Deliverable 8.7

Report of Regional Stakeholder Events

(RSE1)

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SUMMARY

The BENTHIS project addresses problems related to the benthic ecosystem and the effect of bottom trawling in five regional EU areas[1].

Fishing gear affects seabed habitats and causes changes in benthos and the extent of the impact of fisheries has increased over time due to technological innovations and the increase in size and power of fishing vessels and their gear. Several long term studies have shown changes in the benthos, in particular the decrease of long-lived slow-growing species and the increase in short-lived fast growing species (Pitcher et al 2000; Tillin et al 2006). The interpretation however, is not unequivocal since some of the observed changes could also be caused by pollution or climate change (Borja et al 2000; Kroncke et al 2011).

In order to increase the incentives to protect the benthos, BENTHIS focuses on technological gear innovations and the development of sustainable management measures.

It is recognised that effective fisheries management depend on the participation and support by the fishing industry (European Commission COM (2009)163). In order to ensure a strong involvement of the fishing industry and other relevant stakeholders, BENTHIS seek to establish close collaboration with the fishing industry to test innovative technology and develop sustainable management plans.

The objective with this report is to describe the process and the approach for involving stakeholders in the BENTHIS project, analyse and present the stakeholder information which is collected to this point.

The collaboration with stakeholders during the BENTHIS project has been organized as three workshops in each of the five regions and two EU wide stakeholder workshops with representation from all five regions.

The first regional stakeholder event – RSE1 – has been organized as an open dialogue workshop with an explorative character aiming at understanding the needs and expectations of the regional stakeholders as well as encouraging a listing of technological and sustainable management alternatives for reducing impact. The second and the third regional stakeholder events are organized in a more structured manner and will be aiming at feedback related to conceptual alternatives for reducing impact of fisheries in each region.

The analyses of the stakeholder data from the RSE1 do not demonstrate a pattern that is uniform across all five regions. The regional data show that stakeholders provide both support and resistance to alternatives suggested by the stakeholder assembly. Stakeholders in all regions have conflicting attitudes toward certain BENTHIS topics – some regions more than others - as well as attitudes that harmonize. In some regions there is a need for more specific information about regional benthic issues and impact problems.

[1] The five regions are the Mediterranean Sea, Western Waters, North Sea, Black Sea and Baltic Western Sea.

In order to suggest or list technological and sustainable management alternatives for reducing impact, most regional stakeholder groups seek information based on cost-benefit analyses. The project has currently limited data based on cost-benefit analyses but three out of five regions have suggested innovative alternatives for reducing impact based on their own and project knowledge presented to them at this point. See section 3.6 for results of the regional analyses.

In general all regional stakeholder groups question what impact is and how impact should be measured. Most stakeholders seek a more specific and common understanding of the impact concept. The EU wide workshop which was held in the period after the regional events, aimed at dealing with these questions but the stakeholder data reflects a strong variety of positions on the impact concept – see D8.5 Report of EU Stakeholder Workshop (SH1).

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INTRODUCTION

The main objectives of the BENTHIS project are to:

1. Provide the knowledge base that allows an assessment of the status of different types of marine benthic ecosystems in European waters on a regional basis and support indicators of Good Environmental Status (GES), in particular on Seafloor Integrity;
2. Develop the tools required to assess the effects of bottom trawling on the structure and functioning of these benthic ecosystems.
3. Study and test, in close collaboration with the fishing industry, innovative technologies that reduce the impact of demersal fisheries on benthic ecosystem on a regional basis, encompassing the Baltic, North Sea, western waters, Mediterranean and Black Sea;
4. Develop in consultation with the fishing industry and other stakeholders on a regional scale, sustainable management plans that reduce the impact of fishing and quantify its ecological and socio-economic consequences

In order to promote the much needed transition to a more sustainable fishery in the EU, it is important that fisheries scientist collaborate with the fishing industry and related stakeholders in order to develop a common ground on the problems at stake and the possibilities for solutions.

The challenging question for the stakeholder involvement in the BENTHIS project is:

How can science and the fishing industry be brought together to collaborate on innovative technology and innovative management approaches to mitigate the impact?

The stakeholder involvement in the BENTHIS will be exerted in the five regional case study areas defined by the project: Mediterranean, Black Sea, Baltic Sea, Western Waters and the North Sea.

Based on the first regional stakeholder events held during the spring of 2013 the D 8.7 report will present the initial regional stakeholder process and the results of the stakeholder analyses.

The output is a basis for management strategies and an outline of the innovative technologies that initially have been supported by regional stakeholders in order to reduce impact.

1 METHODOLOGY

In the BENTHIS project two main objectives have been set for the activities related to the stakeholder involvement:

Objectives:

5. Study and test, in close collaboration with the fishing industry, innovative technologies that reduce the impact of demersal fisheries on benthic ecosystem on a regional basis, encompassing the Baltic, North Sea, Western Waters, Mediterranean and Black Sea;

6. Develop in consultation with the fishing industry and other stakeholders on a regional scale, sustainable management plans that reduce the impact of fishing and quantify its ecological and socio-economic consequences.

Stakeholder analysis is a term that refers to the action of analyzing the attitudes of stakeholders towards something – in this case the implementation of technological and management innovations to mitigate fishery impacts on the benthic ecosystem. Stakeholder analysis is frequently used during the preparation phase of a project to assess the attitudes of the stakeholders regarding the potential changes. Stakeholder analysis can be done once or on a regular basis to track changes in stakeholder attitudes over time.

Definition of a stakeholder

The classical (and most frequently cited) definition of a stakeholder is Freeman's:

A stakeholder in an organization is (by its definition) any group or individual who can affect or is affected by the achievement of the organization's objective. (Freeman, 1984)

This definition has been accepted but simultaneously criticized depending on the scholarly position. While the business ethics track generally embraces a wider definition, the social science track favors a more narrow one.

It has been argued that a broad definition makes it possible to include even such groups as terrorists and competitors (Phillips, 2003) who, indeed, could affect the firm painfully. This dilemma can partly be resolved by narrowing the definition in a meaningful way. By following Clarkson's argument (Clarkson, 1994), Mitchell et al. argue that the use of risk as a second defining property for the stake in an organization helps to "narrow the stakeholder field to those with legitimate claims, regardless of their power to influence the firm or the legitimacy of their relationship to the firm". (Mitchell et al., 1997). In summary, the concept of a stakeholder is not uniformly accepted. However, in most cases the differences refer to the scope of the definition.

In the stakeholder analysis presented in D 8.7 the more narrow definition by Clarkson et al. is chosen which defines a stakeholder as a group or individual who affect or is affected by the project outcome but also finds a risk or something at stake by being connected to or influenced by the project.

The BENTHIS stakeholders who have been selected for the regional stakeholder events are categorized and listed in section 2.1.

Literature on stakeholder analysis

The growing popularity of stakeholder analysis reflects an increasing recognition of how the characteristics of stakeholders – individuals, groups and organisations – influence on decision-making processes. (Brugha and Varvasovszky, 2000). A stakeholder analysis process has the goal of developing cooperation between the stakeholder and the project team and, ultimately, assuring successful outcomes for the project. Stakeholder analyses are performed when there is a need to clarify the consequences of envisaged changes or at the start of new projects and in connection with organizational changes generally. It is important to identify all potential stakeholders for the purpose of identifying their success criteria and turning these into quality goals.

Appendix A presents a list which identifies some of the best-known and most commonly used methods for stakeholder analysis and mapping.

1.1 The approach

Understanding the needs and expectations of project stakeholders is crucial to the success of any project. In order to get familiar with the BENTHIS stakeholders in each of the five case study regions and anticipate any problems that their issues might create for the project and its implementation, the 3 step process below have been followed:

1. **Process:**
   How can we best discover the needs of the stakeholders?
2. **Preparation:**
   What information do we need to collect from stakeholders, and how do we plan to use that information?
3. **Performance:**
   What is the most effective way to act upon the information intercepted by the stakeholder analysis?

The initial interaction with stakeholders in the BENTHIS project - step 1 and 2, has been carried out from March to June 2013 at Regional Stakeholder Events in the five case study areas of the BENTHIS project. The third step includes the entire analysis of stakeholder data and has particular emphasis on making decisions on how to act upon the data.

It should be noted that the steps 1-3 and especially 2 and 3 will be run through several times during the project period. Three Regional Stakeholder Events have been planned for the next two years and only the first has now been implemented. The first regional stakeholder event is also referred to as RSE1.

1.2 The analysis process

The key aspects of the stakeholder analysis process during the BENTHIS project lifetime are as follows:

1) Identifying stakeholders
2) Determine the interests and goals, influence, power and impact of stakeholders on the project as well as identifying harmony and conflict areas
3) Construct a Stakeholder assessment map (SAM) and Stakeholder reporting matrix (SRM)
4) Review and finalize the SAM and SRM with the project case study leaders
5) Constructing an Analysis Table to analyse stakeholder information (ranking of stakeholders)
6) Choose appropriate strategies to handle stakeholders
7) Implement the information gathered into the project
    - Evaluation of stakeholder groups in relation to a successful implementation of technological and management innovations (long term assessment)

Based on the data from first regional stakeholder events (RSE1) we are able to work through paragraph 1 and partly number 2. We will identify stakeholders; determine their interests and goals in the Reward & Contribution analysis and we attempt to identify areas of harmony, conflict and opportunities for technical and sustainable management initiatives for reducing impact of fisheries on the benthic ecosystem.

During the second and third regional stakeholder events planned for the project, we will have sufficient data for finalizing the analysis process and the ultimate objective is to present a stakeholder strategy ensuring a successful implementation of the BENTHIS project results.

2 BENTHIS STAKEHOLDER INTERACTION

The challenge BENTHIS faces is to advance the scientific knowledge on fishing impact on the benthic ecosystem and habitats as well as collaborate with the fishing industry and other relevant stakeholders to develop technical innovations and management innovations to mitigate the fishing impact.

Information exchange between the project and its regional stakeholders is required in order to obtain credibility of work and at the same time results need to be disseminated to the fishing industry and other stakeholders in an efficient and flexible manner.

Overall three regional stakeholder events have been planned during the lifetime of the BENTHIS project. The first stakeholder event has been carried out during the spring 2013 (project months 6, 7 and 8) in the five case study regions: Baltic Sea, North Sea, Western Waters, Mediterranean and the Black Sea. The second and the third events will be carried out in the fall 2014 and 2015 respectively.

2.1 The Regional Stakeholders

The starting point for the BENTHIS stakeholder interaction has been pointing out the relevant stakeholders that are most likely to be influenced by the project and the stakeholders that most likely will influence the outcome of the project.

Each of the five case study leaders identified the most relevant or potential stakeholders in their region. This process started with a free listing of relevant stakeholders in each of the five regional areas. After discussing and considering a number of practical issues between the five regional leaders, the following stakeholder groups were assessed as relevant project stakeholders:

- State Governmental representatives
- Regional Governmental representatives
- NGO's
- Fishing industry
    - Vessel owners, fishermen and related
    - Gear providers
    - Wholesalers, distributers
- Service Organizations (legal, accountants, economics and related)
    - Public
    - Private
- Scientist

There was no requirements for equal distribution between the stakeholder groups, but it was desireable that the groups were represented as equally as possible. However, it was a requirement that stakeholders should have an explicit opinion or attitude to the aspects BENTHIS is focusing on. The distribution of stakeholder groups in each region is illustrated in sections 2.3.1-2.3.5.

2.2 The RSE1

The first step in organizing the information exchange between stakeholders and project scientists has been organizing the process for stakeholder involvement:

***How can we best discover the needs of potential stakeholders*?**

When gathering a group of stakeholders with different views and needs with regard to the project issues disagreements will occur. In order to cope with possible diversity and welcome it at the same time, the first regional stakeholder events were organized as open dialogue workshops with an explorative character. The interaction process included appreciation and discussions of opportunities in relation to alternative initiatives: Implementation of technological tools and/or implementation of sustainable management plans, that will reduce impact from fisheries on the benthic ecosystem. The goal was to produce a list of initiatives at each stakeholder event through a brainstorm process facilitated by the BENTHIS case study leader. This worked to varying degrees in the five regions, but in all regions sufficient information was gathered to precede the stakeholder process.

The second and the third regional stakeholder events are organized in a more structured manner and will be aiming at feedback related to conceptual alternatives for reducing impact of fisheries in each region.

2.2.1 Stakeholder preparation

What information do we need to collect from stakeholders, and how do we plan to use that information?

At the BENTHIS kick-off meeting the case study leaders agreed on the following four topics as relevant information to gather during the RSE1 interactions with stakeholders:

1. Improve the understanding of selected fisheries and related technologies (each case study separately)
2. Assess the effect of existing and novel technologies on seabed ecosystem
3. Discuss possible consequences for the Industry – ecological and economic factors
4. Ranking of potential initiatives – technological and/or managerial that mitigate possible negative effects

These four topics were included in the agenda of the RSE1 invitation letter sent to the regional stakeholders – see appendix B.

The first three paragraphs set the stage for an open dialogue and discussion. The fourth paragraph is more concrete and here stakeholders were encouraged to prioritize among technological and managerial initiatives they had come up with in order to deal with possible negative impact on the benthic ecosystem.

In addition to this information (related to the four paragraphs) a questionnaire was distributed among stakeholders invited to the RSE1. The purpose of the questionnaire has been to gain insight into stakeholders attitudes regarding innovative technologies in a sustainable managed demersal fishery – also from those who could not attend the stakeholder events in persona. Approximately 300 questionnaires were distributed overall in the five regions. It was expected that there would be a certain unbalanced representation of stakeholder groups and therefor the survey is not representative on a larger scale and most groups are quite small in order to "balance", but it provides a supplement to the analysis which is useful for understanding the attitudes of the specific stakeholder group towards the main issues of the BENTHIS project. The questsionnaire is attached in appendix C.

How to use the information from stakeholders?

The outcome from the RSE1 has been a summary of important topics from discussions, the survey results and an initial selection – an initial ranking of technologies and/or sustainable management tools for reducing negative impact.

Outcome RSE1:

- Main topics from discussions for each region
- Survey results demonstrating stakeholder attitudes towards benthic issues
- Ranking / selection of initiatives for reducing impact

The initial and raw data from the first regional stakeholder events served as input for the EU-wide stakeholder meeting held in June 2013 (project month 8) in Harleem, Nederland. Here further project issues and research questions were raised and compared by a broader group of the stakeholders together with project scientists.

The output from the RSE1 together with the output from the EU-wide workshop forms the foundation of the first stakeholder analysis in the BENTHIS project (D 8.5 and D 8.7).

Subsequent, in project month 10, each of the five case study leaders will prioritize among the potential technological and managerial initiatives that will be relevant to proceed with in order to reduce impact on the benthic ecosystem in their specific region. "Potential initiatives" are initiatives were key stakeholders find it possible to be supportive and were harmony exists among as many key stakeholders as possible. The process is described in the project DOW - WP7.

- RSE1 analysis provides input to WP7: Regional Case Studies
    - Decision making on relevant regional initiatives for mitigating impact

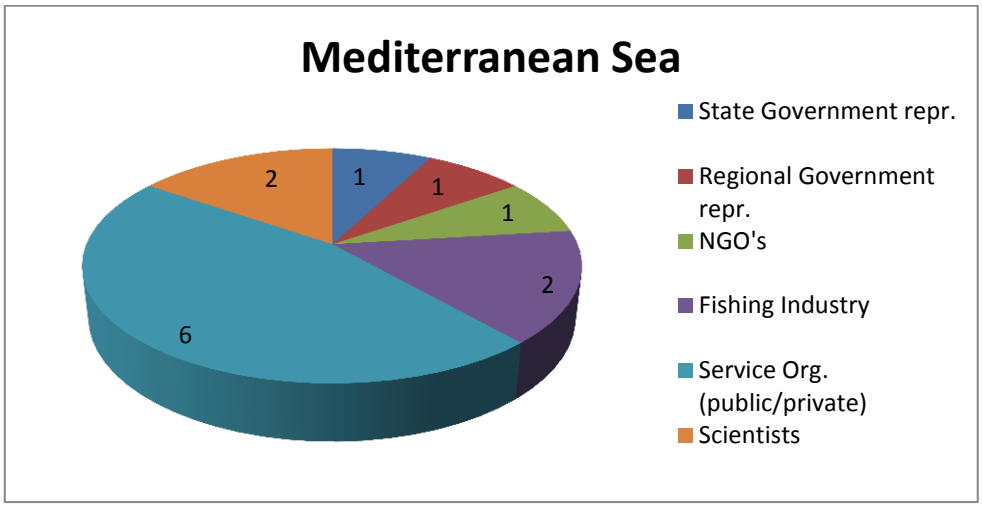
2.3 Data from the 1st RSE

2.3.1 Mediterranean Sea

The stakeholder event in the Mediterranean case study area was the first of the five events and was held in Ancona, Italy on the 22nd of March 2013. In total 23 persons participated in the event.

In figure 1 we find the distribution of the stakeholders at the Mediterranean event:

Figure 1: Distribution of stakeholders at the RSE1 in Ancona



Report

According to the report from the Mediterranean RSE1 (see Appendix D) the focus at the stakeholder event is mainly on demersal otter trawl fisheries. The BENTHIS case study leader for Mediterranean, the CNR/ISMAR research institute – is focusing on pioneering comparisons between traditional otterboards and novel and semi-pelagic otterboards. This has most likely had an impact in the stakeholder representation at the event; the stakeholders were mainly discussing gear development in relation to the benthic issues. The impact on the benthic ecosystem by fisheries is, by the stakeholders, linked with technology and technological innovations.

Many suitable innovations for reducing trawling impact are presented and discussed e.g. the Hydro-rig system, the Sum Wing and the Pulse trawl. This gear is of great interest to the stakeholders due to fuel savings. Fuel savings is a key issue in the discussions. The common feeling among stakeholders is that impact is due to otterboards, trawl net rigging, especially ground rope and tickler chains. Shifting from towed gear to static gears was promoted in this regard.

Most stakeholders agree that initiatives or actions should be made in the technical area.

Survey results

Out of the 23 persons participating in the Mediterranean stakeholder event, 13 stakeholders filled out the survey questionnaire expressing their views on benthic issues related to Governance, Ecology, Management, Socio-economics and Technology. For distribution of stakeholder participation in the survey and results please see section 3.1.3.2.

