



ANALYSIS OF SPECIFIC SCIENTIFIC DOMAINS
COVERING KEY ACTION 5 OF QoL (5FP)
IN THE FIELDS OF
FISHERIES AND AQUACULTURE
(1998 – 2002)



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1. Introduction

Research proposals of direct interest for DG Fish in the 5th Framework Programme (FP5) concern three key actions (KA) of the thematic programme Quality of Life (QoL) : KA 1 (Food, nutrition and health), KA 2 (Control of infectious diseases) and KA 5 (Sustainable agriculture, fisheries and forestry).

Most of the selected projects (88 %) were funded under the specific Key Action 5 “Sustainable agriculture, fisheries and forestry, and integrated development of rural areas including mountain areas”.

As all the calls covering QoL thematic programmes are closed, it is now possible to make an assessment of the accepted projects.

The present analysis covers the field of fisheries and aquaculture under KA 5.

2. Objectives

The main objective of the present study was to analyze the research projects funded under KA 5 and to classify them by specific scientific domains in order to establish to what extent they covered the research objectives of the QoL Work Programme in the field of fisheries and aquaculture.

The proposed classification is intended to give a clear picture of the situation and to provide research institutions and policy makers information on how the research projects cover the different priorities.

Another objective of this study was to investigate the possible links and overlaps amongst projects through the detailed analysis of their research objectives and expected achievements.

Finally, this analysis is expected to help in the drafting of the work programme of priority 8 (Research in support to Fisheries Policy) of the 6 FP, by pointing out which research domains are already well covered by former calls and which ones received little attention from the scientific community.

3. Approach and Methodology

The work was divided into 4 steps :

- ***Step 1 - Identification of the scientific domains:***

The approach adopted to reach the objectives of the study was to consider the **areas and sub-areas** of KA 5 as the basis for the classification of the research projects funded in the field of fisheries and aquaculture. Each area and sub-area was then subdivided into a number of narrower research topics : “scientific domains”. The scientific domains were defined in accordance with the main key elements of each area and sub-area of the work programme, in close concertation with the scientific officers.

The areas or sub-areas concerned by the study as well as the different selected scientific domains are presented in **Table 1**. Detailed description is also given in **Annex 1**.

**Table 1 – Areas, sub-areas and scientific domains covered by the study
(KA 5 – Sustainable fisheries and aquaculture)**

AREA: 5.1.2 Sustainable fisheries and aquaculture

SUB-AREA: 5.1.2.1 Interaction between environment, fisheries and aquaculture

Research will focus on methods and strategies to assess or reduce, where undesirable, the effects of the interactions between environment, fisheries and aquaculture. It will improve our understanding of the impact of environmental changes (whether induced by humans activities or not) on the dynamics of commercially harvested living resources and on aquaculture, with particular emphasis on the effects of toxic algae. To improve the understanding of the impact of fisheries on the marine ecosystems, it will concentrate on the foodwebs, on the physical impact of fishing gear on the seabed, on the demographic structures of exploited fish stocks and by-catches, and on genetic diversity. Furthermore, it will aim at defining specific targets for the protection of biodiversity. As for aquaculture, it will focus on the effects of farm effluents and on the interactions between wild, farmed and ornamental organisms with special emphasis on genetics, including GMO's, and diseases.

Scientific domains :

- E.1 Impact of environment changes on the dynamics of commercial harvested living resources
- E.2 Impact of environment changes on aquaculture
- E.3 Impact of fisheries on the marine ecosystems
- E.4 Impact of aquaculture on the environment
- E.5 Protection of biodiversity

SUB-AREA: 5.1.2.2 Scientific basis of fisheries management

Research will concentrate on the improvement of management tools and on the relationships and interactions between biological, economic and fleet capacity aspects of resource assessment and management, including data requirements. This includes the improvement of available assessment methods used for formulating scientific advice to management, with particular emphasis on the less known resources, the assessment of risks and uncertainties associated with the models, as well as the development, application and/or validation of methods to establish the geographical limits and genetic structure of fish stocks.

Scientific domains :

- F.1 Management systems
- F.2 Improvement of assessment methods
- F.3 Assessment methods for less known resources
- F.4 Establishing geographical limits and genetic structure of fish stocks

SUB-AREA: 5.1.2.3 Improvement of aquatic production

Priority will be granted to multidisciplinary research efforts encompassing various fields of aquaculture genetics and related areas and the clarification of essential biological functions benefiting aquaculture production, including the corresponding genetic bases and heritability. The development of tools to facilitate the identification of suitable source populations with profitable traits including genome mapping and its application will be promoted, with a view to integrate such tools and populations to selective breeding programmes. Research will investigate the influence of nutrition, environment and husbandry on the health of farmed species. It will also address the technical and economic potential of species diversification and technological innovations such as offshore aquaculture, including their environmental aspects. The co-ordination of research for alternatives to fishmeal and fish oil in fish diets will be supported.

Scientific domains :

- A.1 Essential biological functions of farmed species
- A.2 Breeding/Selections
- A.3 Impact of nutrition, environment and husbandry on the health of farmed species

- A.4 New Species
- A.5 Fish meal and fish oil replacement
- A.6 Technologies

AREA: 5.4.3 Monitoring and enforcement of the CFP

Research will focus on improving the collection and interpretation of data resources assessment and management and on anticipating the reactions of economic and social sectors to regulations. It will develop cost-effective methods to ensure implementation and enforcement of regulations (such as technical measures, fishing effort and fishing capacity limitations) and will improve efficiency and accuracy of resource assessment and monitoring. It will also develop methodologies to establish traceability in terms of legally indisputable evidence for the origin of fish and fish products and to monitor and control the risks of emerging diseases in aquaculture in particular viral induced diseases.

Scientific domains :

- M.1 Data Collection, monitoring and auditing
- M.2 Measuring tools
- M.3 Traceability of products

AREA: 5.4.4 Social and economic basis of the CFP

Research will develop methodologies to identify and analyze the processes affecting the different sectors of coastal communities from a socio-economic point of view. In this context it will assess the economic consequences of interactions between resource management, structural interventions, market support mechanisms and financial incentives in the different economic sectors. It will assess the compatibility of different biological, economic and social objectives of fisheries management, and will compare alternative management strategies.

Scientific domains:

- S.1 Structural intervention and financial support
- S.2 Applied and alternative management strategies
- S.3 Compatibility of biological economic and social management
- S.4 Market support mechanisms

- **Step 2 - Types of projects concerned by the study**

Once the domains were defined, the next step was the selection of the different types of projects to be analyzed.

Of the 191 projects of direct interest for DG Fisheries accepted during the 1998-2002 period in Key Action 5, only 108 (56%) were retained in the study.

They concerned :

- Research and technological development projects (R&D)
- Combined R&D and demonstration projects
- Research training networks and thematic networks
- Concerted Actions (CA)
- SME Co-operative research projects (Craft).

The 30 Accompanying measures, 32 student Grants and 21 SME Exploratory awards funded under KA 5 were not analyzed due to the limited research scope of these projects compared to those promoted by the other instruments.

The figures concerning the number of projects funded under the different actions in KA 5 were extracted from the Final Report "Summary of activities in 2002" in Unit A4.

- **Step 3 - Classification of projects by scientific domain**

The classification of the projects by scientific domain was done on the basis of a careful analysis of their technical annexes and annual reports.

The presentation by scientific domain contains:

- an overview of the selected projects,
- a detailed presentation, classified by type of projects : R&D

projects, Concerted Action (CA), Thematic Network (TN), Demonstration projects and SME Co-operative projects (Craft projects).

Each project is described by :

- Title
- Acronym
- Contract number
- Project type
- End date of the project
- EU Contribution (Mio €)

A general overview of the repartition of the 109 projects by area of research and scientific domain is given in **Annex 2**.

- ***Step 4 - Identification of links between projects***

Possible links and overlaps between projects were identified with the assistance of Scientific Officers. They are presented in **Annex 2**.

4. Results

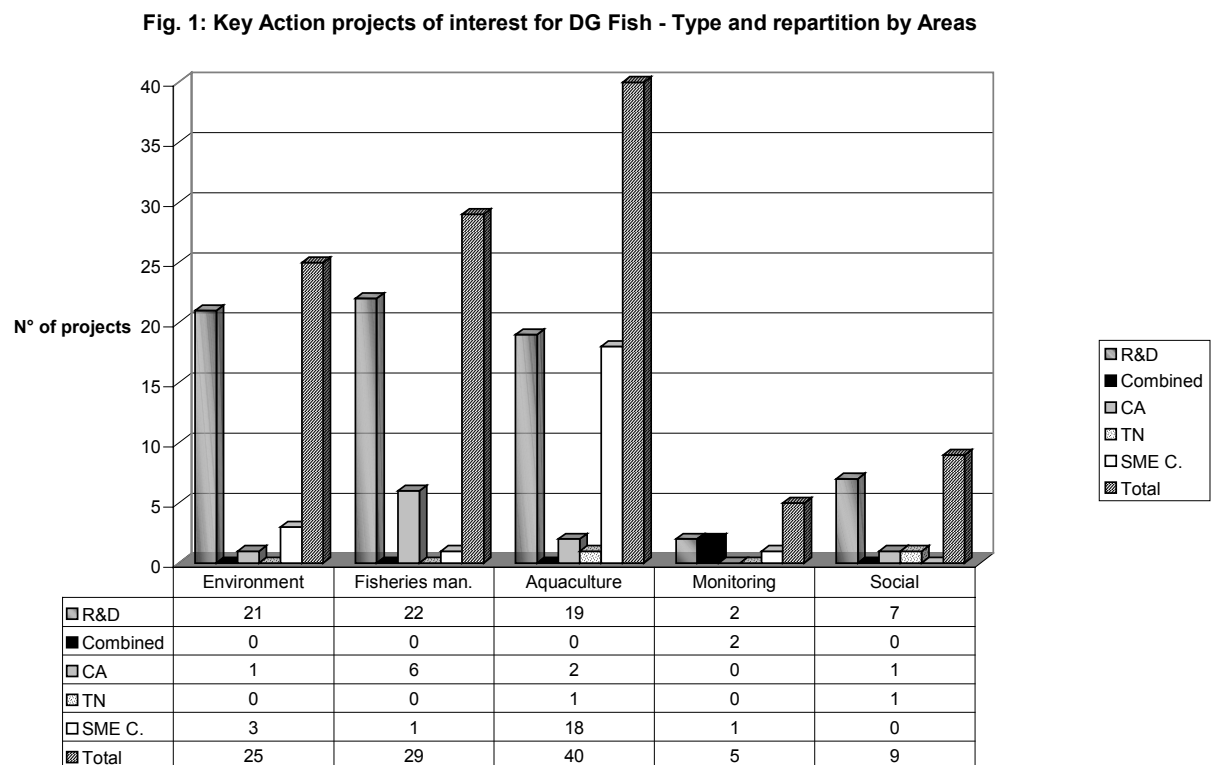
4.1 - Overview breakdown of QoL projects in KA 5

The 108 projects analyzed and classified in this report concerned 71 R&D projects, 23 SME Co-operative projects, 10 Concerted Actions, 2 Thematic Networks and 2 Combined R&D and Demonstration projects.

