New Methodological Approaches for Change in Traditional Sectors: The Case of the Portuguese Fisheries Socio-Economic System

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April 2000

New Methodological Approaches for Change in Traditional Sectors: The Case of the Portuguese Fisheries Socio-Economic System [1]

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1.   Abstract

This paper summarises the methodological approach and main results of the MARHE project (Employment and Human Resources in the Fisheries Socio-Economic System). This project had as its main aim the search for alternative futures for the fisheries sector in Portugal, with particular attention being paid to the human resources situation and the working and living conditions of the fisheries-dependent populations in the coastal areas. This is a particularly interesting case, since fisheries were once an important activity and they are now in deep recession, even though it is generally recognised that the future utilisation of maritime resources offer an immense potential. As part of the research, a Delphi exercise was implemented involving in two successive stages some of the leading actors and experts dealing with the sector in Portugal. Other initiatives were held in the context of the MARHE project providing direct and indirect inputs to the scenarios and recommendations that were put forward in the sequence of the Delphi exercise. Overall the activities described in the paper contributed to the mobilisation of major actors and to discussions that may have practical implication for the future of the sector, if certain conditions are now met in the follow up to the project.

Keywords: Fisheries; Portugal; human resources; scenarios; labour market

JEL codes: J21; J63; O15; Q22; R11

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2.   Introduction

This paper summarises the methodological approach and main results of the MARHE project (Employment and Human Resources in the Fisheries Socio-Economic System).[2] This project had as its main aim the search for alternative futures for the fisheries sector in Portugal, with particular attention being paid to the human resources situation and the working and living conditions of the fisheries-dependent populations in the coastal areas.

The project was based on the combined efforts of actors directly involved in the sector, social scientists and other scientists, and experts who have been working for a long time in connection with the fisheries sector. The evolution of this sector in Portugal over recent decades has been the result of a wide range of factors, particularly the strategies of the main domestic actors, but also of changes in international laws and policies regulating access to fishing areas. As will be seen below, the situation and future prospects of the populations directly associated with the sector have been deteriorating rapidly.

In this context, a research approach such as the one adopted by the MARHE project was particularly pertinent. The project brought together several complementary methodological approaches, with a specific emphasis on prospective tools of enquiry and scenario-building. In addition to this, the origin and stance of the project was one of direct involvement with the main actors whose behaviours have a direct bearing on the future of the sector.

In section 2 we provide the background of the Delphi exercise that was carried out in the context of the MARHE project. The characteristics of the fisheries-dependent communities in Portugal are outlined, and some of the associated factors of immobility are highlighted. As factors of change in this sector (or socio-economic system), we refer to both the potential offered by research activities geared towards practical problems and the possible role of negotiated strategies and policies given the constraints provided by the EU fisheries policy. In section 3 we present the methodological framework and finally the main results of the MARHE Delphi exercise. In the last section we present briefly some major conclusions.

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[2] The MARHE project was made possible by a grant from the PESSOA Programme, implemented and managed by the Portuguese Ministry of Labour and Solidarity.

3.   Factors of change in a traditional sector

3.1.   The socio-economic study of fisheries-dependent communities in Portugal

The core of the fisheries socio-economic system may be defined as a set of differentiated activities of which the harvesting sector forms a part, together with directly related activities occurring both upstream (shipbuilding, gear manufacture) and downstream (processing, distribution and trade). But these closely interrelated economic activities are themselves part of a much broader framework that includes the ecological, institutional and political influences affecting the economic behaviour of the actors in the system.

The value of this broader conceptualisation is that it treats fisheries not as an isolated and independent economic activity (centred only on the harvesting process), but as part of a holistic and more complex system.

In Portugal, this socio-economic system is strongly characterised by a number of unsolved and interdependent problems. Most of those problems are concerning ecological, economic and social issues. In particular, the depletion of the natural resource base, the deterioration of the ecosystems, the fishing over-capacity, poor economic returns, are some of the most significant problems in this industrial system. But, at the same time, the lack of skilled workers with higher levels of education and formal training, and the unemployment and social exclusion aspects in fisheries-dependent communities, are also disturbing the economic development of this sector. Meanwhile, the fisheries socio-economic system provides a stage for acting out the conflicts between the different social actors involved.