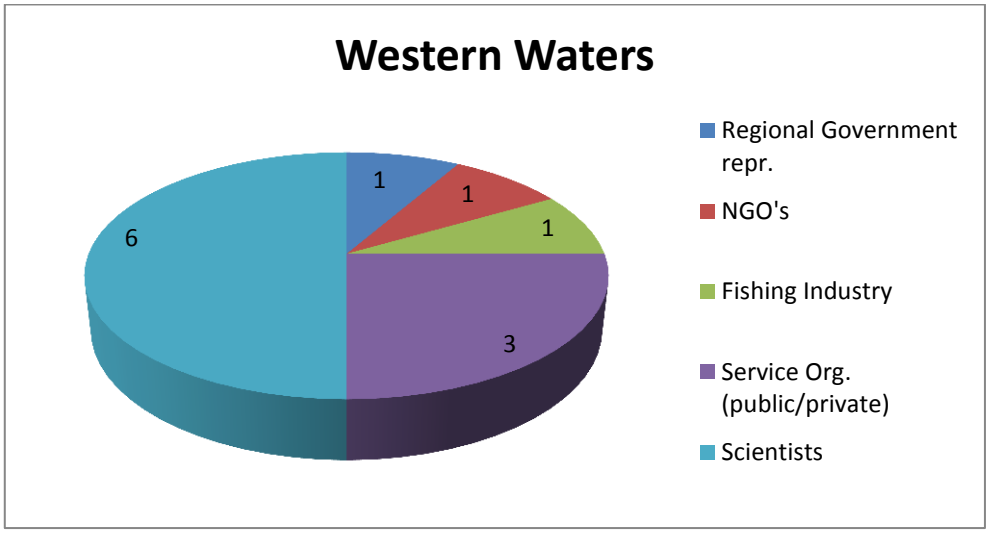
In addition to filling out the multiple choice part of the questionnaire, stakeholders were encouraged to give their comments on what is an important priority regarding to the subject: "Innovative technologies in a sustainable managed demersal fishery". These comments are presented in section 3.1.3.2 as well.

2.3.2 Western Waters RSE

The stakeholder event in the Western Waters area was the second of the five events and was held in Nantes, France at Ifremer on the 23rd of April 2013. In total 13 persons participated in the event.

In figure 2 we find the distribution of the stakeholders at the Western Waters event:

Figure 2: Distribution of stakeholders at the RSE1 in Nantes



Report

According to the report from the Western Waters (see Appendix E) the discussions had its focus on a wide range on factors relevant for the benthic issues. The lobster fishery and the impact on the large mudflat were discussed specifically but the impact of trawling was in general seen as determined by anthropogenic and environmental parameters by the stakeholder group. The effects on the sedimentology of the large mudflat are very contrasting and interbreed with natural dynamics (Report WW pp. 2)

There was a broad agreement on the fact that there are not sufficient studies to build consensus on the effects of bottom trawling, whether negative or positive and cost benefit analysis must be made for a possible conversion. According to stakeholders it should be prioritized to have a

reasonable balance between environmental benefits and socio-economic costs when considering implementation of managerial or technological alternatives.

The stakeholder group came up with an assessment of advantages and disadvantages relating to technological initiatives at the event.

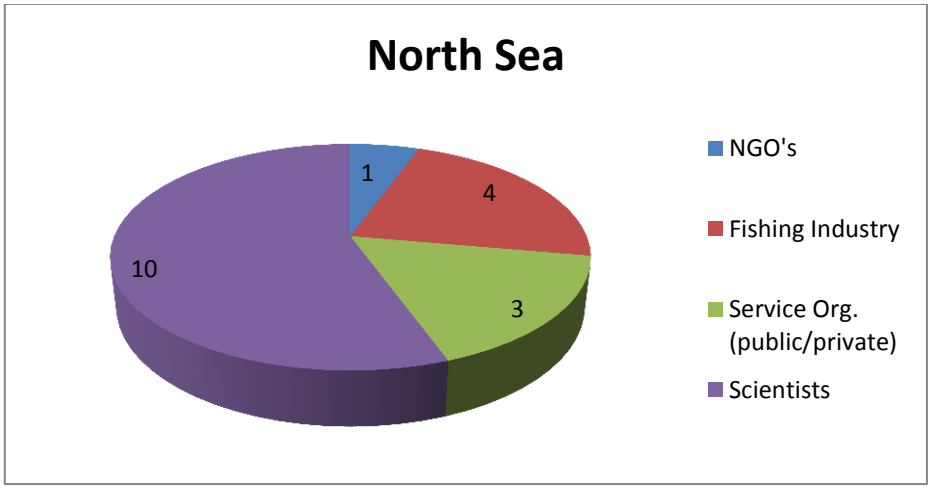
Survey results
The questionnaire was not filled out by any of the stakeholders at the Western Waters event. According to the case study leader the stakeholders felt that some questions required a level of knowledge too important to be considered and most importantly the questionnaire asked for political opinions rather than their opinion as industry and research representatives.

2.3.3 North Sea RSE

The stakeholder event in the North Sea case study area was the third of the five events and was held in Ijmuiden, Holland on the 27th of April 2013. In total 18 persons participated in the event.

In figure 3 we find the distribution of the stakeholders at the North Sea event:

Figure 3: Distribution of stakeholders at the RSE1 in IJmuiden



One representative of the management authorities withdrew from the North Sea stakeholder event because of the lack of participation of NGO's.

Report
According to the report from the North Sea (see Appendix F) the stakeholders at the event had different views on the impact issue. Fishermen were sceptical about the importance of impact, while other stakeholders perceive it as a serious issue. Several management alternatives were suggested and discussed as well as technological development of gear. In general fishing gear that "reads the sea floor" was supported by the stakeholder group. It was noted that reductions in fuel consumption are more important drivers of technological innovations than reducing the ecosystem effects of fishing.

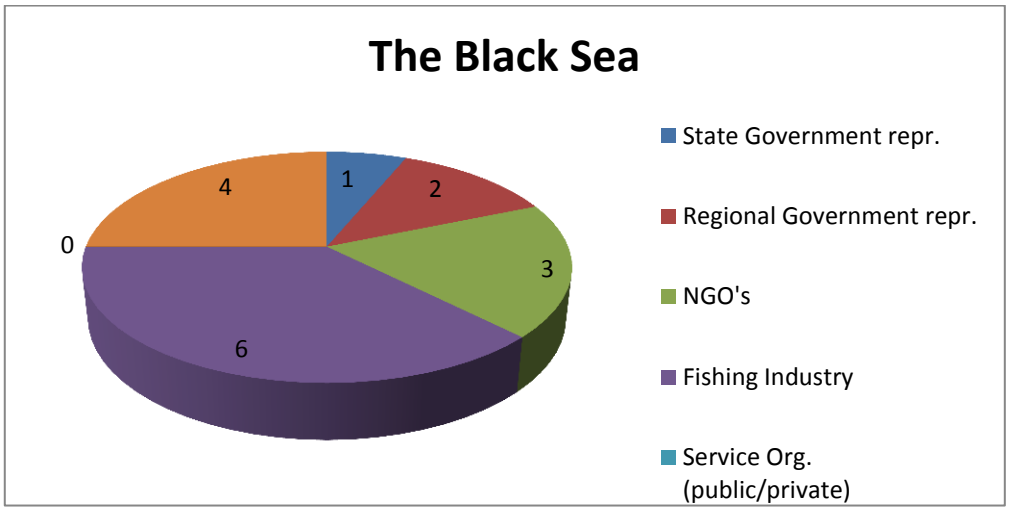
Survey results
A total of 19 questionnaires were filled out by the stakeholders at the North Sea event. For distribution of the stakeholder participation in the survey and results see section 3.3.1.1.

2.3.4 Black Sea RSE

The fourth regional stakeholder event was held in Trabzon, Turkey on the 30th of April 2013. For the full report see Appendix G. A total of 16 stakeholders attended the event besides the project researchers of CFRI.

In figure 4 we find the distribution of the stakeholders at the North Sea event:

Figure 4: Distribution of stakeholders at the RSE1 in Trabzon



The distribution of the stakeholders at the Black Sea event is relatively well balanced.

Report
According to the report from the Black Sea region (see Appendix G) the impact of bottom and beam trawling on commercial and non-commercial benthic fauna is a major concern in the region. Stakeholders also agree that there is a strong need to improve data collection and explore alternative fishing technology to mitigate the negative impact.

At the Black Sea event a ranking of initiatives was made by the stakeholders both within the area of technological innovations and managerial initiatives.

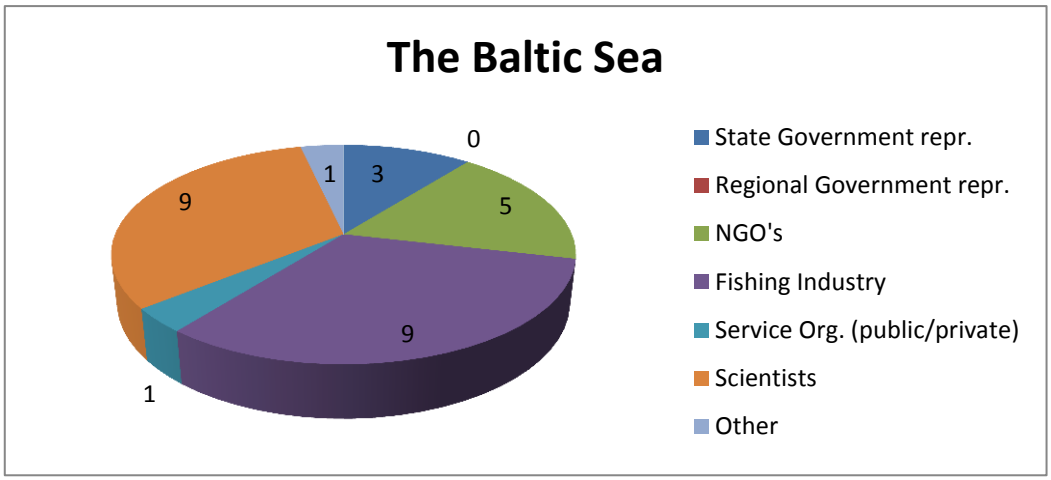
Survey results
All 16 stakeholders present at the event participated in the questionnaire survey and the results can be found in section x and section x.

2.3.5 Baltic Sea

The fifth regional stakeholder event – the Baltic Sea Case Study was held in Charlottenlund, Denmark on the 24th of May 2013. A total of 28 persons participated in the event which is the largest number at any of the first regional stakeholder events.

In figure 5 we find the distribution of the stakeholders at the Baltic Sea event:

Figure 5: Distribution of stakeholders at the RSE1 in Charlottenlund



The distribution at the Baltic event is interesting with regard to the very high and broad participation and especially the representation of environmental organizations. Five representatives are the most at any of the five regional events.

Report

According to the report from the Baltic Sea stakeholder event (see Appendix H) discussions were direct but also characterized by mutual understanding. The Baltic case study focuses mainly on lobster and cod fishery in Kattegat and Østersø respectively and on slam dredging in the area of Lillebælt. A majority of stakeholders pointed out that a higher degree of selective gear is desirable with regard to these fisheries.

The stakeholders discussed in groups and came up with concrete lists of initiatives for reducing benthic impact of fisheries. The initiatives were ranked by stakeholders subsequently. See section 3.6.2.1 for results.

Survey results

We have received nine replies to the questionnaire from the Baltic stakeholders and the results are presented in section 3.6.2.2.

3 STAKEHOLDER ANALYSIS

Based on the data from first regional stakeholder events (RSE1) we are able to analyse the position of the regional stakeholders, their support or resistance towards the suggested initiatives, using the following techniques:

- Brief identification of regional stakeholders and description
- Clarifying stakeholder interests and goals through the Reward & Contribution analysis
- Identify areas of harmony and conflict between stakeholder groups with regard to technological and managerial initiatives
- Evaluate potential initiatives for each region

3.1 General analysis

3.1.1 Reward and contribution perspective

An important part of a stakeholder analysis is to identify the contribution each stakeholder group provides to the project and the reward they expect for this contribution.

Clarifying contributions and rewards also demonstrates the real interest the stakeholder has in the project. The reward is especially linked with the stakeholder's motives for participating in the project.

Furthermore, it is necessary to identify new possibilities for each stakeholder group when implementing, in this case, the mitigation initiatives. The long term goals of a stakeholder can be expressed as Possibilities – last column in table 1.

Analysing the BENTHIS stakeholders' contributions and rewards toward the BENTHIS project is more or less the same for all stakeholders regardless of region. Therefore the analysis is performed on a general level and is applicable to the stakeholder groups from all five regions.

Table 2 provides an overview of the contribution, reward and possibilities for each stakeholder group.

Table 1: The Reward & Contribution perspective

Stakeholder	Contribution	Reward	Possibilities
Industry	Experience and tacit knowledge	Monetary and nonmonetary drivers	Influence Sustainable fishery
Scientists	Models for benthic ecosystem approach	Useful data and information	Innovation within technology and management

State & Regional Gov.	Legal framework and funding schemes	Data + Compliance and tools for decision support	Sustainable ecological, economic and social development
NGO	Acceptance of practices	Accomplishment of "the mission"	Improved sustainability

A stakeholder's contribution to a project is quite forward and expresses what the stakeholder brings into the project. E.g. the Industry has explicit knowledge about demersal fishing that no other stakeholder has. Secondly what reward do they expect to get out it? What is their real interest in the project? The Industry has an obvious monetary drive for influencing project decisions and results. At the same time the representative for the industry stakeholders at the Mediterranean RSE1 states that: *"…. assessment, monitoring and control of the demersal activities in order to make trawl fisheries sustainable needs attention*". The industry is aware that long term survival depends on nonmonetary issues as well and therefore the long term goals expressed as Possibilities in the last column lie in a sustainable fishery.

The Reward & Contribution table helps understand the relatively diverse base of stakeholders in the project and their diverse starting position with regard to issues concerning fisheries impact on the benthic ecosystem. Table 1 indicates clearly that sustainability is the joint long term goals among the stakeholder groups. This is important to underline in the continuing stakeholder process. But what the stakeholders bring into the project and the motives for participating in the project – the expected reward, differs quite a lot obviously. It is e.g. worth noting that for one stakeholder group the reward is related to economic value while the remaining stakeholder groups expect rewards in terms of increased information, legal compliance and welfare issues.

It is essential to see the individual stakeholders in the right perspective both when understanding their needs and expectations regarding "Innovative technologies in a sustainably managed demersal fishery", and also in our mutual communication with each other during the various project phases.

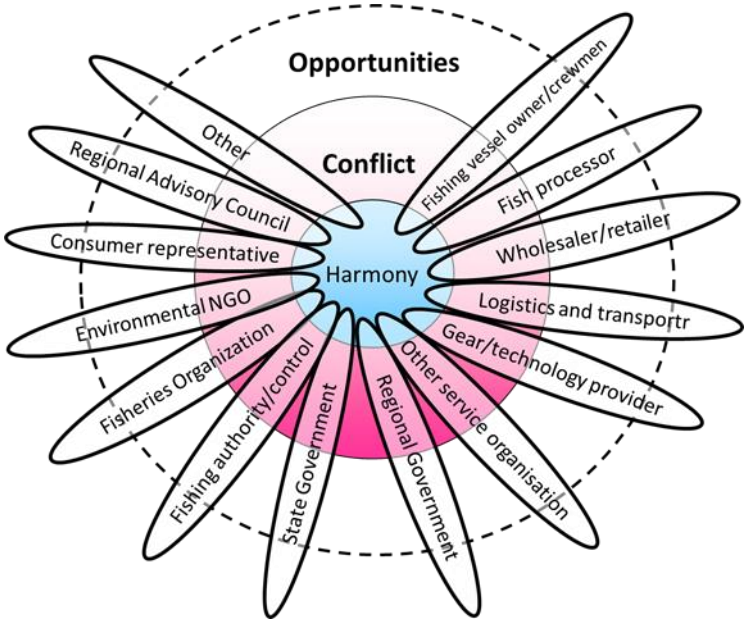
3.1.2 Harmony and conflict perspective

As stated above, different stakeholders have different interests. Sometimes these interests will conflict and sometimes interest of different stakeholders will align and be consistent.

It is important to identify issues or topics in relation to the BENTHIS research question that all stakeholders can agree on – where can we state, that all stakeholders agree on a single or multiple topic or feature in relation to benthic innovative initiatives for reducing impact? At the same time we have to recognize that stakeholders will disagree on certain topics concerning benthic innovations and there will be conflicts among stakeholder groups in relation to the implementation of these innovation. For some issues, we can neither confirm harmony or conflict and these issues are categorized as opportunities.

This reality is illustrated in the circle below:

Figure 6: The stakeholders in a harmony-conflict perspective



Areas of harmony, conflict and opportunities will be analysed and clarified for all case study areas in sections 3.2 to 3.6 below.

3.2 Mediterranean analysis

The stakeholder event conducted in the Mediterranean case study is described in appendix D and the individual stakeholders present at the meeting are described in more detail in the attached appendix.

3.2.1 Identifying stakeholders

The distribution of stakeholders at the Mediterranean stakeholder event is illustrated in figure 1 in section 2.3.1. There is a relatively large part of scientists and service organizations represented and the fishing industry is relatively well represented as well.

The service organizations are both private and public organizations. The public organizations present provide services within these main areas:

- Promoting cooperative strategies and joint marketing activities for Italian fish producers
- Providing services and guidelines related to new fisheries regulations – bringing forward the needs of fish operators also regarding technological innovations
- Providing economic analyses and statistics - Economic research on fisheries and aquaculture

The private organizations present provide services within these main areas:

- Industry organization within the fisheries sector

- Promoting cooperation between local fishing operators, preparing common and transparent rules for the industry, legal and economic support related to market activities

The scientists represented at the Mediterranean event are mainly within the area of marine science and from research institutes. There is however representation from the educational sector as well.

The fishing industry is represented by two manufacturers of equipment for Mediterranean and Ocean fishing and a manufacturer of fishing nets and steel wire ropes.

It should be noted that the representatives from the NGO present at the event have a special focus on the marine sector.

The state and regional governmental representatives represent the political and legally managerial system.

All in all the Mediterranean event is represented by an appropriate stakeholder group concerning the benthic issues albeit relatively overrepresented by service organizations and scientists. Representation of fishermen or vessel owners would have ensured a wider or more balanced stakeholder representation, but the industry is indirectly represented by the private service organizations. Furthermore the presence of one or two more NGO's would have benefitted the NGO representation.

3.2.2 Harmony and conflict among stakeholders

Having identified the regional stakeholders, their roles, expectations and goals (reward and contribution table); the next step in the analysis process is clarifying the stakeholders' attitudes towards benthic issues. *Where can we state, that all stakeholders agree on a single or multiple topic or feature in relation to benthic innovative initiatives*?

Referring to the stakeholder report in appendix D, the Mediterranean stakeholders link the impact issue with gear and technological innovations for reducing impact.

Many suitable innovations for reducing trawling impact are presented and discussed e.g. the Hydro-rig system, the Sum Wing and the Pulse trawl. This gear is of great interest to the stakeholders due to fuel savings. Fuel savings is a key issue in the discussions among stakeholders. The common feeling among stakeholders is that negative impact is due to traditional otterboards, trawl net rigging, especially ground rope and tickler chains. Shifting from towed gear to static gears was promoted in this regard.

It is concluded that most stakeholders support innovative initiatives or actions in the technical area. There is one reservation regarding the pulse trawl which refers to caution and maybe more investigations on the electricity part of the equipment and safety on board.

3.2.2.1 Stakeholder support of suggested initiatives

At the RSE1 in Ancona the following list of initiatives was produced and stakeholders rated their support as follows:

Figure 7: List of technological initiatives at the Mediterranean case study

		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	Subtotal	%
1	Otterboards		26	19.8
2	Twine/Materials/trawl design		25	19.1
3	Shifting from trawl to seine		19	14.5
4	Corrent/coppers		19	14.5
5	Groundgear modification		22	16.8
6	Shifting to static gears		20	15.3
		Total	131	100.0

The group was encouraged to rank or score three of the listed initiatives. The Otter boards and Twine materials trawl design rank close and highest, followed by Ground gear modifications. There is not a distinct difference between the suggested initiatives.

