

Tools for Assessment and Planning of Aquaculture Sustainability



SHORT TITLE:	TAPAS
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ORGANISATION:	University of STIRLING, UK
TOPIC:	H2020- SFS-11b-2015
PROJECT NUMBER:	678396

DELIVERABLE: 4.1

TAPAS Stakeholder Workshop

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History of changes:

Ver	Date	Changes	Author
Ver 1	28.09.2016	First version	Trine Dale and Sindre Langaas
Ver 2	29.09.2016	Input of results from break-out group discussion. Feedback and suggested editions on text.	Trevor Telfer and Lynne Falconer
Ver 3	04.10.2016	Input of results from break-out group discussion. Feedback and suggested editions on text.	Dave Jackson and Joanne Casserly
Ver 4	05.10.2016	Final version	



Refer to this document as: .

Trine Dale, Sindre Langaas, Lynne Falconer, Trevor Telfer, Dave Jackson, Joanne Casserly. Tools for Assessment and Planning of Aquaculture Sustainability (TAPAS) Stakeholder Workshop; outcomes. Held at the Aquaculture Europe 2016, Edinburgh, 23 September 2016. Deliverable 4.1, 24 pp.



SUMMARY

The TAPAS project - Tools for Assessment and Planning of Aquaculture Sustainability - aims to create cost-efficient management tools and practices for the European aquaculture sector to investigate the scope of fish and shellfish farming activity in a location, social interactions, potential environmental impacts and any future risks.

This report describes the first stakeholder workshop, which was on an informative/consultative level. The workshop consisted of two sessions. The first, a series of presentations introducing the TAPAS project to the participants and two further presentations about aquaculture licencing and “bottlenecks” followed by an introduction to ecosystems services and their interaction with aquaculture with respect to how the ecosystem services methodology fits into the TAPAS approach to sustainable development. Session two, was a break-out session. Workshop participants participated in group discussion and the subsequent findings were fed-back to the participants by rapporteurs from each group.

Participants at the workshop had the opportunity to hear and discuss all ideas and concerns with regards to:

1. Aquaculture policy, social carrying capacity of aquaculture
2. EU licencing policies, regulations and bottlenecks for national or regional production
3. Ecosystems services, and their trade-offs, provided and required by European Aquaculture

In summary from the discussions; In relation to food security, there was no unanimous agreement. It was acknowledged that food security is more recognised on a global level rather than locally. The general consensus was that there was no clarity in relation to acceptable impacts of aquaculture. Opinion varied locally and by region. The balance between public perceptions, benefits of aquaculture and ecosystem impacts were the keys in structuring opinions. Overall the delegates agreed that timelines were not acceptable in their current form. Opinions offered highlighted the lack of a timeline rather than the length of the timeline to be the main concern. Licencing, finance and innovation were considered the main bottlenecks to development of aquaculture. The overall consensus of the group was that licencing was a huge bottleneck. Stakeholder engagement was recognised as a key component to the success of the project. The group found that ecosystem services, as a concept, are poorly understood both within the industry and by the general public.

This report provides Deliverable 4.1, for the EU Horizon 2020 TAPAS project, but also makes a significant initial contribution into Deliverable 2.3, which is due for completion in February 2017.

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Rationale and Objectives

The Tools for Assessment and Planning of Aquaculture Sustainability (TAPAS) project, aims to help consolidate the environmental sustainability of European Aquaculture by developing tools, approaches and frameworks to support member states in establishing an efficient regulatory framework, implementing strategic guidelines for the sustainable development of European Aquaculture and developing technology and a decision framework for sustainable growth. In order to achieve such objectives establishment and coordination of stakeholder groups is central to the project.

An important task in TAPAS is to assess the combined environmental and social impacts of aquaculture, and by this identify the economic instruments, management tools and farm practices that will support and incentivize the sustainable development of European aquaculture. A key concept in the TAPAS approach to sustainable development is the concept of ecosystems services. To identify the ecosystems services provided by different segments of European Aquaculture and to develop tools for the quantification of these services is a stated goal in the project. Stakeholder engagement is vital for the assessment and valuation of ecosystems services. Only six months into the project our work has just started, but already at this early stage we want feedback on our approach and on how to ensure stakeholders engagement during the project.

This stakeholder workshop was informative and partly consulting, and will feed into work carried out in TAPAS WP 2 (Requirements Analysis and Stakeholder Integration) and WP 4 (Ecosystems Services and Societal Models).

Workshop also offers the opportunity to build stakeholder partnerships. Throughout the project the inclusion of stakeholder feedback and information is crucial not only in the early stages of data collection but throughout the project to provide feedback on the various steps taken by consortium partners. For example central to task 2.6 stakeholder involvements will be key in development of TAPAS tools and testing of prototypes. Engagement with stakeholders in this early stage of the projects allows for the building of longstanding stakeholder partnerships which will be relied upon as the project develops.

Task objective

Work Package Two (WP2) of the TAPAS project focuses on Requirements Analysis and Stakeholder Integration. The consortium partners of WP2 are tasked with developing a common methodology for data collection on policy, social carrying capacity of aquaculture and the regulatory implementation from the industry, regional and national authorities and stakeholders. This will support member states to establish a coherent and efficient regulatory framework aimed at sustainable growth.

