2014	http://www.noordzeeloket.nl/projecten/gebiedsagenda/ [last accessed 24-3-2015]
D14	Quinn	Interview with Quinn for MERMAID dissemination movie	2014	https://youtu.be/2E9FfxhR09Q [last accessed 24-3-2015]
W1	North Sea Foundation	Presentation at IPA conference	2014	
W2	Ministry of Economic Affairs	Presentation at IPA conference	2014	
W3	Rijkswaterstaat	Presentation at IPA conference	2014	

The following four aspects of discourse were focussed on when analysing the documents and the presentations:

- Problem definition: referring to passages that describe the problem that are, or need to be, solved by MUPS
- Contribution of MUPS: describing what MUPS actually contribute to solving the problem identified
- Design of MUPS: passages that describe what MUPS look like, including different functions and configurations (i.e. sharing physical infrastructure and/or sharing space)
- Roles & responsibilities: describing what actors should play a role in development of MUPS.

Documents and the transcribed panel discussion were analysed using the software program AtlasTI to code the document. The coded passages were analysed following the approach developed by Auerbach and Silverstein (Auerbach & Silverstein, 2003) to group and analyse quotations with the objective to identify common themes and arguments. The following steps were taken: (1) an overview of all associated codes and quotations was printed, (2) key sections of quotations were written down, (3) comparable comments/sections for each code were grouped. This was done in several rounds until a limited number of dominant thematic groups were reached. (4) Lastly the thematic groups were described.

The workshop at the IPA conference also informed the second part of the analysis. After introductory presentations, the session continued with a discussion on the roles of government and the market in, and appropriate instrument to be deployed for, MUPS

development. This discussion addressed the question of governance. It was transcribed for further analysis.

4. Results

This paragraph presents the results of the discourse analysis in the two phases: the documents and the panel discussion. First, we go through the four main components of discourse, that are used in coding the documents. We do this by means of two tables, in which we present the four different aspects of discourse per document. Second, we analyse the panel discussion on consequences for governance.

Tab. 2: Results on problem definition and role of MUPS

No.	Problem definition	Contribution of MUPS to solving the problem
D1	Competition for space.	Combines functions; looking at shared structures.
D2	No problem identified. There is a possibility that MUPS bring synergy by combining different activities.	The foreseen potential synergy lies in: Joint operation and maintenance, Joint training of personnel, Use of offshore construction for multiple purposes, Joint environmental impact assessment and permits, Closure for shipping, with positive effect on insurance costs, allowing for bigger aquaculture constructions.
D3	The need for spatial planning in the North Sea. Space is (becoming) scarce and we need to use it efficiently.	Space is used more efficiently when combining functions.
D4	There is no integrated plan for the North Sea.	[not clear]
D5	Facilities such as offshore wind farms occupy large areas and compete with other uses of maritime space.	Make efficient use of space. Combinations of functions within the same infrastructure offer significant benefits in terms of economics, optimising spatial planning and minimising the impact on the environment.
D6	There is massive infrastructure development for offshore energy and aquaculture.	Reduce costs by optimization of the use of ocean space for various purposes.
D7	Concern about the environmental impact of offshore wind parks and biodiversity loss in the ocean.	Combining offshore wind with biodiversity conservations allows for the use of the space between offshore wind turbines as sheltered areas where nature can flourish.
D8	Current use of the North Sea is not sustainable	The development of offshore can be a trigger for more sustainable use of the North Sea.
D9	Increased competition for space, among others because aquaculture is moving further offshore.	By fixing aquaculture to structures it is possible to reduce costs, have stable connections and prevent losses.
D10	Growing world population growth increases pressure on environment and scarce land.	MUPS make efficient use of marine space.
D11	Reduced availability of fishing grounds.	If offshore wind parks can be used for fishing, more fishing grounds are available. It is also expected that fishermen can provide maritime services.
D12	[no real problem identified that needs the development of MUPS]	MUPS can bring synergy, reducing the total costs for O&M.
D13	A spatial plan for the North Sea needs to be developed. There are various competing claims for space that need to be incorporated into this spatial plan.	MUPS can reduce competition for space in the North Sea.
D14	Have to use the ocean sustainably. High costs for offshore operations and competing spatial claims near the coast.	Offshore operations are moving further offshore, need to combine functions to get a return on investment.
W1	We need renewable energy to combat climate change and we need to produce food. And this needs to be done within the	Make sustainable food and energy production at sea possible.

	carrying capacity of the North sea.	
W2	New production locations for offshore aquaculture are needed.	Provide opportunities for offshore aquaculture.
W3	Offshore wind policy targets come with large spatial claims on an intensively used sea. Aim to make maximum use of the potential of the sea.	Reduce spatial pressure, contribute to economic benefits, contribute to innovation and offer show areas for new technologies.

In these documents, the following options in design and foreseen functions were discussed: renewable energy (unspecified, wind) aquaculture (unspecified, seaweed, mussels), maritime services, biodiversity, fisheries and other. Design of MUPS is also about an important foreseen technological question: do the different function share infrastructure (foundations, buoys, floaters etc) or do they only share space (i.e. take place in the same area).