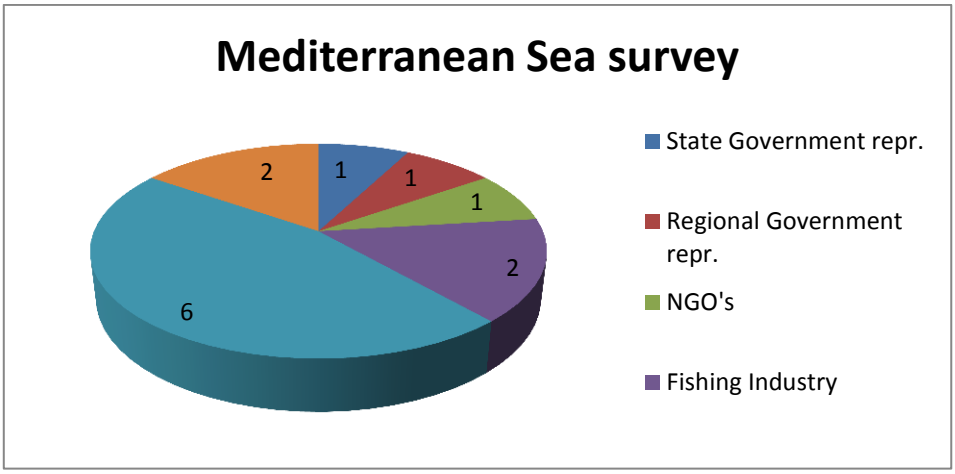
Summarizing, a majority of stakeholders in the Mediterranean case study area support innovative initiatives within otter boards, twine trawl equipment and ground gear in order to reduce impact.

3.2.2.2 Stakeholder attitudes towards BENTHIS topics

The difference in attitudes among stakeholders is clearer when looking at the five BENTHIS topics in the survey questionnaire: Governance, Ecology, Management, Socio-economics and Technology – see survey questionnaire in Appendix C.

Since the representation is not equal among the stakeholders the survey results are not representative on a larger scale and we find the group too small to upscale, but they provide insight into the attitudes of the Mediterranean stakeholders present at the meeting regarding important project issues.

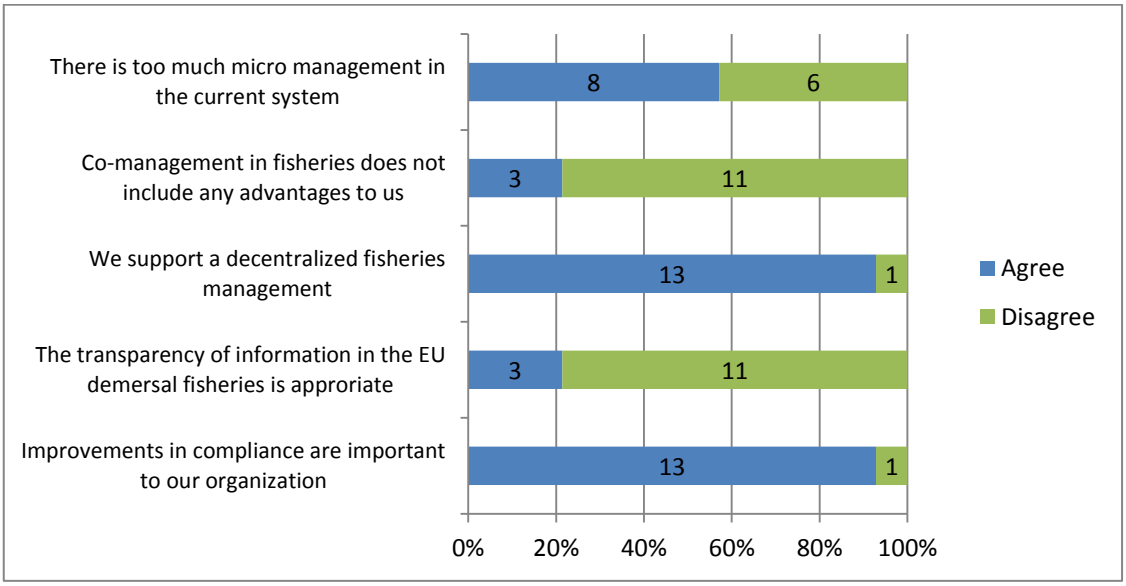
Figure 8: Stakeholder distribution in the Mediterranean survey



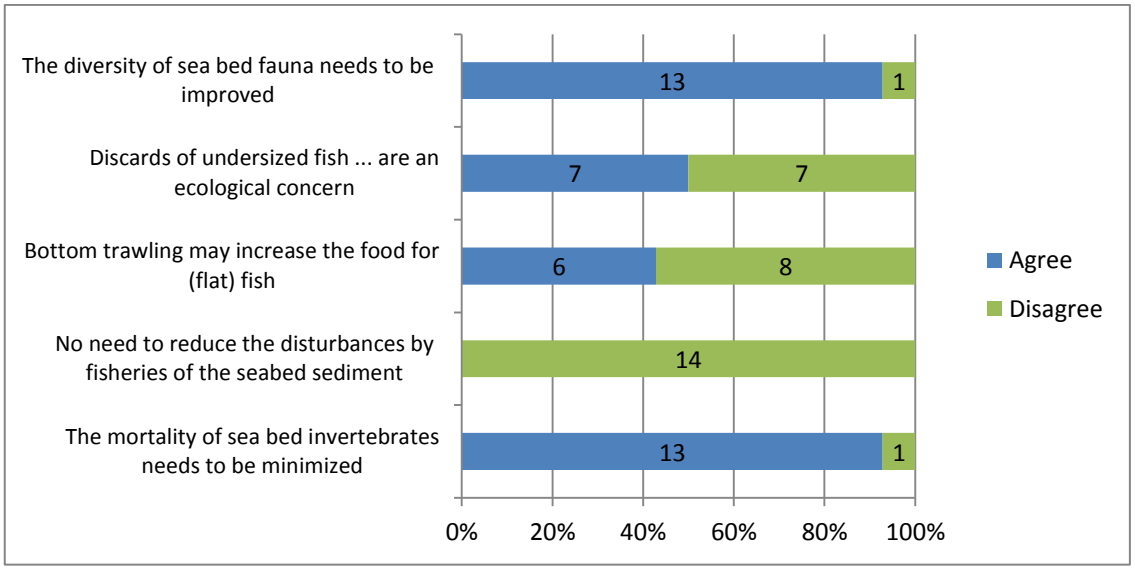
There are relatively many service organizations, public and private (see section 3.1.1) represented in the Mediterranean survey.

The following tables illustrate the 13 survey results from the Mediterranean stakeholders:

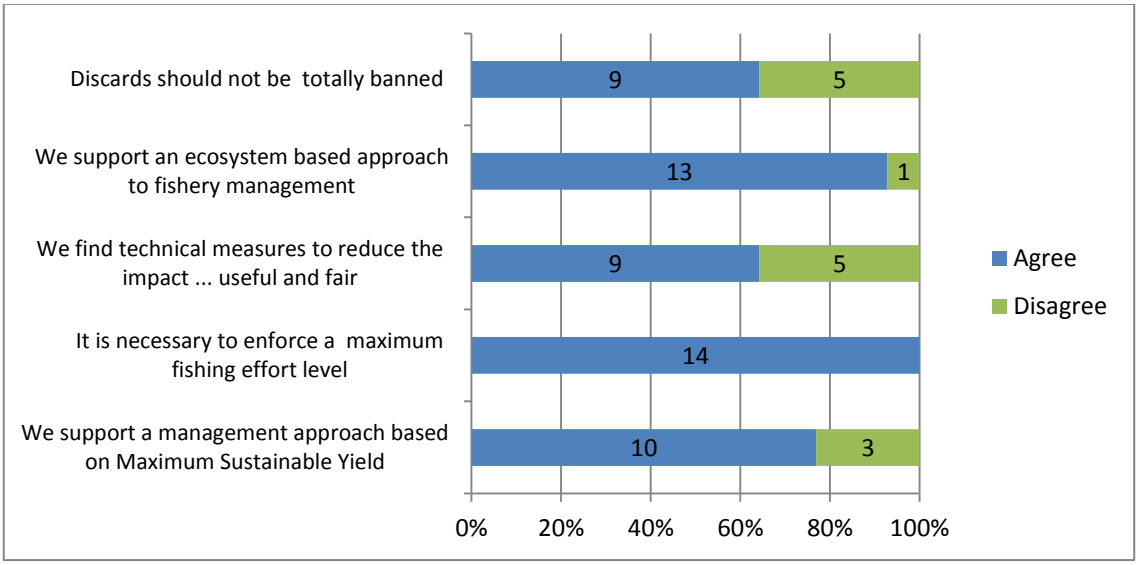
Governance:



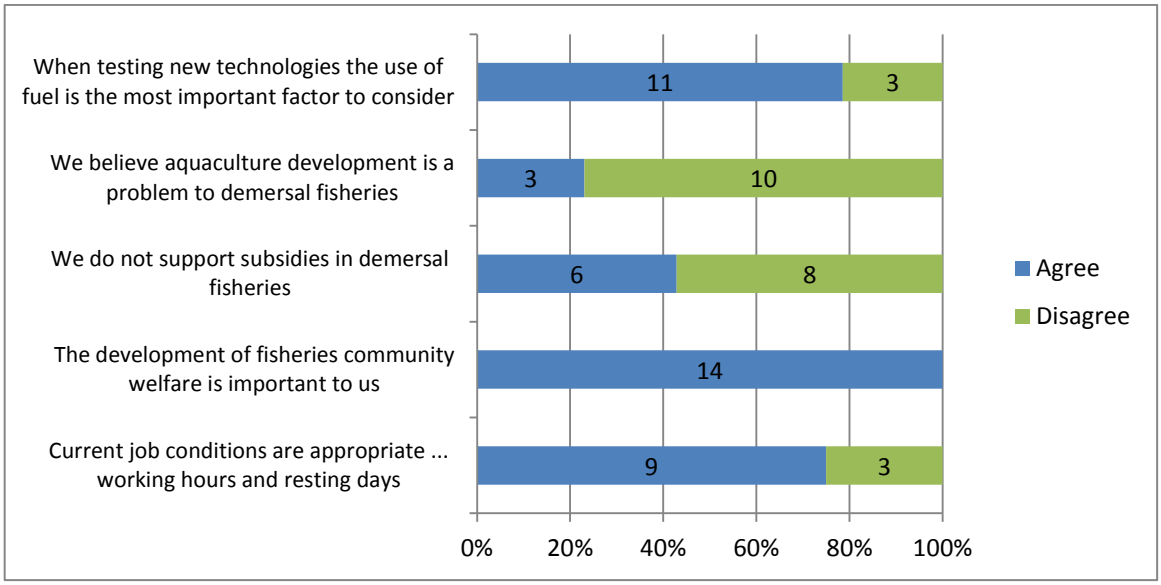
Ecology:



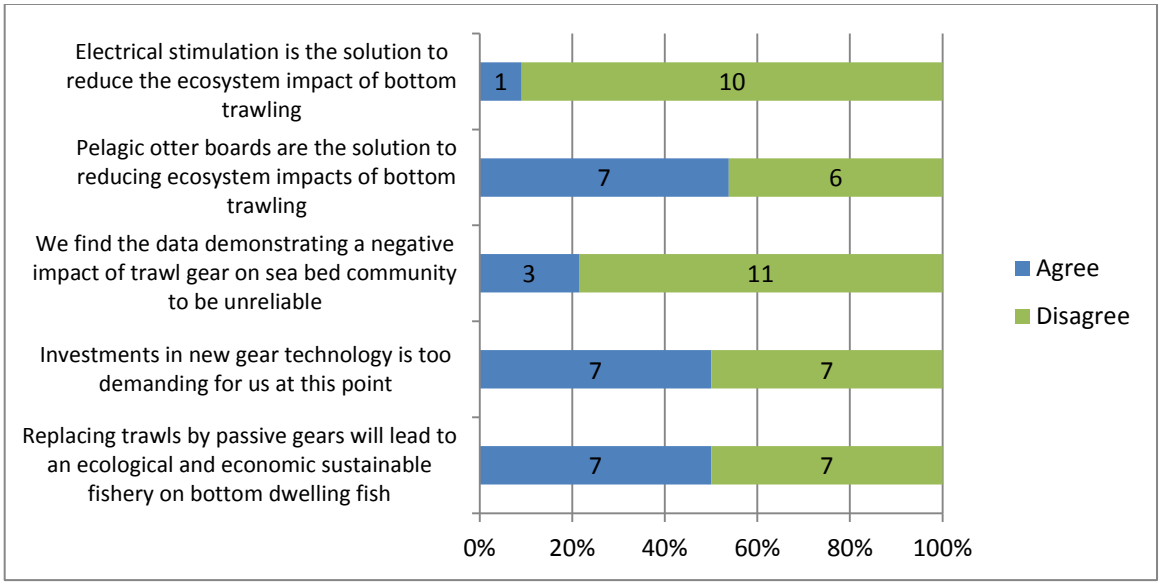
Management:



Socio-economics:



Technology:



On the Technology topic we find the most conflict areas. The only issue a clear majority of stakeholders disagree on is that electrical stimulation is the solution to reducing impact. There is a weak agreement on the data demonstrating a negative impact as unreliable.

It is quite surprising that a relatively high share (6) of the 13 stakeholders do not agree on the statement that pelagic otter boards are the solution to reducing impact, since the ranking of initiatives scored otter boards highest.

Table 2: Comparison of harmony, conflict and opportunity areas of the Mediterranean survey

	Harmony	Conflicts	Opportunites
Governance	Decentralized fisheries management EU transparency not appropriate Co-management	Micro-management	
Ecology	Improve diversity Minimize mortality invertibrates Need to reduce distrurabances	Discards Bottom trawiling increases food for flatfish	
Management	Ecobased approach Enforce max fishing effort level	Discards Technical measures are useful and fair	Support of MSY
Socio-economics	Use of fuel most important Welfare	Subsidies	Job conditions are appropriate
Technology	Electrical stimulation (the puls trawl) Data on impact unreliable	Pel. otterboards is the soulution Inv. in new gear demanding Replacing trawls by passive gears	

When highlighting the comments from the open question part in the questionnaire[2] approximately 50% of the stakeholders point out that "selectivity" is an important priority to them. When developing new fishing gear reducing the accidental capture of unwanted species is clearly important to stakeholders.

Several stakeholders also point out that the complexity is large and a multiple approach[3] is an important priority regarding innovative technologies in a sustainable managed demersal fishery.

There is no clear pattern regarding the attitudes towards priorities – both industry and government representatives feel that selectivity is important and point out the multiple approaches as well.

3.2.3 Evaluation of potential initiatives for Mediterranean Case Study

The discussion among the Mediterranean stakeholders points clearly at technological initiatives for reducing impact on the benthic ecosystem. Stakeholders scored the otter boards (1), the twine trawl (2) and ground gear modifications (3).

[2] Open question in Questionnaire: "What are Important priorities to you regarding innovative technologies in a sustainable managed demersal fishery":

[3] Examples of comments from questionnaires: " Include many relevant topis: 1. Net selectivity 2. Energy consumption 3. Impact on ecosystem", "We must act on a series of actions in the framework "Innovative technologies"", "We need to take many issues into consideration and see how they interact".

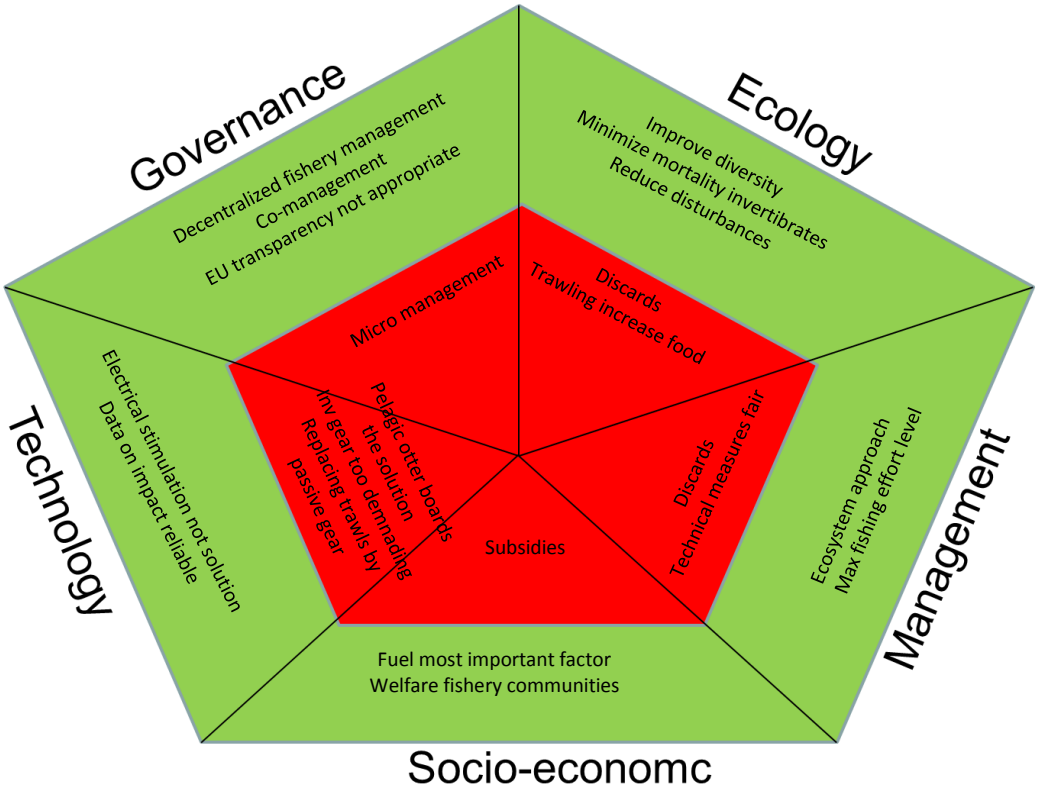
When presented to a number of technological gear innovations for reducing trawling impact the pulse trawl were of special interest due to the impressive fuel savings. A cost-benefit analysis for pelagic otter boards and traditional otter boards respectively was also of great interest to the stakeholder group and it was pointed out that cost-benefit analyses need to be the foundation for assessing technological initiatives. The specific content of such an analysis was questioned by some stakeholders and therefore needs to be clearly communicated and demonstrated in the stakeholder process to come. This may also be related to the fact that half the stakeholders participating in the survey state that "Investing in new gear technologies is too demanding at this point" (Technology section, Q 4).

Summing up there are clear conflicts within micro-management, discards and bottom trawling increasing the food for flatfish, support of subsidies, the pelagic otter boards as a solution, investments in gear being too demanding and finally replacing trawls with passive gears will lead to a sustainable fishery on bottom dwelling fish.