3.2.   The role of research in a changing sector

The future evolution of the work and employment structures and qualifications in the Portuguese fisheries socio-economic system has remained relatively vague and indeterminate. This incertitude is based on the fact that social partners and public administration do not discuss these problems both separately or with each other. At the same time R&D related activities are not articulated with the socio-economic system (producers, shipbuilders, fishermen organisations, fish traders and manufacturers).

There have been no meaningful strategies for the fisheries sector, only a "zero-sum game" orientation in relation to social behaviour: what is won by one social actor, it is what the other one looses. In other words, over-fishing (with complementary technological development) means depletion of natural resources and progressive loose of income in the mid-term. The key decision-makers remain the central government, the

local administration, and the European Commission. The social actors themselves have had little direct involvement in decision-making, except through the traditional links and lobbying pressure.

This situation is characteristic of a segmented policy-making. Only occasionally can one identify a decision that has been taken jointly by the government departments with responsibility for employment, science and technology, education, trade and fisheries. The main reference is the decree that regulates the on board work of fishermen (1998). As a result, fisheries-related problems are not being addressed within an integrated policy-making framework, but are tackled through partial, *ad hoc* decisions based on the situation of existing biological resources, broad economic and financial considerations or even foreign relations.

At the same time, however, the search for new forms of entrepreneurial organisation - mainly as a result of EC decisions - has driven the producers' organisations to search in turn for new negotiating approaches. One example of this is the withdrawal price mechanism that comes into play whenever quayside prices fall below a given level. This market-regulating mechanism has provided few incentives for managing production or for maintaining both the regularity and the quality of supplies. It has had a negative effect on the processing industry and on the management of fish stocks. New conflicts have emerged as a result of these practices (cf. Moniz et al., 2000).

In this context, what seems to be an immediately important and relevant requirement is the development of forecasting techniques for the socio-economic analysis of change in fishing-dependent communities in order to demonstrate the likely impacts of "strategic" decisions taken by any one of the political actors. Scientific research can make an important contribution by providing relevant information on which to base the discussion of alternative pathways using both traditional and new skills and cultural values. This is completely new, since research developed to support forecasting is only based on bio-and econometric methodologies. And this method takes into account only the biological knowledge and the techniques associated with the economics of natural resources.

The new approach to forecasting techniques referred to above should be oriented not only towards clarifying new trends in technological development, but also towards identifying the socio-economic information that will help to facilitate the development of this sector.

This was clearly demonstrated in research that has been carried out recently in Portugal in order to elaborate alternative scenarios for the future development of the fisheries socio-economic system, using the Delphi methodology. The MARHE project - which began with the support of the Peniche Development Association (ADEPE), the Pessoa Programme (Ministry of Labour and Solidarity) and the cooperation of the government department for fisheries, as well as the trade unions (*sindicatos*), the producers' organisations and the vocational training organisations for fisheries (*Forpesca*) - was multi-disciplinary in its approach.

This research project involved not only the traditional players in the area of fisheries biology and economics, but also approaches drawn from other social sciences (sociology, demography and geography) and robotic engineering, as representing the cutting edge of modern technology. It also brought together both academic researchers and the different social actors -- the unions, employers and local authorities *inter alia* -- involved in the

socio-economic subsystem, as well as representatives of sectoral research and administration from Spain, thereby increasing the possibilities of dialogue and the exchange of experiences and insights. This made possible the organisation of networking activities (supported on workshops, conferences, meetings, publications and web pages), and legitimated the selection of experts that took part in the MARHE Delphi exercise.

3.3.   Contributions to policy planning strategies for fisheries

Since the early 1980s, international conventions, multi-lateral agreements and new codes of conduct have created the framework for a new world order for fisheries, in which coastal states will increasingly depend on the resources occurring in their own waters. These conventions were determined either by the EC and other international institutions, including ILO and FAO.[3] As a result, more robust management systems, greater international cooperation and a more sophisticated training programme for all involved in fishing-related activities are still needed. From Portugal's political point of view, the most important international agreement is the Treaty of Rome, establishing the European Community and legitimising the Community's Common Fisheries Policy. This agreement has affected the Portuguese fisheries socio-economic system ever since, mainly in the visible effects of ship dismantling, corporate restructuring, the disinterest shown by young people towards fishing activity and the decline in the labour market.