The WP2 partners have set out to collect data from a wide array of stakeholders to quantify the cause of variations in the licensing process, identify bottlenecks and recognise any regulatory and monitoring problems. Central to this collection of data is the complementary building of long standing stakeholder partnerships which help to build deeper insight and trust and give continuity of stakeholder input.

Task 2.2 consultative work aims to capture the current issues within the aquaculture sector in relation to licensing problems, industry bottlenecks and monitoring problems. A workshop offers a platform to capture this information.

The key objective of **Work Package Four (WP4)**, is to draft a general framework to assess the ecosystems services (ES) provided (and required) by European Aquaculture, the provisioning food being the most apparent. The provisioning services are also the most easily valued, since aquaculture commodities are traded in well established markets. However, aquaculture, particularly extractive aquaculture such as shellfish and macroalgae, also produce ES other than provisioning (e.g. nutrient removal, turbidity reduction, habitat provision and carbon sequestration) as these do not have 'established markets' they are far more difficult to quantify. There is no "one approach fits all" for the assessment of ES, and the approach taken will depend on issues such as type of political/management/regulatory decisions the ES assessment is intended to inform, data availability and scale.

In this task we will build on recently developed frameworks and through a "fitness for purpose" literature review of existing tools and models suggest a suite of alternatives suitable for the main segments of European Aquaculture. This framework will be refined through expert and stakeholder workshops. Data and methods to assess the provision of marine and coastal ecosystem services are scarce compared to terrestrial systems. In this task we will also identify sources of data and suitable indicators.

Introduction to stakeholder workshop

Ecosystem Services can be defined as the benefits people obtain from ecosystems, our natural environment. Not all services are easily quantified and as a result not easily interpreted and understood, Stakeholder involvement therefore, is considered crucial in order to get meaningful assessment of ecosystems services. According to Cash et al. (2003), scientific information is likely to be effective in influencing social responses to the extent that the information that is perceived by stakeholders is credible, relevant and legitimate. Credibility involves the scientific adequacy of the technical evidence and arguments. The issue of relevance, deals with the significance of the assessment with respect to the needs of decision makers. Legitimacy reflects the perception that the production of information and technology has been respectful of stakeholders' divergent values and beliefs, unbiased in its conduct, and fair in its treatment of opposing views and interests (Cash et al. 2003). Stakeholder involvement refers to participation of interest groups (i.e. representatives of local communities, national or local government authorities, politicians, civil society organizations, trade associations and businesses).

There are several levels and forms of stakeholder involvement. According to the BiodivERsa stakeholder handbook (Durham et al. 2014), at least four levels can be defined; (1) "information" (share information with passive stakeholders), (2) "consulting" (they are asked for opinions or information), (3) "involvement" (they are engaged, and may also provide resources or data) and finally at the highest level (4) "collaboration" (fully active engagement is undertaken, stakeholders are effectively partners with the research team, driving the research direction, and/or contributing resources and perspective). The level of

stakeholder engagement is project dependent. The TAPAS project is still in a very early phase, and different levels of stakeholder engagements will be employed during the project. A stakeholder involvement plan is under development.

Venue, participants

The stakeholder workshop was carried out during the Aquaculture Europe (AE) meeting in Edinburgh, Scotland, 23rd September 2016. The workshop was targeted to a wide audience including representatives from aquaculture operators and organisations, regulators, policy makers and scientists. The workshop provided an opportunity for partners to engage with stakeholders about the TAPAS project and provide information for WP2 and WP4. The workshop was publicised through several means; The TAPAS website where participants could register directly (<http://tapas-h2020.eu/ae2016-forum/>), Advertisement by email to stakeholders known by partners, Advertisement on social media via Twitter and LinkedIn, Printed invites distributed from the University of Stirling and AquaBioTech booth the AE 2016 tradeshow (samples of which can be found in Appendix I) and by approaching stakeholder booths at EA 2016 giving direct invites.

A total of 33 attendees participated at the workshop. The participants list consisted of individuals from research institutions (both consortium members and other institutions), consultants companies, EU commission, aquaculture industry and UK governmental organizations.

Program and implementation

The workshop was designed to provide delegates with an opportunity to gain insight and contribute to the TAPAS project. When designing the programme, key objectives included:

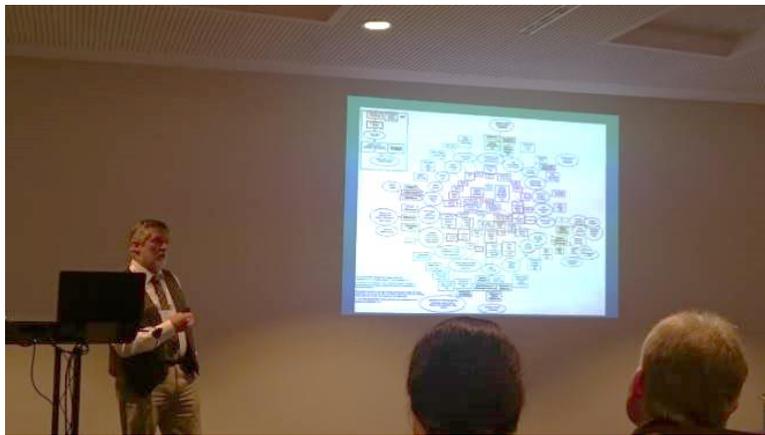
1. Dissemination- allowing for introduction and dissemination of project goals.
2. Question and Answers- encouraging and accommodating questions and answers from those involved, boosting communication and discussion around the topic aquaculture.
3. Involvement of stakeholders- ensuring involvement and participation by everybody present by providing a means of collecting data (this was achieved by forming groups within the breakout session).
4. Collection of data- allowing time for communicating findings within groups to the wider audience to maximise sharing of information and collection of data.

The workshop was divided into two sessions. The first consisted of three presentations, the second, a break out session allowed the workshop delegates to form smaller groups for a discussion segment. This session provided representatives from the aquaculture industry, scientists, strategic planners and regulators with an opportunity to engage with TAPAS partners and offer their opinion on their experience of current EU licensing policies; helping to develop a guideline for effective licensing processes to be adapted within EU states.

Session One: Presentations

A presentation was given by each of the WP leaders to give information on the needs and outcomes, and why stakeholder engagement is important. After each, or at the end, there was an open Q & A session to gather feedback and suggestions from the stakeholders. Presentations were prepared to; introduce the TAPAS project, followed by a presentation on the legislation impacting aquaculture and a presentation on the ecosystems services provided by European aquaculture. All three presentations can be found in Appendix III.

1. ***TAPAS: What it is and why it is useful to you?***
Presented by Trevor Telfer.
2. ***Critical Review of Legislation and Practice and their impact on aquaculture development.***
Presented by Dave Jackson
3. ***Ecosystem Services Provided by European Aquaculture.***
Presented Trine Dale.



Dr Dave Jackson introducing the concept of the 'Horrendogram', an array of current statutes and directives within the EU, giving protection to the marine environment (Boyles & Elliot 2014).

Session Two: Break-out session

The second session or 'break-out' session of the workshop was moderated by Dave Jackson and Trine Dale. Workshop delegates divided into random groups. There were three groups in total. The smaller groups allowed for an in depth analysis. This was achieved by inclusion of points from each of the group members with data on their individual sectors.

To assist with coordination of these discussions, two TAPAS consortium members lead each group. Their purpose was to record findings, mediate discussions and act as rapporteurs. By delegating the role of rapporteur, it allowed for a more in depth analysis of the representative sectors but not excluding any participants as the information was able to be summarised and shared as a whole before close of the workshop.

Participants were given a list of topics/questions that served as a framework for the break-out group discussions. The topics were:

1. *Is aquaculture recognised as a contributor to food security?*
2. *Is there clarity on acceptable impacts of aquaculture?*
3. *What is an acceptable timeline for a decision making process?*

4. *What are the bottlenecks to developing aquaculture?*
5. *How can TAPAS involve stakeholders?*
6. *Are ecosystems services besides food provisioning known and recognized?*

Summary of break-out group discussions

Groups discussed policy, social carrying capacity of aquaculture, and regulatory implementation from the industry, regional and national authorities and other stakeholders. Through discussion the group identified relevant EU licensing policies, regulations and bottlenecks for national or regional production. In relation to ES, groups discussed possible frameworks for the assessment of ecosystems services (ES) provided from European aquaculture and the possible trade-offs that exists between aquaculture provisioning services and other ecosystem services.



A flow-through of the workshop methodology on the day. This was to allow for maximum use of time and opportunity to gather data whilst incorporating stakeholder feedback and engagement.

The key points from each of the discussions were reported back to the workshop delegates. The proceeding remarks represent the stakeholders' point of view and the plenary summary is presented below in the topical format which guided the discussions.

1. Is aquaculture recognised as a contributor to food security?

- The issue of food security is not perceived as a big European issue as long as food is available in the shop (even though Europe is currently a net importer of fish and agricultural food products and this is increasing)
- In Europe there are alternative sources of protein. Salmon, for example, is considered a luxury product rather than a necessity or main protein provider. So food security is more relevant at the global scale rather than national.
- Looking at the “big picture”, people do appreciate that aquaculture will contribute to food security globally.
- In Spain there is increased consumption of fish, people prefer cultured fish because of better control over production processes and feed usage. Therefore it is considered safer than wild caught fish
- In Norway, the agricultural sector does not count fish as contributing to national self-sufficiency in provision of food – of course this is not accepted by the aquaculture sector
- In Ireland there is an anti-aquaculture attitude from the angling community.
- Should also consider social and economic security. Aquaculture provides jobs and income in rural areas where other opportunities are limited.

In relation to food security, there was no unanimous agreement. It was acknowledged that food security is more recognised on a global level rather than locally.

