



Program: FP7 Cooperation

Roadmap of research as an HTML page with its enclosed program for a graphical display

Project acronym:	EUROSHELL
Project title:	Bridging the gap between science and producers to support the European marine mollusc production sector
Project coordinator:	Comité National de la Conchyliculture (CNC)
Grant agreement number:	312025 – FP7 KBBE 2012.1.2-11
Funding scheme:	Coordination Support Action
Deliverable number 4.9:	Roadmap of research as an HTML page with its enclosed program for a graphical display

The roadmap for research is defined on the basis of the 8 axes of the Strategic Agenda for Research and Innovation. It allows visualizing the progress of research for each axis.

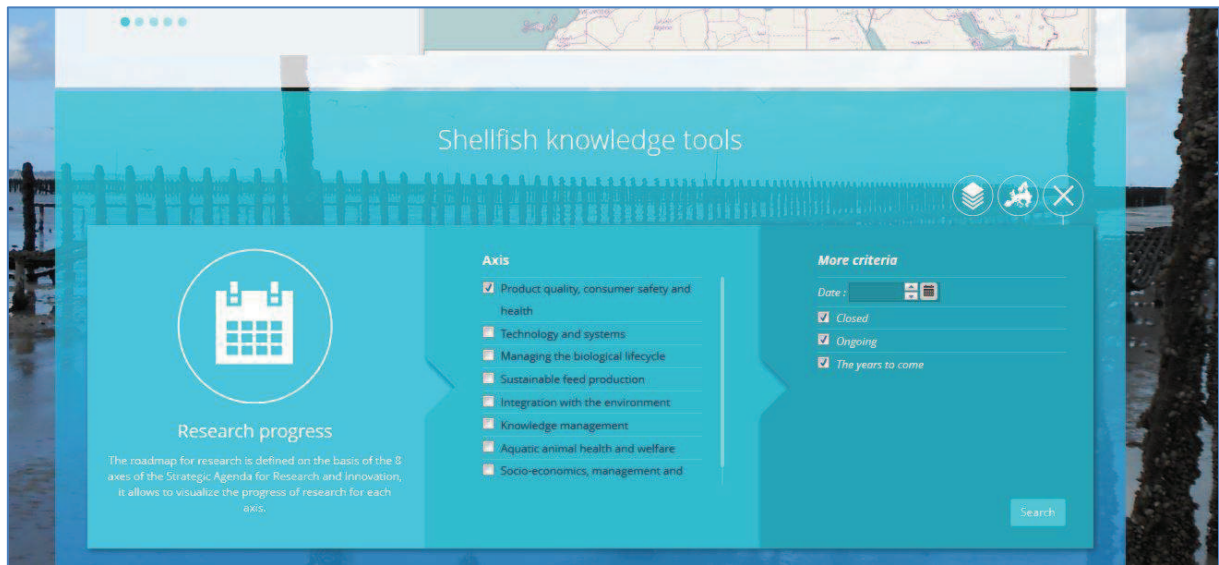
The roadmap is accessible from the home page of the EUROSHELL website: <http://www.euroshell-fp7.eu>