Although Portugal has one of the largest Exclusive Economic Zones (EEZs) in Europe - accounting for almost half of the Community's "common pond" - only 2% of its EEZ is occupied by the continental shelf. Control of the Zone is proving difficult to achieve, as a result of the poor cooperation between the relevant parties and frequent disagreements among the naval protection service, the harbour authorities and the fishermen's organisations. Environmental policies and oceanographic and marine biological research further expose these divisions.

From the point of view of the fisheries harvesting subsystem, the lack of support for fishing in international or third country waters is a particular problem. Once renowned for its distant water fishing fleets, Portugal is now forced to concentrate its activities within its own waters. Portugal has the highest *per capita* consumption of fish within the EU and domestic catches are now balanced by an equivalent level of imports of fish and fish products. While average prices for fish have been increasing during the 1990s, the domestic fishing fleet has been forced to contract in line with the Union's fisheries policy. Renewal of the fishing fleet and improved productivity are proving difficult to achieve.

As the former Secretary of State for Fisheries, Marcelo de Vasconcelos, remarked in 1997, "despite awareness of the present situation and the fact that the medium-term

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[3] The main conventions are the United Nation Convention on the Law of the Sea (1982), the 1993 FAO International Agreement, the FAO Code of Conduct of 1995, and the international convention on standardisation of training, certification and watch in the fishing activities (STCW-F) approved in 1995, at IMO international conference.

prospects are not good, there are still those who continue to ignore the significant changes taking place in the patterns of exploitation which, for years, have been based on intensive fishing and the use of skills on an excessively large scale" (Vasconcelos, 1997).

This is therefore a social behaviour problem. Thus, fisheries policy has to integrate not only the management of natural resources, but also the social problems associated with particular economic strategies. Until now, planning policies affecting the fisheries system have been worked out on the basis of what was called above "zero-sum game": advantages gained by one interest group inevitably mean losses sustained by another interest group. The existence of social objectives in fisheries management policies seems to be an important means of regulation. When this does not occur, the lack of interest in the social questions is replaced, in the context of fisheries management, by exclusive aims such as the preservation of fishing grounds or the maintenance of a profitable industry. It does not rely mainly on intangible investment, and is therefore carried out on low wages, in poor working conditions and non-calculable exhaustion of the natural resources (cf. Moniz, 1998: 276).

It was the complexity of the issue that led to a twofold approach to the identification of problems and the search for solutions through interdisciplinary research and the involvement of the key social actors in the research programme. On the one hand, the MAHRE project involved a Delphi approach with a panel of experts representing different components of the fisheries socio-economic system. On the other hand, parallel investigations included a large-scale survey of young people's attitudes to employment in the fisheries industry, a survey of the working conditions of fishermen in the main fishing harbours, a study of management quality in the manufacturing sector and an analysis of the marine R&D infrastructure. The findings of the project will, it is hoped, assist the development of meaningful planning strategies formulated either by government agencies or by the social partners in the fisheries system. In the remainder of this paper we will concentrate on the prospective work carried out within the MARHE project.

4.   The MARHE Delphi Exercise

4.1.   Methodological framework

A two-round DELPHI exercise was carried out in the spring of 1998 (first round) and the winter of 1998-99 (second round). A panel of 90 experts was selected as the target population to be surveyed. The immediate objective of the exercise was to put forward a certain number of issues that were seen as critical for the future of the fisheries socio-economic system, with the intention of determining whether there was a common attitude and vision towards those issues among the major actors in the system. A total of 58 questions, covering each of the issues selected, were submitted to the experts.

In the organisation of the experts' panel the previous involvement of the research team (that represented here the role of a steering committee) in fieldwork activities and in other

initiatives, namely the organisation of project seminars, in which a large number of the main actors had been involved, was very helpful in deciding upon the individuals to be surveyed. The steering committee of the project validated the selection of the panel members, and helped in the choice of the scenarios themes and in the identification of the system's driving factors. Several of the key informants in this stage had different industrial experiences (fish catching, processing, shipbuilding, and commerce).