When analysing roles and responsibilities, under the heading “actors”, we analysed who took the initiative for the artefacts (study, policy document etc), who funded the work and what role is foreseen for businesses. Table 3 presents the outcomes of these analyses.

Tab. 3: Results of analysis of functions, design and actors

No.	Foreseen functions									Design		Actors (1)		
	Wind	Renewable energy (unspecified)	Seaweed	Mussels	Aquaculture (unspecified)	Maritime services	Nature protection	Fisheries	other	Sharing infrastructure	Sharing space	Initiative	Funding	Business involvement (if relevant)
D1	X		X	X						X		S	?	
D2	X		X									S	G	
D3	X				X				X			G	n.a.	
D4	X	X			X				(2)	X		G	n.a.	Project partner (subcontractor)
D5	X	X			X	X						G	n.a.	
D6	X				X					X	X	S	G	Project partner
D7	X						X				X	S	G	
D8	X	X	X	X	X		X	X	X		X	C		
D9	X	X			X							S	G	
D10	X		X								X	S	G	
D11	X							X			X	B	G	Initiator, leading the project
D12	X			X							X	S	G	Project partner + consulted
D13	X	X	X			X	X		(3)			G	n.a.	Participating in process
D14		X										S	G	
W1	X				X		X				X			
W2	X	X	X	X	X	X		X			X			
W3	X								(4)		X			
	15	6	5	3	7	3	3	2		1	5			

(1) S= science, G= government, C= civil society, B=business.

(2) including central fish action, housing, conference centre, Carbon-capture

(3) A wide range of different combinations is discussed, including various ocean energy technologies, tourism, research, maintenance islands, aquaculture. Various designs are made that represent how these technologies can be combined at sea.

Also includes Blue Growth sectors such as marine biotechnology, deep sea mining and coastal tourism

(4) testing ground for new technologies

5. Analysis

5.1 Framing multi-use platforms at sea: convergence in the making

Different actors have different views on the problems addressed by MUPS and their technical design but the frequency with which different functions are discussed and investigated shows convergence in framing MUPS: competition for space is the dominant problem, solved by a combination of offshore wind energy and seaweed aquaculture.

The analysis above illustrates scientists, policy-makers, civil society and businesses expect MUPS to solve many different problems. The documents suggest that competition for space, and the subsequent challenge for spatial planning procedures are an important problems. Other problems mentioned in the documents are the high costs of operating offshore, pressure on land use, and biodiversity loss. While some of these problems have a public character (e.g. spatial planning at sea) others have a private character (e.g. high costs for offshore operations).

Given the differing views that we encountered in the documents on the problems to be solved by MUPS, it is only logical that there is variety in the foreseen user functions of MUPS; they are expected to accommodate different functions such as wind turbines, wave energy, conference centres, seaweed production, tourism et cetera.

Energy production is expected to become an important basic function of MUPS in all documents. Most studies on MUPS foresee that additional functions are added to the offshore wind parks. Aquaculture is the most mentioned additional function, with seaweeds and mussels mentioned in particular. There are various possible additional functions that are discussed less often in the documents: from conference centres to carbon capture and storage. These are discussed in only a few artefacts.

Occasionally, MUPS are linked to existing and/or defunct oil and gas platforms or new platforms where functions share physical infrastructure (such as new islands). More often, the term MUPS is used to describe combinations of functions in the same geographical area.

The foreseen synergy is expected from shared use of space, rather than infrastructures, and synergies in O&M. Some studies have addressed the high costs for offshore operations, arguing that MUPS can reduce costs for O&M because of synergy between different production functions.

Science and governments are the most dominant actors in initiating investigations into MUPS. Scientists have developed concepts, testing them through models or stakeholder consultation (B. H. Buck et al. 2008; Wever, Krause, & Buck 2015). Government has supported exploratory studies that describe the potential of MUPS, and have addressed some of the (potential) problems for MUPS with regards to policy-making. The emergent picture is that of scientists and policy-makers defining the problems that MUPS should solve and defining the solutions. In 2012 the civil society organisation North Sea Foundation organised a workshop on sustainable multiple use of offshore wind parks, questioning if development of wind energy could be a trigger for sustainable use of the North Sea. Business are consulted to get a grip on their ideas and for their technical expertise. They hardly ever take the initiative to develop – let alone invest in – MUPS.

5.2 Governance for MUPS

It is important to realize that for the North Sea MUPS – including the combination of offshore wind energy with seaweed aquaculture – still are a hypothetical construct. Governance is needed to bring them about. The mode of governance required was discussed in the workshop at the IPA conference. Discussion focussed on the different problem definitions present among the participants and their opinions on the consequences for role distribution between actors.

Participants acknowledged that they have divergent views on MUPS. This is not a bad thing per se; *“if you have different views this also allows you to bring together actors who have different interest of different understanding of a problem or an issue”* (North Sea Foundation). It is argued that diversity in the framing of MUPS can have a function in early phases of development, but that there is also the danger that *“MUPS should solve to many problems or*

combine too many sorts of uses. You then run the risk of not solving anything” (North Sea Foundation).