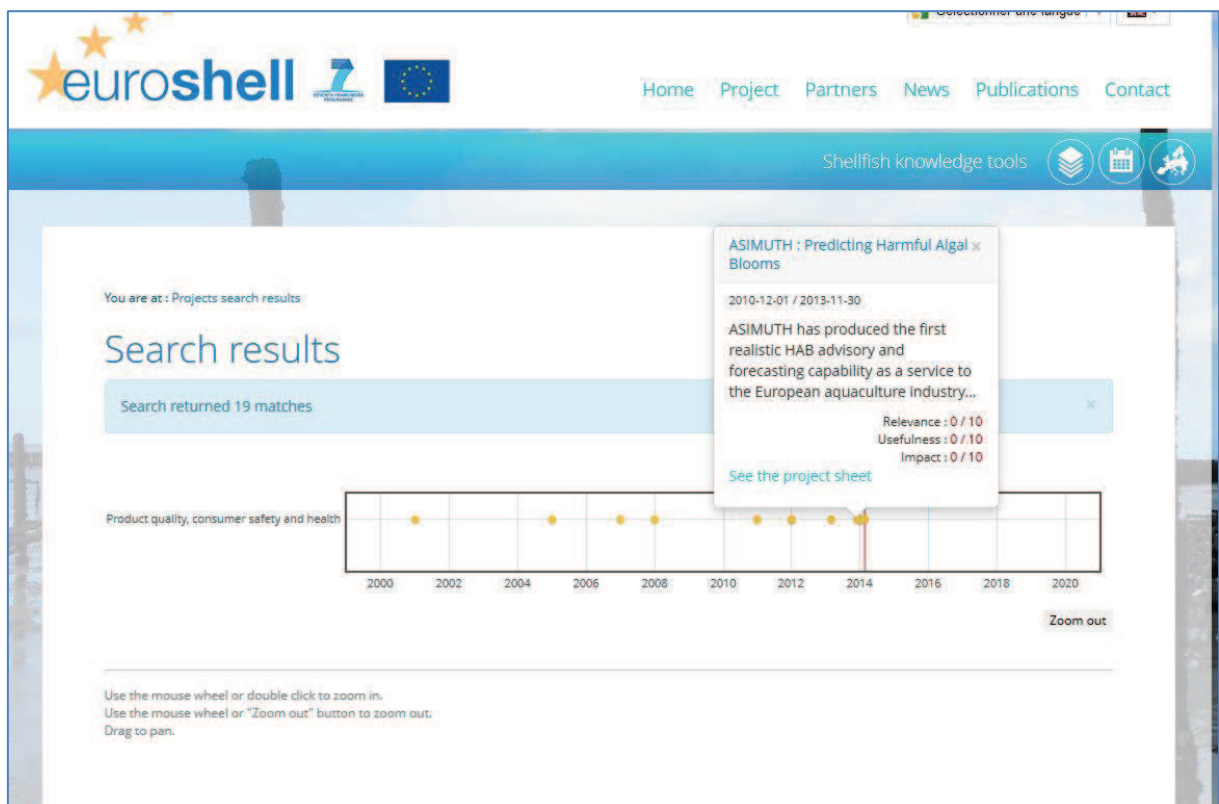
The menu “Research progress” offers a multiple choice corresponding to the 8 axes of the Strategic Agenda for Research:

- Product quality, consumer safety and health
- Technology and systems
- Managing the biological lifecycle
- Sustainable feed production
- Integration with the environment
- Knowledge management
- Aquatic animal health and welfare
- Socio-economics, management and governance

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By selecting one or several themes, a list of concerned research projects are displayed on a scrolling frame:



Clicking on a point (a project), allows to see the details of the project content. A link leads to the project's factsheet included in the knowledge database.

This graphical display allows to visualize quickly where research is lacking and therefore, on which axis should the following projects focus.

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It was decided to use the axis of EATIP's strategic agenda so that this tool can also serve for aquaculture in general.

A specific roadmap for research for the shellfish sector has also been developed, as a result of the regional consultations within Euroshell project (see Deliverable 2.7).

All the issues of shellfish farming can be integrated into EATIP's axis, as shown in the document comparing the goals defined within EATIP and the ones defined within Euroshell (see document below). However, some goals have been added and others do not apply.



This document compares the research and governance priorities resulting from the EUROSHELL consultation workshops with the Thematic Areas, goals and sub-goals of the European Aquaculture Technology and Innovation Platform (EATIP). The EUROSHELL priorities have been placed next to the most appropriate EATIP Goal/Sub-goal and colour coded according to the EUROSHELL themes below.