Their distribution between the different research areas of the work programme is the following:

- KA 5.1.2.3 - *Improvement of aquatic production*: 40 projects or 37% of the 108
- KA 5.1.2.2 - *Scientific basis of fisheries management* : 29 or 27%
- KA 5.1.2.1 - *Interaction between environment, fisheries and aquaculture* : 25 or 23%
- KA 5.4.3 - *Monitoring and enforcement of the CFP* : 5 or 4,5%
- KA 5.4.4 - *Social and economic basis of the CFP* : 9 or 8%

The breakdown of the different types of projects by area or sub area of research is detailed in Fig. 1 for each instrument.



4.2 Overview of SME Co-operative projects

Of the 23 SME Co-operative projects analyzed in the present study, 18 belong to the *Improvement of aquatic production* research area, 3 to the *Interaction between environment, fisheries and aquaculture* area, 1 to the *Scientific basis of fisheries management* and 1 to *Monitoring and enforcement of the CFP* (Fig. 1).

Almost all the scientific domains of the research area *Improvement of aquatic production* have been covered by SME Co-operative projects. Namely : the domain A.2 (Breeding/Selections) presented 4 projects dealing with selection programmes and genetic improvement of seabass, seabream, and oysters, A.4 (New Species) 4 projects on new species in aquatic production such as scallops, pike-perch, sturgeons and sole. A.5 (Fish meal and fish oil replacement) had 4 projects on plant proteins, waste products and carrier ingredients as a possibility for fish meal production, while the 3 SME Co-operative projects in the domain A.3 (Impact of nutrition, environment and husbandry on the health of farmed species) dealt with non-antibiotic measures of disease control and chemical contaminants cumulating in fish.

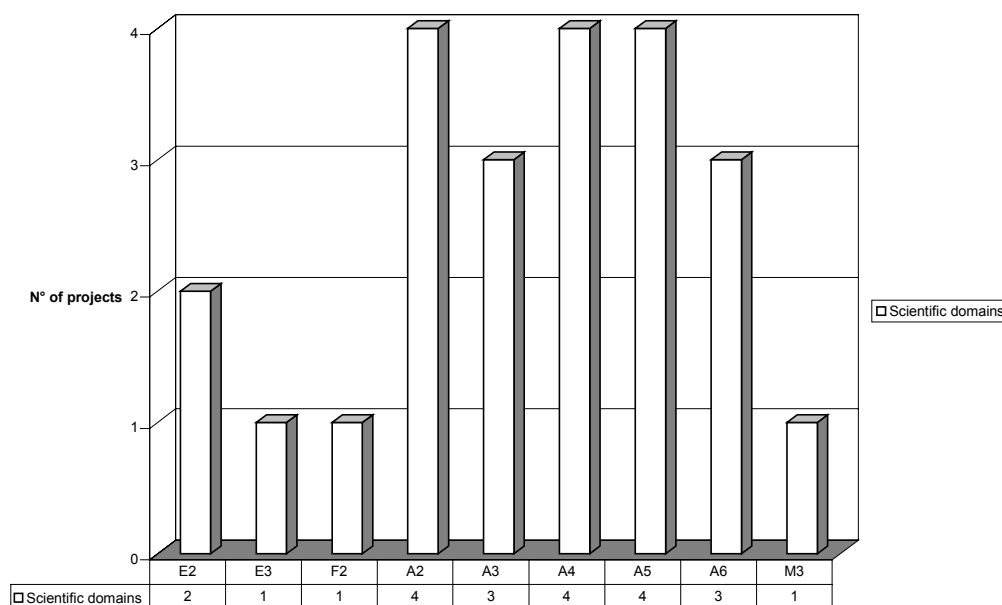
A.6 (Technologies) was covered by 3 projects dealing with technologic systems in the live food breeding and in offshore cultures.

As far as the *Interaction between environment, fisheries and aquaculture* research area was concerned, 2 SME Co-operative projects covered the domain E.2 *Impact of environment changes on aquaculture* with a particular interest in toxic algae and depuration methods. 1 project covered the domain E.3 *Impact of fisheries on the marine ecosystems* and it dealt with harmful algal blooms in coastal waters.

The scientific domain F.2 *Improvement of assessment methods* belonging to the research area *Scientific basis of fisheries management* had 1 project aiming at developing a new artificial bait for commercial deepwater species.

M.3 *Traceability of products* of the research area *Monitoring and enforcement of the CFP* presented 1 SME Co-operative project focusing on traceability of fish products for fish industry (Fig. 2).

Fig. 2: SME Co-operative projects by scientific domains



4.3 Clustering of projects

In order to increase links and exchanges between projects covering one specific research domain, several clusters were promoted. They concerned :

Scientific basis of fisheries management

Management systems (F.1)

With a background of the cod and hake crisis, there exists an emerging interest to re-assess the present research methodologies and their impact on fisheries management. An informal cluster covering three projects related to the evaluation of fisheries management strategies (Q5CA-2002-01693 EASE, Q5RS-2002-01782 PKFM and QLRT-2001-01824 FEMS) was created.

Improvement of aquaculture production

Breeding selection (A.2)

The informal cluster of the two projects related to sea bream (Q5RS-2001-01797 BRIDGEMAP) and sea bass (Q5RS-2001-01701 BASSMAP) genetic mapping continued its activities. This contributed to solid networking among

people working on aquaculture genomics, and a structured response towards the new Framework Programme.

Fish meal and fish oil replacement (A.5)

The informal cluster covering five projects dealing with the replacement of fish meal and fish oil in fish feed (Q5RS-2000-30058 RAFOA, Q5RS-2000-30068 PEPPA, Q5RS-2000-30271 PUFAfeed, Q5RS-2000-30360 FFPARS and Q5RS-2000-31656 GUTINTEGRITY) continued its activities. A Thematic Network aimed at promoting better co-ordination between these projects and further discussing issues related to aquaculture feeds/food safety and quality started at the end of 2002 (Q5TN-2002-00628 FORM). This platform submitted an expression of interest in Priority 5 of FP6 which was favourably evaluated.

Interaction between Environment, Fisheries and Aquaculture

Impact of environment changes on the dynamics of commercial harvested living resources (E1) – Impact of fisheries on the marine ecosystems (E3)

The informal cluster INTERACT “Interaction between environment and fisheries”, will regroup 3 proposals negotiated in 2002 plus 2 ongoing projects in the field of the interactions between Environment and Fisheries. The objective is to facilitate synergies between these projects by exchanging information, organizing co-ordination meetings, increasing participation of external scientists to conferences or workshops and, finally, combining the results in a synthesis to be published.

The following projects are involved: QLRT–2001-00856 MAFCONS (Managing fisheries to conserve groundfish and invertebrate species diversity), QLRT–2001-00799 ETHOFISH (The effect of Turbidity and Hypoxia on the behaviour of coastal marine fishes), QLRT 2001-00787 RESPONSE (Response of benthic communities and sediment to different regimes of fishing disturbance in European coastal waters) and QLRT–2000–993 COST-IMPACT (Costing the impact of demersal fishing on marine ecosystem processes and biodiversity) and QLRT–2000–1685 EFEP (European fisheries Ecosystem Plan).

4.4 Classification

The classification is related to the 5 areas of the Work Programme:

4.4.1 Interaction between environment, fisheries and aquaculture

4.4.2 Scientific basis of fisheries management

4.4.3 Improvement of aquatic production

4.4.4 Monitoring and enforcement of the CFP

4.4.5 Social and economic basis of the CFP

4.4.1. INTERACTION BETWEEN ENVIRONMENT, FISHERIES AND AQUACULTURE

CONTENT

1. Project Classification by scientific domains:

- E.1 Impact of environment changes on the dynamics of commercial harvested living resources**
- E.2 Impact of environment changes on aquaculture**
- E.3 Impact of fisheries on the marine ecosystems**
- E.4 Impact of aquaculture on the environment**
- E.5 Protection of biodiversity**

2. Summary Table

E1 - Impact of environment changes on the dynamics of commercial harvested living resources (whether induced by human activities or not)

This sector of the work programme is covered by five research projects. Four projects aim to investigate the impact of specific climatic and physical phenomena such as hydrographic frontal activity, pressure, turbidity and hypoxia on fish stock dynamics and ecosystems (LIFECO, EELREP, ETHOFISH, CODYSSEY).

One research project deals with the effects of anthropogenic actions on resources. It investigates in particular the impact of hydro power stations in inland waters on eel stocks (EELREP).

The species and the ecosystem investigated are: eel (EELREP, SILVER EEL) and coastal species of the North Sea (LIFECO, ETHOFISH, CODYSSEY)

CLIMATIC

Title : «Linking to ecosystem dynamics in the North Sea and Skagerrak: Importance to fish stock recruitment »

Acronym : LIFECO

Contract Number : Q5RS-2000-30183

Project type : R&D

End: 2003

Contribution : 1.9 Mio €

Title : «Estimation of the reproduction capacity of European eel. (Enhancing the biological basis for sustainable fisheries and aquaculture) »

Acronym : EELREP

Contract Number : Q5RS-2001-01836

Project type : R&D

End: 2004

Contribution : 1.5 Mio €

Link with fisheries management (KA 5.1.2.2.), domain F.4 ("Establishing geographical limits and genetic structure of fish stocks") because it will provide management tools allowing the formulation of reliable decisions for eels ecosystems and eel fishery management.