Clear harmony areas exist within improving performance in relation to the benthic ecosystem and to the ecosystem based approach, to the fact that fuel is the most important factor to consider when testing technologies, that electrical stimulation is not the solution to reducing impact and finally that data demonstrating negative impact is not found unreliable (3 to 11).

The results from the harmony-conflict analysis from the Mediterranean survey listed in table 2 are alternatively illustrated in figure 9. The green areas are areas where stakeholders agree on the statement put forward and the red area presents the statements the stakeholders disagree on, where they are having conflicting attitudes. Areas of opportunities are not presented in figure 9 (see table 2).

Figure 9: Comparison of harmony and conflict areas



The figure reflects the attitudes of the Mediterranean stakeholders participating in the survey at the starting point of the BENTHIS project. There are both conflicting and harmony areas in the group in relation to benthic issues and reducing impact. The case study leader needs to take these into consideration when making decisions on potential regional initiatives for mitigating impact. Where will we get support and where will we meet resistance from the stakeholder group. On a longer term we need to decide on how to act in relation to individual stakeholders on behalf of their attitudes towards current project results (Analysis process described in section 1.2 paragraph 6: *Choose appropriate strategies to handle stakeholders).* A stakeholder action plan will be based on the second and the third stakeholder events as well.

Summarizing, the starting point for a successful long term implementation of technological and management innovations in the Mediterranean area should be otter boards- and ground gear innovations supplemented by cost-benefit analyses that should be disseminated to the stakeholder group in the coming project stakeholder process. This work should be done taking into account the harmony and conflict areas that prevails within the Mediterranean stakeholder group.

3.3 Western Waters analysis

The stakeholder event conducted in the Western Waters case study is described in appendix E and the individual stakeholders present at the meeting are described in more detail in the attached appendix.

3.3.1 Identifying stakeholders

The distribution of stakeholders at the Western Waters stakeholder event is illustrated in figure 2 in section 2.3.2. There is a relatively large part of scientists represented (6) and representatives from service organizations (3). In total 12 stakeholders are present.

The service organizations are private organizations representing the fishing industry and aquaculture industry at different levels. Their objective is to represent and promote the interests of the fishing industry and at the same time ensure a responsible management of fishery resources.

The scientists represented at the Western Waters event are mainly within the area of marine science and are from the Université de Nantes and from a research institute / project (AGLIA) exploring the seabed area in the Bay of Biscay.

The fishing industry is represented by the leading fishing vessel owner in France. Scapeche has a fleet of 17 vessels specialized in different kind of fisheries.

The regional governmental stakeholder represents the political and legally managerial system.

The NGO represent is a national environmental organization whose aim is to preserve marine life and human activities which depend on it.

All in all the Western Waters event is represented by an appropriate stakeholder group concerning the benthic issues albeit relatively unbalanced regarding service organizations and scientists. Representation of a broader group of stakeholders e.g. from the industry and NGO's might have ensured a more diverse stakeholder output.

With regard to the reward and contribution analysis the picture for the Western Waters stakeholders is quite similar to the general picture. Having said that the stakeholder group seem to put more emphasis on social development in the coastal fishery communities as long term Possibilities for participating in the BENTHIS project, and with regard to Rewards the group (scientists and governmental repr.) emphasize a clear need for more and reliable data in order to proceed the stakeholder process and for making decisions about possible initiatives for mitigating impact.

3.3.2 Harmony and conflict among stakeholder groups

The Western Waters case study leader organized a round table discussion at the event and all stakeholders participated jointly. From the discussions it is clear that stakeholders feel the issues concerning "reducing benthic effects" raise a series of questions. The questions relate to definitions and clarifications of the material presented and the agenda topics. Having agreed on

this, the discussion continues actively but there is a certain reticence on how their opinions are interpreted.

The benthic in Western Waters is a heterogeneous and dynamic region with a vast mudflat. Because of soft sediment the impact from fishing is not severe according to the representative from the fishing industry. It is stated that fishing has been on-going for 40 years and fishermen see no negative changes. Some say problems are urgent, but fishermen are not convinced.

Possible changes associated with reducing effects on the benthic – technological and managerial - will affect socio-economically and therefore cost – benefit analysis must be made in order to assess restrictive measures of activities. Quite similar to the Mediterranean stakeholders, the Western Waters stakeholder's emphasize cost-benefit calculations in order to assess and support possible initiatives. The Western Waters stakeholders are not willing to rank any initiatives.

The industry will be interested in investing in new technology if they can see less fuel consumption, less costs, better working conditions etc. But the cost must not be too high, not even in the short term. It is stated that cost-benefit analyses at different timescale are important: "*Fishermen want to be sure of the benefits*".

The group agrees that it is important to enhance more professional knowledge to better understand the current and potential benthic effects. Existing studies are not providing sufficient data and there is too much conflicting data which is difficult to relate to!

It is acknowledged that bottom trawling is of major importance for fishery societies along the French Atlantic coast. There are socially sensitive issues involved when considering innovations that reduce effects on the benthic ecosystem.

The group agrees that the stakeholder meeting has helped draw a general picture of current and alternative technologies and the status of the large mudflat. But this stakeholder event is only a starting foundation for assessing the effects of bottom trawling in the region and for assessing potential innovations.

3.3.2.1 Stakeholder support of suggested initiatives

As noted earlier there was no ranking of technological and managerial initiatives at the Western Waters stakeholder event, but the group as a whole came up with a list of alternative technologies which they evaluated with regard to advantages and disadvantages – see table 3 below. It was made clear that the stakeholders did not want to "select" or rank a specific type of gear and limit themselves to a specific solution.

The stakeholder group at Western Waters wishes to be referred anonymously or regardless of their identity and the opinions on technological alternatives in table 2 are expressed by the group as a whole.

Table 3: Assessment of alternative technological gear by Western Waters group

Technology gear	Environmental benefit	Advantage for fishing	Disadvantage ecological	Disadvantage for fishing
Panel jumper	- Reduces contact with the bottom and so the impact	- Keeps the bottom trawl	- Allows a partial correction for panels - Do not correct the effects of trawling	- Takes time to position
Panels peeled	- Clears the effects panel on the bottom	- Keeps the bottom trawl	- May involve a ballast as bad as the bottom panel	
Trawl twins				
Electric trawl	- Clears the effects of trawling on the bottom - Improves selectivity - Allows fuel economy		- Causes effects on fish nervously system	- Effectiveness of catch prawns unproven
Hydro-rig	- Clears the effects of the device on the bottom			- Alternative to unproven trawl
Trawl off	- Clears the effects of trawling on the bottom			- Effectiveness of zero catches of Norway lobster
Passive arts	- Avoid impacts on the bottom - Allows fuel economy		- Involves a bait	- Involves an increase handling - Strengthens the issue of cohabitation sea - Involves the cost of bait

The stakeholder group states that currently there are not established good management measures and good alternative technologies: "… *it still needs to be defined"*. This stakeholder expression may refer to a lack of basis for evaluating possible initiatives for mitigating impact.

3.3.2.2 Stakeholder attitudes towards BENTHIS topics

The stakeholders at the Western Waters stakeholder event did not wish to participate in the questionnaire survey and thus we have limited data and knowledge about stakeholder attitudes with regard to the project issues: Governance, Ecology, Management, Socio-economics and Technology. See also section 2.3.2.2 above for justifications.

3.3.3 Evaluation of potential initiatives for the Western Waters Case Study

According to the round table discussions especially representatives for the industry in the Western Waters stakeholder group need more evidence for accepting the relationship between negative impact and trawling ".. *You (scientists) have to prove the urgency..*" it is stated. Feedback on these kinds of comments should be prepared to upcoming sessions. A clarification of what impact really means and what it implies is necessary in order to be on the same page.

There is a certain interest in innovative technologies in the stakeholder group but underlying cost-benefit assessments are necessary for the stakeholder group to consider alternative initiatives and it is emphasized that there are socially sensitive issues involved.

According to the case study leader the group as a whole, did not have a specific interest in gear initiatives and this was also the reason why they were cautious by selecting or ranking potential technological initiatives for reducing impact.

When we evaluate the first Western Waters stakeholder event it is clear that increased scientific information which is set in a concrete context is helpful in the further collaborative process with the stakeholder group. The purpose of the stakeholder involvement and how the BENTHIS project will use collected information also need to be further clarified and communicated in this stakeholder group.

Summing up on innovative initiatives, concrete cost-benefits analyses need to be provided in order to assess possible initiatives for reducing impact on the benthic ecosystem in Western Waters.

3.4 North Sea analysis

The stakeholder event held in the North Sea case study is described in appendix F and the individual stakeholders present at the meeting are described in more detail in the attached appendix.

3.4.1 Identifying stakeholders

The distribution of stakeholders at the North Sea stakeholder event is illustrated in figure 3 in section 2.3.3. There is a relatively large part of marine scientists represented (10) and a smaller group of stakeholders from service organizations (3) and the fishing industry (4). One representative from an environmental organization participated in the meeting. Due to low representation of NGO's a governmental representative cancelled his participation. In total 18 stakeholders participated at the event.

The scientists represented are mainly within the area of marine and social science and are from research institutes which conduct research on marine ecosystems.

The three service organizations are private organizations representing the fishing industry in the area of finance and retail thirdly the National Association of Fisheries whose objective is to represent and promote the interests of the fishing industry.

The fishing industry is represented by vessel owners and gear producers.

The NGO representative is from the MSC which certifies sustainable fisheries based on specified standards.

All in all the North Sea event is represented by a relatively broad stakeholder group were scientist and the industry is the majority of the group. There are no representatives from state or regional governments – representing the political and legally managerial system.

With regard to the reward and contribution analysis the picture for the North Sea stakeholders is quite similar to the general picture but the lack of representation from managerial authorities causes a lack of contribution from the legal framework as well as lack of stakeholders which are directly driven by unambiguous measures or goals with regard to ecological, economic and social responsibilities. This does not seem to mean anything significant, but we should be aware of this when aiming at understanding the North Sea stakeholder group and their emphasis.

3.4.2 Harmony and conflict among stakeholder groups

The following discussion topics were listed at the meeting:

1. What is your view on the fisheries impact on the sea bed and the benthic ecosystem?
2. What are the implications for fisheries management?
3. How can we change the impact (mitigation of adverse effects, increasing the productivity) by technical or management measures?

The stakeholders were organized in groups while discussing and presented their main conclusions in plenum subsequently. There was no ranking or scoring of concrete innovative initiatives at the North Sea stakeholder event.

As a starting point a clear conflict exists in the perception of the impact of fishing on the sea bed. Fishermen and vessels owners are sceptical about the importance of fisheries impact or effect on the ecosystem, while other stakeholders perceive this as a serious issue. At the same time fishermen question the credibility of the scientific studies showing the adverse impact of fishing on the sea bed and benthic ecosystem.

A general point of discussion was the question about the choice between ecological values and fisheries production. Obviously the stakeholder group has divergent positions in this regard – especially in the short term. Scientists claim that this is actually not a scientific question but a political question. It was felt that the perception of the public opinion with regard to the impact issues is very important.

3.4.2.1 Stakeholder support of technical and management measures

The discussion on benthic impacts should not only be focussed on technical measures (fishing gear, spatial management) but should also address the complete management system. An important part of the meeting was directed towards management objectives, both in general as well as for the BENTHIS project (AD 2). Fishermen were particularly keen on knowing the extent of protection of the benthic ecosystem that is needed: *Do we want the protection of rare species and how many should be protected? Or can fisheries production be a clear objective too*?

The current management system of quota for single species in mixed fisheries result in extra fishing effort (and more benthic impact) because the over-quota catch cannot be landed and vessels continue fishing to compensate for the loss of revenue. Overall the stakeholder group agrees on “spatial management” in order to mitigate impact.

Other suggestions to management initiatives were: A credit system to manage mixed fisheries both with regard of managing the mixed bag as well as to reduce the trawling impact in certain areas; “fishing on order” which would lead to increased revenue and reduce fishing effort.

Assessing alternative fishing techniques depend on the target species of a fishery:

- Sole fishery: The pulse trawl is interesting and fuel savings are higher compared to the tickler chain beam trawl. Even so stakeholders point out that there are still a lot of questions about the effect of the pulse trawl. Different fishermen held different views on this.
- Plaice fishery: The fly-shoot and the twin (multi) rigging is interesting for the stakeholders. Also the pulse trawl, hydro-rig and out-rigging are mentioned as supportive initiatives here.

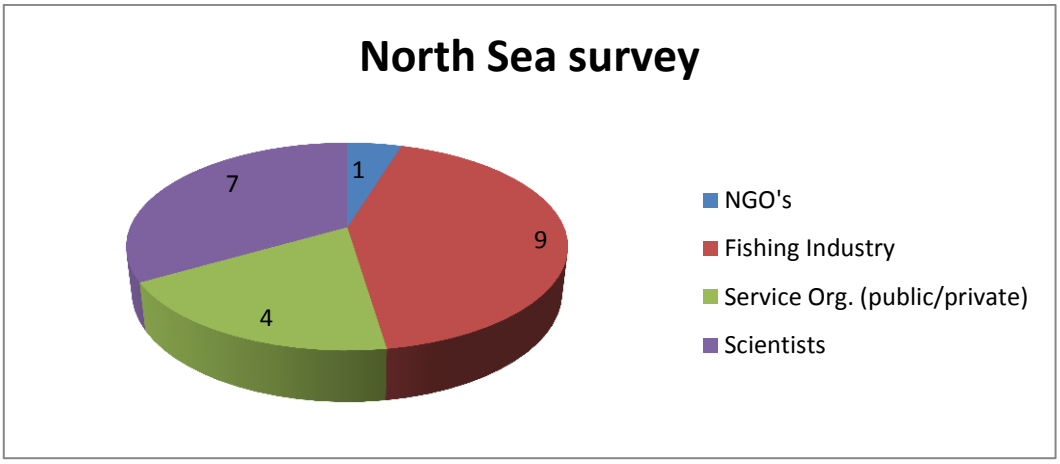
The group agrees that when considering technological initiatives for reducing impact, gear that “reads the sea floor” such as the sum-wing should be considered. It was emphasized by fishery representatives that reductions in fuel consumption are more important drivers of technological innovations than reducing the ecosystem effects of fishing. Considering the motives for the NGO stakeholders in the reward and contribution analysis above, there is a clear conflict with regard to this statement. But in reality these views probably meet halfway since they depend on each other in the long run.

The stakeholder group overall agrees that the effect of a trawl depends on the type of sea bed fished as well as the type of trawl used. It is the combination of the trawl and the type of sea bed that matters when considering impact.

3.4.2.2 Stakeholder attitudes towards BENTHIS topics

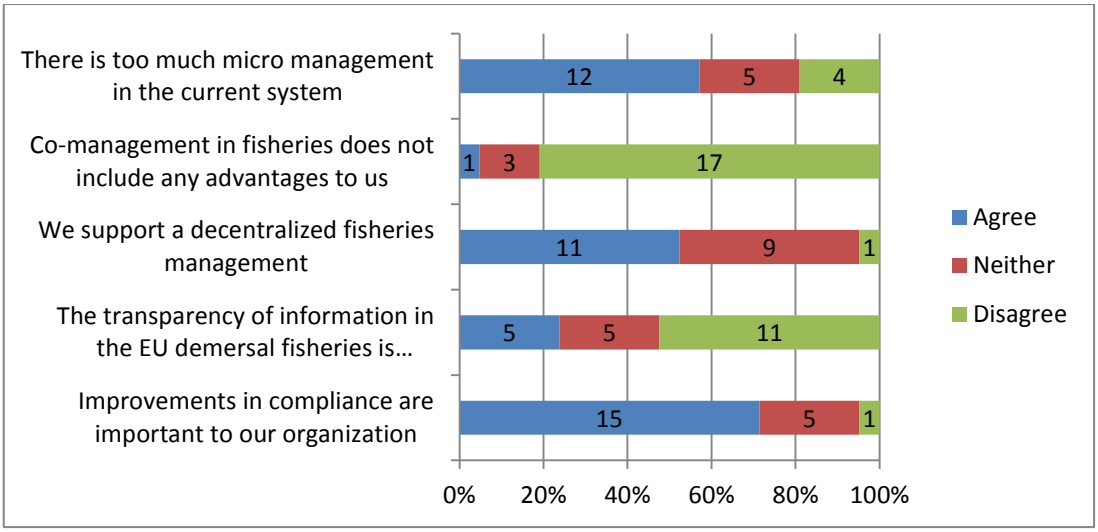
A total of 21 persons participated in the questionnaire survey at the North Sea event which is the most at any of the five events. In the following tables the differences and similarities in attitudes towards the five BENTHIS topics Governance, Management, Socio-economics, Ecology and Technology are illustrated. Since the representation is not equal among the stakeholders the survey results are not representative on a larger scale and we find the group too small to upscale, but they provide insight into the attitudes of the North Sea stakeholders present at the meeting regarding important project issues.