PRODUCT	<ul style="list-style-type: none"> Species biology Breeding and polyploidy Integrated species production Husbandry and best practice Offshore production Larval production and nutrition Equipment and technology Product quality Health & diseases
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MARKET	<ul style="list-style-type: none"> Human health Market overviews Market legislation Distribution, transportation & packaging Traceability Processing Diversification of activities, products, trading opportunities
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Territory/Environment	<ul style="list-style-type: none"> Water quality Health monitoring Carrying capacity Biofouling and anti-fouling Toxic algal blooms Predation Ecosystem services Waste management Adaptation to environmental change
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Management/Governance	<ul style="list-style-type: none"> Learning, training & education Socio-economics Lobbying/industry representation Human capital Communication Assistance for companies Knowledge management & transfer Environmental policy, planning, site selection and ICZM
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TA1: PRODUCT QUALITY, CONSUMER SAFETY AND HEALTH

Maximise the health benefits of aquaculture products

Identify relevant bioactive compounds present in aquaculture products
Better understand the mechanisms and synergies underlying the health benefits of bioactive components from aquaculture products in the promotion of human health

Investigate the specific effects of aquaculture products in sub-groups of the population with specific dietary needs

Explore the differences in terms of health benefit between species and production methods including feed composition

Ensure the continuing safety of aquaculture products

Identify, manage and eliminate existing and potential physical, chemical and biological new hazards and emerging risks; including virus, bacteria, toxins, persistent organic pollutants (POPs), toxic substances, etc

Make available to producers of aquaculture products user-friendly methods to monitor and control the safety of the production, targeting known and emerging hazards

Ensure the manufacture of authentic aquaculture products, regarding the species, quality, processing, use of additives, production method and geographic origin

Better understand the mechanisms and synergies underlying the health risks of undesirable compounds potentially present in aquaculture products for risk management purposes

To deliver high quality European aquaculture products fully meeting consumer expectations including appearance, taste, texture, nutrition and provenance claims

Define and standardize quality parameters of aquaculture products

Develop and validate practical tools and fast methods for processors to measure aquaculture product quality, including physical/chemical parameters such as texture, colour, fat content and to mimic organoleptic parameters such as juiciness

Develop and/or implement new technologies and materials in the seafood processing industry which enhance quality, including that of products to be sold alive

Describe the parameters that can be manipulated to create differentiated products targeted at particular markets and consumer groups.

Develop and establish the foundations for the successful commercial implementation of a robust product certification and a consumer-friendly labelling system for European aquaculture products, based on provenance and quality.

Maximise the health benefits of shellfish products

Focus research on the impact of pollutants on shellfish health (e.g. pesticides) and the means to mitigate the sources of pollution

Improve risk management – biotoxins, disease and microorganisms

Ensure the continuing safety of shellfish products

Develop user-friendly methods and tools to monitor and control the safety of shellfish production

Strengthen the traceability with labels, certifications, PGI (Protected Geographical Indication)

Understand the dynamics of seafood markets

Issue clear recommendations and guidelines for informed policy making on recommended consumption levels

Identify and close harmful gaps in consumers' perception about aquaculture products and the current scientific knowledge

Understand the dynamics of European seafood trade

Markets and marketing

Better consumer communication, based on 'naturelness', consumer protection and health attributes

Diversify markets and develop new markets, including international

Improve the distribution, delivery and packaging of products, optimize their transportation, etc.

Diversify marketing modes, while maintaining a significant proportion of direct sales in order to reduce dependence on supermarkets and hypermarkets

Diversify product offerings: new species, new products (including processed products), based on indigenous species

Pooling marketing among several producers and / or distributors (cooperative)

Promote local market of fresh products



TA2: TECHNOLOGY AND SYSTEMS

Ensure an environmental sustainable industry by the application of new knowledge and technology innovations

Development of technology preventing escapes of fish and eggs from production system

Development of renewable energy sources for aquaculture production facilities

To effectively manage waste nutrients cycling in production systems in order to increase its retention in aquaculture products (polyculture, IMTA, integrated aquaculture)

Reduce waste release from aquaculture production

Development and upgrade of existing technologies for more efficient use of freshwater resources

Develop T&S for the mass production of aquatic organisms (e.g. plankton, seaweed) for industrial use

