Stakeholder Analysis of Marine Parks

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Preface

The stakeholder analysis for Marine Parks, as described in this report, has a long history. In 2004 InnovationNetwork developed the Marine Parks concept. This concept centres on the sustainable production of aquatic biomass (seaweed, mussels, fish) at sea, in combination with other functions such as wind farms. Many parties were involved in this process via workshops and design sessions. A captain's dinner was also held to discuss the concept with several top corporate executives. Partly on the instigation of InnovationNetwork, the then Ministry of Economic Affairs opened the Small Business Innovation and Research (SBIR) scheme for seaweed cultivation projects in 2009. Two consortiums that were co-initiated by InnovationNetwork then carried out a successful feasibility study and are currently making the first steps towards pilots, again with support from the SBIR scheme. This appears to have kick-started a vital new development towards the production and, possibly , processing of aquatic biomass at sea for e.g. food, pharmaceutical and energy applications. The sea provides sufficient space for this activity, without causing any competition for land-based food production.

Whether this initiative is brought to full maturity depends largely on the attitude of the various stakeholders. At present, it is mainly the researchers and designers who are driving the process, but in due course the business community must take over the baton; the stakeholder analysis shows that businesses are still adopting a 'wait and see' attitude. Government (provincial and national) is broadly positive towards Marine Parks, while NGOs are neutral. Interestingly, all parties see sustainability, and ecological sustainability in particular, as an important criterion for joining or supporting this project. In this connection, it is essential to give the most important stakeholders a say in the direction of the project at an early stage. This study led to

the decision to set up a management group, including representatives of the most important stakeholders, in order to take Marine Parks to the next stage.

This research was carried out by Gohar Isakhanyan, who previously made a stakeholder analysis for Agroparks when studying at Wageningen University. She will continue her work in this area as part of her PhD research at the Business Administration section. This study is essential for those who wish to deepen their insights into the diverse interests and forces surrounding the development of Marine Parks.

Dr. G. Vos,
InnovationNetwork, manager

Contents

Executive summary

InnovationNetwork developed the concept of 'marine parks' several years ago in order to address the issues of sustainability and economic development at sea. During these years, the concept has taken various formats, and discussed with various societal groups. The project nonetheless remains in the conceptual stage; it yet to be developed or implemented.

This study analyses the stakeholders of marine parks in light of system innovation, with the objective of determining the potential impact of stakeholders on processes involved in realizing marine-park projects. The study aims to guide marine-park designers and project implementers so that they can avoid the expected opposition and gain support from the stakeholders.

The research was conducted according to the following methodological strategy: (1) literature study on system innovations, stakeholder analysis; (2) desk research on marine-park projects, wind farms, seafood and seaweed production; (3) empirical research based on fourteen semi-structured, face-to-face interviews with representatives from stakeholder groups. All data were analysed in order to allow conclusions to be drawn and recommendations to be made.

The results indicate that marine parks are clusters for creating sustainable production at sea by integrating renewable energy production with aquaculture and by making effective use of ecosystem functions, thus enabling the multidisciplinary and multifunctional use of space in marine environment, as well as production at sea, with minimum environmental impact. Marine parks are system innovations, in which stakeholders play an important role. The process

of realizing system innovation involves five phases: initiation, development, reinvention, implementation and completion.

Marine parks are designed in four formats: offshore, near-shore, inshore and onshore. The results of our research suggest that technological possibilities and knowledge levels decrease, as projects are located further from the shore, while stakeholder conflicts are more common in onshore projects.

The potential stakeholders identified in the analysis can be classified into the following groups:
1. Project designers and developers
2. National, regional and local governments, public authorities
3. Potential member companies, partners
4. Financial institutions
5. Knowledge institutes
6. Environmental organizations

The analysis of the stakes and interests held by these stakeholders reveals many conflicting stakes among key stakeholders. These conflicting stakes may generate negative expectations on the part of various stakeholders, thus creating opposition. For this reason, project designers and developers should take the stakes and interests of stakeholders into account and consider them strategically.

The power analysis demonstrated that none of the individual stakeholders are powerful enough to accomplish the project objectives on its own. A combination of groups may increase their power, thus enabling them to realize projects.

Among the powerful stakeholders, project designers, developers and public authorities are supportive of marine-park projects, but the real drivers of project realization – potential future members, partners and financial institutions – are neutral and thus experience no sense of urgency to joining the project. At this stage of project development, strong opposition does not exist. However, the existing industries, wind farms, portal activities, environmental organisations, may become neglectful.

The study also identifies the losses and benefits expected by the stakeholders. On the one hand, they expect the development of new businesses and the expansion of existing businesses, knowledge improvement, the creation of new research lines and, most importantly, the implementation of a new system. On the other hand, key stakeholders expect to lose both their reputations and any resources they have invested if the project fails to become sustainable. They also expect the loss of fishing areas, negative visual impact, noise and obstructions, as well as reductions in land and marine area.

The research concludes that processes involved in the realization of marine-park projects, which are pertinent to sustainability issues, are likely to meet stakeholder resistance. Moreover, key stakeholders bear a crucial impact on the processes involved in realizing such projects. If their expectations, interests and stakes are positive, these stakeholders

can accelerate the realization of marine-park projects through their support. In contrast, projects can be delayed by the resistance and non-cooperative behaviour of stakeholders whose stakes are in conflict with the objectives of the project and whose expectations are negative. The strategic involvement of key stakeholders at the right moment through carefully chosen communication channels is therefore an essential part of ecosystem-based management.

The analysis of the results leads to number of strategy recommendations and learning points for the designers and developers of marine-park projects with regard to proper stakeholder management and the effective realization of these projects. The recommendations are presented in two groups: (1) recommendations for project management and (2) recommendations for communication.

The main recommendation to the project designers and developers is creation of a management team to deal with technological aspects of the project realisation, as well as with the organisational, financial, strategic and stakeholder management issues. Second important step is to strengthen the communication not only among the project designers, developers and knowledge institutes, but also with the potential member companies and partners, financial institutions and environmental organisations.

Keywords: Marine Parks, System Innovation, Stakeholder Analysis.

1.
Introduction

1.1
Problem Description

Awareness of environmental problems in aquaculture has increased significantly in recent years. According to the Food and Agriculture Organization (2010), 11 of the world's 15 major fishing areas and 69 % of the world's major fish species are declining and in urgent need of attention. The greatest challenge involves finding sustainable ways to maintain and increase the scale of fish production in order to meet the increasing demand of a growing global population. According to estimates, the world population is expected to increase to nine billion by 2050, with 60 % of all of these people living within 60 km of the sea (FAO, 2010). The demand for products from the sea (e.g. food, feed and fuel) will increase accordingly. At present, the amount of fish retrieved from the sea has already reached to its ecological limits. The world's major fishing areas and 69% of its major fish species are in decline. Although onshore aquaculture is currently increasing as well, space limitations prevent it from becoming sustainable. Furthermore, the transition from an oil-based economy to a bio-based economy will increase the demand for biomass, including biomass from aquatic origin (e.g. seaweed). Fulfilling these demands sustainably and with respect for environmental capacity will require new concepts of production for seafood and aquatic biomass.

Against this background, InnovationNetwork launched the concept of marine parks in 2004. This concept entails the production of various forms of aquatic food and biomass (e.g. fish, shellfish, mussels, seaweeds) at sea, combined in clusters and using the present infrastructure (i.e. wind farms, oil and gas platforms). The

combination of different sectors enables synergy and the efficient use of space. For example, seaweed cultivation can have positive environmental impact, including the uptake of nutrients from fish production by the seaweed and the enhancement of marine biodiversity. The seaweed and the cultivation systems offer substrate for attachment, shelter and feed for molluscs and fish. The system can even be managed as a nursery for young fish in order to restore fish population in the North Sea. During these years, the concept has taken various different formats, and it has been discussed with various societal groups. The project is nonetheless still in the conceptual stage, and it has yet not been developed or implemented.

Examples of marine-park designs under the discussion include BioQ8, Sea-Spar-Star, North Sea Fish Platform, Almare, Amalia Wind Park and Seaweeds in the Closed System (ZIGS). These projects entail innovation in aquaculture business, and they are characterized by a high level of uncertainty starting in the early stages of development, when upcoming challenges are very difficult to foresee (Chiesa *et al.*, 2009; O'Connor, 2008). Marine parks involve system innovation, the development of which is a long-term process that extends beyond the boundaries of individual organizations, thereby changing the relations within a network. The results of system innovations usually do not emerge until after the stakeholders or the network of involved parties have been formed and after the innovation has passed through the search and learning processes. System innovations succeed when all involved actors contribute with their own inputs. In general, system innovations that involve key stakeholders are the most effective. Nevertheless, many interrelated factors may hinder the development and implementation of system innovation, which requires changes in the outside world. Stakeholder failure is one factor that can lead to the failure of system innovation. The satisfaction of key stakeholders is a central issue in strategic management, as the accomplishment of the company mission depends upon it.