2. Is there clarity on acceptable impacts?

- It depends on where you are and who you are.
- A location issue: Some municipalities are more positive regarding the impacts of aquaculture, some is less positive. But there is no clarity.
- There is a trade-off between impacts and societal benefits. Communities reliant on aquaculture for jobs may be likely to accept more “impacts” than others.
- The public conception of the status and trends with regard to the impact of aquaculture is not really known, because media tend to highlight negative news and events, not trends.
- Objections by local inhabitants. In particular owners of holiday homes and local fishermen are very influential and shaping “acceptable impacts”.
- All stakeholders have different opinions.
- Farmers have to go through the same impact assessment process for every single site, even those in very similar locations.
- An alternative approach has been used by the onshore wind sector, who acknowledges there will be impacts and they provide money to the local community as a form of compensation to account for that impact. However, that introduces other issues as to how much an impact is worth etc. and who can benefit from it.
- For agriculture there is nothing comparable – much easier to expand and start up new businesses

The general consensus was that there was no clarity in relation to acceptable impacts of aquaculture. Opinion varied locally and by region. The balance between public perceptions, benefits of aquaculture and ecosystem impacts were the keys in structuring opinions.

3. What is an acceptable timeline for a decision making process?

- Lack of timelines for decision making is problematic. The group were asked, how long the licensing process took, answers varied from 6-12 months to indefinite. When asked, 'what you think would be a realistic but acceptable timeline', the group answered, 'should be 4-6 months, similar to planning on land'.
- One concern was that either time lines or a tracking system should be instigated to identify hold ups when applying/renewing or dealing with licensing.
- Stakeholders felt that a reluctance or inability to make a decision by regulators delayed the process.
- Gap between the industry and research was identified.
- The environmental impact statement (EIS) is not considered impartial as the license applicant pays to get this done rather EISs should be carried out by an independent organisation.

Overall the delegates agreed that timelines were not acceptable in their current form. Opinions offered highlighted the lack of a timeline rather than the length of the timeline to be the main concern.

4. What are the bottlenecks to developing aquaculture?

- Licenses are too lengthy and costly to apply for. Licenses are too short once granted. Need of a more simple process for renewals and amendments, renewal are just as complicated and expensive as initial application. Lack of support for licensing and administration.
- The number of agencies involved in the licensing process and the perception of this as a bottleneck was highlighted by group members. Recent EU research found that, agencies interacting with process varied from 2-12 per state across Europe. They also found, no correlation between time and agencies. The perception of a bottleneck in this instance was reflected by how well coordinated the bodies are rather than the number of bodies involved.
- Agencies have a lack of knowledge to make decisions, lack of responsibility and lack of decision makers.
- Balancing act, if licenses are too easily granted it throws off the balance and has negative effects for environment and directly the economy.
- Legacy licenses can hinder planning and development in some areas, sometimes hindering modern spatial planning initiatives.
- Taxation is enormous coupled with start-up costs. No motivation to take up a job in the industry. Like farming there should be grants available and incentives.
- Licensing issues and high costs of finance put people off aquaculture as a choice of industry and employment. This is hindering growth and development and not in keeping with current blue growth strategy.
- Unwillingness to adapt to new technologies and innovate to new strategies.
- Prejudice of consumers towards aquaculture produce and the perceptions of these produces hinder markets.

Licensing, finance and innovation were considered the main bottlenecks to development of aquaculture. The overall consensus of the group was that licensing was a huge bottleneck.

5. How can TAPAS involve stakeholders?

- Workshops are useful for bringing together lots of different stakeholders. However, workshops can be expensive, and many stakeholders will not have funds to attend.
- It is important to recognise a range of stakeholders encompassing producers, regulators, NGOs and researchers throughout the entirety of the project.
- It is important to collaborate with other EU projects to avoid overlap and maximise productivity.
- Talk to suppliers. Get them involved in the project as they are key to public perception.

Stakeholder engagement was recognised as a key component to the success of the project.

6. Are ecosystems services, besides food provisioning, known and recognized?

- People do not understand the benefits from aquaculture.
- Emphasis has been on impacts rather than benefits. Lots of research projects focusing on the negative aspects of the industry but the same effort should also be made to establish the ecosystem services provided by aquaculture.
- Look across the sector at different production methods. Evidence from the USA that IMTA is beneficial.
- Comparisons with ES for land based farming products, how do aquaculture compare

The group found that ecosystem services, as a concept, are poorly understood both within the industry and by the general public.

References

Boyles, S & Elliot, M. (2014). Marine Legislation- The ultimate 'horrendogram': International law, European directives & national implementation. *Marine Pollution Bulletin*. 86.

Cash DW., Clark WC., Alcock F., Dickson NM., Eckley N., Guston DH., Jäger J. & Mitchell RB. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences* 100(14): 8086-8091

Durham E., Baker H., Smith M., Moore E. & Morgan V. (2014). *The BiodivERsA Stakeholder Engagement Hand-book*. BiodivERsA, Paris

Appendix I

Invitation to workshop presented on TAPAS web page.



Tools for Assessment and Planning of Aquaculture Sustainability

Edinburgh International Conference Centre (EICC)

Edinburgh, Scotland
20-23 September 2016

Visit us at *Aquaculture Europe 2016* Industry Forum

Dedicated *TAPAS project* session on Friday, September 23, 10:30 - 12:50 in Menteith Room

TAPAS
Tools for Assessment and Planning of Aquaculture Sustainability

aquaculture europe 16

Leaflet distributed throughout the venue at the Aquaculture Europe 2016 conference.