Meet the demand for aquaculture products in EU by the development of efficient technologies to support continued growth

Development of farming equipment and operational procedures for off-shore sites

Develop technology and systems for best site selection

Maximize efficiency of Recirculation Aquaculture Systems (RAS) and reduce accumulation of persistent compounds

Develop marine and freshwater integrated aquaculture systems (e.g. polyculture, IMTA) for production of present and new species and Environmental services

Develop of production systems for new aquaculture products (new species, premium class and/or certified products) for changing markets

Reduce the incidence of diseases by developing T&S

Develop T&S for improved utilisation of existing sites

Development of technology to support production of new fish feeds (formulated, live feed)

Ensure the profitability of the aquaculture industry by developing improved management systems and technology

Development of automation for all stages of production (hatcheries, on growing, processing) for all present and future production system

Improve or develop novel systems to control biofouling of aquaculture equipment

Develop technologies for improved quality of seed for all present and future production system

Developing technologies for total utilisation of farmed products

Production technologies

Develop offshore production techniques to minimize land use conflicts

Improve the distribution, delivery and packaging of products, optimize their transportation, etc.

Ensure the profitability of the sector by developing improved management systems and technology

Develop technologies for improved quality of seed for all present and future production system

Developing technologies for total utilisation of farmed products, especially shells

Find solutions to fight against predators / competitors / invasive species

Ensure technology for ethical and healthy production of high quality aquatic products

Integration of technology management and biology for improving welfare and the prevention of disease outbreaks
To improve technology for transfer, handling and slaughtering of aquaculture products with respect to welfare and ethics

Develop standardised detection and quantification methods for pathogens affecting humans
Develop technology and procedures for monitoring of welfare status of fish during all production stages

Ensure technology for ethical and healthy production of high quality shellfish products

Develop standardised detection and quantification methods for pathogens affecting humans

Develop techniques allowing companies to adapt to changing environmental conditions (innovative equipment, closed loops, water treatment techniques, etc ...)

Improve water treatment systems



TA3: Managing the Biological Lifecycle

Establish predictability and improve output at every production stage of the lifecycle

Develop indicators and tools to estimate/measure predictability and establishing the current variation level in farms
Improve animal performance at all stages, including egg and larval quality and its effects on performance during grow-out and/or ameliorate technological performance (protocols standardization / amended technology)
Improve sanitary control by better understanding the microbial environment (biotic & abiotic)

Genetic improvement of productive, health and animal welfare traits

Selective breeding to target important traits e.g. adaptation to alternative feed sources, disease resistance, feed efficiency, fillet yield, flesh quality, nutritional profile and human health factors
Develop efficient tools (genetic, molecular, genomics) or adapt genetic tools from other sectors to introduce disease resistance in breeding programs to get « robust » animals, resistant to disease, stress, changing environment

Identify and quantify genetic correlations between productive, disease resistance and welfare traits to enforce synergies between traits and avoid unwanted effects of selective breeding for productivity traits
Increase industry and policy makers awareness and competence about potential gains and implementation of selective breeding programs

Improve broodstock management methods and control reproduction in captivity

Identify reproduction related problems, and knowledge gaps for each major aquaculture species in Europe (finfish and molluscs)
Evaluate the impact of sexual maturation on growth the welfare and potential risk of disease susceptibility
Understand the role of genetic, physiological, nutritional, behavioural and environmental factors on the spawning of gametes of high quality and the timing of spawning to facilitate year round supply
Control puberty by understanding the role of genetic and physiological factors, including the effects of environment, husbandry practices and nutrition
Cryopreserve for biosecurity, predictability, distribution and bio-banking
Understand the basis sex determination and sex differentiation (genetic, environmental and physiological) to enable monosex production

Develop new sterilisation methods as an alternative to triploidy, and (when not possible) methods to allow production of triploids at an industrial scale for species usually propagated with mass spawning (cod, sea bass, sea bream,...)