This study analyses the stakeholders of marine parks as cluster and as system innovation. The outcomes of the research include strategy recommendations and learning points for project designers and project developers with regard to the further effective implementation of projects and proper stakeholder management.

1.2
Research Objective

The aim of this research is to generate insight into the potential impact of stakeholders on the realization of marine-park projects as system innovation.

The objective of this research is to determine the potential impact of the stakeholders on processes involved in the realization of marine-park projects by identifying and analysing the key stakeholders.

The stakeholder analysis addresses the following factors: stakes, internal/external stakeholders, position, power, urgency, expectations and communication amongst stakeholders.

1.3
Research Questions

The following research questions were formulated based on the defined problem and the research objective.

Main Question
What impact do key stakeholders have on processes involved in the realization of marine parks?
This question was investigated according to the following
sub-questions:
1. Who are the potential stakeholders involved in marine-park projects and what are their stakes?
2. What power and position do potential stakeholders have?
3. Which stakeholders are the key stakeholders?
4. What is the level of urgency for the stakeholders?
5. Which benefits or losses do stakeholders expect?
6. How does communication proceed between the project and the stakeholders?

The answers to the research questions were used to derive conclusions and formulate recommendations for project managers and designers regarding the strategic realization of projects and proper stakeholder management.

2. Literature Study, Desk Research

2.1 Marine Parks

As mentioned above, InnovationNetwork developed the concept of marine parks several years ago in order to address issues of increasing demand for seafood and aquatic biomass in a sustainable way. Increases in the world population will increase the demand for products from the sea (e.g. food, feed and fuel). At present, the amount of fish retrieved from the sea has already reached its ecological limits, although the market size (e.g. for branded frozen fish and seafood) in Europe continues to grow (see Table 1).

Name	2001	2002	2003	2004	2005
Fish and seafood	3 319	3 523	3 642	3 711	3 714

Table 1:
Frozen Fish and Seafood Market Size (in € billions).
Source: Euromonitor.

Moreover, the world's major fishing areas and 69 % of its major fish species are in decline. Meeting the increasing demands of a growing global population will require increasing production at sea in a sustainable manner. Aquaculture, which also includes the farming of seaweeds, is a fast growing sector (World Wildlife Fund, 2010). At present, onshore aquaculture is growing, but not in a sustainable way. Moreover, several studies have shown that current ocean-based fish-farming technology is not sustainable. For example, salmon farming is associated with major concerns that the chemicals needed to kill sea lice may also affect crabs, lobsters and copepods (Scientific American, 2010).

Furthermore, the transition from an oil-based economy to a bio-based economy will increase the demand for biomass, including biomass of aquatic origin (e.g. seaweed). Fulfilling these demands in a sustainable way with respect for environmental capacity will require new concepts of production for seafood and aquatic biomass.

As launched, the concept of marine parks entails the production of various forms of aquatic food and biomass (e.g. fish, mussels, seaweeds) at sea, combined in clusters and using infrastructures that are already present (e.g. wind farms, oil and gas platforms) (Broeze, *et. al.*, 2004). The combination of different sectors enables synergy and the efficient use of space. For example, seaweed cultivation can have positive environmental impact, including the uptake of nutrients from fish production and the enhancement of marine biodiversity. The seaweed and the cultivation systems offer substrate for attachment, shelter, and feed for molluscs and fish. The system can even be managed as a nursery for young fish in order to restore fish population in the North Sea.

Because marine parks bring new systems into practice, they can be described as system innovations. Further details about system innovation are provided in Section 2.2 System Innovation.

Definition
Marine parks are clusters for creating sustainable production at sea by integrating renewable energy production with aquaculture and by making effective use of ecosystem functions, thus enabling the multidisciplinary and multifunctional use of space, as well as production at sea, with minimum environmental impact.

Examples
Marine parks are designed in four formats:
- Offshore (>20 km from the coast)
- Near shore (10 – 20 km from the coast)
- Inshore (<10 km from the coast)
- Onshore (on the coast)

One example of **offshore** design is BioQ8, which combines the production of algae, seaweed, mussels and fish with energy generation in the wave rotor (Van Beek and Florentinus, 2008). The Almare is another example of an offshore marine-park project. This project combines a floating construction with underwater areas and aquaculture, possibly supplemented by wave and wind energy (Van Beek and Florentinus, 2008). The idea of clustering the production of seaweed and seafood with energy production in the Princess Amalia Wind Farm (offshore) has recently become a topic of discussion as well.

The Sea-Spar-Star design is an example of a **near-shore** marine park. In this design, anchored floating structures for wind turbines can be combined with closed floating structures for the cultivation of fish, shellfish, or other cultures (e.g. algae, aquatic algae, and seaweeds). These floating structures are also applicable in offshore constructions. Another new marine-park project that has been presented, 'Seaweeds

in a Closed System', is located near shore and suggests a placement of floating platforms of seaweed and shellfish hatcheries. These hatcheries can also be placed in between the wind turbines in offshore wind parks. Other examples of inshore and onshore designs have yet to be published. In general, however, the cultivation of seaweed and seafood in combination with wind farms is one of the first steps in the development of marine parks (InnovatieNetwerk, 2010).

2.2
System Innovation

There are several types of innovations, including incremental, radical, semi-radical, organizational, product, process, design and management. System innovation can be described as a combination of all of these types (Geels, 2005). System innovations are currently needed in order to address several societal problems in various sectors, including energy, sustainability, population growth and the associated increase in the demand for food.

In this context, marine parks can be recognized as system innovations. In general, marine parks are identifiable entities that contain interdependent elements and create synergy. Moreover, marine parks address issues of sustainability in order to offer solutions for the growing demand for food and other biomass, and scarcity of the seafood supply.

System innovations require several years to plan and set the stage for implementation (Van de Ven *et al.,* 1999; De Bruijn *et al.,* 2004). As system innovations, marine parks can be characterized as comprehensive projects with a long-term horizon (10-20 years), requiring the efforts of many stakeholders, as well as a change of perspective. System innovations start to yield positive results once the stakeholders or the network of the parties involved in the innovation have passed through the search and learning processes (Rutten and Van Oosten, 1999). The stability of these type of systems can be ensured through interaction and networking (O'Connor, 2008). In general, system innovation process involves the following phases (De Bruijn *et al.*, 2004; Van de Ven *et al.*, 1999):
- Initiation
- Development
- Reinvention
- Implementation
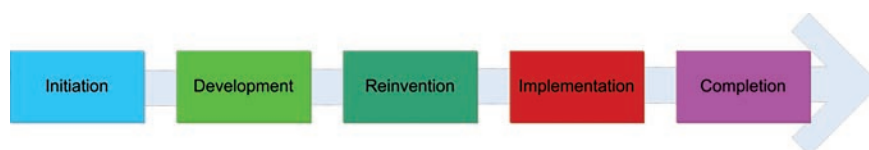- Completion (see Figure 2).

Figure 1: Realization phases of system innovation.

In the **initiation phase,** the idea is generated by one or more of the following drivers: knowledge, market and government (De Bruijn *et al.*, 2004). In the case of marine-park projects, the initiation phase has

been driven by the combination of all three drivers. During the **development phase**, the initiative ideas are expressed in numerical form, and activities start to proceed; obstacles to project design appear largely because of unexpected or unforeseen external events. In this phase, stakeholders should be involved in the process determining the mission, objectives and main concerns of the marine-park project (Pomeroy, 2008). In the **implementation phase**, the innovation is adopted and institutionalized as an ongoing programme (Van de Ven *et al.,* 1999). The boundaries between processes of development and those of implementation become blurred, and reinvention may take place in the process of implementation (Rogers, 2005). **Reinvention** is positively related to implementation and adoption, as the innovation moves from the developers to the implementers. Finally, in the **completion phase**, the innovation becomes fully functional; it is either implemented and institutionalized, or it is terminated when the resources are exhausted (Van de Ven *et al.,* 1999).

The realization of system innovation may be impeded during any of these phases. In addition to solving problems, system innovations tend to create new ones, which can ultimately lead to failure (Kemp *et al.,* 1998). The innovation-system approach presumes that innovation does not take place in isolation and that interaction between actors is central to the process (Klein Woolthuis *et al.,* 2005). It is therefore essential to involve societal actors (i.e. groups of stakeholders) in the various phases of realizing marine-park projects.