The existence of different views is a problem when it comes to the development of effective governance. One participant expressed that a common denominator is required for development of a governance mix. *“You should first identify what the conflicting views are before you can come to a possible common denominator. The common denominator should be an underlying public/societal principle that draws the contours of the playing field. The discussion on MUPS cannot remain a marine spatial planning exercise. It should be based on the underlying principle of sustainable management of marine ecosystems” (North Sea Foundation).* Lack of a common denominator makes it problematic to come to the desired governance mix and agree on the policy instruments needed.

The participants discussed the role of government. Governments are concerned with the development of MUPS: *“when we are talking about MUPS we are actually talking about future problems and problems at this moment. We as government have to foresee these problems, we have to articulate policy how to deal with it” (Ministry of Economic Affairs).* Government has an interest in MUPS as they can develop innovations to strengthen the knowledge and competitive advantage of the Dutch industries. *“MUPS can offer show areas for new technologies and innovations, to show that they work within Dutch waters” (Rijkswaterstaat).*

Although this explains the involvement of government in MUPS, the next question was what they can actually do; what instruments can they deploy? The participants consider direct involvement in developing MUPS out of scope: *“It is a difficult role because we have very little means. The government has a role to stimulate and facilitate developments, its role is not to develop windfarms or to develop other technology. Those have to be developed by enterprises, by people who have the idea.” (Rijkswaterstaat).*

Since MUPS have not been developed so far, governance is primarily necessary to (a) arouse interest among involved actors to participate in the development and (b) to ensure that rules and regulations are favourable and set the right conditions and incentives for MUPS development. The panel expects much from network governance. *“This is one of the roles of the government to help to bring those parties together that are thinking about those development” (Rijkswaterstaat).* *“The role of the Ministry is to facilitate and to stimulate it. The key is innovation and cooperation. Good cooperation between offshore industry and research institutes is essential to solve the problems” (Ministry of Economic Affairs).*

It is stated that development of governance requires a sense of urgency but *“there is no sense of urgency for MUPS. We see companies are not so interested” (Ministry of Economic Affairs).* The question is how the government can create a sense of urgency among businesses. Lack of space is a problem specific for the North Sea but not a strong motivation for developing governance that stimulates development in other seas. For that *“there are other problems like climate change and food production to develop a sense of urgency” (North Sea Foundation).*

6. Conclusions

Discourse analysis illustrates that documents that address MUPS do not have a single uniform frame of MUPS; the documents reflect diverging views on the problems MUPS can solve, the functions they should accommodate and the technical lay-out of the platforms. Until now, this broad framing of MUPS was an advantage as it gives the diversity of actors room for manoeuvre to participate in the discussion at an abstract level as there is something in it for all. However, it troubles the development of an effective and shared governance mix required to align the involved actors and make that crucial step forward towards the realization of MUPS.

This research points towards a crucial discontinuity in the framing of MUPS: the problems that the actors identify have a public nature but the government expects private actors to take the lead in the development of MUPS. To develop a governance mix and assign roles to both private and public actors it is necessary to identify and prioritise the problems to be solved by MUPS and determine who is responsible for solving what problems.

The difficulty of attributing roles and responsibilities is not unique to the development of MUPS and appears more often in governance for the complex marine system (Parés, Dresdner & Salgado 2015). The Marine Strategy Framework Directive is seen as a major step forwards in the management of marine systems (Bigagli 2015) but the fragmentation of the European marine governance system remains a point of concern (Raakjaer, Leeuwen, Tatenhove & Hadjimichael 2014).

The development of MUPS was at first hampered by a lack of knowledge on technical feasibility of MUPS. As knowledge on these aspects is building up within the various research programmes taking place, this step is taken. Now it is time for public and private actors to catch up and find an effective mode of governance as MUPS have the potential to be part of the solution to public and private problems. Governments look towards private actors to take the initiative. Although businesses might be in the lead in the future, the current lack of urgency among business impedes the development of MUPS. The role of the government at the moment is to select the right governance mix to enhance and stimulate businesses to come with innovative solutions that have a turnover in the future.

Efforts to improve governance for MUPS need to be based on a proper prioritisation of problems to be tackled. If the problem is a private one, such as high costs of offshore O&M, the initiative lies with private actors. Government can facilitate development by identification and removal of obstacles in legislation that these actors face or stimulate economic activities through subsidies and research support. If MUPS solve public problems such as biodiversity protection or food security, governments are to play a lead role. The key question is if governments given sufficient weight to global concerns such as food security and global warming to justify a greater role of public authorities in the development of MUPS.

Acknowledgements

This research is supported by the FP7-OCEAN-2011 project “Innovative Multi-purpose off-shore platforms: planning, Design and operation”, MERMAID, 288710, under the call “Ocean of Tomorrow and the TripleP@sea research programme, funded by the Netherlands Ministry of Economic Affairs.

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