The panel members were drawn from a wide range of backgrounds, including fishing sector organisations, trade unions, the larger fishing firms, the supplying and fish-processing industries, the government, the R&D and training infrastructure, and finally the university sector. After a process of sending out the questionnaires and establishing direct contacts with the surveyed experts, a total of 35 responses were validated and analysed as part of the first round of the Delphi exercise. The breakdown of these responses according to the respondents' sectors of provenance was relatively close to that of the original 90-member panel.

The questionnaire that was sent out had a relatively complex structure and required more than one hour to be filled in. The structure that was used drew its inspiration from other questionnaires tested successfully before in several well-known foresight studies, namely in the technology-forecasting exercises than have been organised in Japan since the 1970s and again, more recently, in the 1990s, as well as in Europe, more specifically in Germany, United Kingdom and France (cf. NISTEP, 1992; BMFT, 1993; Héraud et al., 1997; Barré, 2000).

The 58 questions that were selected as representing the critical foresight issues for the future of the sector were organised around thematic fields, covering aspects such as the situation of the natural and human resources and the conditions of the national fleet. For each of the 58 issues, the respondent had to state his/her opinion by choosing an alternative reply or by awarding a mark to each of six different topics. These six topics were: self-assessment of expertise; importance of the issue; need for local inter-institutional co-operation; need for international co-operation; availability of competencies; and finally expected date of occurrence and/or solution of the problems related to the issue.

The second round was prepared as a follow-up to a seminar at which the results of the first round were publicly presented and discussed. In the second round the research team decided to concentrate on a smaller number of variables. Therefore, only 15 issues were selected for this part of the exercise. Among these 15 issues, 10 were the ones that had been ranked as the "most important" by the experts in the first round.

The remaining 5 issues had also been ranked as of relatively high importance by most experts, but these showed a larger variance in the responses, with some experts also awarding low marks. Table 1 shows those 15 issues and also the change in the ranking that occurred between the first and the second rounds of the Delphi exercise. The questionnaires in the second round were addressed to respondents that had sent back their responses in the first round. Despite the concentration on only 15 variables, the remaining structure of the questionnaire was kept largely unchanged, except that the results of the first round were presented in summary form, providing information on the previous responses' weighted averages and variances.

Table 1. Some results of the MARHE Delphi exercise

1st round ranking	2nd round ranking	Importance of the issue (weighted average, 2nd round)	Probable period of occurrence, in years (weighted average, 2nd round)	Issues / Variables in the questionnaire
1	1	2.96	7.1	The development of responsible fisheries practices will allow for the preservation of the natural resources
3	2	2.92	4.9	Areas with endangered stocks will be declared protected areas
5	3	2.88	10.4	Information about the condition of stocks will be widely available
6	4	2.88	3.9	Conservationist actions will be carried out together with social support measures (training, other)
> 10	5	2.88	5.3	Work on board will become more productive as multi-skilled forms of work develop
7	6	2.85	8.2	Inspection of fishing activities will become more effective
9	7	2.83	2.7	The infrastructure will be able to design and offer courses that are appropriate to local conditions
8	8	2.83	4.9	The improvement of the sector's situation will only be possible with extensive forms of social dialogue
2	9	2.81	8.4	The control of the exclusive fisheries zone will be possible with the concurrence of the maritime authorities, the fishing firms and the R&D sector
4	10	2.81	8.0	Systematic information about the condition of stocks will be available
> 10	11	2.72	4.7	Detection equipment will be available in all units of the fleet
10	12	2.63	6.9	New organisation models will spring up in the traditional small-fisheries part of the fleet
> 10	13	2.44	3.0	Search systems will be widely used to assess shoal size, quality and movements
> 10	14	2.42	4.1	Location equipment (radar, GPS) will be installed in all units of the fleet as a result of compulsory measures
> 10	15	2.29	6.7	International co-operation regarding the problems of the sector will increase