2.3
Stakeholder Analysis

Stakeholder analysis is a tool for investigating the beliefs and ideas of stakeholders with conflicting interests and for examining expected future directions of the project. Stakeholder analysis also supports project developers in their assessment of the project environment and their negotiating position, and it can help them to make decisions regarding stakeholder involvement. The involvement of stakeholders can allow the opportunity to create mutual understanding of the issues at hand, to explore and integrate ideas, solutions, to create and achieve common goals (Pomeroy, 2008). In addition, stakeholder analysis provides a chance to formulate the main assumptions regarding project viability at the beginning of each phase of project realization.

Stakeholders are persons, groups or institutions who have an interest in the marine parks under consideration, who have influence on the realization processes or who will be affected by the project's realization, as well as those who have either active or passive impact on processes of decision-making and realization.

Key stakeholders are those who can significantly influence the project or who are important to its success.

Stakeholders in system innovation

Stakeholders play an important role in processes involved in the realization of system innovations. Such innovations can be affected by the expectations of stakeholders until their success fails to be proven and until their potential benefits have been specified through practical application (Kemp *et al.,* 1998). On the one hand, the involvement of many different stakeholders in a system innovation requires resources in terms of time, personnel and financing. On the other hand, the conflicting interests of too many stakeholders can result in delays or even the failure of system-innovation projects (Freeman *et al.,* 2007). Stakeholder analysis focuses on stakes, internal/external stakeholders, positions, power, urgency, expectations and communication.

Given the importance of the stakeholders in the realization of system innovation, the potential stakeholders of marine parks have been defined and their stakes/interests have been identified. A stake is a personal or financial interest or involvement in a project. The list below identifies the groups of potential stakeholders of marine parks:
- Project designers and developers
- National, regional and local governments, public authorities
- Potential member companies, partners
- Financial institutions
- Knowledge institutes
- Environmental organizations

Among these stakeholders, key stakeholders can be identified according to their power. Power is the capacity or ability to accomplish an objective; it can be based upon strength, force, official function or legal right (Webster's II, 1984). Power can also refer to the extent to which a stakeholder is capable of influencing or forcing others to take particular decisions or act in certain ways (Varvasovszky and Brugha, 2000). The position of stakeholders thus refers to their status as proponents or opponents of the project (Bryson, *et al.*, 2002).

In addition to power, the level of urgency experienced by each stakeholder group was investigated. Level of urgency refers to the extent to which stakeholder demand immediate attention (Mitchell *et al.*, 1997), including cases in which stakeholders will not tolerate any delays in the implementation of a project (i.e. time sensitivity). The expectations of stakeholders were then identified in terms of their beliefs or anticipations regarding the benefits, losses or both associated with the realization of marine parks. Finally, the current communication means and frequencies were investigated.

3.
Methodology

3.1
Research Strategy

After considering several methodological strategies, the following was chosen as the guiding strategy for the entire study. The figure below (Figure 2) presents the framework of the research:
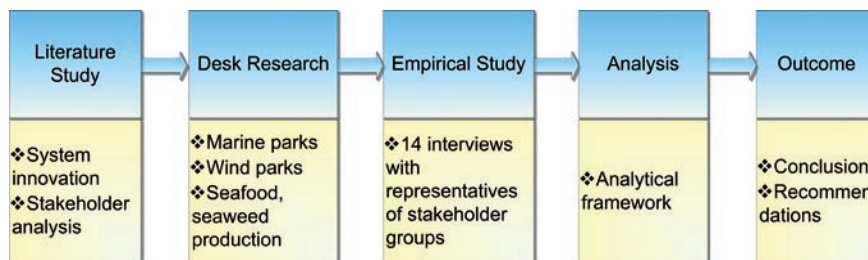
Literature Study	Desk Research	Empirical Study	Analysis	Outcome
❖System innovation ❖Stakeholder analysis	❖Marine parks ❖Wind parks ❖Seafood, seaweed production	❖14 interviews with representatives of stakeholder groups	❖Analytical framework	❖Conclusion ❖Recommendations

Figure 2: Research Framework.

The research began with literature study and desk research on system innovations, stakeholder analysis and marine parks. This resulted in the definition of marine parks, the investigation of processes involved in the realization of marine parks as system innovations, and stakeholder analysis. The main sources of information were books, reports, scientific articles and previous studies, in addition to other sources (e.g. official web sites, on-line announcements, news reports).

Results from the literature study and desk research were used to identify the groups of potential stakeholders of marine parks and to create the interview protocol.

Empirical data were gathered by organizing several semi-structured, face-to-face interviews with representatives from each stakeholder group. Important strategic choices were involved in decisions regarding who should be considered a key stakeholder, how and when. After a sufficient number of interviews had been conducted, the results were analysed. Together with the results of the literature study, the results of the analysis were used to draw conclusions and formulate recommendations.

3.2
Interview protocol

Based on the suggested literature, the potential stakeholders were categorized into six groups. One or two representatives of each stakeholder group were interviewed. It is should be mentioned that the workshop '*Zeewieren als duurzame grondstof*' [Seaweed as sustainable raw material], which was organized by InnovationNetwork, was of great importance at the start of this research. In addition to increasing the awareness of stakeholders regarding the project, the workshop provided an opportunity to gather proper empirical data for this study. Following the workshop, appointments were made with the representatives from the stakeholder groups by e-mail and telephone. It should be noted that stakeholders who did not participate in the workshop were contacted in addition to those on the workshop contact list, although there was little response (20%) from the non-participating stakeholders. These stakeholders were reluctant to be interviewed, as most were completely unaware of the project, and they found it difficult to discuss a subject of which they were not aware. Despite these difficulties, 14 successful semi-structured interviews were conducted in December 2010 and January 2011, covering various aspects of marine-park stakeholder analysis.

3.3
Questionnaires

Based on the literature study and methodology, a general questionnaire was constructed and used to derive specific questionnaires for each group of stakeholders. Each questionnaire contains 22 to 24 questions, both closed and open questions. For closed questions, respondents were asked to choose on answer from a set of possible responses. For open questions, they were expected to give their opinion. In general, it took from 30 to 45 minutes to complete the questionnaire. In most cases, the project was discussed with respondents after they had completed the questionnaire; this discussion lasted approximately 15 to 20 minutes. All of the interviews were recorded and transcribed. For reasons of confidentiality, the recordings and transcripts will not be published.

4.
Empirical Study – Analysis of Results

4.1
Marine Parks

This section presents the complete definition and description of marine parks, based on the literature study and desk research. This definition was discussed in detail with all of the respondents in order to obtain their opinion, remarks and suggestions.

The first concern that respondents expressed about marine-park projects involved possible confusion with regard to the term 'marine park'. This term is usually used to refer to areas that have been designated as marine conservation reserves. Based on the literature study, desk research and discussions with various stakeholders, the definition of marine parks was formulated as follows:

Marine parks are clusters for creating sustainable production at sea by integrating renewable energy production with aquaculture and by making effective use of ecosystem functions, thus enabling the multidisciplinary and multifunctional use of space in the marine environment, as well as production at sea, with minimum environmental impact.

4.2
Onshore, Inshore, Near-shore or Offshore?

Marine parks combine various activities concerning the production of biomass, seafood and sea plants in marine areas in order to create synergy and enable sustainable production. During the early developmental stages of projects, various possibilities and directions can be accepted, and various predictable changes should be adopted, subject to several limitations, one of which involves space. Questions concerning space involve such issues as where and how far from the coast the marine park should be located, whether it should be a mixed farm and whether it will be possible to achieve the best outcomes at relatively low cost and with minimal stakeholder conflicts. The analysis presented below reveals differences in onshore, inshore, near-shore and offshore projects.

Onshore pilot projects can be used primarily for developing knowledge concerning capabilities and possibilities for the production of plants or fish, or similar matters. Onshore projects are the most likely of all project types to have directly involved stakeholders with conflicting stakes (e.g. with regard to the scarcity of available space). The scarcity of land resources in the Netherlands is well known, and there are special requirements for specific land use objectives, including logistics, tourism and portal activities. Moreover, the displacement of water from the sea into onshore projects may require energy consumption and generate disadvantages for economic and business activities, and it could reduce the sustainability of production.

Inshore and near-shore projects offer additional possibilities for establishing clusters. In contrast to the land-user stakeholders involved in onshore projects, the conflicting stakeholders for inshore or near-shore projects consist largely of water users (e.g. fishery organizations and organizations for the protection of water ecology). According to specialists, inshore and near-shore projects are incapable of supplying the required amount of seaweed, again due to space limitations. Parks need massive space in order to produce the demanded quantities of seaweed.