Manage the life cycle of carefully selected “new” species that have high economic importance

Develop efficient tools to identify best candidates for domestication

Genetic improvement of productive, health and animal welfare traits

Selective breeding for disease resistance

Diversification

Identify new species for production

Optimize the management of natural stocks

Improve the management of natural wild seed beds to allow better natural collection with stronger individuals, to ensure the good condition of wildlife and the preservation of biodiversity, and to guarantee a certain independence of producers for their spat supply.

Promote adequate genetic management of new species

Develop hatcheries - especially for emerging of new species
Conduct studies on the lifecycle and its variation in different natural production areas



TA4: Sustainable Feed Production

Base formulation of Future Fish Feeds on solid knowledge of fish nutritional requirements, and expand the number of well characterized and sustainable raw materials which can be used

Improve knowledge on nutritional requirements of fish commonly farmed in Europe and for promising new species

Provide a sufficient characterization of nutritional value of alternative raw materials, both in current use as well as of new promising or underutilized marine or terrestrial sources, considering their sustainability, to increase flexibility in formulating highly nutritious feeds, of low environmental impact and appropriate for different aquaculture systems.

Clarify the potential of commonly used and novel microingredients to optimize efficiency of diet utilization by fish

Evaluate the effects of using alternative feed ingredients to the content of key bioactive compounds of aquaculture products and understand how to optimize their nutritional value in order to tailor aquaculture products for maximizing the consumer health benefits.

Adapt feeding procedures to ensure optimal feed utilization and minimize environmental impact

Provide necessary information to support/change regulatory measures

Advanced novel feed technologies to produce cost effective feed with improved quality

Develop novel technology and improved processing routes for cost effective and sustainable fish feed production

Novel and improved larval feed technology for better survival, larval growth performance and quality

Improved understanding of the interactions between ingredient properties and processing conditions affecting physical feed quality and utilization of nutrients

Documentation on safe use of animal by-products

Environmental impact of aquaculture production

Understand and minimize non desired effects of alternative diets on fish health and welfare

Response of alimentary system to alternative feeds and development of methods and markers for assessing dietary effects

Research on the effects of diet on the gastrointestinal and systemic immune system and subsequently on disease susceptibility

Evaluation of the relation of dietary changes to the aetiology of production diseases

Evaluation of diet involvement in stress, behavioural and feeding responses of fish and methods for remediating possible adverse effects and optimizing performance.

Adapt and utilize advanced methods to understand and model nutritional responses

In vivo and in vitro models to examine physiological responses to nutrients

Integrative tools -omic tools

Mathematical modeling of nutritional responses and possible contaminant accumulation in fish

Resolve strategic research problems in fish nutrition

Development of feeds to a) maximize protein accretion and minimize lipid deposition, b) achieve optimal product composition promoting human health.

Development of selection tools for improving nutrient utilisation and protein/lipid deposition contributing to biological efficiency of aquaculture species via selective breeding and via choice of broodstock material (species, strain)

Formulation of targeted feed compounds, feeding and fish management practices that condition farmed species to novel feeds, increase adaptability, reduce stress, and increase biological efficiency.



TA5: Integration with the environment

To establish fundamental scientific knowledge on the assimilation capacity of biogenic wastes from aquaculture to determine acceptable emission rates for Benthic and Pelagic Ecosystems (Biogenic waste assimilations in Ecosystems)

To establish a scientific based concept for the management of biogenic waste emission to open waters with relevant indicators for assessing chemical and ecosystem state as a contribution for the implementation of the Water Framework Directive (WFD)

To determine assimilative capabilities and the environmentally acceptable critical loading rates of biogenic wastes per volume and per area of sea floor, including the contribution or ecological services of shellfish and macroalgae farmed in aquaculture locations

To establish integrated management tools for waste emission which consider assimilation capabilities, hydrodynamic energy and presence of sensitive habitats as a tool for siting, spatial planning and ecosystem based management of aquaculture

To establish technology to minimise emission of biogenic matter from aquaculture and to minimize the potential Environmental influence of the actual emissions by means of Environmental management and integrated multi-trophic Aquaculture (Technology to minimise biogenic impacts)