Title : «The effect of turbidity and hypoxia on the behaviour of coastal marine fishes »

Acronym : ETHOFISH

Contract Number : QLRS-2002-00799

Project type : R&D

End: 2005

Contribution : 1.8 Mio €

Title : « Cod spatial dynamics and vertical movements in European waters and implication in fisheries management »

Acronym : CODYSSEY

Contract Number : Q5RS-2002-00813

Project type : R&D

End: 2006

Contribution : 2.3 Mio €

Link with fisheries management (Domain F.2) because it evaluates the effectiveness of assessment and management methods on cod stocks.

HUMAN

Title : « **Management of silver eel: Human impact on downstream migrating silver eel in the river Meuse** »

Acronym : SILVER EEL

Contract Number : Q5RS-2000-31141

Project type : R&D

End: 2003

Contribution : 0.4 Mio €

E2 - Impact of environment changes on aquaculture (particular emphasis on the effects of toxic algae)

Three projects deal with toxic algae research and its impact on shellfish farming.

DETAL and HAB-BUOY focus on detection methods of harmful algal blooms in coastal waters. The main objective is to increase the level of sensitivity and the rapidity of the current methodologies (microscopic observation and molecular and biochemical techniques).

TALISMAN investigates toxin uptake process and natural depuration in some species (scallops and mussels) and at different growth levels. The main objective is to develop accelerated depuration methods.

Title : « **Fluorescent rapid and ultra-sensitive detection test for the tracking of toxic algal species in the marine environment** »

Acronym : DETAL

Contract Number : Q5RS-2000-30778

Project type : R&D

End: 2003

Contribution : 1 Mio €

Title : « **Algal toxins, their accumulation and loss in commercially important shellfish, including larval mortality and appraisal of accelerated depuration** »

Acronym : TALISMAN

Contract Number : Q5CR-2002-70849

Project type : SME Co-operative

End: 2004

Contribution : 0.8 Mio €

Title : « **In situ imaging and recognition of harmful algal bloom species by artificial neural network** »

Acronym : HAB-BUOY

Contract Number : Q5CR-2002-71699

Project type : SME Co-operative

End:: 2005

Contribution :0.7Mio €

E3 - Impact of fisheries on the marine ecosystems

Eight projects are funded in this scientific domain. They cover most of the priorities indicated in the workprogramme, e.g. impact of fisheries on foodweb, physical impact of gears, impact of fishing on the structure of the stocks and genetic diversity.

Research on foodweb predominantly comprises investigation of the top predators of the marine ecosystems.

Three projects (DISCBIRD, IMPRESS, REDCAFE) focus on the impacts of fisheries on seabird communities.

Four clustered projects deal with the effects of demersal fishing on benthic diversity and ecosystems (COST-IMPACT, MAFCONS, RESPONSE, EFEP).

As far as the structure of fish stocks is concerned, ROCKCOD studies the possibility to promote added value to non commercial and discarded species.

Foodweb (Seabirds)

Title : « **Interactions between the marine environment, predators, and prey: Implications for sustainable sandeel fisheries** »

Acronym : IMPRESS

Contract Number : Q5RS-2000-30864

Project type : R&D

End: 2004

Contribution : 2.6 Mio €

Title : « **Effects of changes in fishery discarding rates on seabird communities** »

Acronym : DISCBIRD

Contract Number : Q5RS-2001-00839

Project type : R&D

End: 2005

Contribution : 1.4 Mio €

Title : « **Reducing the conflict between cormorants and fisheries on a pan-European scale** »

Acronym : REDCAFE

Contract Number : Q5CA-2000-31387

Project type : Concerted Action

End: 2002

Contribution : 0.4 Mio €

Impact of Fishing activities on the ecosystem

Title : « **Costing the impact of demersal fishing on marine ecosystem processes and biodiversity** »

Acronym : COST-IMPACT

Contract Number : Q5RS-2001-00993

Project type : R&D

End: 2004

Contribution : 1.5 Mio €

Title : « **European Fisheries Ecosystem Plan** »

Acronym : EFEP

Contract Number : Q5RS-2001-01685

Project type : R&D

End: 2004

Contribution : 1.2 Mio €

Title : « **Response of benthic communities and sediment to different regimens of fishing disturbance in European coastal waters** »

Acronym : RESPONSE

Contract Number : Q5RS-2002-00787

Project type : R&D

End: 2005

Contribution : 1.6 Mio €

Title : « **Managing Fisheries to Conserve Groundfish and Benthic Invertebrate Species Diversity** »

Acronym : MAFCONS

Contract Number : Q5RS-2002-00856

Project type : R&D

End: 2006

Contribution : 2.1 Mio €

Structure of stocks

Title : « **Promoting higher added value to a finfish species rejected to sea** »

Acronym : ROCKCOD

Contract Number : Q5CR-2002-71709

Project type : SME Cooperative

Endv2004

Contribution : 0.4 Mio €

E4 - Impact of aquaculture on the environment (effects of farm effluents, interaction with wild animals, GMOs, disease)

Among the seven projects identified in this scientific domain, four focus on the impact of farm effluents on the environment: Polyaquaculture systems (SEAPURA), biofilter deployment effectiveness (BIOFAQs), environmental monitoring of fish cage farms (MERAMED) and the effects of nutrient release on benthic communities (MEDVEG).

The SUNBAWS and SALIMPACT projects investigate the interactions between wild and farmed fish. SUMBAWS studies in particular the infestation by parasitic sea lice of wild Atlantic salmon and sea trout stocks as possible transfer from farmed species. The second project (SALIMPACT) focuses on genetic variation in natural populations of Atlantic salmon and brown trout due to aquaculture disease transmission.

One project (AQCESS) investigates positive and negative effects of aquaculture on the local physical marine environment.

Effluents

Title : « **Biofiltration and Aquaculture: An evaluation of hard substrate deployment performance within mariculture developments** »

Acronym : BIOFAQS

Contract Number : Q5RS-2000-30305

Project type : R&D

End: 2003

Contribution : 1.3 Mio €

Title : « **Species diversification and improvement of aquatic production in seaweeds purifying effluents from integrated fish farms and from other waste sources** »

Acronym : SEAPURA

Contract Number : Q5RS-2000-31334
Project type : R&D
End: 2004

Contribution : 1.1 Mio €

Link to Domain A.6 "Technologies" of the KA 5.1.2.3 Improvement of aquatic production because it will improve knowledge in the technologic systems for integrated aquaculture.

Title : « **Development of monitoring guidelines and modelling tools for environmental effects from Mediterranean aquaculture** »

Acronym : MERAMED

Contract Number : Q5RS-2000-31779

Project type : R&D

End: 2003

Contribution : 0.9 Mio €

Title : « **Effects of nutrient release from Mediterranean fish farms on benthic vegetation in coastal ecosystems** »

Acronym : MedVeg

Contract Number : Q5RS-2001-02456

Project type : R&D

End: 2004

Contribution : 1.2 Mio €

Interaction wild

Title : « **Sustainable management of interactions between aquaculture and wild salmonid fish** »

Acronym : SUMBAWS

Contract Number : Q5RS-2002-00730

Project type : R&D

End: 2005

Contribution : 1.6 Mio €

Genetic

Title : « **Impact of aquaculture on the immune response genes of natural salmonid populations: Spatial and temporal genetic signatures and potential fitness consequences** »

Acronym : SALIMPACT

Contract Number : Q5RS-2001-01185

Project type : R&D

End: 2004

Contribution : 1.3 Mio €

Ecosystem

Title : « **Aquaculture and coastal economy and social sustainability** »

Acronym : AQCESS

Contract Number : Q5RS-2000-31151

Project type : R&D

End: 2003

Contribution : 1.8 Mio €

Link: Domain S.3 "Compatibility of biological, economic and social management" of KA 5.4.4 "Social and economic basis of the CFP", because it aim to analyse the predictions for socio-economic, environmental and biological sustainability resulting from the interactions between aquaculture and fisheries.

E5 - Protection of biodiversity

Three projects focus on the relationship between protected marine areas and fisheries.

BIOMEX investigates the importance of protected areas as possible source of biomass for fishery, while VALFEZ estimates the ecological and socio-economic value of exclusion zones and their value and performance in respect to fisheries management.

VALFEZ evaluates the ecological and socio-economic value of exclusion zones as a tool of fisheries management and uses these results to create an analytical tool for management decision-makers.

Title : « **Value of exclusion zones as a fisheries management tool in Europe: A strategic evaluation and the development of an analytical framework** »

Acronym : VALFEZ

Contract Number : QLK5-CT1999-01271

Project type : R&D

End: 2002

Contribution : 0.8 Mio €

Link to Domain S.2 "Applied and alternative management strategies" of KA 5.4.4 "Social and economic basis of the CFP".