In contrast, offshore projects have the advantage of large available area for farming and fewer issues with fisheries and other entities. The environment in the sea, however, is very harsh (e.g. rust formation on constructions, strong wind and wave magnitude). There may be conflicts with currently functioning offshore wind-farm constructions, and not all wind farms are capable of adapting to a new system inside the farm area. Even for those that are capable of doing so, the attitude of the wind-farm management towards innovation is another crucial issue.

The figure below (Figure 3) presents a graphic illustration of the various factors in Onshore→Inshore→Near-shore→Offshore transition processes.
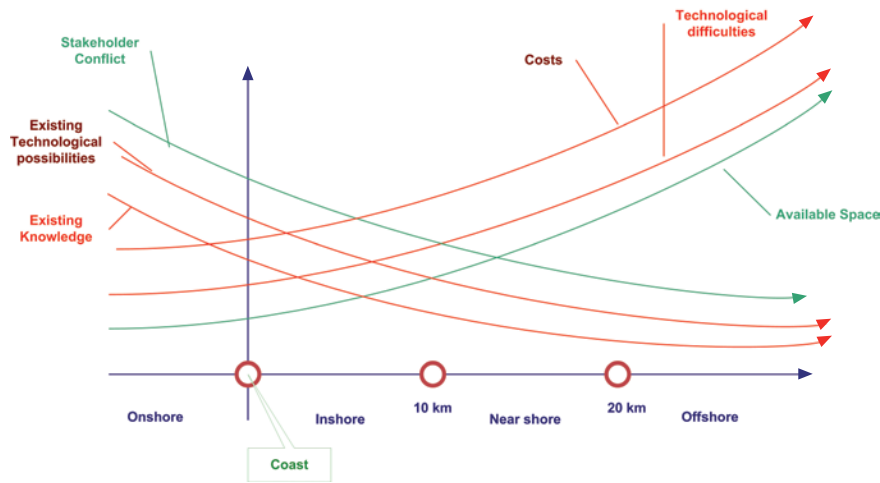
Figure 3 shows the changes in six factors involved in a project: existing knowledge, existing technological possibilities, probable extent of stakeholder conflict, available space, technological difficulties and costs.

Although the estimations represented in the graph are not mathematically accurate, it does depict the approximate change in the factors listed above. For example, existing knowledge, current technological possibilities and the probability of stakeholder conflict decrease along the axis from onshore to offshore, while technological difficulties, costs and available space increase. Although several of these factors (e.g. existing technology, existing knowledge and costs) are potentially subject to change, others (e.g. the naturally harsh offshore environment and the scarcity of space onshore) are impossible to change.

The lesson offered by this graph is that it is important to recognize the influential factors and adopt special measures in order to manage them. Given that these factors exceed the scope of stakeholder analysis, this issue is left for further research.

4.3
Key Stakeholders

The list of potential stakeholders can be endless. It is thus important to identify the key stakeholders and concentrate efforts on satisfying their needs. The outcomes of the empirical study can be used to compile a list of the key stakeholders for marine parks (see Table 2).

N	Stakeholder Group	Key Stakeholders
1.	Project designers and developers	InnovatieNetwerk
		Koers &Vaart
		EcoFys
		Hortimare
2.	Public organizations	National government
		Regional government
		Local government
		Productschap Vis
3.	Potential member companies, Partners	Energy companies
		Seaweed producers
		Construction and technological companies
		Biomass users
4.	Financial institutions	Banks
5.	Knowledge institutes	Wageningen University and Research Centre
		Deltares
6.	Environmental organizations	Foundations
		NGOs

Table 2: Key Stakeholders for Marine Parks.

It is worth mentioning that the list of key stakeholders is not certain and fixed. This list is likely to vary during the realization of marine-park projects. For this reason, the involvement of stakeholders should vary according to the phases of project realization. The importance of these stakeholders in the project design phase is detailed in Section 4.6 Power.

4.4
Stake/Interest

In this section, the main stakes and interests of the key stakeholders are presented and the strength of their interests is discussed. In addition, the conflicting stakes of various stakeholders are analysed.

First, InnovationNetwork aspires to accomplish the goal of setting radical new concepts in agriculture, agribusiness, food and rural areas through the innovations aimed at sustainable development with a

long-term focus. In addition to their mission to develop the ideas, they seek to put them into practice. Ideas that remain in the form of reports without being put into practice are designated by the institution as failures in the pursuit of the mission. Second, the other project developers have an interest in starting new businesses or expanding the existing businesses within the Dutch maritime industry. In the current competitive market, it is easier to establish a new company following the innovation than it is to penetrate the existing market. Although marine-park project design is not the only activity of the designers and developers, their interest in developing it and changing the maritime system by implementing innovative ideas is very strong. The stakes are further enhanced by the substantial underlying idea of renewable energy production and, more specifically, energy creation from wind, waves, biomass and similar sources.

National governments have a strong interest in the role of facilitator, while regional and local governments are interested in these kinds of projects to the extent that they develop economic activity and create new employment opportunities without decreasing the quality of life for individual citizens. Other public organizations are apparently interested in protecting the rights of the current industries existing within the marine-park area (e.g. *Productschap Vis*) and ensuring the availability of alternative and fair income.

The main stakes of potential member companies and partners include business development, new business opportunities and the expansion of existing companies through the sale of the knowledge and experience generated by the test farm, through the implementation of innovations for sustainable development and similar endeavours. Meanwhile, the end-product users have an interest in innovation in new raw materials, primarily as a source of protein (e.g. for animal feed, pipes or energy production). In other words, end-product users seek new market opportunities in order to strengthen their innovative positions and ensure corporate stability in the face of competitive rivalries and a rapidly changing environment. Although they have strong interests in the new products (e.g. new raw materials), these companies are not dependent upon the realization of marine-park projects for their continuation.

Financial institutions have strong interest in financing the business, lending money and, accordingly, earning interest in return. They are not enthusiastic for direct investments, however, in projects that are not viable.

Knowledge institutes have a stake in developing sustainable projects in which all possible environmental impacts have been considered. They also seek to develop knowledge and help other companies in the Netherlands to develop new products, processes and systems. For these institutes, marine-park projects are very important, and their interest in their development is very strong.

Environmental organizations are interested in promoting sustainable methods of producing renewable energy (e.g. wind or biomass). The strength of their interest depends upon the size of the project and its potential environmental impact.

In summary, most of the stakeholders have relatively high interest in the projects. With the exception of the project designers, however, stakeholders are apathetic towards the realization of such projects, and they are therefore reluctant to become pioneers in innovation. The strength of the interests of different groups of stakeholders is mapped in Figure 4: Power-Interest Matrix.

Conflicting Stakes

In the investigation of the stakes and interests of the stakeholders, it is of great importance to analyse the conflicting stakes around the project.

The competition existing among project designers and developers of various financial resources (e.g. competition between knowledge institutes for the opportunity to conduct particular studies, or between commercial organizations to be the first to realize particular innovations) may increase the conflicting stakes among important stakeholders and hinder project development. Such competition, however, poses less of a threat to the realization of projects than do the conflicting stakes existing outside the group of project designers. The most likely conflicting stakes among the groups of stakeholders are emphasized in the following list:

1. A marine park is a spatial project, which means that it requires considerable space and will consequently affect the wild fishing industry.
2. The offshore project in the existing wind farm may conflict with the wind-farm foundations.
3. Near-shore, onshore and inshore marine parks face conflicts with leisure companies.
4. Near-shore, onshore and inshore marine parks face conflicts with portal activities, while the co-operation with them may lead to new economic activities for harbours.
5. Inshore marine parks face spatial limitations in the shore and competition for land use (e.g. for energy, housing or industrial purposes).
6. Marine parks may have a negative influence on the marine environment, which would thus conflict with the missions of environmental organizations. Nevertheless, it may as well promote biodiversity.

To conclude, many conflicting stakes among key stakeholders can be imagined. Conflicting stakes may generate negative attitudes for various stakeholders, thereby creating opposition. The designers and developers of marine-park projects should therefore take the stakes and interests of stakeholders into account and consider them in a strategic manner.

4.5
Internal/External Stakeholders

According to the literature, internal stakeholders are those working within the organization that is designing, promoting, developing or implementing the project; all other stakeholders are considered external.

At this stage in the realization of marine-park projects, the classification of stakeholders as internal or external is approximate rather than precise. The involvement of the stakeholders also differs throughout the various phases of system innovation. The classification of stakeholders as internal or external is therefore presented below according to the phases in the realization of system innovation.