To improve feeding technology, feeding management and feed composition of Mediterranean aquaculture in order to minimise biogenic emission from aquaculture installations per unit fish produced

To learn how optimal siting and the best available technology for environmental management can minimise the potential environmental influence of emissions per unit fish produced

To explore the potential environmental benefits of an expansion of marine aquaculture of fish, shellfish and macroalgae to exposed Atlantic and European marginal seas

To explore potentials of utilising wastes from existing and new European cage fish farms in exposed waters for combined feeding and extractive aquaculture (IMTA), with a focus on co-farming of fish, macroalgae and vulnerable non-fed invertebrates

To understand the fate and cumulative effects of Synthetic agents used in aquaculture and minimizing their impact on the environment (Fate of Synthetic agents in ecosystem)

To better understanding mechanisms and risks for harmful ecosystem interactions of pharmaceuticals and chemical antifouling agents

To study cumulative effects and fate of new antifouling and pharmaceutical agents that are beneficial for aquaculture, their ecosystem interaction in the near site and far-field environments

Improved watershed management

Better and standardised assessment of carrying capacity, including the contribution of ecological services of shellfish

Conduct studies on the dynamics of plankton as shellfish nutrition sources

Develop integrated production systems

To improve access to field data with the possibility to build a transparent surveillance and reporting network of the fish infections and volumes and classes of pharmaceuticals used by fish farms to regulatory agencies in order to minimize their usage and their impact into the environment

To establish more fundamental knowledge to understand the interactions between farmed and wild stocks, including wildlife (Interactions of farmed and wild stocks)

To better understand the potential positive and negative aquaculture interactions with fisheries and ecosystems, including wild life, predators and exotic species

To better understand diseases and parasite interactions between farmed and wild organisms

To better understand the genetic interactions between wild and farmed stocks

To develop or adapt tools and measures in support of appropriate environmental governance for aquaculture (Tools for environmental governance)

To adapt existing and development of new planning tools used for site selection based on ecosystem assimilative capacity and spatial planning for further aquaculture development

To adapt existing and develop new management tools and measures used for environmental monitoring, production optimization and minimizing aquaculture impact

To harmonize environmental regulations and legislation, and implement regulations between European Countries

To develop techniques and procedures for quantification of environmental and ecological services provided by aquaculture farms and encourage farmer based voluntary contribution to environmental management

Tools for environmental governance

Better planning tools used for site selection based on spatial planning

Improve environmental monitoring and information towards professionals, including a better responsiveness of monitoring networks

Harmonize environmental regulations and legislation, and implement regulations between European Countries

Quantify the environmental and ecological services provided by shellfish farms to support the shellfish sector - bioremediation, phytoremediation, carbon sequestration, acidification...

Establish best practice for 'disaster' management and develop tools for planning and communication to farmers

Improve watershed management, facilitating the barriers to classification of sites and moving up from B to A

Protect shellfish waters and allow production in protected zones or areas

Implement measures to protect territories, particularly those where shellfish farming is practiced, while ensuring that these measures do not constitute barriers limiting shellfish farming.

Focus research on the impact of environmental pollutants on shellfish health (e.g. pesticides) and the means to mitigate the sources of pollution

Better understand the effects of climate changes, allowing shellfish farmers to adapt



TA6: Knowledge Management

To manage Knowledge effectively within the European Aquaculture sector

- To efficiently and effectively create knowledge that is focused on outcomes and impacts on industry and ensure that research efforts are not duplicated
- To efficiently and effectively manage and transfer knowledge including the dedicated transfer to identified users and translation of research results for stakeholder uptake
- To encourage the protection of legal rights, management of IP, and adherence to ethical standards in a manner that ensures open innovation and the development of a sustainable sector
- To promote sustainable aquaculture practices through the transfer and application of knowledge and technology, including the challenges of food production, environmental protection, product safety and economic viability

Ensure the availability and efficient use of aquaculture research infrastructures across all boundaries to benefit the Industry