Title : « **Assessment of BIOMass EXport from marine protected areas and its impacts on fisheries in the western Mediterranean Sea** »

Acronym : BIOMEX

Contract Number : Q5RS-2002-00891

Project type : R&D

End: 2005

Contribution : 2 Mio €

Summary table : Projects classification by scientific domains in the research area **Interaction between environment, fisheries and aquaculture**

Legend:		belonging domain
		related domain

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms
Q5RS-2000-30183/LIFECO																						
Q5RS-2001-01836/EELREP																						
QLRS-2002-00799/ETHOFISH																						
Q5RS-2002-00813/CODYSEY																						
Q5RS-2000-31141/SILVER EEL																						
Q5RS-2000-30778/DETAL																						
Q5CR-2002-70849/TALISMAN																						
Q5CR-2002-71699/HAB-BUOY																						
Q5RS-2000-30864/IMPRESS																						
Q5RS-2001-00839/DISCBIRD																						
Q5CA-2000-31387/REDCAFE																						
Q5RS-2001-00993/COST-IMPACT																						
Q5RS-2001-01685/EFEP																						
Q5RS-2002-00787/RESPONSE																						
Q5RS-2002-00856/MAFCONS																						
Q5CR-2002-71709/ROCKCOD																						
Q5RS-2000-30305/BIOFAQS																						
Q5RS-2000-31779/MERAMED																						
Q5RS-2001-02456/MedVeg																						
Q5RS-2000-31334/SEAPURA																						
Q5RS-2002-00730/SUMBAWS																						
Q5RS-2001-01185/SALIMPACT																						
Q5RS-2000-31151/AQCESS																						
QLK5-CT1999-01271/VALFEZ																						
Q5RS-2002-00891/BIOMEX-01																						

4.4.2 Scientific basis of fisheries management

CONTENT

1. Project Classification by scientific domains:

F.1 Management systems

F.2 Improvement of assessment methods

F.3 Assessment methods for less known resources

F.4 Establishing geographical limits and genetic structure of fish stocks

2. Summary Table

F1 - Management systems

This research domain has been covered by 3 R&D projects and 1 CA. Among the different aspects of management systems in fisheries, one project (RESPONSIBLE) focuses on the chain of responsibilities (From EU to local individuals) to assess its consistency and give possible alternatives. FERMS aims to develop a computer simulation framework for the evolution of management strategies, starting from case studies. The different steps, from scientific advice to management decisions and policy process, are the subjects of the study of PKFN, with particular regard to the North Sea cod fisheries management. A Concerted Action (EASE) deals with quality and quantity of resources devoted to data collection and the value of this data in the provision of advice on fisheries management.

Title : « **Sharing responsibilities in fisheries management** »

Acronym : RESPONSIBLE

Contract Number : Q5RS-2001-01998

Project type : R&D

End: 2004

Contribution : 0.5 Mio €

Title : « **Policy and knowledge in fisheries management - the North Sea cod case** »

Acronym : PKFM

Contract Number : Q5RS-2002-01782

Project type : R&D

End: 2005

Contribution : 0.9 Mio €

Title : « **Framework for the Evaluation of Management Strategies** »

Acronym : FEMS

Contract Number : Q5RS-2002-01824

Project type : R&D

End: 2005

Contribution : 0.4 Mio €

Title : « **European Advice System Evaluation** »

Acronym : EASE

Contract Number : Q5CA-2002-01693

Project type : CA

End: 2005

Contribution : 0.9 Mio €

Link to Domain M.1 "Data collection, monitoring and auditing" of Key action 5.4.3 Monitoring and enforcement of the CFP because it gives basis for more appropriate data collection.

F2 - Improvement of assessment methods

This research domain has been covered by 13 R&D projects, 3 CAs and 1 SME Co-operative project.

Among the R&D projects, 7 deal with stock assessment methods of different marine fish species. MACOM, RASER and IBACS respectively study cod stocks demographic structure, methods for measuring fecundity of cod and hake, and the biological basis of age estimation for cod and hake.

Small pelagic stocks are the objects of study in SARDYN (sardine) and in ANREC (pilchard and anchovy). SARDYN aims to improve knowledge on the

stock structure while ANREC focuses on external forces influences on the stock.

Studies on the scientific basis for the management of Atlantic mackerel (GBMAF) and swordfish (SIDS) stocks have also been founded.

Selectivity of fishing gears in relation to mortality estimations of various stocks is the subject of study of RECOVERY, PREMECS II and SURVIVAL.

Two R&D projects deal with the assessment of acoustic methods in trawl surveys: CATEFA is related to survey procedures for the identification of ground fish species while SIMFAMI focuses more on pelagic species.

One research project deals with costs and benefits for fishery management of models based on detailed marine ecological processes.

The 3 concerted actions founded under this particular domain aim to coordinate research on management aspects, like salmon management methods (SALMODEL) and reliability of fish age estimation procedures (TACADAR). MUTFISHARE has a broader spectrum of research topics, from biological to technological research in fishery and aquaculture.

The only SME Co-operative research project founded aims to develop a new artificial bait for commercial deepwater species.

Title : « Combining geostatistical and bayesian methods to improve the scientific basis for the management of atlantic mackerel fisheries »

Acronym : GBMAF

Contract Number : QLK5-CT1999-01253

Project type : R&D

End: 2003

Contribution : 0.5 Mio €

Title : « Sexual identification and development in the swordfish - Improved determination tools for more efficient stock assessment and implementation of control measures »

Acronym : SIDS

Contract Number : QLK5-CT1999-01567

Project type : R&D

End: 2002

Contribution : 0.3 Mio €

Link to Domain A.1 "Essential biological functions of farmed species" of Key action 5.1.2.3 "Improvement of aquatic production" because it studies a vital function such as gonadal maturity of swordfish

Title : « Development of structurally detailed statistically testable models of marine populations »

Acronym : DST2

Contract Number : QLK5-CT1999-01609

Project type : R&D

End: 2003

Contribution : 3 Mio €

Title : « Demonstration of maternal effects of Atlantic cod: combining the use of unique mesocosm and novel molecular techniques »

Acronym : MACOM

Contract Number : QLK5-CT1999-01617

Project type : R&D

End: 2002

Contribution : 1 Mio €

Link to Domain E.1" Impact of environment changes on the dynamics of commercial harvested living resources" of Key Action 5.1.2.1 Interaction between environment, fisheries

and aquaculture”, because it provides information on the influence of fisheries (anthropic actions) on cod size and age composition.

Title : « **Combining Acoustic and Trawl data for Estimating Fish Abundance.** »

Acronym : CATEFA

Contract Number : Q5RS-2001-02038

Project type : R&D

End: 2004

Contribution : 1.1 Mio €

Title : « **Species Identification Methods From Acoustic Multifrequency Information»**

Acronym : SIMFAMI

Contract Number : Q5RS-2001-02054

Project type : R&D

End: 2004

Contribution : 1 Mio €

Title : « **Sardine dynamics and stock structure in the North-East Atlantic** »

Acronym : SARDYN

Contract Number : Q5RS-2002-000818

Project type : R&D

End: 2005

Contribution : 1.2 Mio €

Title : « **Research on effective cod stock recovery measures** »

Acronym : RECOVERY

Contract Number : Q5RS-2002-00935

Project type : R&D

End: 2005

Contribution : 1.5 Mio €

Title : « **Association of Physical and Biological processes acting on Recruitment and post-Recruitment of Anchovy»**

Acronym : ANREC

Contract Number : Q5RS-2002-01216

Project type : R&D

End: 2005

Contribution : 1.3 Mio €

Link to Domain E.1” Impact of environment changes on the dynamics of commercial harvested living resources” of Key Action 5.1.2.1 Interaction between environment, fisheries and aquaculture”, because it provides information on the influence of physical forces (environmental condition and oceanographic features) on the stock structure.

Title : « **Development of predictive model of cod-end selectivity** »

Acronym : PREMECS II

Contract Number : Q5RS-2002-01328

Project type : R&D

End: 2005

Contribution : 1.2 Mio €

Title : « **SURVIVAL : An assessment of mortality in fish escaping from trawl codends and its use in fisheries management.**»

Acronym : SURVIVAL

Contract Number : Q5RS-2002-01603

Project type : R&D

End: 2005

Contribution : 1.3 Mio €

Title : « **Integrated approach to the biological basis of age estimation in commercially important fish species** »

Acronym : IBACS

Contract Number : Q5RS-2002-01610

Project type : R&D

End: 2005

Contribution : 1 Mio €

Title : « **Reproduction and Stock Evaluation for Recovery.** »

Acronym : RASER

Contract Number : Q5RS-2002-01825

Project type : R&D

End: 2005

Contribution : 1 Mio €

Title : « **A coordinated approach towards development of a scientific basis for management of wild Atlantic salmon in the North-East Atlantic** »

Acronym : SALMODEL

Contract Number : QLK5-CT1999-01546

Project type : CA

End: 2002

Contribution : 0.8 Mio €

Title : « **Mutualization on fisheries and aquaculture European Research Institutes.** »

Acronym : MUTFISHARE

Contract Number : Q5CA-2002-1353

Project type : CA

End: 2005

Contribution : 0.5 Mio €

Title : « **Towards Accreditation and Certification of Age Determination of Aquatic Resources** »

Acronym : TACADAR

Contract Number : Q5CA-2002-01891

Project type : CA

End: 2006

Contribution : 0.2 Mio €

Title : « **Artificial Bait Alternatives, mainly based on fish waste** »

Acronym : ARTIBAIT

Contract Number : Q5CR-2000-70427

Project type : SME Co-operative

End: 2003

Contribution : 05 Mio €

F3 - Assessment methods for less known resources

This specific domain of the Work Programme has been covered by 2 Concerted Actions. EDFAM aims to provide a framework for the future data requirements, assessment and management of European decapod crustacea while CEPHSTOCK aims to review knowledge and issues concerning cephalopod fisheries biology and stock structure.

Title : « **European decapod fisheries: Assessment and management** »

Acronym : EDFAM

Contract Number : QLK5-CT1999-01272

Project type : CA

End: 2003

Contribution : 0.7 Mio €

Link to Domain S.3 "Compatibility of biological economic and social management" of Key action 5.4.4 Social and economic basis of the CFP because it has a reference to biological and socio-economic issues in European decapod crustacea fishery.

Title : « Cephalopods stocks in European waters: review, analysis, assessment and sustainable management »

Acronym : CEPHSTOCK

Contract Number : Q5CA-2002-00962

Project type : CA

End: 2005

Contribution : 0.9 Mio €

F4 - Establishing geographical limits and genetic structure of fish stocks

The 6 R&D projects funded under this domain focus on genetic structure of commercially important fish stocks in different areas to improve fisheries management.

Two projects deal with herring stocks genetic structure in West of Britain and around Ireland waters (WESTHER) and West of Scotland, North Sea, Kattegat, Skagerrak and Western Baltic (HERGEN).

METACOD focuses on the extent of genetic sub-structure of North Atlantic cod stocks. Research on the horse mackerel from North-eastern Atlantic to the Mediterranean Sea (HOMSIR) and on redfish populations in the Irminger Sea and adjacent waters (REDFISH) has also been founded.

MARINEGGS deals with the development of genetic markers to identify eggs from commercially important fish species.