TAPAS Stakeholder Workshop



Tools for Assessment and Planning of Aquaculture Sustainability

European
Aquaculture Society
Conference

Edinburgh Conference
Centre

23rd September 2016

10:30 am

Menteith Room

<http://tapas-h2020.eu/>

This project has received funding from the
EU H2020 research and innovation
programme under Grant Agreement No
678396



The workshop provides an opportunity to gain insight
and contribute to the TAPAS project.

TAPAS: What it is and why is it useful to you?

Trevor Telfer

**Critical Review of Legislation and Practice and Their Impact on
Aquaculture Development**

Dave Jackson

Ecosystem Services Provided by European Aquaculture

Trine Dale

Stakeholder Breakout Session

Moderators: Dave Jackson & Trine Dale

This session provides representatives from the
aquaculture industry, scientists, strategic planners and
regulators an opportunity to engage with TAPAS
partners and offer their opinion on their experience of
current EU licensing policies; helping to develop a
guideline for effective licensing processes to be adapted
within EU states.

Appendix II

Workshop programme.



This project has received funding from the EU
H2020 research and innovation programme
under Grant Agreement No 678396



Tools for Assessment and Planning of Aquaculture Sustainability

TAPAS - Stakeholder workshop programme

Menteith Room, 10.30 – 12.50, Friday 23rd September.

TAPAS: What it is and why it useful to you?
Trevor Telfer

PART I

Critical Review of Legislation and Practice and their impact on aquaculture development
Dave Jackson

Ecosystem services provided by European aquaculture
Trine Dale

PART II

Stakeholder breakout sessions

Moderators: Dave Jackson & Trine Dale

- TAPAS will use a requirements analysis to evaluate existing regulatory and licensing frameworks across the EU and will propose new, flexible approaches.
- TAPAS will also evaluate existing tools for economic assessment of aquaculture sustainability affecting sectoral growth.
- TAPAS will critically evaluate the capabilities and verification level of existing ecosystem planning tools and will develop new approaches for evaluation of carrying capacities, environmental impact and future risk.
- TAPAS will improve existing and develop new models for far- and near-field environmental assessment.
- The innovative methodologies and components emerging from TAPAS will be integrated in an Aquaculture Sustainability Toolbox complemented by a decision support system to support the development and implementation of coastal and marine spatial planning enabling less costly, more transparent and more efficient licensing.



Appendix III

Presentations as part of session one introducing TAPAS.

TAPAS: What it is and why it is useful to you? Presented by Trevor Telfer.



Tools for Assessment and Planning of Aquaculture Sustainability

University of Stirling
Coordinator
TREVOR TELFER



1

Project description

What are the main objectives?

- To identify sustainability requirements and licensing approaches, and identify bottlenecks hampering cost-efficient licensing and regulatory practices.
- To identify the gap between the availability of and needs for models, modelling and decision frameworks, and to critically analyse and refine existing tools and technologies
- To assess the environmental services provided by European aquaculture
- To strengthen management practices and develop an Aquaculture Sustainability Toolkit for timely and cost-efficient environmental assessment and regulation

What will the project offer?

- Environmental models, tools, management approaches and decision frameworks (**TAPAS-Smart**) to support EU Member States towards establishing a coherent and efficient regulatory framework



4

Project description

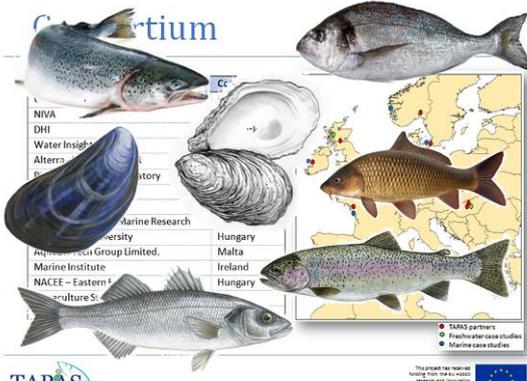
What is TAPAS about?

- Four year study to investigate the current limits to fish farming, the social interactions, and more effective management of aquaculture carrying capacity.
- Create cost efficient management tools and practices for the aquaculture sector across Europe
- To support transparent and efficient licensing, enhancing environment sustainability and thus improve the potential for food production and employment.




2

Cartium



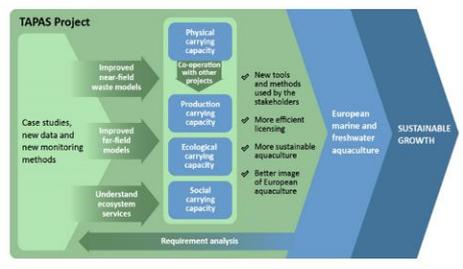
Map of Europe showing TAPAS partners locations: NIVA, DHI, Water Insights, Alterra, Marine Research, University, Aquaculture Group Limited, Marine Institute, NACEE - Eastern, Aquaculture S.