SI realization phases / Stakeholders	Initiation	Development	Re-invention	Implementation	Completion
1. Project designers and developers	I	I	I	E	E
2. National, regional and local governments	E	E	E	E	E
3. Potential member companies — Energy companies	E	I	I	I	I
Seaweed, seafood producers	E	I	I	I	I
Construction and technological companies	E	I	I	I	I
End-product users	E	I	I	I	I
4. Financial institutions	E	E	E	I	I
5. Knowledge institutes	I	E	I	E	E
6. Environmental organizations	E	E	E	E	E

Table 3 shows the status of the stakeholders as internal or external in the various phases in the realization of system innovation. For example, project designers and developers are internal during the initiation phase, as are knowledge institutes. At this stage, the rest of the stakeholders are external; they are not directly involved in the project. As shown in the table, the same stakeholders may be either internal or external in various phases. For example, knowledge institutes are internal during the initiation phase and, if necessary, the reinvention phase. During the rest of the innovation realization, knowledge institutes remain external.

In summary, different groups of stakeholders play internal or external roles in different stages of system innovation. While a group of stakeholders may appear to be out of game (external) once its mission in the realization of the project is accomplished, new external players may appear inside the project as internal stakeholders. Overall, the identification of stakeholders as internal or external is used as an indicator of stakeholder involvement in the processes involved in the realization of projects (see Section 4.10).
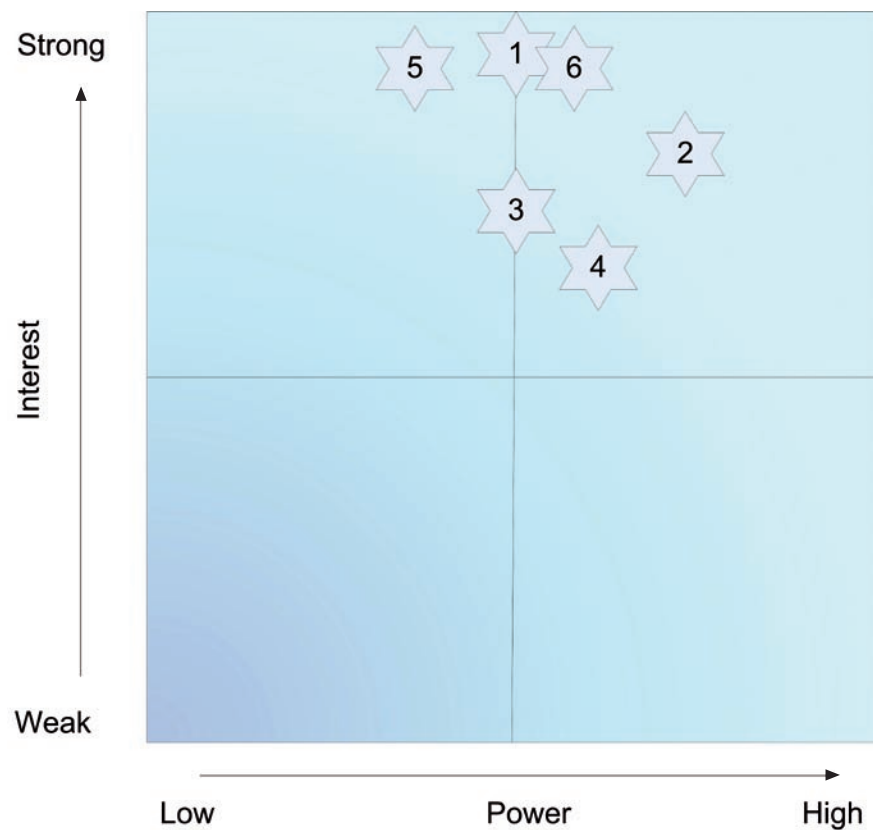
Table 3: Internal/External Stakeholders.

4.6
Power

This section presents the capacity of the stakeholders to accomplish the project's objective, as well as their strength and force. It also addresses the capacity of stakeholders to influence or force, and their ability to have an impact on the realization of marine parks.

In general, none of the stakeholders has enough strength, force or official or legal right to accomplish the project objective alone. In the figure below, the stakeholder groups are mapped within a power-interest matrix. The estimations of power and interest are approximate and intended to provide a general overview (see Figure 4). It is based on the statements of the stakeholders during the interviews.

Figure 4: Power-Interest matrix .

In Figure 4, the numbered stars represent groups of stakeholders in the following order:
1. Marine-park designers and developers
2. National, regional and local governments
3. Potential member companies, partners
4. Financial institutions
5. Knowledge institutes
6. Environmental organizations

As shown in the figure, the stakeholders have very high or high interest in projects, although none has sufficient power to realize a project alone. In contrast, they possess power to block, to slow down

or to compel essential changes. For instance, if the public authorities do not license the activities, it will be impossible to start the project.

In conclusion, a marine-park project involves changing an entire system, within which each stakeholder has a specific type of influence. Although the stakeholders are not powerful enough to accomplish the project objectives on their own, joining forces with other groups may increase their power and enable the realization of projects.

4.7
Position

Position refers to the stakeholders' status as a proponent or opponent of a given project (Bryson *et al.*, 2002). The positions of stakeholders can be largely determined by assessing them according to their willingness to accept the importance of projects. Stakeholders who agree with the implementation of a project are considered proponents; those who disagree are considered opponents, and those who do not have a clear opinion (or whose opinion cannot be determined) are considered neutral.

While analysing the position of the stakeholders, it is important to consider their power as well. In the figure below, the stakeholder groups are mapped according to power and position.
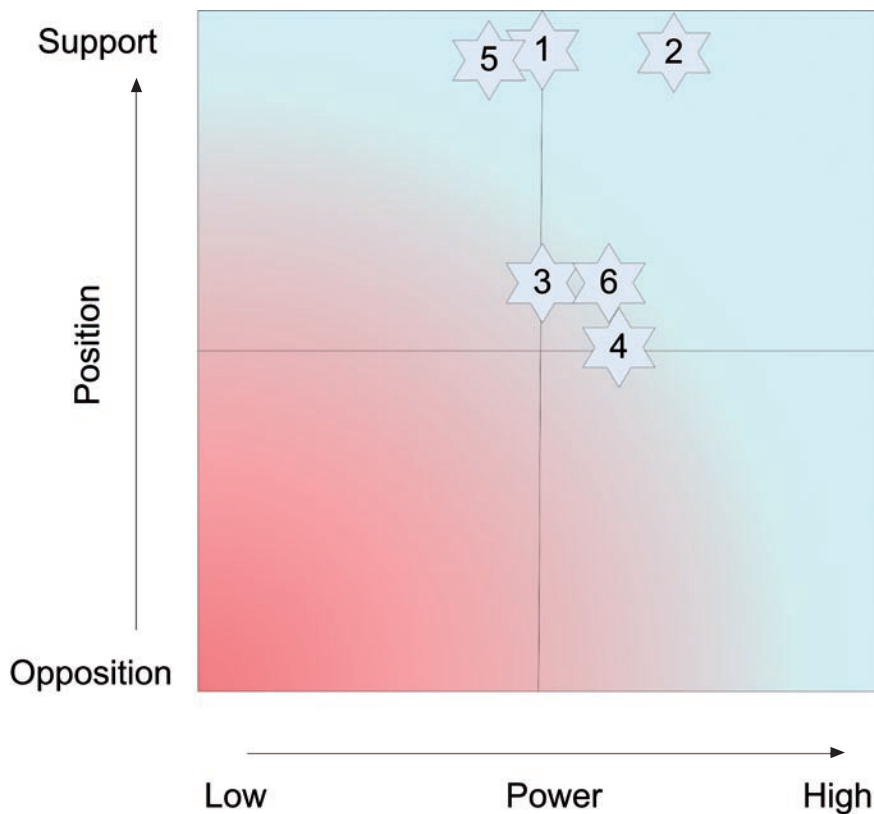

Figure 5: Power/Position.

In Figure 5, the numbered stars represent the stakeholder groups in the following order:
1. Marine-park designers and developers
2. National, regional and local governments
3. Potential member companies; partners
4. Financial institutions
5. Knowledge institutes
6. Environmental organizations

Figure 5 maps the stakeholders based on their position (opposition to support) and the power (low to high). As shown in the figure, most of the stakeholders are supportive, some of them are neutral and none of them is opponent.