Title : « Genetic identification of fish eggs by species-specific DNA markers for use in stock biomass assessments and detection of commercial fraud »

Acronym : MARINEGGS

Contract Number : QLK5-CT1999-01157

Project type : R&D

End: 2003

Contribution : 1.3 Mio €

Title : « Population structure, reproductive strategies and demography of redfish (Genus *Sebastes*) in the Irminger Sea and adjacent waters (ICES V, XII and XIV; NAFO 1) »

Acronym : REDFISH

Contract Number : QLK5-CT1999-01222

Project type : R&D

End: 2003

Contribution : 2.9 Mio €

Title : « A multidisciplinary approach using genetic markers and biological tags in horse mackerel (*Trachurus trachurus*) stock structure analysis »

Acronym : HOMSIR

Contract Number : QLK5-CT1999-01438

Project type : R&D

End: 2003

Contribution : 1.3 Mio €

Title : « **Role of sub-stock structure in the maintenance of cod meta populations** »

Acronym : METACOD

Contract Number : Q5RS-2001-00953

Project type : R&D

End: 2005

Contribution : 2 Mio €

Title : « **Conservation of diversity in an exploited species: spatio-temporal variation in the genetics of herring (*Clupea harengus*) in the North Sea and adjacent areas** »

Acronym : HERGEN

Contract Number : Q5RS-2001-01370

Project type : R&D

End: 2004

Contribution : 1.5 Mio €

Title : « **A Multidisciplinary Approach to the Identification of Herring (*Clupea harengus* L.) Stock Components West of the British Isles Using Biological Tags and Genetic Markers** »

Acronym : WESTHER

Contract Number : Q5RS-2002-01056

Project type : R&D

End: 2005

Contribution : 1.8 Mio €

Summary table : Projects classification by scientific domains in the research area **Scientific basis of fisheries management**

Legend:		belonging domain
		related domain

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms
Q5RS-2001-01998/RESPONSIBLE																						
Q5RS-2002-01782/PKFM																						
Q5RS-2002-01824/FEMS																						
Q5CA-2002-01693/EASE																						
Q5RS-2002-000818/SARDYN																						
Q5RS-2002-00935/RECOVERY																						
Q5RS-2002-01216/ANREC																						
QLK5-CT1999-01567/SIDS																						
QLK5-CT1999-01617/MACOM																						
QLK5-CT1999-01253/GBMAF																						
QLK5-CT1999-01609/DST2																						
Q5RS-2001-02038/CATEFA																						
Q5RS-2001-02054/SIMFAMI																						
Q5RS-2002-01328/PREMECS II																						
Q5RS-2002-01603/SURVIVAL																						
Q5RS-2002-01610/IBACS																						
Q5RS-2002-01825/RASER																						
QLK5-CT1999-01546/SALMODEL																						
Q5CA-2002-1353/MUTFISHARE																						
Q5CA-2002-01891/TACADAR																						
Q5CR-2000-70427/ARTIBAIT																						

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QLK5-CT1999-01272/EDFAM																							
Q5CA-2002-00962/CEPHSTOCK																							
QLK5-CT1999-01157/MARINEGGS																							
QLK5-CT1999-01222/REDFISH																							
QLK5-CT1999-01438/HOMSIR																							
Q5RS-2001-01370/HERGEN																							
Q5RS-2001-00953/METACOD																							
Q5RS-2002-01056/WESTHER																							

4.4.3 Improvement of aquatic production

CONTENT

1. Project Classification by scientific domains:

A.1 Essential biological functions of farmed species

A.2 Breeding/Selections

A.3 Impact of nutrition, environment and husbandry on the health of farmed species

A.4 New Species

A.5 Fish meal and fish oil replacement

A.6 Technologies

2. Summary Table

A1 - Essential biological functions of farmed species

Research projects under this domain aim to improve knowledge on fundamental biological functions of farmed species in order to clarify problems related to fish growth, maturation and quality.

The physiological mechanisms and biological functions studies range from larval development and juvenile growth (AARDE), sex maturation (PUBERTIMING) and sex differentiation (PROBASS) to skeletal development and calcium physiology (FISHCAL) and mechanisms regulating pigmentation in fish (COLORED). The species studied are seabass (PUBERTIMING, PROBASS), seabram (FISHCAL), halibut (AARDE), red porgy (COLORED), salmon (PUBERTIMING), rainbow trout (PUBERTIMING).

Title : «**Improving production efficiency of sea bass farming by developing methodologies to eliminate environmental androgenesis**»

Acronym : PROBASS

Contract Number : Q5RS-2000-31365

Project type : R&D

End: 2003

Contribution : 1.4 Mio €

Title : «**Environmental, nutritional and neuroendocrine regulation of skin coloration in the red porgy (pargus pargus), towards the development of natural hue in culture populations** »

Acronym : COLORED

Contract Number : Q5RS-2000-31629

Project type : R&D

End: 2003

Contribution : 1 Mio €

Link with the domain A.4 "New species" because the red porgy (Pargus pargus) is one of the suggested species for differentiate fish farming.

Title : «**Calcium, the backbone of fish culture: Importance in skeletal formation, reproduction and normal physiology**»

Acronym : FISHCAL

Contract Number : Q5RS-2001-01465

Project type : R&D

End: 2005

Contribution : 1.4 Mio €

Title : «**ARRESTED DEVELOPMENT: The Molecular and Endocrine Basis of Flatfish Metamorphosis**»

Acronym : AARDE

Contract Number : Q5RS-2002-01192

Project type : R&D

End: 2005

Contribution : 1.3 Mio €

Title : «**Photoperiod control of puberty in farmed fish : Development of new techniques and research into underlying physiological mechanisms**»

Acronym : PUBERTIMING

Contract Number : Q5RS-2002-01801

Project type : R&D

End: 2005

Contribution : 1.3 Mio €

A2 – Breeding/Selection

The 10 founded projects under this domain (6 R&D, 4 SME Co-operative) deal with selection programmes and genetic improvement of farmed species.

The species studied are: seabass (HERITABOLUM, BASSMAP, FREEZEBASS) rainbow trout (PROGRESS, STRESSGENES), seabream (BRIDGE-MAP, FREE GENES, CRYOCYTE), flat oyster (BOLCI(R)), rotifers (ROTINGEN).

Title : «**Protein and growth efficiency in salmonid selection** »

Acronym : PROGRESS

Contract Number : Q5RS-2001-00994

Project type : R&D

End: 2004

Contribution : 0.8 Mio €

Link with Domain A.5 “Fish meal and fish oil replacement” because it addresses salmonid selection at improving protein growth, thus combining on an interesting way genetics and nutrition. The project could bring more insight about the mechanisms governing protein efficiency and genetics in fish, and could thus provide the basis for selection of strains more adapted to alternative protein sources.

Title : « **Tools for the genetic improvement of sea bass. Construction and preliminary application of a medium density linkage and synteny map** »

Acronym : BASSMAP

Contract Number : Q5RS-2001-01701

Project type : R&D

End: 2005

Contribution : 1.2 Mio €

Title : «**Bridging genomes: an integrated genomic approach toward genetic improvement of aquacultured fish species** »

Acronym : BRIDGE-MAP

Contract Number : Q5RS-2001-01797

Project type : R&D

End: 2005

Contribution : 1.3 Mio €

Title : «**A functional genomic approach to measuring stress in fish aquaculture** »

Acronym : STRESSGENES

Contract Number : Q5RS-2001-02211

Project type : R&D

End: 2004

Contribution : 2 Mio €

Title : « **Towards the Development of Technologies for Cryopreservation of Fish Oocytes** »

Acronym : CRYOCYTE

Contract Number : Q5RS-2002-00784

Project type : R&D

End: 2005

Contribution : 1.9 Mio €

Title : «**Genetic implications in the production of rotifers in commercial finfish hatcheries** »

Acronym : ROTINGEN

Contract Number : Q5RS-2002-01302

Project type : R&D

End: 2005

Contribution : 1.1 Mio €

Title : «**Freezing milt as tool for genetic improvement of farmed seabream** »

Acronym : FREE GENES

Contract Number : Q5CR-2001-70687

Project type : SME Co-operative

End: 2004

Contribution : 0.3 Mio €

Title : « **Setting up of a sperm cryobank for seabass** »

Acronym : FREEZEBASS

Contract Number : Q5CT-2002-71209

Project type : SME Co-operative

End: 2004

Contribution : 0.2 Mio €

Title : «**Estimation of genetic parameters for seabass** »

Acronym : HERITABOLUM

Contract Number : Q5CR-2002-71720

Project type : SME Co-operative

End:

Contribution : 0.5 Mio €

Title : «**Bonamia ostreae life cycle investigations, optimised production of resistant Ostrea edulis Spat, and studies of oyster (Ostrea edulis) immune mechanisms** »

Acronym : BOLCI(R)

Contract Number : Q5CR-2002-72338

Project type : SME Co-operative

End:

Contribution : 0.6 Mio €

A3 - Impact of nutrition, environment and husbandry on health of farmed species

This particular sector of the Work Programme has been covered by 5 projects (2 R&D, 3 SME Co-operative).

Most of the projects (PROBE, AQUACURE, RMBC) aim at developing measures of disease control in aquaculture alternative to the use of antibiotics. They analyze the effects of probiotic bacteria (PROBE), environmental-friendly agents (AQUACURE) and bacterial communities antagonist (RMBC) on larval rearing and health.

The DAPAFF project addresses the issue of chemical contaminants such as dioxins and PCBs cumulating in fish through feed.

ORCIS focuses on impact of nutrition and environment farm conditions as possible causes of skeletal deformities, a quality problem that can affect farmed sea bass.

Title : «**Improved procedures for flatfish larval rearing through the use of probiotic bacteria** »

Acronym : PROBE

Contract Number : Q5RS-2000-31457

Project type : R&D

End: 2003

Contribution : 1.4 Mio €

Link to Domain E.4 "Impact of aquaculture on the environment" of KA 5.1.2.1 "Interactions between environment, fisheries and aquaculture", because it aims to a progressive reduction of antibiotic use in aquaculture with a positive impact on the environment.