Figure 10: Stakeholder distribution in the North Sea survey

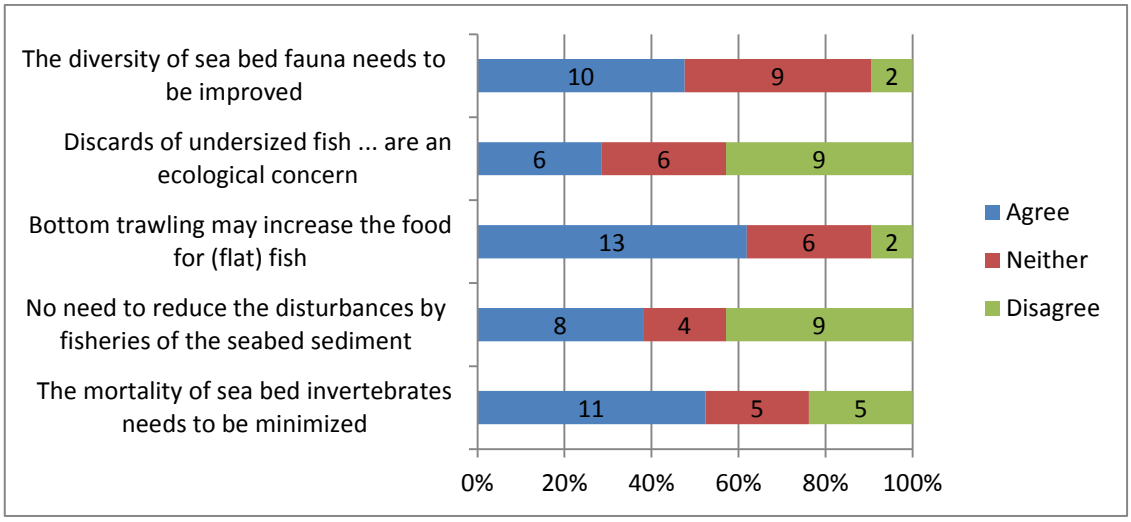


Please note that the North Sea questionnaire compared to the Mediterranean survey includes a "Neither" option. The following tables illustrate the survey results from the stakeholders at the North Sea event:

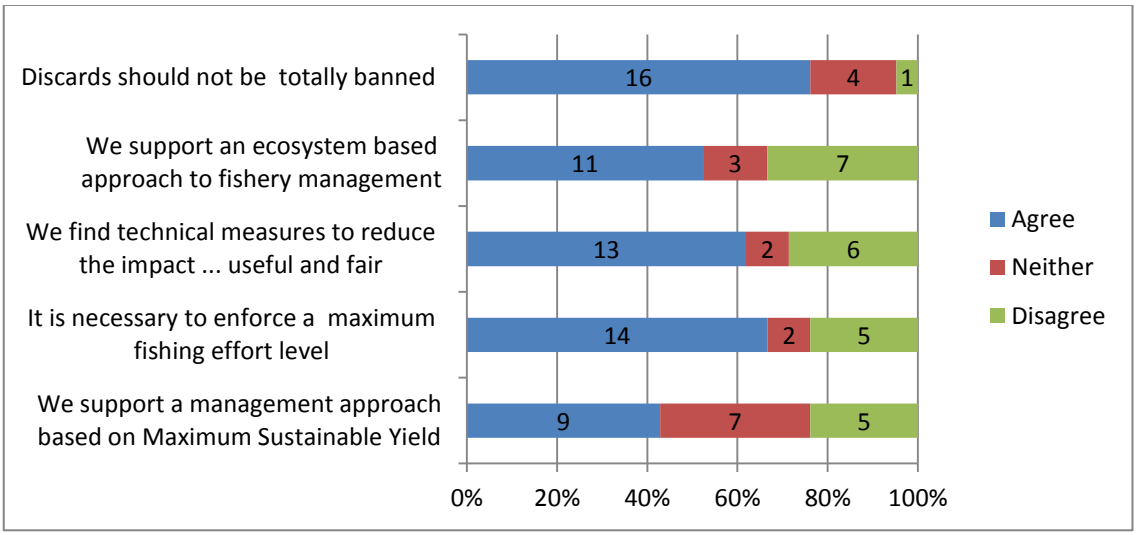
Governance:



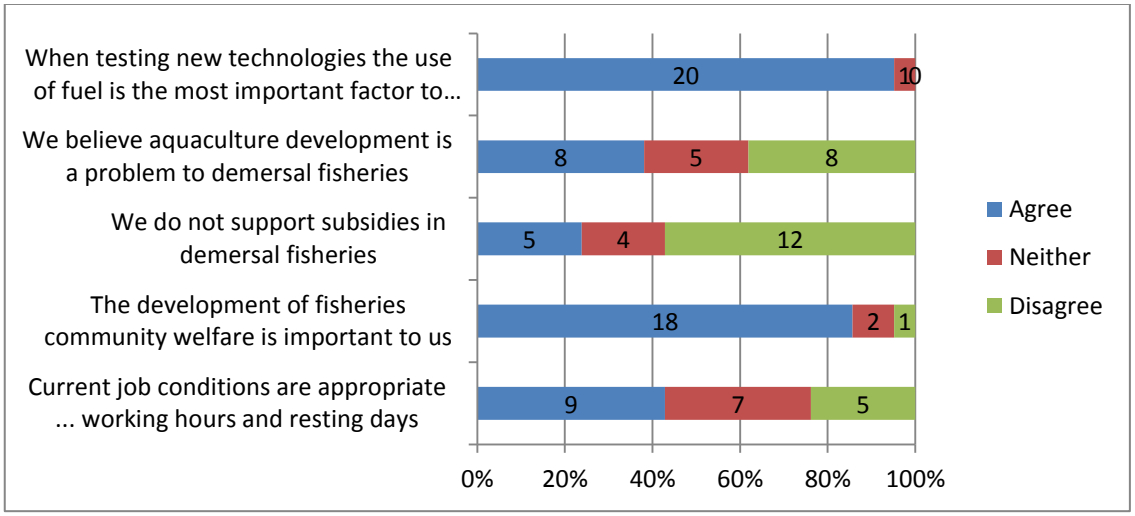
Ecology:



Management:



Socio-economics:



Technology:

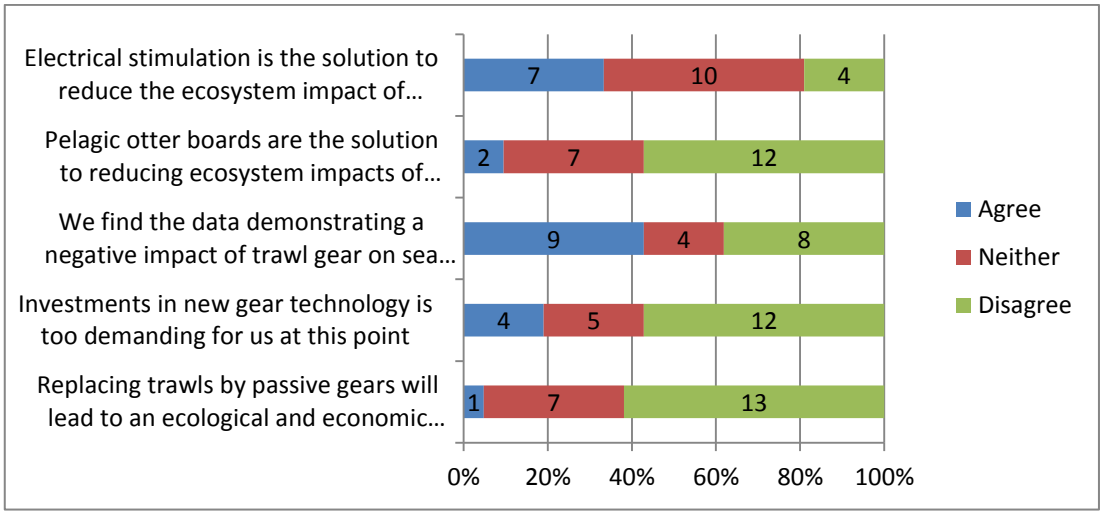


Table 4: Comparison of harmony, conflict and opportunity areas of the North Sea case study

	Harmony	Conflicts	Opportunites
Governance	Co-management no advantage	The tranparency not appropriate	Decentralized fishery management Too much micro managenment
Ecology		No need to reduce distubances Minimize mortality of invertibrates Discards Need to improve diversity Bottom trawling increase food	
Management	Discards Enforce max fishing effort level	Ecobased approach Support of max MSY	Technical measures useful and fair
Socio-economics	Fuel is the most important factor Welfare	Jobconditions appropriate	Subsidies
Technology		Electrical stimulation Pel. Otterboards the solution Data on impact reliable Investments too demanding	Replacing trawls by passive gears

When highlighting the comments from the open question part in the questionnaire[4] the focus is on striking a balance between economic, environmental and social factors. Selectivity is pointed out as well in relation to technological initiatives and finally an encouragement to all to come up with results!

The industry representatives emphasise the importance of claiming the rights to fish and providing food to the population. Other stakeholders suggest using multiple methods and thereby less effort and disruption.

3.4.3 Evaluation of potential initiatives for the North Sea Case Study

Summing up on the attitudes of the North Sea stakeholder group there are relatively many conflict areas which they do not agree nor disagree on as a group.

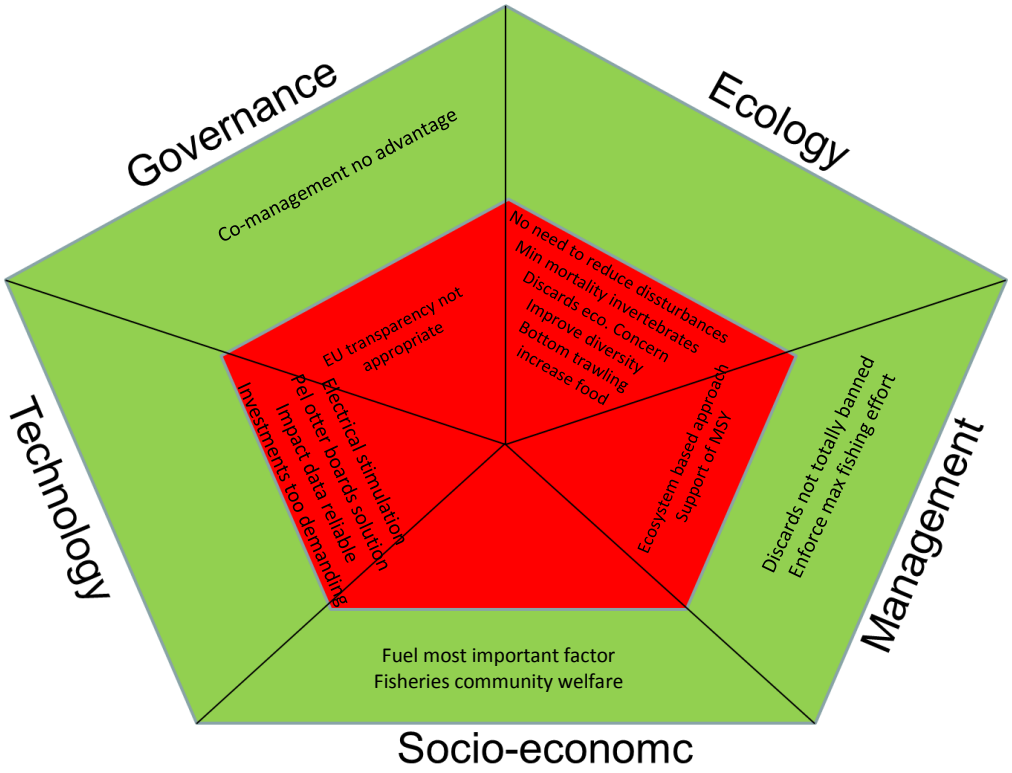
Areas of harmony exist within: Co-management includes advantages, discards should not be totally banned, it is necessary to enforce a maximum fishing effort, fuel is the most important factor to consider and finally within the importance of development of fisheries community welfare.

There are clear conflicts within: Transparency of EU information not appropriate, no need to reduce disturbances, minimize mortality of invertebrates, discards are an ecological concern, we need to improve diversity, bottom trawling increases food for flatfish, an ecosystem-based approach, support of MSY, job conditions are appropriate, electrical stimulation is the solution to reducing impact, pelagic otter boards are the solution, data on impact are reliable and finally that investments in new technology are too demanding.

The results from the harmony-conflict analysis from the North Sea survey listed in table 4 are alternatively illustrated in figure 10. The green areas are areas where stakeholders agree on the statement put forward and the red area presents statements the stakeholders disagree on, where they are having conflicting attitudes. Areas of opportunities are not presented in figure 10 (see table 4).

[4] Open question in Questionnaire: “What are Important priorities to you regarding innovative technologies in a sustainable managed demersal fishery”:

Figure 11: Comparison of harmony and conflict areas



The figure reflects the attitudes of the North Sea stakeholders participating in the survey at the starting point of the BENTHIS project. Note that the red area is relatively "heavy".

When proceeding with initiatives for reducing impact in the North Sea case study - technical and managerial – the case study leader needs to be aware of a relatively diverse stakeholder group with different positions with regard to the perception of the seriousness of fisheries impact and the need to mitigate possibly negative impact.

The discussions confirm a stakeholder need for the objectives to be clear: What are we aiming for when we discuss impact on the ecosystem and mitigation strategies – what do we need to achieve? *What is the extent of protection and can fisheries production be a goal as well* - was put forward by the industry representatives.

Possible consequence scenarios could be disseminated to the industry part of the North Sea stakeholder group and as in the other case study regions cost-benefit analyses will provide a rewarding basis in the continuing stakeholder process.

3.5 Black Sea analysis

The stakeholder event held in the Black Sea case study region is described in detail in appendix G and the individual stakeholders present at the meeting are described in the attached appendix as well.

3.5.1 Identifying stakeholders

The distribution of stakeholders at the Black Sea stakeholder event is illustrated in figure 4 in section 2.3.4. There is a relatively large part of representatives from the fishing industry (6) and two smaller groups of stakeholders - scientists (4) and environmental organizations (3). A representative from a service organization and two from regional government participated in the meeting as well. In total 16 stakeholders participated in the event.

The fishing industry is represented by vessel owners and fishermen - locally called Rapa fishermen, fishing with beam trawl. One diver fishing for sea snail is present and two of the six representatives are processors and the one of them is a vessels owner as well.

The scientists represented are within the area of marine research and gear technology employed at research institutes and university faculties conducting research on benthic ecosystems.

The environmental representatives are from organizations that operate in areas such as underwater research, conservation of Mediterranean society and traditional fisheries society.

The three governmental stakeholders represent the political and legally managerial system.

All in all the Black Sea event is represented by a relatively balanced stakeholder group even though the industry and scientist form the majority of the group. The NGO's are well represented at the Black Sea event compared to most of the other regions.

With regard to the reward and contribution analysis the picture for the Black Sea stakeholders is quite similar to the general picture. However the reward for scientists and governmental representatives appears to be more significant in the Black Sea region. The need for useful data and research information in order to improve the tools for managerial decision support seems marked. This need is also reflected in the EU wide workshop subsequently where stakeholders from the Mediterranean and Black Sea regions give their concrete suggestions to data required in order to define and manage benthic impact of fisheries.

3.5.2 Harmony and conflict among stakeholder groups

The following discussion topics were listed at the meeting:

1. Improve the understanding of bottom trawling
2. Assess the effect of existing and novel technologies on benthic ecosystem
3. Possible consequences for the industry – economic and ecological factors

The stakeholders were organized in groups while discussing and presented their main conclusions in plenum subsequently. Additionally, there was a ranking of innovative managerial and technological initiatives at the Black Sea stakeholder event. These results are presented in the next section.

Initially, the stakeholder group agrees that adverse impact of bottom and beam trawling (algarna) on the benthic fauna is a major concern in Turkey and has raised many speculations often without any firm scientific basis (fisheries are carried out near shore habitat, 0-50 m).

The degree of impact raises quite some disagreement in the stakeholder group, the fishermen pointing out that the negative impact of bottom trawling is not that severe as proposed by some stakeholders. The stirring of the sediment reveals nutrients and oxygenate the bottom and the productivity of the seafloor increases, it is claimed.

Scientists feel there is a need to improve the data collection methodology suitable to the conditions in the Southern Black Sea and to collect basic fishery and ecological data and explore alternative fishing technology to mitigate the negative ecosystem effects. Government representatives agree that a standardized method for registering fishery data is required.

There seems to be diverse opinions about the consequenses the data collection and alternative fishing technologies will have on the fishing industry. It is suggested that economic performance measures of alternative technologies should be evaluated, but most stakeholders agree that good fishery management tools and plans can improve the benthic ecosystem and reduce impact. However, the industry points out that *".. fishermen should have the rights to speak while making decisions regarding alternative gears and other management plans*" and *"... the fisherman should not be faced with an economic loss while gear modifications are being planned and developed*".

A clear conflict exists among the fishing industry and the NGO's who feel that the beam trawl (algarna) should be forbidden due to the very negative impact on the benthic structure especially in some regions in the Black Sea. Scientists point out that the algarna beam trawl can be modified with e.g. wheels and the governmental representatives agree that the algarna must be modified and selectivity prioritized. They do understand the preferences in relation to this gear due to its high yields and one representative points out that "*if algarna is used legally and adequately with the present rules of circular, it will not make any harm..".*

Stakeholders from the fishing industry point out that algarna should be allowed to operate at night at least as it will mitigate impact compared to daytime fishing. The industry is not in favor of pots as a current alternative. They do not see this gear as commercially viable.

Overall there are clear differences or conflicts in the attitudes in the Black Sea stakeholder group regarding use of fishing gear and innovative technological equipment. The fishing industry claims that the Black Sea should be evaluated apart from other localities because of its distinctive ecological features and biodiversity. The management rules should also be constituted on a regional base, it is claimed.

Overall the stakeholder groups point out that scientific studies and an improvable database is essential for a sustainable ecosystem and the management regulations should be based on

these findings. Finally, the fishermen should commit to this development and help test the innovative techniques.

3.5.2.1 Stakeholder support of technical and management measures

The Black Sea stakeholder group chose to rank technical and managerial initiatives in relation to:

1) Beam trawl
2) Bottom trawl

The stakeholders suggested a series of initiatives in the left side of the two tables below and subsequent they ranked the initiatives on a board using green, yellow and red posters. The total ranking can be seen in the right side of the table. If there is a majority of green and partly yellow posters, the initiative is categorized as a harmony area. If stakeholders have ranked the initiative with red posters the initiative is categorized as a conflict area. Areas where it is difficult to decide whether conflict or harmony, are categorized as opportunity areas – there are opportunities for solutions and possible support.

At the top of the table we see which stakeholder groups have ranked which initiatives.

Table 5: Ranking of initiatives in relation to Beam trawl

BEAM TRAWL							
	Initiatives	Decision	S	NGO	G	F	Total
A	To implement wheeled algarna (T)	G	+	+	+	+++	6
		Y	+++	HARMONY			5
		R					0
B	To allow day and night operation and double gear (M)	G				+++	3
		Y	+	CONFLICT			1
		R	++	+	+		4
C	To shorten the duration of dragging (M)	G	+	+	+	++	5
		Y		HARMONY			0
		R					0
D	To ban algarna, to use trap, pot/basket and hookah (T)	G	+	+		+	3
		Y	+++	CONFLICT			6
		R				+++	3
E	To implement only trap and pot as an alternative to algarna (T)	G	+++	+	+	++	6
		Y		HARMONY			0
		R					0
F	To allow algarna between May and December (M)	G				++	2
		Y		CONFLICT			0
		R	++	+	+		4
G	To introduce daily quota for sea snail catch (M)	G	++	+	+		4
		Y		CONFLICT			0
		R				++	2

With regard to the Beam trawl we acknowledge that there are more conflicting initiatives than supportive initiatives. Implementing wheeled algarna has relatively strong support in the stakeholder group and should be considered as a potential initiative. Together with the

managerial initiative that involves shortening the duration time of dragging, there seems to be a basis for further innovations regarding the beam trawl equipment.

Below we see the stakeholder ranking for the bottom trawl initiatives:

Table 6: Ranking of initiatives in relation to Bottom trawl

BOTTOM TRAWL							
	Initiatives	Decision	S	NGO	G	F	Total
A	To shorten the duration of dragging	G Y R	++++	++	++		12 0 0
B	To implement square mesh size (40mm) in trawl net	G Y R	++++++++			++++++	20 0 0
C	To shorten the daily operation time in sea	G Y R	++	+	+	++	6 0 0
D	To mitigate the impact on sea floor by modifying the boards and lead line	G Y R	+	+	+	++	5 1 0
E	To increase the mesh size in bottom trawl nets	G Y R	++	+	+	++	4 1 2
F	To regulate 'depth and distance from land' limitations according to local geographic differences .	G Y R	+	+	+	+	4 2 0
G	To reduce the trawl fishery fleet	G Y R	+++	+	+	+	5 1 1
H	To widen the fishery areas	G Y R	+	+	+	++	2 1 4
I	To close the sensitive coastal habitats to all kind of fishery	G Y R	+++	+	+	++	5 0 2
J	To activate AIS (Automatic Identification System)	G Y R	+++	+		++	4 0 2

There are an equal number of areas of harmony and conflicts among the bottom trawl initiatives. The initiatives listed are mostly within the managerial area and are aimed at regulating the trawl fishery. The stakeholder group assess the technical initiative "Modifying boards and lead lines" as an opportunity area which should be noted. Otherwise the group support initiatives that shorten the duration time of dragging and daily operation time at sea; implement square mesh sizes (40 mm) and regulate the depth and distances from land. Surprisingly activating AIS does not gather support in the group. This is a well-known managerial tool in other regions. Closing sensitive areas is not a harmony area which the industry and a single governmental representative agree on.