- Ensure international and inter-regional cooperation to develop research infrastructures that can meet emerging needs
- Increase the awareness of existing research infrastructures (functionalities, scale, services and access) for all stakeholders

To Collect and Collate Evidence to Inform communications on the benefits of the European Aquaculture sector for Society and the Environment

TA6: Knowledge Management

To manage Knowledge effectively within the European shellfish sector

- Create knowledge that is focused on outcomes and impacts on industry and ensure that research efforts are not duplicated
- Disseminate knowledge to different audiences (consumers, school, public ...).
- To encourage the protection of legal rights, management of IP, and adherence to ethical standards in a manner that ensures open innovation and the development of a sustainable sector
- Promote the transfer and application of knowledge and technology, including the challenges of food production, environmental protection, product safety and economic viability
- Improve the accessibility to data resulting from monitoring and control activities
- Develop an annual (national) showcase of shellfish research
- Better coordination between scientists and professionals to pool research efforts and encourage industry to participate in research

Ensure the availability and efficient use of aquaculture research infrastructures across all boundaries to benefit the Industry

- Increase the awareness of existing research infrastructures (functionalities, scale, services and access)
- Create a national information repository (for example under the Ministry of Public Health) to overcome the fragmentation of data of interest for the sector (product data, environmental data)
- Strengthen the activities of platforms and technical centers to experiment and innovate with new technologies, provide spat and be a contact point for follow up.

Better communication on the shellfish sector

To develop an evidence based knowledge resource to inform communications on the environmental and societal attributes provided by European aquaculture sectors

To understand perceptions of aquaculture across Europe and identify stakeholder groups as advocates so that public communication campaigns are targeted and responsive

To foster and build the human capital of the European shellfish sector

Promotion of formal and informal lifelong learning opportunities at all levels as a central strategy for ensuring knowledge transfer for a sustainable, innovative and competent workforce

Exploration of new models and partnerships for learning and its accreditation to encourage career development and innovation in the sector

Attract and retain talented, enthusiastic and able individuals to work in the aquaculture sector and to foster entrepreneurship

Seek to maximise appropriate career pathways and job satisfaction.

Promote and enable peer-to-peer networking and collaboration as key components of an innovative European aquaculture sector

To create and sustain effective links between industry and research communities.

Develop a common communication strategy to improve the image of the sector (dirty banks, ugly infrastructure...can give a bad image) as a symbol of the territorial identity

To foster and build the human capital of the European aquaculture sector

Develop ad hoc training courses to get shellfish farming qualifications

Better train agents of the shellfish sector and strengthen communication among them

Develop training programmes to improve fund raising capabilities and access to European programs

Promote the profession of oyster-opener, which gives value to products

Develop education programs to promote the quality of the product



TA7: AQUATIC ANIMAL HEALTH AND WELFARE

Improve fish health by increasing the understanding of host parasite interactions and to have access to effective vaccines and immunomodulators

Improving understanding of host pathogen understanding
Development of new vaccines and improvement of existing vaccines and diagnostic tests, including their application to all stages of finfish life cycles
Research required on mode of action and use of immunomodulators

Application of epidemiological principles to minimise the threat of existing, emerging and exotic diseases

Improve understanding of transmission mechanisms, of all pathogens at all levels from farm, through country to Europe level
Understand the industry structure (network) and its vulnerabilities to endemic and epidemic diseases
Development of framework (model) for evaluating the relative importance of health and welfare threats, including bio-economic modelling and risk assessment and biosecurity
Improve strategic data availability through standardisation

Turn understanding into strategies through industry, government, academic participation in research and consultation

Use and develop best practise to optimise efficacy of treatments and prevention methods

Minimise treatment when possible by using best practice
Investigate Alternate remedies and methods such as probiotics and biological control
Improve and streamline the medicine and Licensing system
Improve application of management measures with emphasis on alternative control measures
Develop methods for effective delivery of treatments in novel systems e.g. large off-shore cages, well boats etc

Measure welfare/Stress and understand its consequences if compromised in order to incorporate welfare as core component of production management

Develop and Improve existing welfare/stress indices
Understand and quantify short and long term consequences of compromised welfare, such as reduced growth, reduced feed efficiency, health, treatment effects, product quality etc.
Incorporate welfare/low stress management as a major factor in production and legislation decisions and in on-going risk, cost and Gap analysis.