The project designers and developers are pioneers in innovation. They are the first movers with regard to establishing new systems. Moreover, they are the strongest supporters at this stage of project realization (together with knowledge institutes and the national government). Potential future member companies and financial institutions may support the project to the extent that it will bring economic benefits to their businesses and increase their reputation in terms of involvement in sustainable development. The environmental organizations are similarly neutral. These organizations are likely to express support for a project if the designers are able to prove both theoretically and practically that it would have no negative environmental impact, that the net environmental effect would be positive, or both. In addition, the potential future members of marine parks, public organizations, knowledge institutes, and environmental organizations express their willingness to support projects by investing time and human resources into discovering the best environmental and economical solution for realizing the park.

In conclusion, financial and legal support from public authorities is of primary importance during the development stage of project realization, while the neutral position of potential future members and financial institutions may make it necessary to apply substantial resources in order to attract them to join the project.

Potential Threats
This section contains an analysis of the potential threats to marine-park projects.

The most important threat is the failure of sustainability. If a project diverges from the principle of sustainable production, stakeholders will shift from supporters into opponents or, in the best case, to a neutral position. For this reason, the chance of failure will increase substantially for projects that are practically incapable of realizing the promised sustainability in three aspects (i.e. the 3Ps: People, Planet, Profit). For example, open-net cage fish farms can pollute the environment by releasing significant amounts of nutrients, chemicals and pharmaceuticals, by allowing the fish to escape from the cage, by introducing parasites and diseases to the environment, by using caught wild fish for fish feed, through conflict with predators and similar actions (WWF, 2011). Opposition can be avoided by

neutralizing these negative effects during the process of project development.

Another threat involves the existence of current industries in marine areas. If these industries appear to lack sufficient space for fishing or production, they will create opposition and, accordingly, significant delays in the realization of projects in which they are not involved in the projects. A further threat is that the absence of a strong, viable business plan will result in the resistance of financial institutions to invest or to make large loans.

In conclusion, marine-park projects face strong threats, although there are comparable opportunities to convert these threats into opportunities. For example, although the existence of current industries may be a threat to the realization of a project due to land conflicts, it could also involve opportunities with regard to potential members or partner companies that could become part of the project.

4.8
Urgency

Urgency refers to the extent to which stakeholders claim immediate attention (time sensitivity). The urgency of the marine-park projects from the perspective of stakeholders was investigated at two levels: (1) the urgency of project implementation for the stakeholders and (2) the urgency of the project from an economic and environmental perspective. The outcome of the study shows that different stakeholder groups experience different levels of urgency (see Figure 6 below).
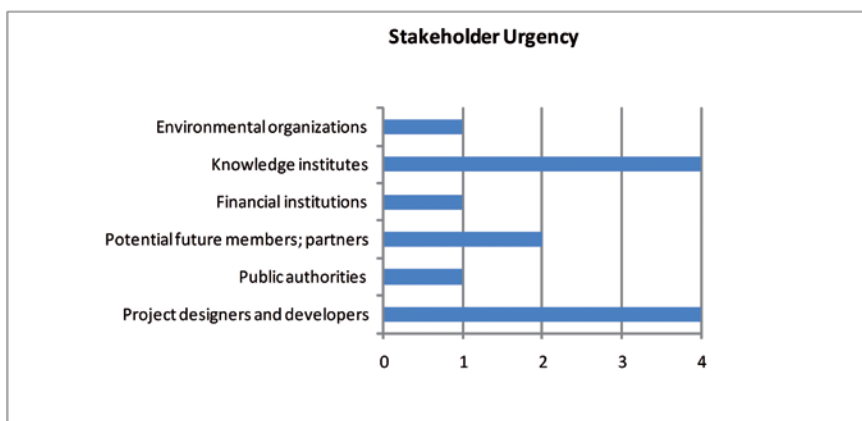

Figure 6: Stakeholder Urgency.

Figure 6 shows the urgency of project realization for the stakeholders along a four-point scale (**1:** 'in no hurry', **2:** 'relatively high', **3:** 'high', **4:** 'very high'). As shown in the figure, the real drivers of the project development (i.e. the potential future members) are in no hurry with regard to project development. This may affect their activities, leading them to approach project carefully and not accelerate their efforts. This could cause significant delays in project development. In contrast, project designers and developers consider the project urgent. Moreover, because they are aware that the full realization of the

project will require from 10 to 20 years, they presume that activities should start as soon as possible.

The stakeholders also assessed the urgency of project realization from the perspective of the economy and global sustainability. It is interesting to note the correlation between the urgency of the project for stakeholders and their opinion regarding the urgency of the project from the perspective of the economy and sustainability (see Figure 7).
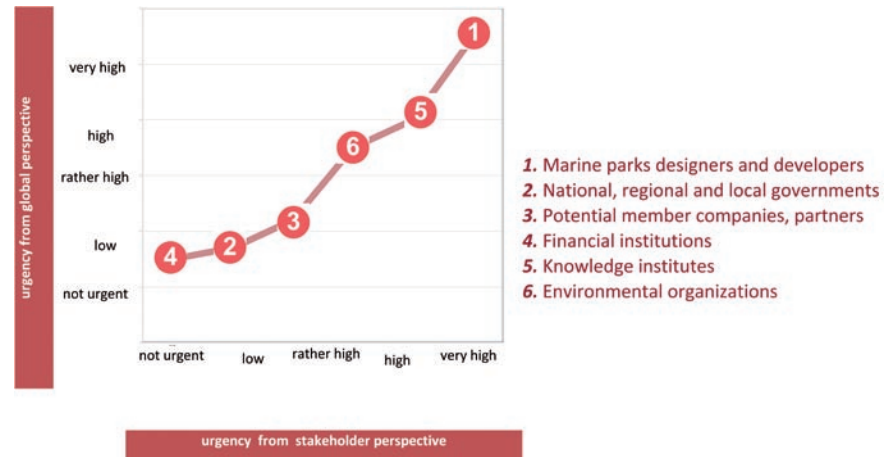
Figure 7: Urgency Correlation.

Figure 7 demonstrates the correlation between the urgency of the project realization for specific stakeholders, as well as the opinions of stakeholders regarding the urgency from the perspective of the economy and global sustainability. As shown in this chart, stakeholders who feel no urgency are inclined to attribute little critical urgency to the realization of the project from the perspective of the economy and global sustainability. In general, stakeholders who are aware of the details of particular projects and able to foresee their benefits presume high urgency. Conversely, stakeholders who are not acquainted with the features of a project or its possible consequences tend to assign little urgency to its realization.

In conclusion, the link between the urgency of project realization for the company and its perceived urgency from an economic and global-sustainability perspective can explain the beliefs and expectations of the various stakeholders. The empirical data allow no conclusions regarding whether the projects are indeed urgent from an economic and global environmental perspective. However, several scientific reports prove that the realization of such projects is indeed urgent with regard to assuring sustainable production and a healthy food supply for the growing population, as well as with regard to establishing natural energy production and achieving an 'oil-free' national economy. Overall, it can be stated that, as they develop a stronger sense of urgency regarding the projects, stakeholders will be quicker to come into action, thereby accelerating the realization process. Conversely, stakeholders who are in no hurry or who do not believe that the food supply or renewable energy are current issues that require immediate attention are likely to be reluctant to change and slow to act, and they may create essential delays in the realization of projects.

4.9
Expectations

System innovations can be affected by the expectations of stakeholders until their success fails to be proven and until their potential benefits have been specified through practical application in practice (Kemp *et al.,* 1998). Understanding the motives of stakeholders is a primary step towards overcoming potential external barriers. The benefits and losses expected by the various stakeholder groups with regard to marine-park projects are presented in the section below.

In general, stakeholders who expectations regarding project realization negative tend to be reluctant to accept change and are therefore tend to neglect such projects. Conversely, stakeholders who anticipate benefits tend to have an innovative, coalition-building attitude and take a supportive position.

Benefits
First, the designers expect the development of new business or the expansion of existing companies, as well as a new system. They also expect to create the effective use of marine resources and sustainable production of biomass, thereby enabling the production of clean energy and increasing the supply of healthy food for humans and feed for animals. In addition, the designers expect the realization of their projects to bring new economical activity and consequently new employment. Second, knowledge institutes expect to achieve their organizational objectives though the realization of projects. For example, the Plant Research International organization at Wageningen University and Research Centre has the ambition to double the level of agro-production (including plant production), to reduce environmental damage by 50 % by 2050 and to export the knowledge that they have generated. In addition, knowledge institutes will benefit from knowledge development, as illustrated by the new research lines in agronomy and in coastal or offshore combined structures. Third, environmental organizations expect general environmental benefits from sustainable production (*NRC Handelsblad*, 2010).

In general, the stakeholders expect that their reputations will be enhanced by the successful and sustainable realization of marine parks.