All 15 issues were awarded relatively high marks in the second stage, ranging between 2.29 and 2.96 on a scale where 0 meant "irrelevant", 1 "limited importance" and 2 and 3 "significant" and "very significant importance" respectively. The variance in the

responses also showed a considerable decrease between the first and the second rounds, which may be seen as indicating a certain stability in terms of the key variables or aspects driving the future of the fisheries socio-economic system. Nevertheless, the diversity of possible dates on which the issues under observation will probably occur or on which a solution is expected to be found may be seen as indicating that the system as a whole will only experience qualitative change over a relatively long period.
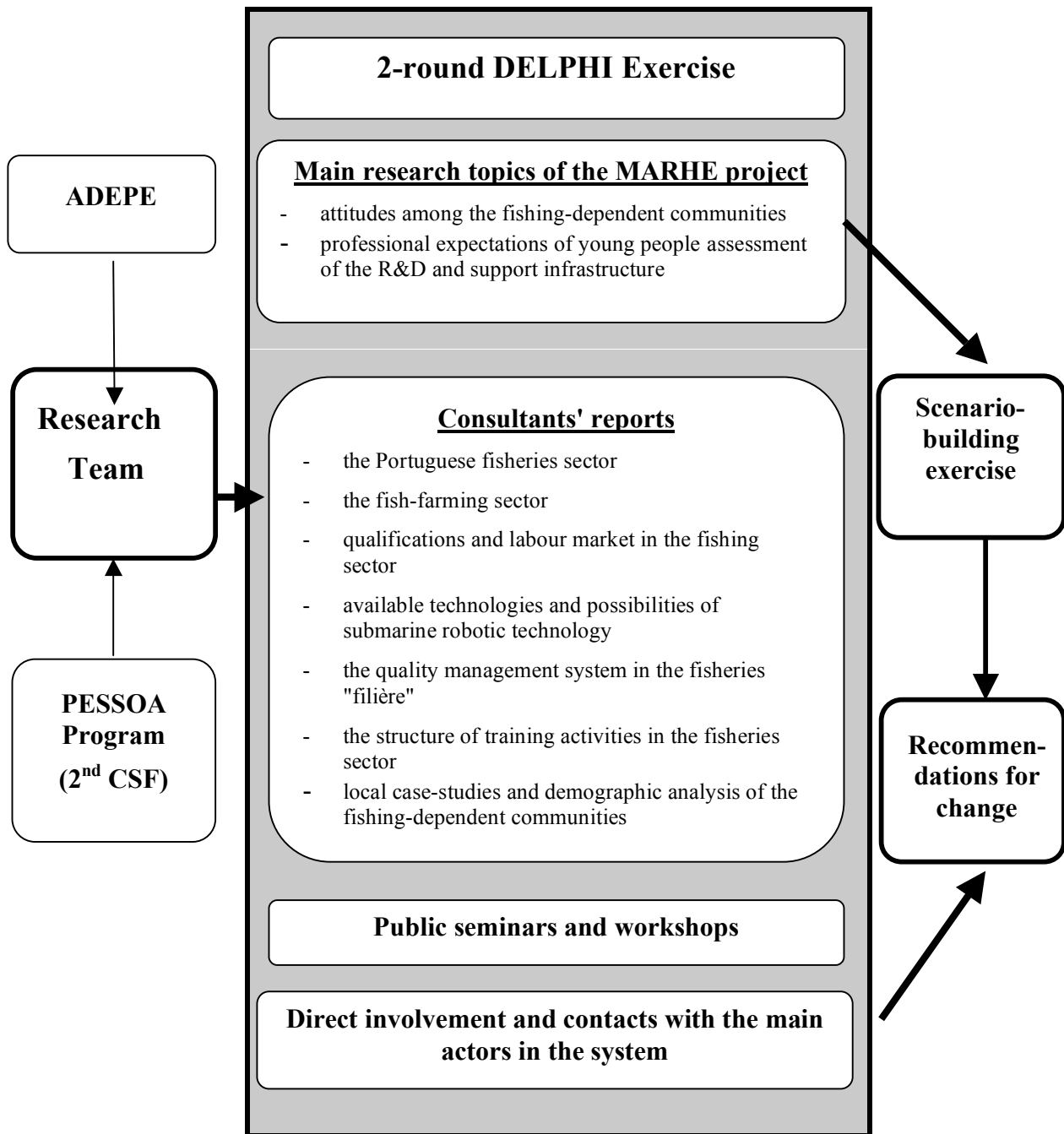
4.2. *Major findings stemming from the MARHE Delphi exercise*