Title : «**Optimisation of rearing conditions in sea bass for eliminated lordosis and improved musculoskeletal growth** »

Acronym : ORCIS

Contract Number : Q5RS-2001-01233

Project type : R&D

End: 2004

Contribution : 1 Mio €

Title : « **Dioxin and PCB accumulation in farmed fish from feed** »

Acronym : DAPAFF

Contract Number : Q5CR-2000-70418

Project type : SME Co-operative

End: 2002

Contribution : 0.2 Mio €

Title : «**Application of environmental-friendly agents with antimicrobial properties in Aquaculture** »

Acronym : AQUACURE

Contract Number : Q5CR-2002-71272

Project type : SME Co-operative

End: 2004

Contribution : 0.3 Mio €

Link to Domain E.4 "Impact of aquaculture on the environment" of KA 5.1.2.1 "Interactions between environment, fisheries and aquaculture", because it aims to a progressive reduction of antibiotic use in aquaculture with a positive impact on the environment.

Title : « **The use of RMBC's for bacterial management in marine larval fish** »

Acronym : RMBC

Contract Number : Q5CR-2002-72221

Project type : SME Co-operative

End: 2004

Contribution : 0.2 Mio €

Link to Domain A.6 "Technologies"

Link to Domain E.4 "Impact of aquaculture on the environment" of KA 5.1.2.1 "Interactions between environment, fisheries and aquaculture", because it aims to a progressive reduction of antibiotic use in aquaculture with a positive impact on the environment.

A4 - New species

Among the 5 projects dealing with new species , 4 are SME CRAFT projects. The 4 projects focus on specific problems related to new species such as survival increasing of scallops (SCALQUAL), technical and economical feasibility of pike-perch culture (LUCIOPERCA), sex determination of sturgeons at a very early stage (STURGEON SEXING) and farming techniques for commercial production of sole (SOLEMATES).

REPRO-DOTT aims to obtain a controlled reproduction of Bluefin Tuna studying the reproductive biology and physiology of this migratory species.

Title : « **Reproduction of the Bluefin Tuna in Captivity - A feasibility study for the domestication of *Thunnus thynnus*** »

Acronym : REPRO-DOTT

Contract Number : Q5RS-2002-01355

Project type : R&D

End: 2005

Contribution : 1.5 Mio €

Title : « **Improving the quality of cultivated scallops to ensure a viable aquaculture production** »

Acronym : SCALQUAL

Contract Number : Q5CR-2000-70310

Project type : SME Co-operative

End: 2003

Contribution : 0.3 Mio €

Title : « **Bio-economic feasibility of intensive culture of pike-perch** »

Acronym : LUCIOPERCA

Contract Number : Q5CR-2001-70594

Project type : SME Co-operative

End: 2003

Contribution : 0.5 Mio €

Title : « **Design and development of commercial scale farming technologies for sole** »

Acronym : SOLEMATES

Contract Number : Q5CR-2002-71039

Project type : SME Co-operative

End: 2004

Contribution : 0.9 Mio €

Title : « **Genetic sex determination in sturgeons : practical application in caviar production** »

Acronym : Sturgeon Sexing

Contract Number : Q5CR-2002-72183

Project type : SME Co-operative

End:

Contribution : 0.5 Mio €

A5 - Fish meal and fish oil replacement

The 11 funded projects under this domain deal with alternative feed resources to fish meal and fish oil and related feed quality issues in aquaculture. Some examples of alternative feed for farmed fish investigated in the projects are heterotrophic and mixotrophic microorganisms (PUFAFEED), vegetable oils (RAFOA, GUTINTEGRY, FPARS), plant proteins (FISHMEAL REPLACEMENT, PEPPA), and waste products (Protein Omega Concentrate) from shrimp peeling lines (BYPROFEED). FORM is a Thematic Network aimed at promoting better co-ordination between some of these projects and further discussing issues related to aquaculture feeds/food safety and quality. AQUALITY, instead, studies the currently applied feed by the marine fish farming industry in correlation to quality parameters of farmed fishes while PULSEFISH deals with carrier ingredients in feed.

SELFISH is a project of general nature to support new feed development and that could also contribute to this topic.

Title : « **Researching alternatives to fish oil for aquaculture** »

Acronym : RAFOA

Contract Number : Q5RS-2000-30058

Project type : R&D

End: 2004

Contribution : 2.6 Mio €

Title : «**Perspectives of plant protein use in Aquaculture: Biological, environmental and socio-economic consequences** »

Acronym : PEPPA

Contract Number : Q5RS-2000-30068

Project type : R&D

End: 2003

Contribution : 1.8 Mio €

Title : «**Feed for aquatic animals that contains cultivated marine microorganisms as alternatives for fish oil** »

Acronym : PUFAFEED

Contract Number : Q5RS-2000-30271

Project type : R&D

End: 2003

Contribution : 1.1 Mio €

Title : «**Cloning and functional analysis of fish peroxisome proliferator-activated receptors: The transcriptional control of lipid metabolism in farmed fish species** »

Acronym : FPPARS

Contract Number : Q5RS-2000-30360

Project type : R&D

End: 2003

Contribution : 0.8 Mio €

Link to Domain A.1 "Essential biological functions of farmed species" because it will provide new insights on the genetic controls involved in energy balance of farmed fishes.

Title : «**Gastrointestinal functions and food intake regulation in Salmonids: Impact of dietary vegetable lipids**»

Acronym : GUTINTEGRITY

Contract Number : Q5RS-2000-31656

Project type : R&D

End: 2003

Contribution : 1.2 Mio €

Link to Domain A.1 "Essential biological functions of farmed species" because it studies a vital function such as food intake regulation in the gastrointestinal tract of salmonid.

Title : «**Dietary self-selection in fish: a geometrical approach for optimising aquaculture production**»

Acronym : SELFISH

Contract Number : Q5CA-2001-00989

Project type : CA

End: 2004

Contribution : 0.3 Mio €

Title : «**Fish Oil and Meal Replacement** »

Acronym : FORM

Contract Number : Q5TN-2002-00628

Project type : TN

End: 2006

Contribution : 0.5 Mio €

Title : «**Utilisation of by products from shrimp peeling, for feed addition to lobster fry, halibut juveniles, organic farmed salmon par and arctic char par and adults** »

Acronym : BYPROFEED

Contract Number : Q5CR-2001-70626

Project type : SME Co-operative

End: 2004

Contribution : 0.4 Mio €

Title : « **Developing a partial fishmeal replacer from EU plant raw materials for use in aquaculture** »

Acronym : FISHMEAL REPLACEMENT

Contract Number : Q5CR-2001-70684

Project type : SME Co-operative

End: 2004

Contribution : 0.6 Mio €

Title : « **Optimised aquaculture product quality through better feed quality and feed management**»

Acronym : AQUALITY

Contract Number : Q5CR-2002-71664

Project type : SME Co-operative

End:

Contribution : 0.4 Mio €

Title : « **Technological Improvement of the Utilisation of Pulse Proteins and Fish Protein Concentrate in Fish Feeds** »

Acronym : PULSEFISH

Contract Number : Q5CR-2002-72052

Project type : SME Co-operative

End: 2004

Contribution : 0.3 Mio €

A6 – Technologies

The 3 projects founded are SME CRAFT projects and deal with alternative and specific technologic systems in fish and molluscs farming.

A great attention is given to improving technology in the live food breeding and feed in general, such as rotifer culture (ROTRECIRC) and preservation of copepod eggs (POCEFF).

OMUR brings innovation in mussel farming designing and testing of offshore rafts.

Title : « **Development of a recirculation system for the high density rotifer culture on commercial scale** »

Acronym : ROTRECIRC

Contract Number : Q5CR-2000-70186

Project type : SME Co-operative

End: 2002

Contribution : 0.2 Mio €

Title : «**Modular and Submersible Offshore Mussel Rafts** »

Acronym : OMUR

Contract Number : Q5CR-2002-71781

Project type : SME Co-operative

End: 2004

Contribution : 0.4 Mio €

Title : «**Preservation of Copepod eggs for fish farming** »
Acronym : POCEFF
Contract Number : Q5CR-2002-72468
Project type : SME Co-operative
End:
Contribution : 0.7 Mio €

HORIZONTAL

This project aims to increase and improve scientific and technological awareness of European research project among aquaculture industry, particularly SMEs.

Title : « Aqua-Flow: European network for the dissemination of aquaculture R&D information»

Acronym : AQUA-FLOW NETWORK

Contract Number : Q5CA-2000-30105

Project type : CA

End: 2003

Contribution : 1.4 Mio €

Summary table : Projects classification by scientific domains in the research area **Improvement of aquatic production**

Legend:		belonging domain
		related domain

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms
Q5RS-2000-31629/COLORED																						
Q5RS-2000-31365/PROBASS																						
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Q5RS-2002-01801/PUBERTIMING																						
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Q5RS-2001-02211/STRESSGENES																						
Q5RS-2001-01797/BRIDGE-MAP																						
Q5RS-2001-01701/BASSMAP																						
Q5RS-2002-01302/ROTINGEN																						
Q5RS-2002-00784/CRYOCYTE																						
Q5CR-2002-71720/HERITABOLUM																						
Q5CR-2001-70687/FREE GENES																						
Q5CT-2002-71209/FREEZE BASS																						
Q5CR-2002-72338/BOLCI(R)																						
Q5RS-2000-31457/PROBE																						
Q5RS-2001-01233/ORCIS																						
Q5CR-2000-70418/DAPAFF																						
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Q5RS-2002-01355/REPRO-DOTT																						
Q5CR-2001-70594/LUCIOPERCA																						

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms
Q5CR-2000-70310/SCALQUAL																						
Q5CR-2002-72183/Sturgeon Sexing																						
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Q5RS-2000-30360/FPPARS																						
Q5RS-2000-30068/PEPPA																						
Q5RS-2000-30058/RAFOA																						
Q5CA-2001-00989/SELFISH																						
Q5TN-2002-00628/FORM																						
Q5CR-2002-71664/AQUALITY																						
Q5CR-2001-70626/BYPROFEED																						
Q5CR-2001-70684/FISHMEAL R.																						
Q5CR-2002-72052/PULSEFISH																						
Q5CR-2000-70186/ROTRECIRC																						
Q5CR-2002-71781/OMUR																						
Q5CR-2002-72468/POCEFF																						
Q5CA-2000-30105/AQUA-FLOW N.																						