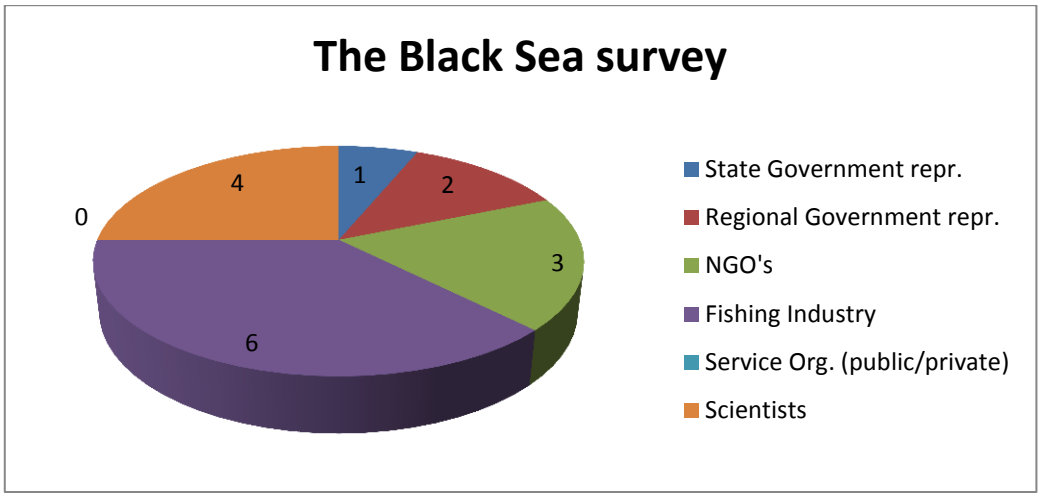
3.5.2.2 Stakeholder attitudes towards BENTHIS topics

Among the Black Sea stakeholders all 16 that participated at the event also participated in the questionnaire survey. As in the other regional stakeholder events the stakeholders expressed their attitudes towards the five topics: Governance, Ecology, Management, Socio-economic and Technology.

Since the representation is not equal among the stakeholders the survey results are not representative on a larger scale and we find the group too small to upscale, but they provide insight into the attitudes of the Black Sea stakeholders present at the meeting regarding important project issues.

The following stakeholder groups represent the Black Sea survey results

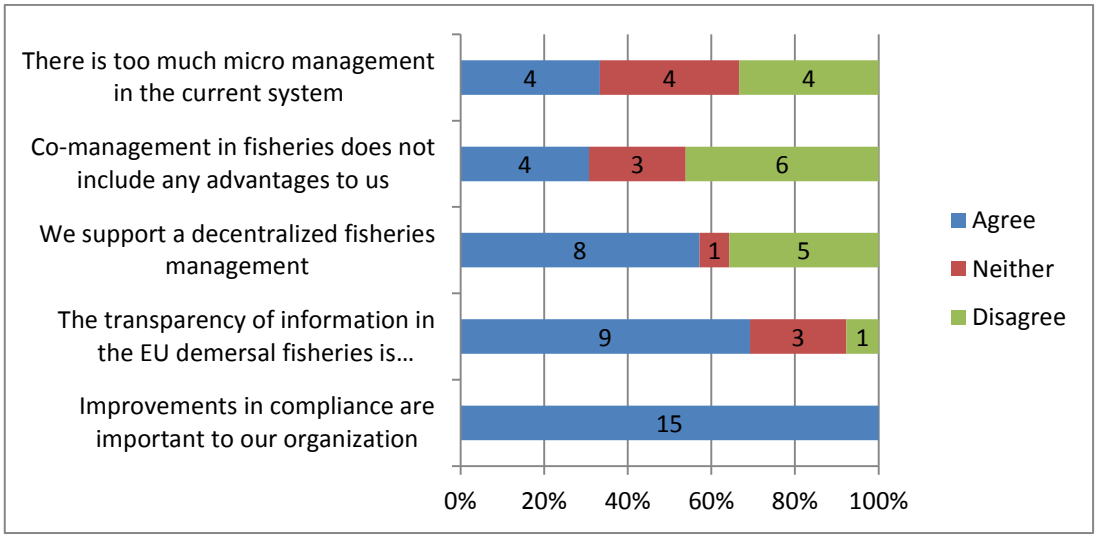
Figure 12: Stakeholder distribution in the Black Sea survey



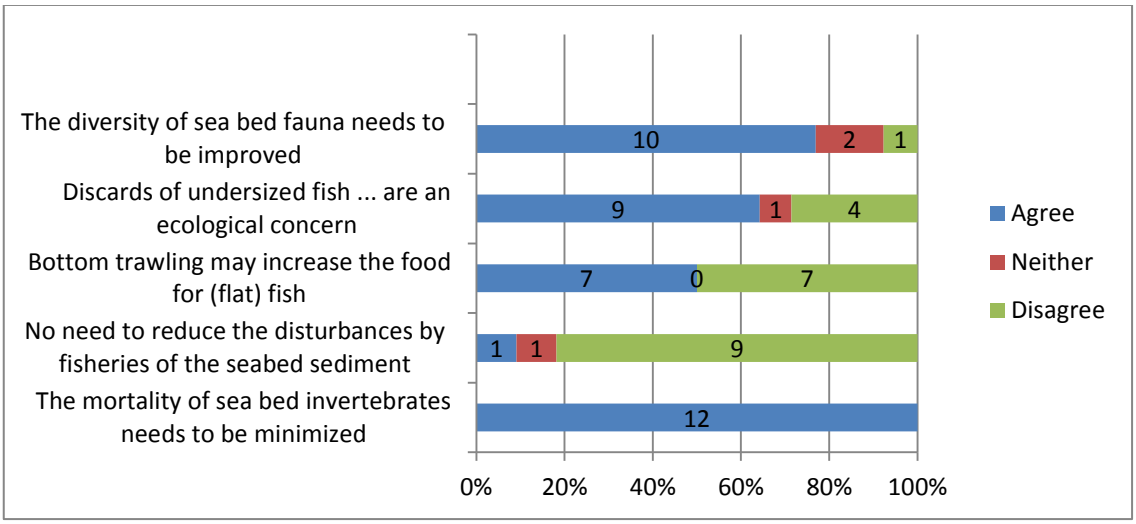
The fishing industry and scientists are relatively well represented in the survey. It should be noted that stakeholders did not fill out all 5 x 5 questions and “Neither” is included as an option in the questionnaire.

The following tables illustrate the survey results from the Black Sea stakeholders:

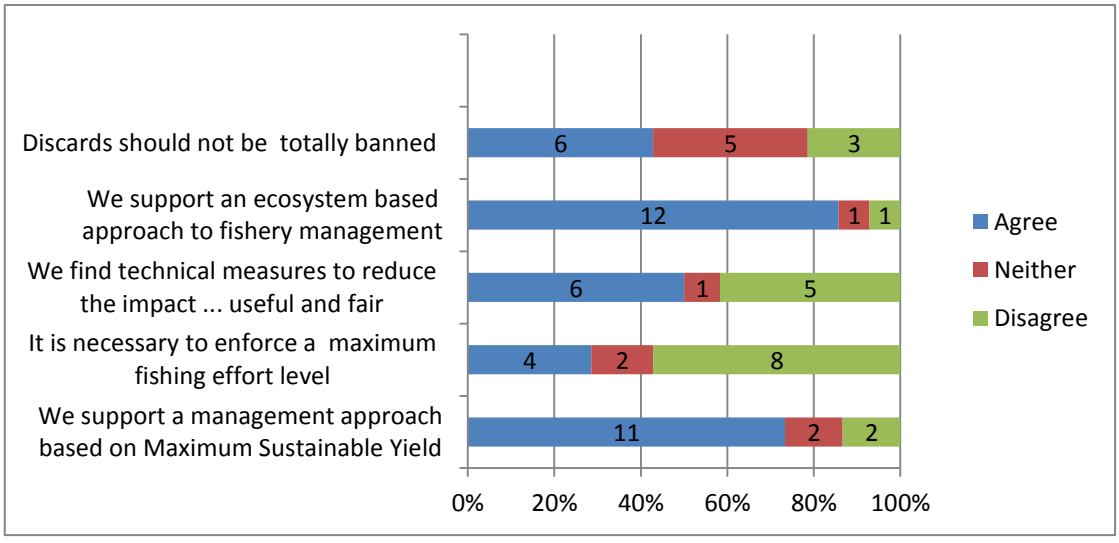
Governance:



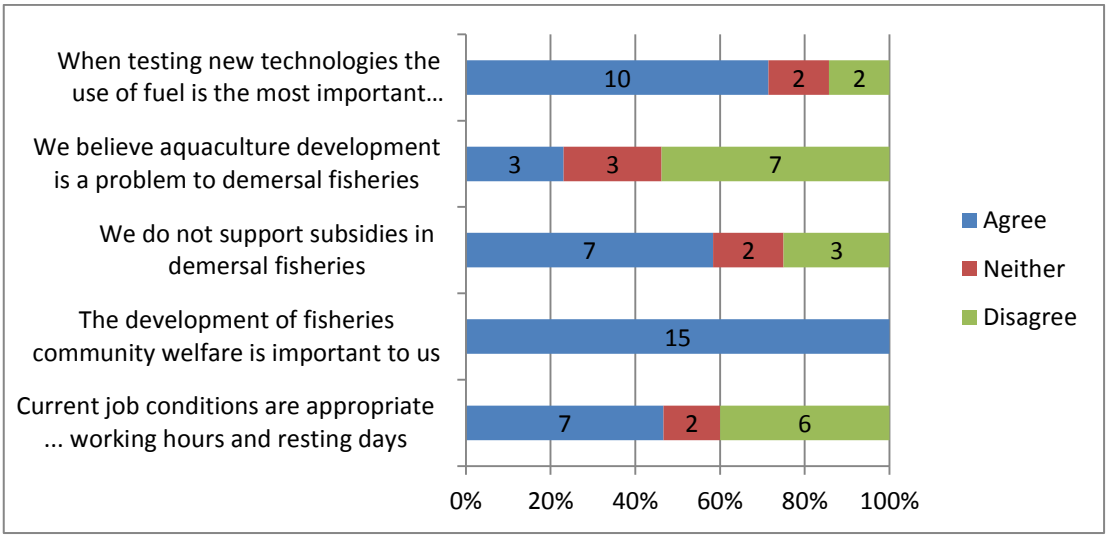
Ecology:



Management:



Socio-economics:



Technology:

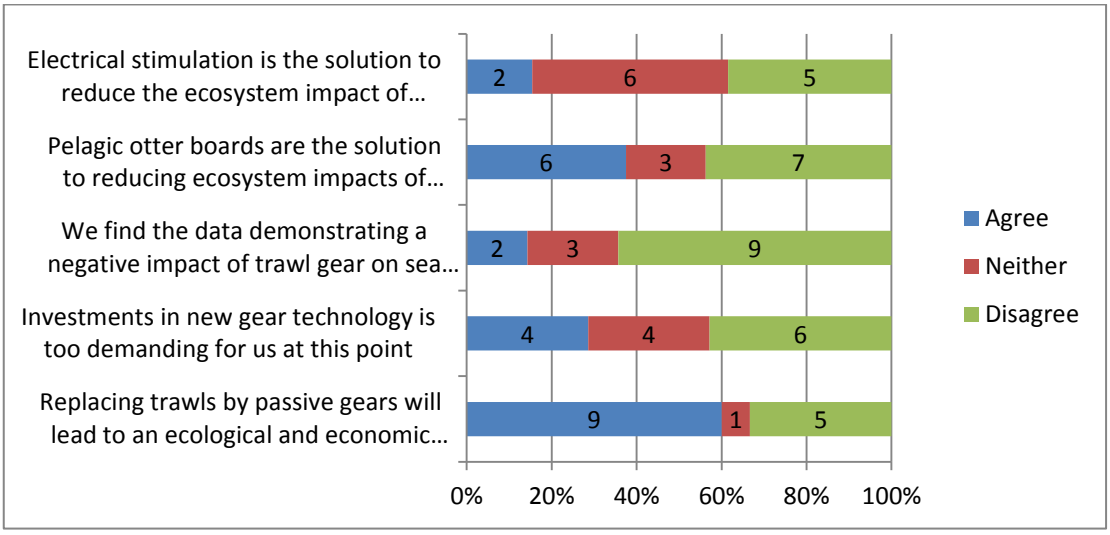


Table 7: Comparison of harmony, conflict and opportunity areas of the Black Sea case study

	Harmony	Conflicts	Opportunites
Governance	The EU transparency	Decentralized fishery managament Co-management no advantage Too much micro management	
Ecology	Improve diversity Minimize mortality of invertebrates Reduce disturbances	Bottom trawling increase food Discards	

Management	Ecobased approach Support of MSY	Discards Technical measures useful and fair Enforce max fishing level	
Socio-economics	Fuel most important factor Community welfare	Jobconditions appropriate	Subsidies
Technology		Investments in technology too demanding Replacing trawls by passive gear	Electrical stimulation the solution Pel. otterboards the solution Data on impact reliable

When highlighting the comments from the open question part in the questionnaire[5] several stakeholders point out selectivity as a priority, more and better controls and a redefinition of allowed gear from the governmental administration.

According to a representative from regional government, socio-economics must be considered when discussing maritime policies. Closure of sensitive habitats is pointed out by NGO's in contrary to fishermen pointing out that more flexible rules should be considered in order to survive.

3.5.3 Evaluation of potential initiatives for the Black Sea Case Study

With regard to the initiatives listed at the meeting, there seem to be support for technological development of the beam trawl (algarna) and for "*Modifying boards and lead lines"* in relation to the bottom trawl. Together with the stakeholder support of some of the regional managerial initiatives listed, there are grounds for taking action in relation to regional technological and managerial innovative initiatives in the Black Sea case study.

From the group discussions, we note that there is a strong or urgent need for collecting basic fishery and ecological data and explore alternative fishing technology to mitigate the negative ecosystem effects. Scientists and governmental representatives seek an improved data collection methodology – "*a standardized method for registering fishery data .."*. This may also be essential in order to evaluate the economic performance measures of the ranked initiatives.

Summarizing on the harmony and conflicts between the Black Sea stakeholders, the different parties have very strong views.

According to the survey we find harmony within transparency of EU information is appropriate, diversity needs to be improved, minimize mortality of invertebrates, need to reduce disturbances, support of an ecosystem-based approach, support of MSY, fuel is the most important factor and development of fishery community welfare is important.

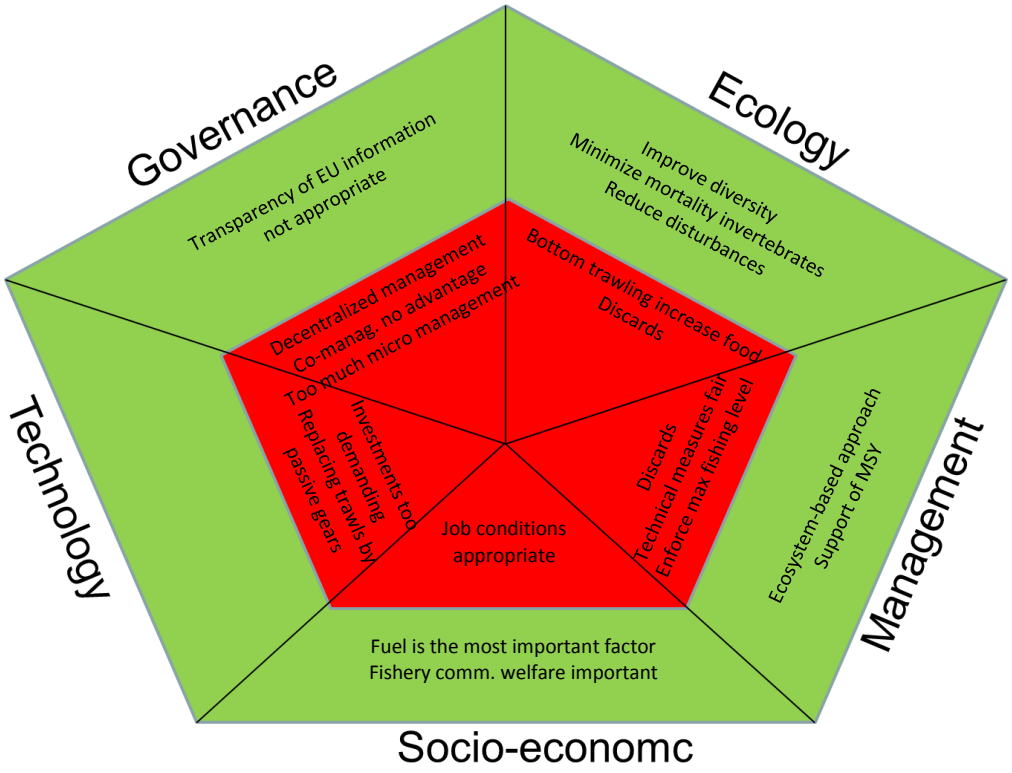
[5] Open question in Questionnaire: "What are Important priorities to you regarding innovative technologies in a sustainable managed demersal fishery":

We find conflicts within the areas of support of decentralized fishery management, co-management no advantage to us, too much micro-management, bottom trawling increase food, discards an ecological concern, discards should not totally be banned, technical measures are fair, enforce a max fishing effort, job conditions are appropriate, investments in technology are too demanding, replacing trawls by passive gears will lead to sustainability. Compared to other regions the numbers of conflicts areas are quite comprehensive in the Black Sea stakeholder group.

We should note that most harmony areas are related to the improvement of the benthic ecosystem and the will to reduce impact. The group supports the need to improve diversity, reduce disturbances etc. but at the same time the group have diverging attitudes towards many of the managerial regulations and initiatives highlighted in the Technology section in the questionnaire.

The results from the harmony-conflict analysis from the Black Sea survey listed in table 7 are alternatively illustrated in figure 13. The green areas are areas where stakeholders agree on the statement put forward and the red area presents statements the stakeholders disagree on, where they are having conflicting attitudes. Areas of opportunities are not presented in figure 13 (see table 7).

Figure 13: Comparison of harmony and conflict areas



The figure reflects the attitudes of the Black Sea stakeholders participating in the survey at the starting point of the BENTHIS project. Note that the red area is relatively “heavy”.

When proceeding with initiatives for reducing impact in the Black Sea case study - technical and managerial – the case study leader needs to be aware of a relatively diverse stakeholder group with different positions with regard to where efforts should concentrate but it is important and rewarding for the process that the will to improve the situation (reduce impact) is present in the Black Sea stakeholder group.

3.6 Baltic Sea analysis

The stakeholder event held in the Baltic Sea case study region is described in appendix H and the individual stakeholders present at the meeting are listed in the attached appendix as well.