Legend: ● TAPAS partners, ○ Freshwater case studies, □ Marine case studies



5

Project description

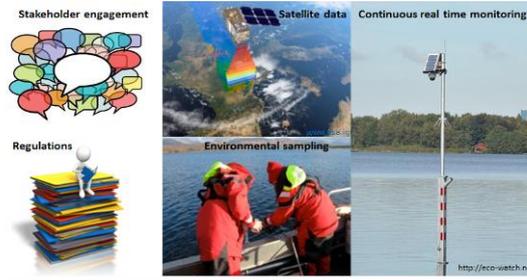


The flowchart shows the TAPAS project process starting with 'Requirement analysis' leading to 'Improved near-field waste models', 'Case studies, new data and new monitoring methods', and 'Understand ecosystem services'. These lead to 'Physical carrying capacity', 'Production carrying capacity', 'Ecological carrying capacity', and 'Social carrying capacity'. These capacities then lead to 'New tools and methods used by the stakeholders', 'More efficient licensing', 'More sustainable aquaculture', and 'Better image of European aquaculture'. The final outcome is 'European marine and freshwater aquaculture' leading to 'SUSTAINABLE GROWTH'.



3

TAPAS - data collection



Stakeholder engagement: A group of people in a meeting.

Regulations: A stack of colorful books.

Satellite data: A satellite in space.

Environmental sampling: Two people in red gear on a boat.

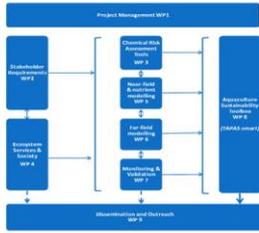
Continuous real-time monitoring: A sensor on a pole in the water.

URL: <http://ecowatch.nl/>



6

TAPAS - project structure



Who is leading what?

- WP1 – Project management (*UOS*)
- WP2 - Requirements Analysis and Stakeholder Integration (*MI*)
- WP3 - Environmental Risk Assessment of potentially toxic substances (*ALT*)
- WP4 - Ecosystem Services and Societal models (*NIVA*)
- WP5 - Near Field Models for regulation and site selection (*UOS*)
- WP6 - Far Field Models (*PML*)
- WP7 - Monitoring and Validation (*WI*)
- WP8 - Aquaculture Sustainability Toolbox (*TAPAS-smart*) (*DHI*)
- WP9 - Dissemination, Outreach and Exploitation (*ABT*)



7



www.tapas-h2020.eu
info@tapas-h2020.eu



10

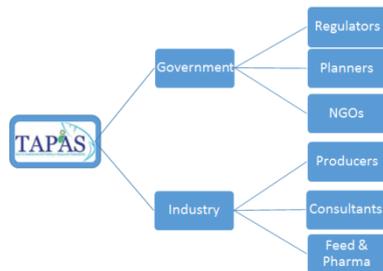
TAPAS – milestones

- Stakeholder workshops (Sept 2016)
- Requirements analysis and bottle-necks to EU regulation (Sept 2017)
- External tools evaluated (Sept 2017)
- Preliminary TAPAS models available for testing (March 2018)
- Datasets from case-studies completed (March 2019)
- Full TAPAS-Smart available for testing (June 2019)
- All project results available for exploitation (Feb 2020)



8

Potential links with “Stakeholders”



9



Critical Review of Legislation and Practice and their impact on aquaculture development, presented by Dave Jackson.

Critical Review of Legislation and Practice and Their Impact on Aquaculture Development

Dave Jackson

The project has received funding from the EU Horizon research and innovation programme under Grant Agreement No. 678396

1

Tomorrow's Offshore Seafood Industry ?

- In fact EU aquaculture production is showing almost no growth.
- In some countries it has declined.

Why?

4

EU Policy on aquaculture

Strategic Guidelines for the sustainable development of EU aquaculture 2013

1. Available data show a growing gap – estimated at 8 million tonnes – between the consumption of seafood in the EU and captures from fisheries.
2. The Commission (& MS) aim reduce this gap by environmentally, socially and economically sustainable EU aquaculture
3. Aquaculture can contribute to the overall objective of filling the gap between EU consumption and production of seafood in a way that is environmentally, socially and economically sustainable.
4. Each Member State to indicate in a multiannual national plan its own aquaculture growth objectives (volume and value).

2

Is EU legislation impacting on aquaculture?

“A majority of the experts point out that the administrative issues are far more important to solve than the technical ones. The EWG 14-10 experts identified environmental regulations, difficulties in the licenses process due to multilevel governance and competition for space both on land and in the coastal zones as the most important areas to be addressed to increase growth in the EU aquaculture sector.”

Scientific, Technical and Economic Committee for Fisheries (STECF) – The economic performance of the EU aquaculture sector (STECF 14-18), 2014

5

Hunter or Shepherd ?

“With earth's burgeoning human populations to feed we must turn to the sea with new understanding and new technology. We need to farm it as we farm the land.”

JACQUES COUSTEAU,
1973

3

How is EU law impacting on aquaculture development?

Very little hard data available
EU is trying to compile information at present

Expert and stakeholder opinion suggests:-

- Complex processes not clearly understood leading to delays
- Very costly data gathering and analysis taking time and money
- Uncertainty as to requirements leading to misunderstanding and “gold plated standard” approach
- Lack of a unified approach at EU, National & Regional authority levels.