Improve knowledge on shellfish health

Improve shellfish health monitoring and management

Develop predictive tools to rapidly detect pathologies

Develop predictive tools to be able to adapt farming practices and to respond to crises (closures)

Determine the different sources of risks due to the introduction of pathogens

Improve risk assessment: Viral/E. coli/ Norovirus/ biotoxins/ algal blooms



TAB: SOCIO-ECONOMICS, MANAGEMENT AND GOVERNANCE

To promote effective governance - establishing a 'level playing field' for aquaculture within and outside Europe

- To standardise decision-making processes on aquaculture activities by employing good principles of governance (e.g. cohesiveness, openness, participation, effectiveness and accountability)
- To ensure policies consider potential impacts of management measures on aquaculture from a vertical (local, national, regional and international) and horizontal (between sectors e.g. aquaculture and fisheries) perspective
- To simplify legislation and reduce time from application to award of licence
- To ensure food produced with ingredients and processes outside Europe should comply with EC standards
- To link social and economic dimensions of aquaculture with environmental considerations in a fair, legitimate and transparent manner
- To develop a European database to better inform the aquaculture industry of drivers underpinning local, national, regional and international markets.
- To provide a transparent and user-friendly decision support system for effective aquaculture governance that can weigh potential benefits and costs of different management measures to all interested parties

To establish an enabling environment for innovation and growth to allow aquaculture to realise its full potential

- To identify standard methods to measure trade-offs between risk and return on aquaculture projects in regulatory evaluations
- To identify incentives to promote investment in aquaculture and ensure longevity of sustainable production
- To establish policies that recognise property rights of aquaculture enterprises and offer methods on how to balance economic, social and environmental impacts of aquaculture on an area
- To facilitate open and inclusive dialogue in decision-making about growth of all aquaculture related activities
- To ensure communication on research and development between industry, scientists and policy makers is facilitated through joint development of effective communication strategies

To better understand social and economic dimensions of aquaculture at different scales

- To develop aquaculture as an attractive and viable livelihood for achieving income generation and food security for all interested communities including coastal and rural areas

More 'streamlined' governance - simplification and coherence of regulations and administrative procedures

- To standardise decision-making processes on aquaculture activities by employing good principles of governance (e.g. cohesiveness, openness, participation, effectiveness and accountability)
- Better management measures at a policy level
- To simplify legislation and reduce time from application to award of licence
- To link social and economic dimensions of shellfish aquaculture with environmental considerations in a fair, legitimate and transparent manner

Conduct studies on the carbon footprint of European shellfish products compared to non-EU products and to other products (from aquaculture or others)

Assistance for (small) companies

- Develop mechanisms that enable small producers to compete on markets. Grant interest free loans for SMEs
- Identify and classify suitable areas for shellfish farming with appropriate criteria
- Recover unproductive areas

To better understand social and economic dimensions of shellfish culture

To promote social and economic benefits associated with aquaculture through evidence based scientific information communicated using different media formats appropriate for different target audiences

To better understand what parameters explain social and economic impacts of aquaculture including spatio-temporal trends

To improve understanding of methods and tools to apply social and economic data to decision-making

To provide a transparent decision support system for linking relationships between social and economic factors with environmental considerations to inform what type of governance structure is needed to support sustainable development of the sector

Conduct more comprehensive and reliable studies on the profession, other than those relating to the production, to better understand the sector: market conditions, economic importance of the sector, sociological knowledge, business needs, economic sustainability of businesses, etc.

Promote the social and territorial implantation of the shellfish sector: it creates jobs and is related to other activities. It cannot be relocated.