3.6.1 Identifying stakeholders

The distribution of stakeholders at the Baltic Sea stakeholder event is illustrated in figure 5 in section 2.3.5. In total 28 stakeholders participated in the event and they represent the largest stakeholder group in the project. There is a relatively large part of stakeholders from the fishing industry (9) and marine scientist represented (9). There are five representatives from NGO’s which is the most at any of the five events. State Government is represented by three stakeholders and service organizations by one and finally a representative from the Baltic Regional Advisory Council attended the Baltic event.

The fishing industry is represented by vessel owners, gear providers and processors as well as a provider of monitoring services for environmental underwater research.

The scientists represented are mainly within the area of marine sciences and technology and are from research institutes and universities which conduct research on aquatic resources.

The service organization present is the Danish National Association of Fisheries whose objective is to represent and promote the interests of the fishing industry.

The NGO representatives are from Greenpeace, WWF and Oceana respectively whose objectives are to preserve the marine and wild life.

The government representatives are from Environmental Departments and Commercial Affairs in Denmark and Sweden respectively. The three governmental stakeholders represent the political and legally managerial system.

The Baltic Sea participants form a balanced and broad stakeholder group representing the defined project stakeholder groups of the BENTHIS project – see section 2.1.

With regard to the reward and contribution analysis the picture for the Baltic Sea stakeholders is quite similar to the general picture but it should be noted that with respect to the expected rewards of the scientist and governmental representatives, regional data and research

information is already available to a high degree in the Baltic region. The stakeholders' motivations for participating lie in the implementation part and their focus in a contribution and reward perspective is in the long term possibilities. As a case study leader, one should be aware that this requires dissemination of performance measures at a relatively early stage in the project which again makes the group able to make decisions on potential alternatives at a relatively early stage as well. This was partly reflected at the EU wide workshop where the Baltic stakeholder group came a relatively long way in their discussions of what impact is – see section 3.7.2.

3.6.2 Harmony and conflict among stakeholder groups

Representatives from the fishing industry initially question the degree of negative impact by fisheries compared to other environmental factors influencing the benthic ecosystem. The different stakeholders, especially NGO's and some governmental representatives have different interpretations of what impact is and when it is severe. This discussion is especially related to the fishery of blue mussels. The Baltic case study focuses mainly on lobster and cod fishery in Kattegat and Østersø respectively and on slam dredging in the area of Lillebælt.

A majority of stakeholders point out that a higher degree of selective gear is desirable with regard to the Baltic fisheries.

Governmental representatives point out that the new fishery policies probably will focus on the ecosystems and have an ecological management approach. What does this mean for the fishery? Instead of focusing on the impact of individual fishstocks, focus is on ecosystems. But how we are supposed to qualify our management system for this approach we really dont know yet, we are searching for solutions. The scientific advisors will have to come forward with the impact issues - what is impact? What levels are acceptable? We have to consider different species when measuring impact and how they are affected by changes in ecosystem - a sort of "Total" fishery management. We have goals for satisfying levels of ecosystems but the problem is deciding how to reach them. Is closing of whole areas a solution or is closing of points the solution? We are not sure yet.

Regarding technological initiatives stakeholders agree that in general they need better documentation for how different gear influences or reduces seabed impact.

In the next section we will identify areas of harmony and conflict among the stakeholders with regard to initiatives in the technical, managerial and environmental area.

After the open discussions in the collective stakeholder group, stakeholders were divided into three groups and were encouraged to discuss and list three to five technical and managerial initiatives that they feel will reduce impact on the benthic ecosystem as well as environmental considerations. The three groups were:

1. NGO's
2. Fishing industry
3. Government representatives

After the group discussions and presentation in plenum, there was a ranking of the innovative initiatives on a board – see next section.

3.6.2.1 Stakeholder support of technical and management measures

The groups suggested a series of initiatives – listed in the left side of the tables below. They ranked the initiatives using green, yellow and red posters. The total ranking can be seen in the right side of the tables.

If there is a majority of green and partly yellow posters, there is harmony in the group with regard to that specific initiative. If stakeholders have ranked the initiative with red posters the initiative is categorized as an initiative that will raise conflicting opinions in the stakeholder group and should be dealt with as such. Areas of opportunities are areas where it is difficult to decide whether the initiative raises a conflict or creates harmony but there are opportunities for possible support since the resistance is relatively small.

At the top of the tables we see how the individual stakeholder groups have ranked the suggested initiatives.

Table 8: Ranking of initiatives by fishing industry

FISHING INDUSTRY							
	Initiatives	Decision	S	NGO	G	F	Total
A	Lobster fishing: Allow larger amount of bycatch in order to reduce discard. (M)	G Y R	++	OPPORTUNITY		+++ ++	3 8 0
B	Investigate the negative impact of the seal population on seabed, fishery and ecosystem (M)	G Y R	+	+++ CONFLICT	+	+++++	10 2 2
C	Investigate the effect of the technical actions that have been implemented the last 10-15 years (M)	G Y R	++ +	HARMONY		++++++	8 3 0
D	Use of floating SKOVLE - possible reduced efficiency (T)	G Y R	+++	+++ HARMONY		++++++	12 2 0
E	Scrabers that are lighter and better localization (T)	G Y R	+	HARMONY		+++++++++	10 7 0
F	Multi rigging in lobster fishing (T)	G Y R	+++	CONFLICT		++++++	6 3 2
G	Less rigid rules (M) - Must not limit the development of innovative gear	G Y R	+	OPPORTUNITY	+	++++ ++	5 3 1
H	Funding opportunities for development of innovative gear (T)	G Y R	++ +	HARMONY		++++++ 11	19 1

Table 9: Ranking of initiatives by governmental representatives

GOV. REPRESENTATIVES							
	Initiatives	Decision	S	NGO	G	F	Total
A	Regionally based management plans for fisheries with an ecosystem approach – thereby less seabed/bottom impact (M)	G Y R	+++	++++	+	+++ +	11 1 0
B	Protected (deep sea) areas which on a totally basis contributes to a better condition/status for bottom habitat (M)	G Y R	+++ +	++++	++	++ +++	9 3 3
C	Both protected areas and demands for gear with less bottom impact – together with financial incentives – this can lead to development of innovative technologies and use of alternative gear (M)	G Y R	+++	++++	+ +	+++ ++++	1 5 0

HARMONY

CONFLICT

OPPORTUNITY

Table 10: Ranking of initiatives by NGO's

NGO's							
	Initiatives	Decision	S	NGO	G	F	Total
A	The objective is to secure the integrity of the ecosystem (M)	G Y R	++	++++	++ +	++ +++++ +	10 7 1
B	Large fully protected areas (M)	G Y R	++ +	++++	++	++++..10	8 1 10
C	Areas where only passive gears is allowed (where development is monitored) (T)	G Y R		+++	++		5 0 0
D	Increasing efficiency regarding none towing gear (T)	G Y R	++	+++++	+	++ ++ ++++++	10 2 6

OPPORTUNITY

CONFLICT

HARMONY

The initiatives listed by the fishing industry form a majority of harmony areas among the Baltic stakeholders. The only conflict relates to multi rigging in lobster fishing. The managerial initiatives listed by the governmental representatives seem to gather support to an ecosystem approach among the stakeholders but there are opportunities within a management initiative both considering protection of sensitive areas and at the same time allowing gear with less bottom impact supplemented with financial incentives. With regard to environmental considerations presented by NGO's, it is clear that fishermen will not accept large fully protected areas as well as none towing gear, but the stakeholders see opportunities in securing the integrity of the ecosystem – initiative A.

Highlighting the initiatives related to technical innovations potential initiative lies in using floating boards, lighter scrapers and development of equipment that is better at locating.

Generating funding opportunities for development of innovative gear also gathers broad support.

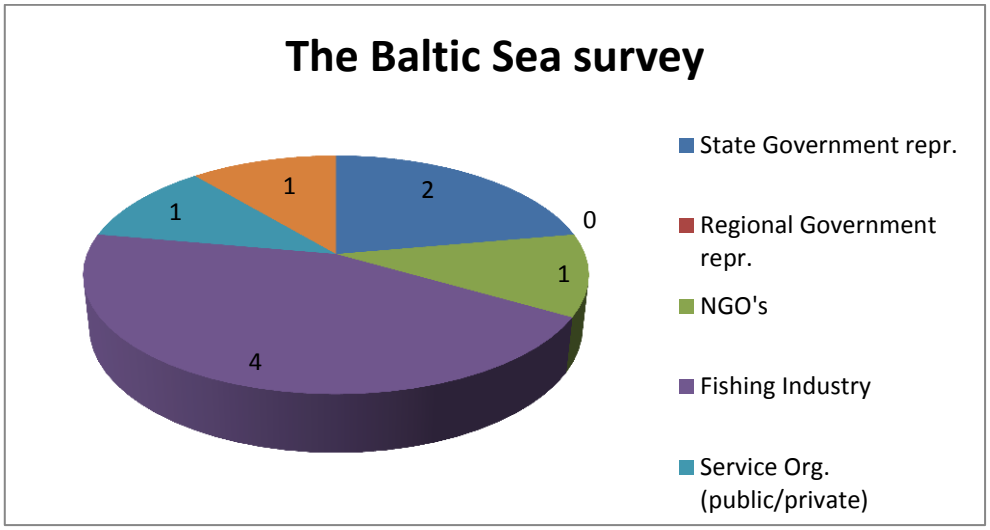
"Protecting sensitive areas" is accepted as a managerial initiative if financial compensation is given. Otherwise an ecosystem approach gathers relatively strong support in the stakeholder group. Referring to the initial discussions, governmental representative point out that there are some ambiguities about the objectives - "*We have goals for satisfying levels of ecosystems but the problem is deciding how to reach them. Is closing of whole areas a solution or is closing of points the solution? We are not sure yet*".

3.6.2.2 Stakeholder attitudes towards BENTHIS topics

Among the Baltic Sea stakeholders 9 participated in the survey. The event was held quite close to the date of the EU wide stakeholder workshop and there was limited time to follow up on the questionnaires subsequently.

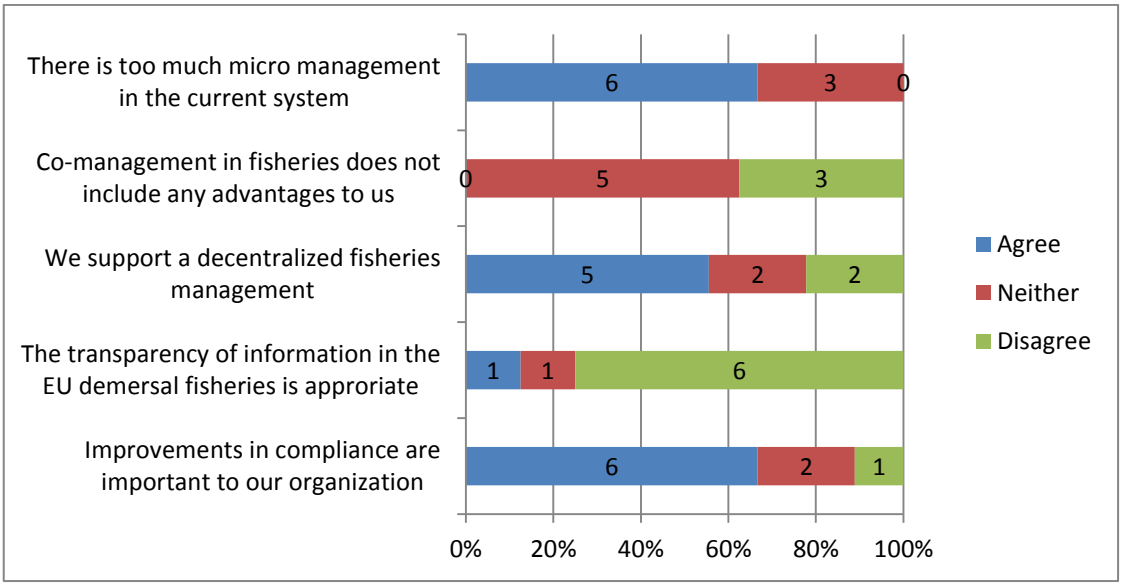
The following stakeholder groups represent the Baltic Sea survey results. It should be noted that the fishing industry is relatively well represented.

Figure 14: Stakeholder distribution in the Baltic Sea survey

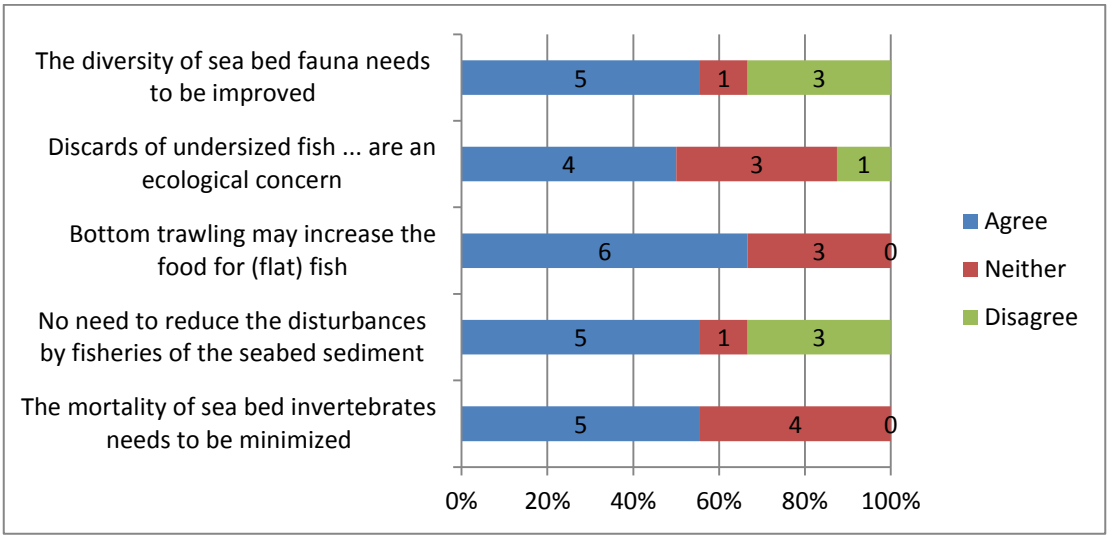


As in the other regional stakeholder events the stakeholders expressed their attitudes toward five topics which the project group has found relevant for the BENTHIS project: Governance, Ecology, Management, Socio-economic and Technology. Since the representation is not equal among the stakeholders the survey results are not representative on a larger scale and we find the group too small to upscale, but they provide insight into the attitudes of the Baltic Sea stakeholders present at the meeting regarding important project issues.

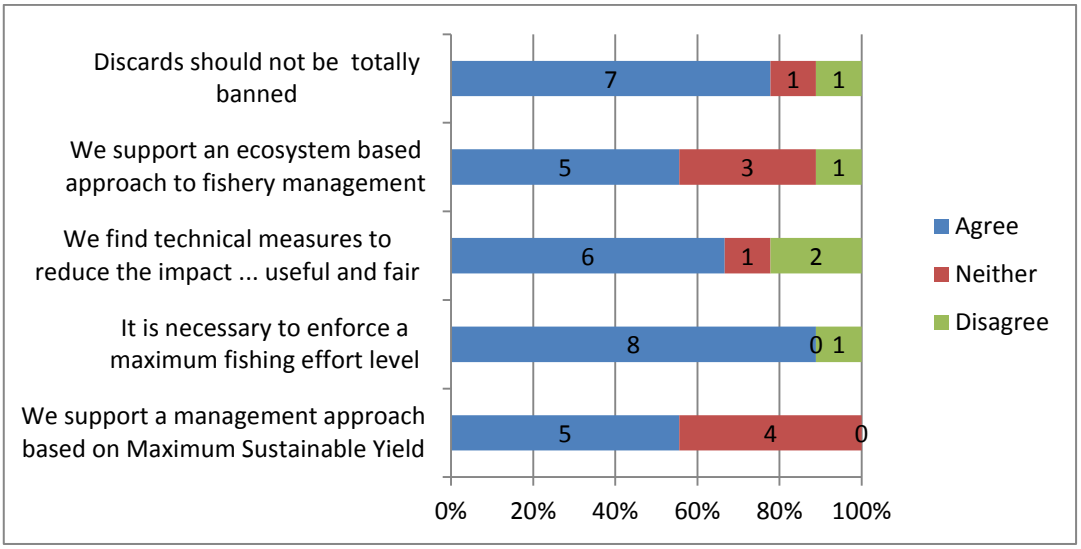
Governance:



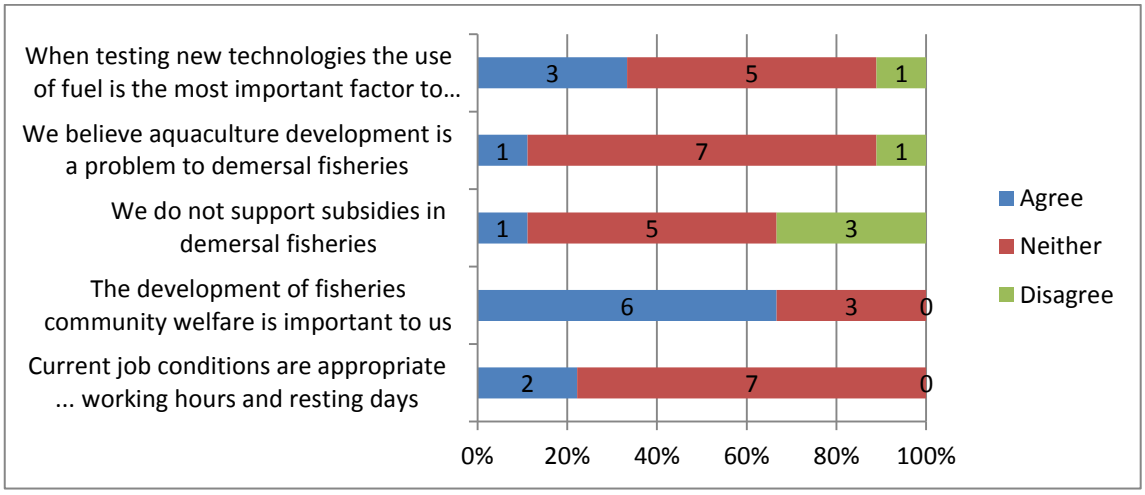
Ecology:



Management:



Socio-economics:



Technology:

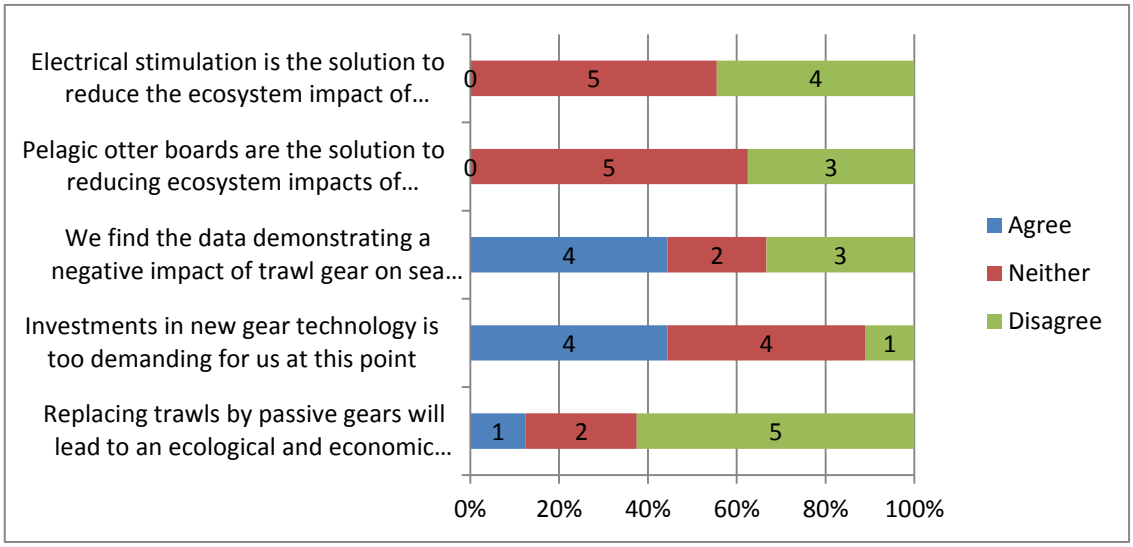


Table 12: Comparison of harmony, conflict and opportunity areas of the Baltic Sea case study

	Harmony	**Conflicts**	**Opportunites**
Governance	Too much microman. EU transparency	Co-management	Decentralized fish. management
Ecology		Improve diversity Need to reduce disturbances Minimize mortality of invertibrates	Discards Bottom trawling increase food
Management	Discards Tech. measures useful Enforce max fishing effort level	Support of MSY	Eco based approach
Socio-economics		Subsidies	Fuel is the most important factor Welfare Jobconditions appropr.
Technology	Replacing trawls by passive gears	Electrical stimulation the solution Pel otterboards the solution Date on impact reliable	Investments too demanding

The comments on important priorities from the Baltic stakeholders focus on “selectivity” as well as on “protecting sensitive areas”. A constructive dialogue and a multiple approach when decisions are made is pointed out and the industry seeks more and reliable data together with counselling on biological consequences of trawling. Industry stakeholders need better access to research data and here is a clear dissemination task for the case study leader to handle.