6

The way forward for European aquaculture

Commissioner Vella (Brussels, 24 May 2016)

- Need to continue to help the European aquaculture sector grow.
- Create sustainable jobs and growth in Europe.
- Contribute to improved food security for European citizens.
- Over the next 10 years we can increase the value of the EU aquaculture sector by 30% - without compromising on our environmental standards.
- Slow, costly and complex procedures mean that many regions miss out on the jobs and growth that new aquaculture business can bring.
- Help identify and eliminate unnecessary red tape and gold-plating of standards, which deter and prevent growth in the sector

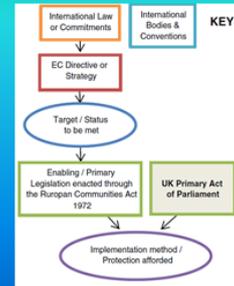
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There is a process to implement international & transnational law:

- International conventions e.g. OSPAR, UNCLOS etc.
- EU directives and regulations
- Bilateral treaties

This process has implications for EU aquaculture

Case Study: UK



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Birds Directive 79/409/EEC (April 1979). It is the oldest piece of EU legislation on the environment. Amended in 2009, it became 2009/147/EC.

Key developments in EU law

Habitats Directive 92/43/EEC (May 1992) on the conservation of natural habitats aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements.

Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive.



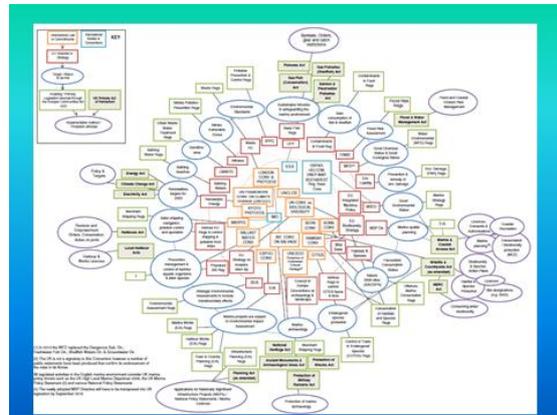
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Some EU Law impacting on Aquaculture:-

Marine Spatial Framework Dir. 2014/89/EU
Water Framework Dir. 2000/60/EC
Shellfish Waters Dir. 2006/113/EC
The Habitats Dir. 92/43/EEC
The Birds Dir. 2009/147/EC
Natura 2000
Listed Diseases Dir. 2006/88/EC
Health of Aqua Animals & Products Reg. 2006/68/EC
Marine Strategy Framework Dir. 2008/56/EC
Hazardous Waste Dir. 2000/532/EC
Waste Dir. 2006/12/EC
Environmental Liability Dir. 2004/35/EC
Aarhus Convention: 2003/4/EC, 2003/35/EC
EIA Dir. 2014/52/EU
Dangerous Substances 2006/11/EC
Animal Health Law 2016/429/EU
Use of Alien & Locally Absent Species in Aqua 708/2007/EC
Residues of Veterinary Medicinal Products Dir. 96/23/EC
Hygiene Rules for Food of Animal Origin Reg. 853/2004/EC

#19 and counting!

9



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TAPAS:

Tools for Assessment and Planning of Aquaculture Sustainability

TAPAS will use a requirements analysis to evaluate existing regulatory and licensing frameworks across the EU, taking account of the range of production environments and specificities and emerging approaches such as offshore technologies, integrated multi-trophic aquaculture, and integration with other sectors. We will propose new, flexible approaches to open methods of coordination, working to unified, common standards.

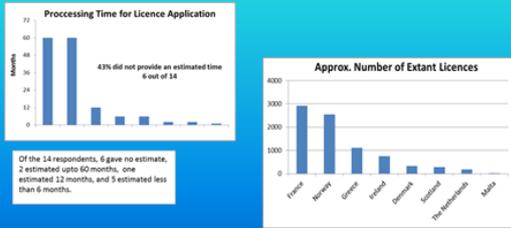
Goals:-

Identify bottlenecks, suggest solutions and ground-truth with stakeholders



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Some preliminary results from the TAPAS project



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Next Steps?

- Identify bottlenecks
- Ground-truth with stakeholders
- Simplify administrative procedures
- Co-ordinated spatial planning
- Develop management tools (*toolbox*)
- Multi-annual national strategic plan for aquaculture

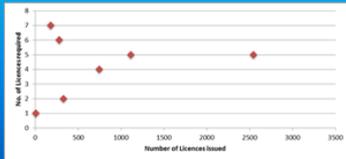
"Providing a better framework for the aquaculture industry is by far the most important issue to solve to lay the foundation for future growth in the European aquaculture sector."

16

Multiple licenses for a single operation !

Most aquaculture producers are SMEs

The weight of regulatory and administrative costs compared to turnover and number of employees can be up to ten times higher for SMEs than for large companies



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Some Key questions for you

- Is aquaculture recognised as a contributor to food security?
- Is there clarity on acceptable impacts of aquaculture?
- What is an acceptable timeline for a decision making process?
- What are the bottlenecks to developing aquaculture?