4.4.4 Monitoring and enforcement of the CFP

CONTENT

1. Project Classification by scientific domains:

M.1 Data collection, monitoring and auditing

M.2 Measuring tools

M.3 Traceability of products

2. Summary Table

M1 - Data collection, monitoring and auditing

This research domain has been covered by 2 projects dealing with monitoring of fisheries.

TEMETEC aims to give an understanding of the causes of inefficiency in fisheries production in relation to fishery management tools.

IMPAST deals with Satellite Technologies applied to fisheries monitoring.

Title : « **Technical efficiency in EU fisheries: Implications for monitoring and management through effort control** »

Acronym : TEMEC

Contract Number : QLK5-CT1999-01295

Project type : Combined R&D and demonstration

End: 2003

Contribution : 1 Mio €

Link to Domain S.1 "Structural intervention and financial support" of KA 5.4.4 "Social and economic basis of the CFP" because among management tools subject of study there are technical efficiency of fleets, fleets size and innovations on board.

Title : « **Improving fisheries monitoring through integrating passive and active satellite-based technologies** »

Acronym : IMPAST

Contract Number : Q5RS-2001-02266

Project type : R&D

End: 2004

Contribution : 1.6 Mio €

M2- Measuring tools

Only 1 project concerns this scientific domain. The OMEGA project intends to develop a new mesh gauge suitable for fisheries inspection, research and industry.

Title : « **Development and Testing of an Objective Mesh Gauge** »

Acronym : OMEGA

Contract Number : Q5CO-2002-01335

Project type : Combined R&D and demonstration

End: 2005

Contribution : 0.4 Mio €

M3 - Traceability of products

One R&D project and one SME Co-operative project have been funded under this domain.

The main objective of CODTRACE is to provide information on the location of Cod spawning and harvest by optimising all relevant techniques in fish traceability.

A partial contribution to traceability of products is given by the SME Co-operative project EESD. The project aims to develop modular software packages for fishing industry to improve acquisition of catch and landing data.

Title : « **Establishing traceability for cod (Gadus morhua): determining location of spawning and harvest** »

Acronym : CODTRACE

Contract Number : Q5RS-2001-01697

Project type : R&D

End: 2004

Contribution : 1.7 Mio €

Linked to Domain F.4 "Establishing geographical limits and genetic structure of fish stocks" of KA 5.1.2.2 "Scientific basis of fisheries management". The project results can improve information on Cod geographical location of spawning and harvest in the major marine basis (Irish Shelf, Baltic Sea, Irish Sea, North Sea, Iceland waters).

Title : « **Fisheries Computer Aided Management**»

Acronym : EESD-3

Contract Number : Q5CR-2001-70746

Project type : SME Co-operative

End: 2003

Contribution : 0.6 Mio €

Summary table : Projects classification by scientific domains in the research area **Monitoring and enforcement of the CFP**

Legend:		belonging domain
		related domain

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP				
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms	
Q5RS-2001-02266/IMPAST																							
QLK5-CT1999-01295/TEMEC																							
Q5CO-2002-01335/OMEGA																							
Q5RS-2001-01697/CODTRACE																							
Q5CR-2001-70746/EESD-3																							

4.4.5 Social and economic basis of the CFP

CONTENT

1. Project Classification by scientific domains:

S.1 Structural intervention and financial support

S.2 Applied and alternative management strategies

S.3 Compatibility of biological economic and social management

S.4 Market support mechanisms

2. Summary Table

S1 - Structural intervention and financial support

The research projects under this domain aim to improve the decision process at the level of public policy makers. Two projects investigate the contribution of the EU management of fisheries on fleet dynamics and on fishing communities (TECTAC) and on the development of coastal regions (PECHDEV).

EAEF gives a partial contribution to the understanding of the influence of fisheries management on fleet segments developing analytical tools to exploit data and improve estimations.

Title : « **Élaboration et application d'un modèle calculable d'équilibre général à l'analyse de la contribution des activités halieutiques au développement régional** »

Acronym : PECHDEV

Contract Number : Q5RS-2001-02277

Project type : R&D

End: 2005

Contribution : 0.9 Mio €

Title : « **Technical developments and tactical adaptations of important EU fleets.** »

Acronym : TECTAC

Contract Number : Q5RS-2002-01291

Project type : R&D

End: 2005

Contribution : 1.8 Mio €

Title : « **Economic Assessment of European Fisheries** »

Acronym : EAEF

Contract Number : Q5CA-2001-01502

Project type : CA

End: 2004

Contribution : 1.5 Mio €

Linked to Domain M.1 "Data collection, monitoring and auditing" of KA 5.4.3 Monitoring and Enforcement of CFP because it will produce procedures for compilation of existing economic data regarding the performance of specific fishing fleets.

S2 – Applied and alternative management strategies

Under this research priority of the work programme, 1 project has been founded.

MOFISH aims to develop multi-objective models of the Common Fishery Policy.

Title : « **Multiple objectives in the management of EU fisheries** »

Acronym : MOFISH

Contract Number : QLK5-CT1999-01273

Project type : R&D

End: 2003

Contribution : 0.9 Mio €

S3 – Compatibility of biological, economic and social management

Under this Domain 3 R&D projects and 1 TN have been funded.

Two R&D projects deal with fishermen's behaviour in response to EU Regulations. MFBUNRR analyses relations between conservation regulations (IVQ, Individual vessel quota) and fishermen's social and economic responses. FISHREG focuses more on compliance with regulations and social reactions.

One project (BEMMFISH) aims to create a management computer model for Mediterranean fisheries which integrates biological and economic dimensions. The TN FEMMES focuses on the role of women in both family and artisanal-based and industrial production activities in fishing and aquaculture, an interesting aspect not mentioned by the Common Fishery Policy.

Title : « **Fishery regulation and the economic responses of fishermen: perceptions and compliance** »

Acronym : FISHREG

Contract Number : QLK5-CT1999-01405

Project type : R&D

End: 2003

Contribution : 0.9 Mio €

Title : « **Bio-Economic modelling of Mediterranean Fisheries** »

Acronym : BEMMFISH

Contract Number : Q5RS-2001-01533

Project type : R&D

End: 2004

Contribution : 0.9 Mio €

Title : « **Modelling fishermen's behaviour under new regulatory regimes** »

Acronym : MFBUNRR

Contract Number : Q5RS-2001-01535

Project type : R&D

End: 2004

Contribution : 0.6 Mio €

Title : « **Les femmes dans la pêche et les cultures marines en Europe.** »

Acronym : FEMMES

Contract Number : Q5TN-2002-01560

Project type : TN

End: 2005

Contribution : 0.7 Mio €

S4 – Market support mechanisms

The only project founded under this domain aims to improve knowledge in the field of the seafood value chain in Europe.

Title : « **Margins along the European seafood value chain. Impact of the salmon industry on market structures** »

Acronym : SALMAR

Contract Number : QLK5-CT1999-01346

Project type : R&D

End: 2002

Contribution : 1.3 Mio €

Summary table : Projects classification by scientific domains in the research area **Social and Economic basis of the CFP**

Legend:		belonging domain
		related domain

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP				
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms	
Q5RS-2001-02277/PECHDEV																							
Q5RS-2002-01291/TECTAC																							
Q5CA-2001-01502/EAEF																							
QLK5-CT1999-01273/MOFISH																							
QLK5-CT1999-01405/FISHREG																							
Q5RS-2001-01535/MFBUNRR																							
Q5RS-2001-01533/BEMMFISH																							
Q5TN-2002-01560/FEMMES																							
QLK5-CT1999-01346/SALMAR																							

5. Conclusions

This analysis of specific domains covering KA 5 of QoL in the fields of Aquaculture and Fisheries provides information to the scientific community and to the decision makers. It is a useful document to facilitate the implementation of the priority 8 (“Research for policy support”) of the next Framework Programme (6FP), because it gives a clear picture of the topics already covered in the 5FP.

The analysis shows that all the research areas and subareas of the work programme were covered with a prevalence for *Interaction between Environment, Fisheries and Aquaculture* with 23% of the projects, *Scientific basis for fishery management* (27%) and *Improvement of aquatic production* (37%).

In addition, concerning the specific actions, the majority of the research projects of Key Action 5 were R&D and SME Co-operative projects. Concerted Actions and Thematic Networks were marginal.

Entering into more detail, the analysis shows a prevalence of several scientific domains when considering the number of funded projects.

In the research area *Interaction between Environment, Fisheries and Aquaculture*, two domains are well covered: E.3 Impact of fisheries on the marine ecosystems and E.4 Impact of aquaculture on the environment, with respectively 8 and 7 projects out of 25.