3.6.3 Evaluation of potential initiatives for the Baltic Case Study

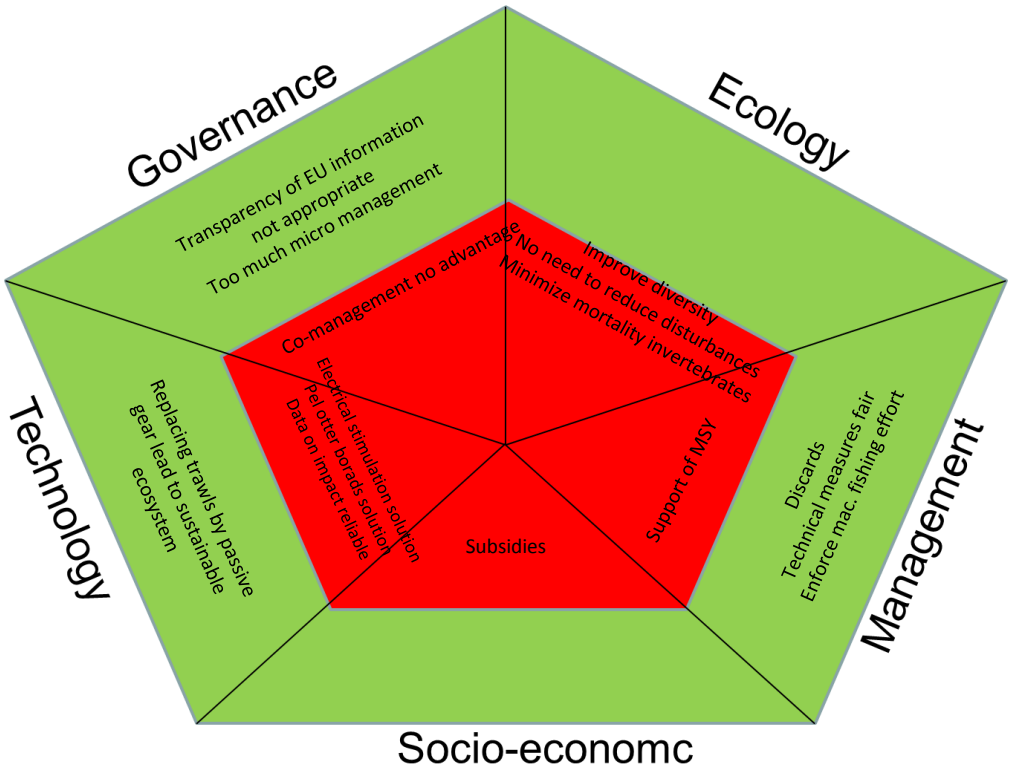
Summing up on the attitudes of the Baltic Sea stakeholder group there are relatively many opportunity areas which they do not clearly agree nor disagree on as a group.

Areas of harmony exist within: Too much micro management, transparency of EU information not appropriate, discards should not be totally banned; technical measures are fair, it is necessary to enforce a maximum fishing effort and replacing trawls by passive gears lead to sustainable ecosystem.

There are conflicts within: Co-management no advantage to us, we need to improve diversity, no need to reduce disturbances, minimize mortality of invertebrates, support of MSY, subsidies, electrical stimulation is the solution to reducing impact, pelagic otter boards are the solution and data on impact are reliable.

The results from the harmony-conflict analysis from the Black Sea survey listed in table 12 are alternatively illustrated in figure 15. The green areas are areas where stakeholders agree on the statement put forward and the red area presents statements the stakeholders disagree on, where they are having conflicting attitudes. Areas of opportunities are not presented in figure 15 (see table 12).

Figure 15: Comparison of harmony and conflict areas



The figure reflects the attitudes of the Baltic Sea stakeholders participating in the survey at the starting point of the BENTHIS project. The case study leader needs to be aware that the

stakeholders participating in the survey agree on limited areas of the five topics but there are a good proportion of opportunity areas to deal with. Since a relatively small part of the Baltic stakeholders participated in the survey it should not be emphasized too much.

With regard to the initiatives listed at the meeting, there seems to be support for technological development of boards and scrapers as well as innovations within efficiency of locating the catch.

With regard to managerial initiatives listed, it seems that a cross between protecting areas and allowing lighter gear that has less impact gathers some support – an opportunity area. Again this point at requirements for technological innovations and according to the stakeholder group, funding opportunities should be provided as well – harmony area.

Stakeholders in the Baltic region support the ecosystem approach according to the ranking of managerial initiatives. From the group discussions, we note that there is a need for decision making on how to reach the goals for an acceptable level of impact. Issues related to “What is impact” and “How to measure impact” were discussed further at the EU wide Stakeholder Workshop (D8.5) where the Baltic stakeholder group were able to clarify these issues further.

4 CONCLUSIONS AND RECOMMENDATIONS

This final part of the report summarises the objectives with the regional stakeholder involvement and the various conclusions on the analyses for each case study region. However, further work needs to be done in order to precede successful stakeholder collaboration and therefore recommendations are suggested in certain areas.

According to the DOW task 8.2 and 8.3 the main objectives with the initial stakeholder involvement (WP 8) are to:

- Identify regional stakeholders
- Provide the core structure for information exchange between the project and its regional stakeholders

Understanding the needs and expectations of the regional stakeholders had been assessed as significant in the BENTHIS project. In order to become aware of the BENTHIS stakeholders in each of the five case study regions and anticipate any problems that their issues might create for the project and its implementation, the 3 step process below have been followed as described in section 1.1 The approach:

1. **Process:**
   How can we best discover the needs of the stakeholders?
2. **Preparation:**
   What information do we need to collect from stakeholders, and how do we plan to use that information?
3. **Performance:**
   What is the most effective way to act upon the information intercepted by the stakeholder analysis?

Steps 1 and 2 have been the focus when organizing the input needed at the first Regional Stakeholder Event – RSE1.

The RSE's 1 have been structured as open dialogue workshops with an exploratory approach (see section 2.2) and in addition to discovering the needs and expectations of regional stakeholders the concrete output or information we have striven to achieve is ranking of important technologies and sustainable management tools for EU benthic demersal fisheries. This output is in terms of the opinion of the regional stakeholders.

Achieving a concrete ranking of technological and sustainable managerial initiatives has worked to a varying degree in the five case study regions. In relation to discussing the benthic issues the individual regional stakeholder groups are at different stages or places and the ranking of initiatives has not been temporally suitable for all regional groups. This, we must note and include in the upcoming planning of RSE2 and not least in the tasks which are related to WP7 (Regional Case Studies).

When analysing the stakeholder information from the RSE's 1 the emphasis has been on:

1) Identifying and describing stakeholder groups
2) Determine:
    - Contribution (interest) and rewards (motives) and long term goals for individual stakeholder groups
    - Harmony and conflict areas (stakeholder attitudes)
    - Technological and sustainable management initiatives

The summarized results of the analyses show the following:

1. **Mediterranean**
    a. Support of technological initiatives for reducing impact
        i. Pelagic otter boards and ground gear modifications
        ii. Fuel savings the most important driver
    b. Provide Cost-benefit analyses and disseminate
2. **Western Waters**
    a. More evidence is needed for accepting the relationship between negative impact and trawling. A clarification of what impact really means and what it implies is clearly necessary in order for project scientists and stakeholders to be on the same page.
    b. Need cost-benefit analyses before assessing possible initiatives for reducing impact on the benthic ecosystem in Western Waters.
3. **North Sea**
    a. A relatively diverse stakeholder group with different positions with regard to the perception of the seriousness of fisheries impact and the need to mitigate possibly negative impact.
    b. Objectives need to be clear: What are we aiming for when we discuss impact on the ecosystem and mitigation strategies – what do we need to achieve?
    c. Technological innovations within gear that “reads the sea floor”
4. **Black Sea**
    a. Support of technological development of the beam trawl (algarna) and the bottom trawl.
    b. Urgent need for collecting basic fishery and ecological data and explore alternative fishing technology to mitigate the negative ecosystem effects.
    c. A relatively diverse stakeholder group with different positions with regard to where efforts should concentrate but there is a strong will to take action and improve the situation (reduce impact) in the Black Sea stakeholder group.
5. **Baltic Sea**
    a. Support of technological and sustainable management initiatives
        i. Boards and scrapers – lighter gear
        ii. Efficiency in locating the catch
        iii. Ecosystem based approach to sustainable fishery management
    b. Urgent need for a decision on an acceptable level of impact when regulating the demersal fisheries based on an ecosystem based approach (how much pressure should we tolerate?)

In addition to the presented conclusions the regional case study leaders need to consider the support and resistance (harmony and conflict areas) in the specific stakeholder group and how this will affect the further collaboration with the stakeholders. Obviously, focusing on areas that gather support in the stakeholder group prevents friction in the group.

4.1 Recommendations for the continuing stakeholder process

In closing, there are some topics that are applicable to all the five case studies. These topics have come to light during the RSE's 1, and based on our[6] perceptions of the stakeholder process and results we recommend the case study leaders to pay attention to the following areas in the on-going stakeholder collaboration:

- Decide and disseminate estimated regional impact – how much pressure (impact) should be tolerated?
- Cost-benefit analyses should be provided in all case studies in relation to technological and sustainable management initiatives – the dissemination is essential, see individual evaluations.
    - Bear in mind that fuel savings is the most important driver for the industry part of the stakeholder groups when assessing impact and mitigation initiatives.
- When trying to achieve support of claims and contexts in relation to benthic issues, more and precise data should be presented and disseminated by case study leaders (BENTHIS scientists) in order to obtain interest, motivation and support from regional stakeholders.

[6] Syntesa – SME01, leader of task 8.3: Regional Stakeholder Events and dissemination

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APPENDIX A: LITERATURE ON STAKEHOLDER ANALYSIS AND MAPPING

- Mitchell, Agle et al. (1997) proposed a classification of stakeholders based on power to influence, the legitimacy of each stakeholder's relationship with the organisation, and the urgency of the stakeholder's claim on the organization. The results of this classification may assess the fundamental question of "which groups are stakeholders deserving or requiring manager's attention, and which are not?" This is salience - "the degree to which managers give priority to competing stakeholder claims" (Mitchell, Agle et al., 1997:854)

- Fletcher, Guthrie et al. (2003) defined a process for mapping stakeholder expectations based on value hierarchies and Key Performance Areas (KPA),

- Cameron, Crawley et al. (2010) defined a process for ranking stakeholders based on needs and the relative importance of stakeholders to others in the network.

- Savage, Nix et al. (1991) offer a way to classify stakeholders according to potential for threat and potential for cooperation.

- Turner, Kristoffer and Thurloway (2002) have developed a process of identification, assessment of awareness, support, influence leading to strategies for communication and assessing stakeholder satisfaction, and who is aware or ignorant and whether their attitude is supportive or opposing.

- Kennon, Howden and Hartley have developed a stakeholder analysis tool better suited to project planning, which allows project teams to consider the important human and social capital resources required to improve project planning and implementation.

- Gregersen (2011) has demonstrated a stakeholder analysis in order to obtain a balanced view with regard to practicality and acceptability of precision livestock farming (PLF) technologies within the livestock and aquaculture industry, especially focusing on agreement and disagreement among stakeholders towards PLF, requirements on contribution and reward from each stakeholder and possibilities for new practices and procedures arising from PLF.

APPENDIX B: LETTER OF INVITATION

Dear _____,

On behalf of the BENTHIS Project Consortium we kindly invite you to participate in the first regional stakeholder event that will take place on March ___, 2013 at _____ .
The stakeholder event is the first of three events, the second taking place in the autumn 2014 and the third in 2016.

WHO SHOULD ATTEND?

The framework of the BENTHIS project considers innovative technologies in a sustainable managed demersal fishery. For more detailed information about the project please go to: http://www.wageningenur.nl/en/show/Benthic-Ecosystem-Fisheries-Impact-Study-BENTHIS.htm.
We approach all group of stakeholders with business and other interest in demersal fisheries. The event may be of special interest to: Fishing companies and employees, technology providers, fish business agencies, vessel owners and agents who support the demersal fishing industry in different ways as well as representatives of NGO's and governmental employees responsible for fisheries management.
The success of the BENTHIS project will critically depend on an open and transparent communication between scientists, the fishing sector and other stakeholders about research focus and the interpretation of results. We look forward to your participation in this important project and appreciate your help in increasing the understanding of issues related to demersal fishing in your region.

WHAT IS HAPPENING?

This first stakeholder event will be organized as an open dialog workshop with a facilitated brain storm process among local stakeholder groups. The process will include discussions of the following topics:

1. Improve the understanding of selected fisheries and related technologies
2. Assess the effect of existing and novel technologies on seabed ecosystem
3. Discuss possible consequenses for the industry – ecological and economic factors
4. Ranking of potential initiatives that mitigate possible negative effects

In order to clarify the position of the fishing industry and other stakeholders on a range of issues we would like you to answer the quesstionnaire below and bring it to the stakeholder event. At the end of the program we will present the results to you and they will be presented anonymously.
We are looking forward to welcome you at [venue] on [weekday and date]
Yours sincerely,

AGENDA

Time	Topic	Speaker
9:00-9:15	**Introduction**	
9:15-10:15	**Presentations of novel benthic technologies**	
10:15-11:00	**Discussion in groups of 2-3 initiatives and brain storm improvements**	
11:00-11:15	**Refreshments**	
11:15-11:45	**Presentation in plenum with Questions & Answers**	
11:45-12:15	**Scoring of proposed initiatives**	
12:15-12:45	**Summarise scoring and conclusion**	
12:45-13:30	**Lunch**	

APPENDIX C: QUESTIONNAIRE RSE1

1. Organization name (optional): _____

2. Type of organisation (main activity):

If Public Organization:
- 2.1.1 Regional government ☐
- 2.1.2 State government ☐
- 2.1.3 Fishing authority/control ☐
- 2.1.4 Other ☐

If Private Organization
- 2.2.1 Fishing vessel owner/crewmen ☐
- 2.2.2 Fish processor ☐
- 2.2.3 Wholesaler/retailer ☐
- 2.2.4 Logistics and transport ☐
- 2.2.5 Gear/technology provider ☐
- 2.2.6 Other service organisation (Legal, Accountant, Consultants etc.) ☐

If Other Organisation:
- 2.3.1 Environmental NGO ☐
- 2.3.2 Consumer representative ☐
- 2.3.3 Other (please specify): _____

3. Contact details (optional) (contact person, mail): _____

4. Your role in the Organization: __ Top Management __ Middle management ___ Other

1. Mission of the organization: _____

2. How do you rate your agreement or disagreement with the following statements?

Topics	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Governance					
Improvements in compliance are important to our organization	☐	☐	☐	☐	☐
The transparency of information in the EU demersal fisheries is approriate, eg. economic, biologic, environment, social, and politic	☐	☐	☐	☐	☐
We support a decentralized fisheries management	☐	☐	☐	☐	☐
Co-management in fisheries does not include any advantages to us	☐	☐	☐	☐	☐
There is too much micro management in the current system	☐	☐	☐	☐	☐
Ecology					
The mortality of sea bed invertebrates needs to be minimized	☐	☐	☐	☐	☐

Topics	Strongly agree	Agree	Neither	Disagree	Strongly disagree
There is no need to reduce the disturbances by fisheries of the sea bed sediment	☐	☐	☐	☐	☐
Bottom trawling may increase the food for (flat) fish	☐	☐	☐	☐	☐
Discards of undersized or non-commercial fish in demersal fisheries are an ecological concern.	☐	☐	☐	☐	☐
The diversity of sea bed fauna needs to be improved	☐	☐	☐	☐	☐
Management					
We support a management approach based on Maximum Sustainable Yield	☐	☐	☐	☐	☐
It is necessary to enforce a maximum fishing effort level	☐	☐	☐	☐	☐
We find technical measures to reduce the impact of fishing on the benthos useful and fair	☐	☐	☐	☐	☐
We support an ecosystem based approach to fishery management	☐	☐	☐	☐	☐
Discards should not be totally banned	☐	☐	☐	☐	☐
Socio-economy					
Current job conditions are appropriate with respect to working hours and resting days	☐	☐	☐	☐	☐
The development of fisheries community welfare is important to us	☐	☐	☐	☐	☐
We do not support subsidies in demersal fisheries	☐	☐	☐	☐	☐
We believe aquaculture development is a problem to demersal fisheries	☐	☐	☐	☐	☐
When testing new technologies the use of fuel is the most important factor to consider	☐	☐	☐	☐	☐
Technology					
Replacing trawls by passive gears will lead to an ecological and economic sustainable fishery on bottom dwelling fish	☐	☐	☐	☐	☐
Investments in new gear technology is too demanding for us at this point	☐	☐	☐	☐	☐
We find the data demonstrating a negative impact of trawl gear on sea bed community to be unreliable	☐	☐	☐	☐	☐
Pelagic otter boards are the solution to reducing ecosystem impacts of bottom trawling	☐	☐	☐	☐	☐
Electrical stimulation is the solution to reduce the ecosystem impact of bottom trawling	☐	☐	☐	☐	☐

3. Finally, what is an important priority for you regarding the subject “Innovative technologies in a sustainable managed demersal fishery”?