Loss
First, project designers expect project failure to result in losses. Should the projects fail to realize their promises regarding sustainable production (or fail completely), the project designers would lose both the resources they had invested (e.g. in terms of time, finances and human resources) and their reputations. Second, the projects that are not based on the existing offshore wind farms are expected to entail the loss of fishing ground. Third, environmental organizations are likely to count any activity in the North Sea as a loss for the environment. According to Greenpeace, aquaculture is not a solution

for overfishing; although traditional forms of aquaculture can and do make substantial contributions to food supplies in areas of the world where food needs are acute, such methods must be sustainable (Greenpeace, 2011).

In conclusion, stakeholders expect the realization of marine-park projects to generate both benefits and losses. The expectations of the stakeholders form the foundation for their positions. In the interest of proper expectation management and the formation of a supportive coalition, it is very important to address the expected losses and ensure that the expected benefits will occur.

4.10
Communication

Given the crucial role of social alignment in any system innovation, communication among the various stakeholders in marine parks is of critical importance. Effective interaction between the stakeholders may ensure the success of the introduction, development and implementation of system-innovative projects (Van Der Veen, 2010). One of the most important channels of communication is the coalition – an allied group that brings various parties or groups together for a particular purpose, usually for a limited time. If a coalition supports the plan and joins the efforts, the project implementation can proceed smoothly and effectively (Blackstock and Richards, 2007). These coalitions can serve as learning communities, which work towards shared goals and objectives (Loorbach, 2007; Friedman and Miles, 2006). The identification of appropriate stakeholder involvement and communication strategies (e.g. in which ways, at what stage, how) enhances the quality of the project design.

Communication amongst marine park stakeholders is currently strengthening. In recent years, coalitions (consortium) have been formed and several workshops have been organized to identify the technological possibilities of project realization, in addition to the potential for cooperation. Nevertheless, communication currently occurs mainly amongst the project designers, developers and knowledge institutes. For example, end-product user companies, as well as animal feed and construction companies have recently been involved in project planning. In fact, not all potential member companies or partners are aware that the projects exist. Even the environmental organizations and financial institutions have not been consulted in detail regarding project developments.

The table below presents the optimal involvement of the stakeholders in various phases of system innovation. This information can be used to formulate the stakeholder involvement strategy.

SI realization phases / Stakeholders	Initiation	Development	Re-invention	Implementation	Completion
1.1. Project designers	☒	☒	☒		
1.2. Project developers	☒	☒	☒	☒	
2. National, regional and local governments		☒		☒	
3. Potential member companies — Energy companies	☒	☒	☒	☒	☒
3. Potential member companies — Seaweed, seafood producers	☒	☒	☒	☒	☒
3. Potential member companies — Construction and technological companies	☒	☒	☒	☒	☒
3. Potential member companies — End product users	☒	☒	☒	☒	☒
4. Financial institutions — < EUR 500 000				☒	☒
4. Financial institutions — >EUR 500 000		☒		☒	☒
5. Knowledge institutes	☒		☒		
6. Environmental organizations	☒	☒	☒		

As shown in this table, different groups of stakeholders are involved in each of the five realization phases. For example, project designers, developers, knowledge institutes and environmental organizations are involved in the initiation phase, but not in the completion phase. Nonetheless, almost all potential member companies and partners should be involved in the entire process of realizing system innovation.

In addition to the optimal involvement of the stakeholders, it is important to determine the extent to which the involvement of stakeholders should progress, as well as why and how it should progress. For example, the involvement of environmental organizations in the initiation phase is useful in terms of both avoiding further opposition and utilizing their current time and personnel resources for research. The involvement of the governmental agencies in the development and implementation of projects could result in legal permission to start the project, as well as possible opportunities for subsidies.

Finally, it is crucial to avoid ignoring key stakeholders and overestimating non-crucial stakeholders. Doing so could create the impression that the stakes and importance of one stakeholder are weighted more heavily than others are.

In summary, the processes involved in the realization processes of various system-innovative projects related to issues of sustainability are likely to meet stakeholder resistance. Inappropriate communication, faulty timing with regard to stakeholder involvement and improper management may lead to severe opposition. The strategic involvement of key stakeholders – at the right moment and through carefully selected communication channels – is an essential part of ecosystem-based management.

Table 4: Stakeholder Involvement in Different Phases of the Project.

5. Conclusion

In conclusion, the literature study, desk research and empirical investigation have achieved the objective of this research. Throughout this report, the potential impact of the stakeholders on processes involved in the realization of marine-park projects has been identified by addressing each of the research questions separately.

First, the definition of marine park was presented: 'Marine parks are clusters for creating sustainable production at sea by integrating renewable energy production with aquaculture and by making effective use of ecosystem functions, thus enabling the multidisciplinary and multifunctional use of space in the marine environment, as well as production at sea, with minimum environmental impact'.

Marine-park projects were subsequently identified as system innovations, the realization of which takes place in the following phases:
- Initiation
- Development
- Reinvention
- Implementation
- Completion

The potential stakeholder groups of marine parks as system innovation are as follows:
- marine parks designers and developers
- National, regional and local governments; public organizations
- Potential member companies; partners
- Financial institutions
- Knowledge institutes
- Environmental organizations

From within these groups of stakeholders, key stakeholders were identified, who have significant impact on the realization of the marine-park projects or who are significantly affected by the realization of such projects. It appears that different key stakeholders are involved in the various processes involved in realizing system innovation. While the primary stakeholders in the initial phase of project realization consist largely of project designers and knowledge institutes, member companies and financial institutions are the only key stakeholders remaining in the completion phase.

After identifying the key stakeholders, their stakes and interests were investigated. In this analysis, it became clear that most stakeholders have relatively high interest in the projects. With the exception of the project designers, however, all of the stakeholders are apathetic with regard to project realization and are therefore reluctant to become pioneers in innovation. This research has also revealed that the establishment of marine parks can be a subject of dispute amongst the various stakeholders. The projects may involve restrictions and objections (e.g. negative visual impact, noise, obstructions, limited availability of land and disputes regarding the use of land and marine areas). Based on the analysis of marine-park locations, we can conclude that offshore projects have greater long-term potential, while small-scale inshore and near-shore marine parks are more viable in the short term. In general, many conflicting stakes concerning marine parks may result in negative expectations – and consequently, opposition – on the part of various stakeholders.

The next issue to be addressed was power. The stakeholders involved have a high level of power through cooperation. None of the stakeholders has sufficient power to realize a project alone.

The analysis of stakeholder positions indicated that many stakeholders are supportive of projects, as long as they can meet their promises regarding sustainability, although financial institutions and potential future members are neutral. Because of their neutral position, substantial resources may be required in order to attract these companies to join a project.

With regard to project urgency, we can conclude that most stakeholders (with the exception of knowledge institutes and few project developers) are in no hurry with regard to project realization. Although the empirical data allow no conclusions with regard the actual urgency of the projects from a global economic and environmental perspective, several scientific reports do prove the urgency of the projects with regard to ensuring sustainable production and a healthy food supply for the growing population, as well as establishing natural energy production and achieving an 'oil-free' national economy.

The primary benefits expected from projects are business development, expansion, reputation enhancement and new system development. The most important expected losses involve environmental damage through additional activities in the sea, followed by the loss of fishing areas and other conflicts with existing industries. In general,

stakeholders with negative expectations regarding project realization are reluctant to accept change and therefore tend to neglect such projects, while those who anticipate benefits have an innovative, coalition-building attitude and a supportive position.

Finally, the interaction between stakeholders is currently taking place only amongst knowledge institutes, project designers and several project developers, even though the optimal involvement of project stakeholders in the different phases of realizing system innovations suggests that environmental organizations and especially potential member companies should be involved in the initiation processes. Faulty timing of stakeholder involvement and improper management may lead to severe opposition. For this reason, the involvement of the key stakeholders at the right moment and through carefully chosen communication channels is essential for ecosystem-based management.

Taking all of the results of our analysis into consideration, we can conclude that key stakeholders have an essential impact on processes involved in the realization of projects. Supporters who hold positive expectations, interests and stakes, and who perceive high urgency (time sensitivity) for these processes may accelerate the realization of marine-park projects through their support. Conversely, stakeholders whose stakes are in conflict with the objectives of the project and those with negative expectations can create delays through their resistance and uncooperative behaviour.

6. Recommendations

In the final step of this study, recommendations were formulated for project designers, project managers and developers with regard to proper stakeholder management and for the strategic realization of marine parks and other system-innovative projects.