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Conclusions so far:-

- The complex nature of aquaculture legislation is a major issue.
- The administrative burden is heaviest on SME's.
- Need to implement EU environmental legislation without imposing unnecessary burdens on producers.
- Need to deal with environmental planning and compliance thresholds at a regional or local level;-not SME level.
- Much work to be done on identifying thresholds & management tools to simplify the process.

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Ecosystem Services Provided by European Aquaculture, presented by Trine Dale.

TAPAS Project

Ecosystem services provided by European aquaculture

TAPAS stakeholder workshop, Edinburgh 23.09.2016
Presented by Trine Dale, NIVA

UNIVERSITY OF STIRLING, NIVA, PML, HMC, Marine Institute, ST, i dea, DHI, NACEE, TAPAS

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Ecosystems services valuation

Total Economic Value

Use Value / Non-use Value

Direct Use Value, Indirect Use Value, Option Value, Request Value, Existence Value

There is a range of different methods out there to perform ecosystems services valuation

Source: UN Food and Agricultural Organisation, "What Are Ecosystem Services?"
<http://www.fao.org/cs/csa/guest/aboutPESS.html>

TAPAS

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What are ecosystems services ?

SHERMAN'S LAGOON BY JIM TOOMEY

.....many people have an intuitive idea about the concept:

- it has something to do with the goods our ecosystems can provide
- the services can somehow be valued

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2

Provisioning service

Cultural services? Comparable vineyards & farmland

Supporting & regulating services
Nutrient recycling
Carbon sequestration

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= all benefits humans derive from ecosystems. They are often grouped in four categories; provisioning, regulating, cultural and supporting services. Concept became popular with the "Millennium Ecosystem Assessment" (2005).

<p>PROVISIONING SERVICES</p> <p>Products obtained from ecosystems</p> <ul style="list-style-type: none"> Energy Seafood Biomedical Transportation National defense 	<p>REGULATING SERVICES</p> <p>Benefits obtained from the regulation of ecosystem processes</p> <ul style="list-style-type: none"> Flood prevention Climate regulation Erosion control Control of pests and pathogens 	<p>CULTURAL SERVICES</p> <p>Nonmaterial benefits obtained from ecosystems</p> <ul style="list-style-type: none"> Educational Recreational Heritage Spiritual
<p>SUPPORTING SERVICES</p> <p>Services necessary for the production of all other ecosystem services</p> <ul style="list-style-type: none"> Biological diversity maintenance Nutrient recycling Primary productivity 		

source: Final Recommendations of the Interagency Ocean Policy Taskforce, 2010

TAPAS 30.09.2016

3

Trade-offs and synergies

Current Conditions and Alternative Future Scenario (Model Input)	Change in Ecosystem Services (Model Output)			
	Aquaculture Yield	Coastal Protection	Fisheries	Recreation
Current conditions	—	—	—	—
Scenario 1: Aquaculture: add netpens and oyster racks	↑	—	—	↓
Scenario 2: Restore and Protect: add netpens and oyster racks, removing to restore beach	↓	↑	↓	↑

Source: Silvert, S., Karlsen, F. (eds), 2010. Farming the Sea: Innovative Approaches to Understand, Protect and Value Ecosystem Services across Limited Marine, UNEP World Conservation Monitoring Center, Cambridge, UK

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Strengths of ecosystems services approach

- Clear and logical framework organised into four categories
- Is interdisciplinary; gives meaning to both natural and social sciences
- Provides a benchmark for analysing synergies and trade-offs between environmental conservation and economic development
- Is helpful developing and communicating interdependencies between politics, conservation goals, human uses and well-being

....and weaknesses

- Has an anthropocentric focus and exclude the intrinsic value of different entities in nature
- Comprise economic valuation..... and leads to commodification
- Logic in theory- but vague in practise. Becomes popular "catch-all" phrase



©CartoonKajin

TAPAS
The project has received funding from the EU Horizon research and innovation programme under Grant Agreement No 678396

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TAPAS 

Thank you for your attention



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Why spend time talking about ES here today ?

Important tasks in TAPAS:

- To assess the combined environmental and social impacts of aquaculture
- To identify the economic instruments, management tools and farm practices that will support and incentivize the sustainable development of European aquaculture.

A key concept in the TAPAS approach to sustainable development is ecosystems services. And it is a state goal

- To identify the ecosystems services provided by different segments of European aquaculture
- To develop tools for the quantification of these services

↓

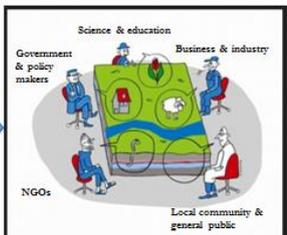
General framework will be developed and used in selected case studies

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Stakeholder engagement

Ecosystem Services inherently involve people whose values define the benefits of nature's services.



We need stakeholder involvement in TAPAS

for part II discussions:
How can we get you as potential stakeholders involved

Source: <http://www.rechtstromen.nl/projecten/projecten/ecosystem-services/the-recht-strom/>

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