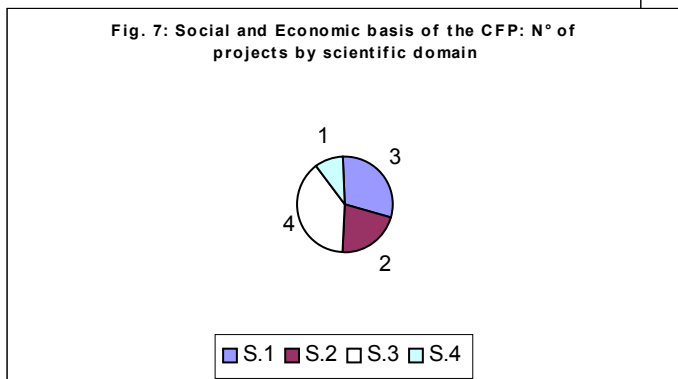
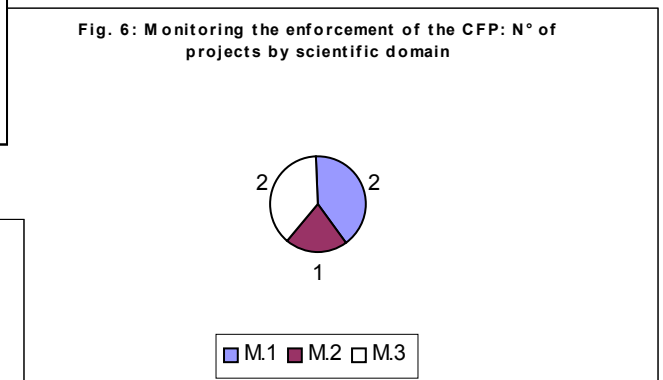
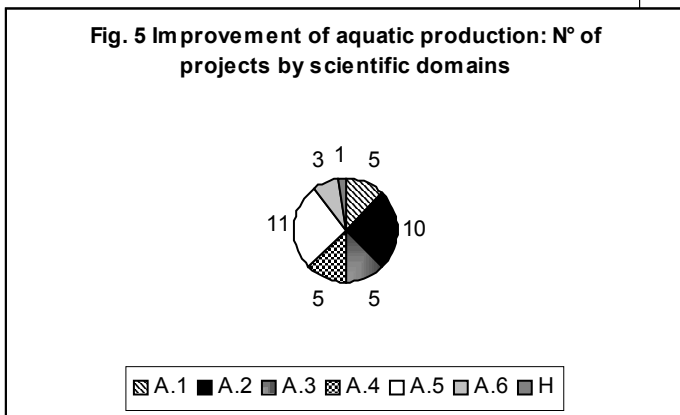
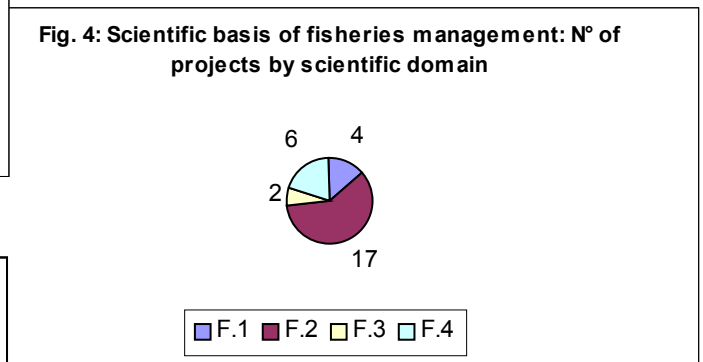
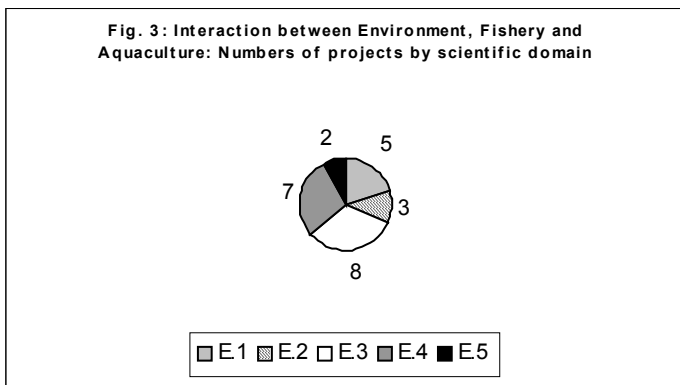
The *Scientific basis for fishery management* research area of the Work programme includes 17 projects out of 29 on the improvement of assessment methods of management systems in fisheries (F.2 Improvement of assessment methods) while only 2 projects cover the domain F.3 Assessment methods for less known resources.

Of the six scientific domains identified under the research area *Improvement of aquatic production*, priority was given to A.2 Breeding/Selections and A.6 Fish meal and fish oil replacement, with respectively 10 and 11 founded projects out of 40. The domains A.1 (Essential biological functions of farmed species), A.3 (Impact of nutrition, environment and husbandry on the health of farmed species) and A.4 (New Species) include 5 projects each. There are

3 projects dealing with specific technological systems in aquaculture (A.6 Technologies).

The scientific domains of the research areas *Monitoring and enforcement of the CFP* and *Social and economic basis of the CFP* were covered by a limited number of projects.

The repartition of the number of projects by Area and domain is illustrated in figures 3, 4, 5, 6, 7.



ANNEX 1

Scientific Domains

CONTENTS

- A. Interaction between environment, fisheries and aquaculture**
- B. Scientific basis of fisheries management**
- C. Improvement of aquatic production**
- D. Monitoring the enforcement of the CFP**
- E. Social and economic basis of the CFP**

A. Interaction between environment, fisheries and aquaculture

General objective
Develop methods and strategies to assess or reduce the effects of the interactions between Environment, fisheries and aquaculture

Specific Objectives
a) Improve our understanding of the impact of environmental changes on the harvested living resources and aquaculture and vice versa
b) Define specific targets for the protection of biodiversity

Domains
1 - Impact of environment changes on the dynamics of commercial harvested living resources (whether induced by human activities or not)
2 - Impact of environment changes on aquaculture (particular emphasis on the effects of toxic algae)
3 - Impact of fisheries on the marine ecosystems (foodweb, physical impact, structure of fish stocks, genetic diversity)
4 - Impact of aquaculture on the environment (effects of farm effluents, interaction with wild animals, GMOs, disease)
5 - Protection of biodiversity

B. Scientific basis of fisheries management

General objective
Improvement of management tools and investigating relationships between biological, economic and fleet aspects of resource assessment and management

Domains
1 - Management systems
2 - Improvement of assessment methods
3 - Assessment methods for less known resources
4 - Establishing geographical limits and genetic structure of fish stocks

C. Improvement of aquatic production

General objective
To increase the knowledge in the various and multidisciplinary fields of aquaculture

Domains
1 - Essential biological functions of farmed species
2 - Breeding/Selections
3 - Impact of nutrition, environment and husbandry on the health of farmed species
4 - New Species
5 - Fish meal and fish oil replacement
6 - Technologies

D. Monitoring and enforcement of the CFP

General objective
To support CFP regulations and enforcement

Domains
1 - Data collection, monitoring and auditing
2 - Measuring tools
3 - Traceability of products

E. Social and economic basis of the CFP

General objective
To identify and assess the social economic effects of the CFP

Domains
1 - Structural intervention and financial support
2 - Applied and alternative management strategies
3 - Compatibility of biological economic and social management
4 - Market support mechanisms

ANNEX 2

CONTENT

F. Summary Matrix

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms
Q5RS-2000-30183/LIFECO																						
Q5RS-2001-01836/EELREP																						
QLRS-2002-00799/ETHOFISH																						
Q5RS-2002-00813/CODYSSEY																						
Q5RS-2000-31141/SILVER EEL																						
Q5RS-2000-30778/DETAL																						
Q5CR-2002-70849/TALISMAN																						
Q5CR-2002-71699/HAB-BUOY																						
Q5RS-2000-30864/IMPRESS																						
Q5RS-2001-00839/DISCBIRD																						
Q5CA-2000-31387/REDCAFE																						
Q5RS-2001-00993/COST-IMPACT																						
Q5RS-2001-01685/EFEP																						
Q5RS-2002-00787/RESPONSE																						
Q5RS-2002-00856/MAFCONS																						
Q5CR-2002-71709/ROCKCOD																						
Q5RS-2000-30305/BIOFAQS																						
Q5RS-2000-31779/MERAMED																						
Q5RS-2001-02456/MedVeg																						
Q5RS-2000-31334/SEAPURA																						
Q5RS-2002-00730/SUMBAWS																						
Q5RS-2001-01185/SALIMPACT																						
Q5RS-2000-31151/AQCESS																						
QLK5-CT1999-01271/VALFEZ																						
Q5RS-2002-00891/BIOMEX-01																						

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms
Q5RS-2001-01998/RESPONSIBLE																						
Q5RS-2002-01782/PKFM																						
Q5RS-2002-01824/FEMS																						
Q5CA-2002-01693/EASE																						
Q5RS-2002-000818/SARDYN																						
Q5RS-2002-00935/RECOVERY																						
Q5RS-2002-01216/ANREC																						
QLK5-CT1999-01567/SIDS																						
QLK5-CT1999-01617/MACOM																						
QLK5-CT1999-01253/GBMAF																						
QLK5-CT1999-01609/DST2																						
Q5RS-2001-02038/CATEFA																						
Q5RS-2001-02054/SIMFAMI																						
Q5RS-2002-01328/PREMECS II																						
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Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
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QLK5-CT1999-01157/MARINEGGS																						
QLK5-CT1999-01222/REDFISH																						
QLK5-CT1999-01438/HOMSIR																						
Q5RS-2001-01370/HERGEN																						
Q5RS-2001-00953/METACOD																						
Q5RS-2002-01056/WESTHER																						

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
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Q5CR-2002-72221/RMBC																						
Q5RS-2002-01355/REPRO-DOTT																						
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Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP			
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Q5RS-2000-30058/RAFOA																						
Q5CA-2001-00989/SELFISH																						
Q5TN-2002-00628/FORM																						
Q5CR-2002-71664/AQUALITY																						
Q5CR-2001-70626/BYPROFEED																						
Q5CR-2001-70684/FISHMEAL R.																						
Q5CR-2002-72052/PULSEFISH																						
Q5CR-2000-70186/ROTRECIRC																						
Q5CR-2002-71781/OMUR																						
Q5CR-2002-72468/POCEFF																						
Q5CA-2000-30105/AQUA-FLOW N.																						

Scientific domains Projects	Environment, fisheries and aquaculture					Fisheries management				Aquatic production						Monitoring CFP			Social and ec. basis CFP				
	1 - Impact of environment changes on the dynamics of commercial harvested living resources	2 - Impact of environment changes on aquaculture	3 - Impact of fisheries on the marine ecosystems	4 - Impact of aquaculture on the environment	5 - Protection of biodiversity	1-Management systems	2-Improvement of assessment methods	3- Assessment methods for less known resources	4-Establishing geographical limits and genetic structure of fish stocks	1 - Essential Biological Functions	2 - Breeding/Selections	3 - Impact of nutrition, environment and husbandry on health	4 - New species	5 - Fish meal and fish oil replacement	6 - Technologies	1 - Data Collections, monitoring and auditing	2- Measuring tools	3 - Traceability of products	1 - Structural intervention and financial support	2 - Applied and alternative management strategies	3 - Compatibility of biological economic and social management	4 - Market support mechanisms	
Q5RS-2001-02266/IMPAST																							
QLK5-CT1999-01295/TEMEC																							
Q5CO-2002-01335/OMEGA																							
Q5RS-2001-01697/CODTRACE																							
Q5CR-2001-70746/EESD-3																							