From the beginning, it is important to emphasize that the realization of marine parks is a long-term process that exceeds the boundaries of any individual organization, thus changing the relations within a network. The results of system innovations may not emerge until after the key stakeholders or the networks of parties have become involved and after the innovation has passed through the search and learning processes. System innovation will succeed if all involved actors contribute with their own input. Potential stakeholders can include anyone: individuals, groups, neighbours, organizations, institutions, societies, competitors, the media or even potential job applicants (Donaldson and Preston, 1995; Mitchell *et al.*, 1997). The parties who are to be considered as key stakeholders should be selected strategically, however, as should the manner and the timing of their involvement.

Our recommendations for the successful realization of marine-park projects are listed in two categories: recommendations for communication and recommendations for project management.

Communication
1. Associate the project with climate-change issues, thus gaining the support of political and international organizations.
2. Ensure continued support by regularly engaging the key stakeholders.

3. Show the key stakeholders the benefits they can expect and provide examples of other similar successful projects, thus attracting new members (partners).
4. Ensure the involvement of stakeholders in project evaluations and in making choices amongst project options through discussions. The more participatory the process of setting goal and objectives is, the greater the stakeholder acceptance will be.
5. Use a variety of participatory tools and methods, including focus group discussions, preference rankings, roundtables, workshops, informal networking and sightseeing with specialists, managers and scientists.
6. Avoid breakdowns in communication, which may result in unexpected problems (e.g. lack of support or unwillingness to continue the cooperation).

Management
1. Build a management team (group) of marine parks in order to address the technological aspects of project realization, as well as issues related to organization, finances, strategy and stakeholder management.
2. Provide focus to strategies by being clear about the goal and objectives of the project and about what can be achieved.
3. Include supportive stakeholders in the coalition (consortium). This consortium or a newly formed management team can assist in setting priorities and identifying objectives through stakeholder meetings and group discussions.
4. Empower stakeholders through environmental education, capacity building and social communication.
5. Continually acknowledge and consider the strategies of all stakeholders.
6. Acknowledge and address expected losses, and ensure that the expected benefits will occur.
7. Keep the promises of sustainable production, which form the main means of success.

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6. Joop Coolen – Marine Ecology Project Manager at North Sea Foundation
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10. Anouk Florentinus – Consultant at EcoFys
11. Jan de Wilt – Project Manager at InnovationNetwork

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13. Vincent Wedekind – Sales Manager at PipeLife
14. Marko Berkhout – Product Manager at PipeLife
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Samenvatting

InnovatieNetwerk heeft enkele jaren geleden het concept 'Mariene Parken' ontwikkeld als reactie op de problematiek met betrekking tot duurzaamheid en mariene economische ontwikkeling. In de loop der jaren heeft dit concept op verschillende manieren vorm gekregen en is er overlegd met diverse maatschappelijke organisaties. Desondanks is het vooralsnog gebleven bij een concept dat nog verder moet worden ontwikkeld en geïmplementeerd.

Voor dit onderzoek zijn de stakeholders van Mariene Parken geanalyseerd in het licht van systeeminnovatie, met als doel de invloed te bepalen die stakeholders kunnen hebben op processen die een rol spelen bij de realisatie van Mariene Parken. Het onderzoek is erop gericht ontwerpers van Mariene Parken en projectuitvoerders aanknopingspunten te bieden voor het overwinnen van tegenstand en het vergroten van de steun door stakeholders.

Het onderzoek is uitgevoerd volgens de volgende methodologische strategie: (1) literatuuronderzoek naar systeeminnovatie, stakeholderanalyse; (2) bureauonderzoek naar Mariene Parkprojecten, windmolenparken, vis- en zeewierproductie; (3) empirisch onderzoek op basis van veertien semi-gestructureerde, persoonlijke interviews met vertegenwoordigers van stakeholdersgroepen. Alle gegevens zijn vervolgens geanalyseerd, wat heeft geleid tot een aantal conclusies en aanbevelingen.

Mariene Parken zijn clusters voor het creëren van duurzame mariene productie, dankzij de integratie van energieproductie met aquacultuur en effectief gebruik van de functies van het ecosysteem.

Hierdoor wordt multidisciplinair en multifunctioneel gebruik van de ruimte in een mariene omgeving mogelijk, evenals productie op zee met minimale gevolgen voor het milieu. Mariene Parken zijn een vorm van systeeminnovatie, waarbij de stakeholders een belangrijke rol spelen. De realisatie van systeeminnovaties is een proces dat uit vijf fases bestaat: initiatie, ontwikkeling, heruitvinding, implementatie en voltooiing.

Er zijn vier verschillende soorten Mariene Parken: offshore, nearshore, inshore en onshore. De bevindingen uit ons onderzoek wijzen erop dat de technologische mogelijkheden en kennis afnemen naarmate een project verder uit de kust ligt, terwijl daar de minste conflicten tussen stakeholders worden verwacht.

Tijdens de analyse zijn de volgende groepen stakeholders geïdentificeerd:
1. Projectontwerpers en -ontwikkelaars
2. Nationale, regionale en lokale overheid
3. Potentiële gelieerde bedrijven, partners
4. Financiële instellingen
5. Kennisorganisaties
6. Milieuorganisaties

Een analyse van de risico's en belangen van deze stakeholders wijst op een groot aantal mogelijk conflicterende belangen tussen stakeholders. Dergelijke conflicterende belangen kunnen leiden tot negatieve verwachtingen bij stakeholders, wat leidt tot tegenstand. Daarom moeten projectontwerpers en -ontwikkelaars rekening houden met de risico's en belangen van stakeholders en daar strategisch op inspelen.

Uit een analyse bleek dat geen van de afzonderlijke stakeholders het vermogen heeft om de doelstellingen van een project zonder steun van buitenaf te realiseren, maar dat een combinatie van groepen wel degelijk in staat kan zijn om projecten te realiseren.

Van de belangrijkste stakeholders zijn het de projectontwerpers, projectontwikkelaars en lokale overheid die Mariene Parkprojecten steunen, terwijl de echte stakeholders van dergelijke projecten (bedrijven en financiële instellingen) neutraal zijn en geen druk voelen om bij een dergelijk project te betrokken te raken. Tijdens deze fase van de projectontwikkeling is er geen sprake van sterke tegenstand. Daar staat echter tegenover dat reeds betrokken spelers, zoals windmolenparken, havens en milieuorganisaties hun steun kunnen onthouden.

Voor het onderzoek zijn ook de verliezen en voordelen die de stakeholders verwachten geïnventariseerd. Aan de ene kant verwachten zij de ontwikkeling van nieuwe zakelijke activiteiten en een uitbreiding van de reeds bestaande, naast meer kennis, het ontstaan van nieuwe onderzoekslijnen en – als belangrijkste – de implementatie

van een nieuw systeem. Aan de andere kant verwachten belangrijke stakeholders reputatieschade en verlies van geïnvesteerde middelen als het project niet haalbaar blijkt te zijn. Daarnaast verwachten zij verlies van visgronden, horizonvervuiling, geluidshinder en een aantasting van gebieden op land en zee.

Het onderzoek komt tot de conclusie dat de processen die een rol spelen bij de realisering van Mariene Parkprojecten, waarbij sprake is van duurzaamheidsproblematiek, bij stakeholders vaak weerstand oproepen. De belangrijkste stakeholders hebben een bepalende invloed op de realisatie van Mariene Parken. Als zij positieve verwachtingen en belangen hebben, kunnen de stakeholders de realisatie van Mariene Parkprojecten met hun steun versnellen. Daar staat echter tegenover dat projecten vertraging kunnen oplopen als gevolg van weerstand en gebrek aan medewerking bij stakeholders van wie de belangen in strijd zijn met de doelstellingen van het project en die daardoor negatieve verwachtingen hebben. Het via zorgvuldig gekozen communicatiekanalen op het juiste moment op strategisch niveau betrekken van de belangrijkste stakeholders is dan ook essentieel.

De analyse van de resultaten levert een aantal strategische aanbevelingen en leerpunten op voor ontwerpers en ontwikkelaars van Mariene Parkprojecten voor de omgang met stakeholders en een effectieve projectrealisatie. De aanbevelingen zijn onderverdeeld in twee groepen: (1) aanbevelingen voor projectmanagement en (2) aanbevelingen voor communicatie.

De voornaamste aanbeveling aan projectontwerpers en -ontwikkelaars is het opzetten van een managementteam voor zowel de technologische aspecten van de projectrealisatie als de organisatorische, financiële, strategische en op stakeholders gerichte aspecten. Een tweede belangrijke stap is het intensiveren van de communicatie, niet alleen tussen projectontwerpers, -ontwikkelaars en kennisorganisaties, maar ook met potentieel gelieerde bedrijven en partners, financiële instellingen en milieuorganisaties.

Trefwoorden: Mariene Parken, Systeeminnovatie, Stakeholderanalyse.