In substantive terms, the analysis of the issues selected by the panel as being the most important shows that there is an appreciable concentration around variables concerning the preservation and utilisation of natural resources. However, most variables also refer to a knowledge dimension, namely in terms of R&D and training activities, and also to a social and institutional dimension. This latter dimension is seen as very important in bringing about cultural change and making effective the conservationist measures and the policies for improving the knowledge-base and the skills needed to move forward. In general the respondents stressed the need for a strong interaction and collaboration between different national actors in order to find solutions for the problems facing the sector, even though in the case of certain issues, namely those relating to the conservation of stocks, strong international collaboration is also advocated by the experts.[4]

A new project seminar was convened after completion of the second round, to present the findings of the different research lines and particularly to discuss the results of the Delphi survey. The scenario-building activities of the project also had a natural culminating point in that seminar, providing a necessary synthesis between the Delphi exercise and the outputs of the main research lines and the consultants' activities (see Figure 1).

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[4] More detailed information about the preparation, results and analysis of the MARHE-Delphi exercise is presented in Moniz, Godinho, Kovacs and Vicente, 2000.

Figure 1- The MARHE Project

2-round DELPHI Exercise

Main research topics of the MARHE project

- attitudes among the fishing-dependent communities
- professional expectations of young people assessment of the R&D and support infrastructure

ADEPE

Research Team

PESSOA Program (2nd CSF)

Consultants' reports

- the Portuguese fisheries sector
- the fish-farming sector
- qualifications and labour market in the fishing sector
- available technologies and possibilities of submarine robotic technology
- the quality management system in the fisheries "filière"
- the structure of training activities in the fisheries sector
- local case-studies and demographic analysis of the fishing-dependent communities

Public seminars and workshops

Direct involvement and contacts with the main actors in the system

Scenario-building exercise

Recommendations for change

The main research outputs that were reported to the seminar included, in addition to the Delphi results, a study about the attitudes of fishermen in the main fishing ports in Portugal (Vicente and Ramos, 2000), a survey carried out among youngsters of secondary-school age living in the coastal fishing centres to analyse their future professional expectations (Kovacs, 2000) and a socio-economic assessment of the marine R&D activities carried out in the laboratories of public institutes and universities around the country (Godinho, 2000). These studies were particularly illuminating regarding longer-term trends, bringing direct inputs into the scenarios produced by the team.

The reference scenarios that were put forward consisted basically of two contrasting alternatives, C1 and C2, which were respectively named "Overcoming the crisis" and "Deepening of the crisis". C2 stems from a simple extension of the trends felt over recent decades, with no renewal of either the active population or the marine resources, combined with the absence of dialogue and interaction between the main social and economic actors in the system. In relation to C1, two possibilities were considered: C1b, which was seen as a partial solution to the present crisis, and C1a, which was put forward as embodying the full potential for change in the system. This last possibility, which involves deep structural and qualitative change, can only materialise if certain conditions are met.

The opportunities for change were perceived as very significant, but a comprehensive understanding of the structural and behavioural weaknesses in the system also showed the difficulties in implementing innovative strategies. Both the discussion with the main actors and the project results led to a systematic presentation of recommendations, covering a wide range of measures that may be helpful in eliminating some of the barriers to change.

Among the various recommendations that were put forward, the most important were those concerning the improvement of the resource management approach, the support and orientation of R&D and training activities, and on a closer cooperation between fishing activity and the supplying and user sectors.

Other very important recommendations pointed out to the need of changes in the marketing, processing and distribution of fish products, the development of new products and new forms of consumption, the promotion of adequate finance mechanisms, the improvement in the transfer of newer and more appropriate technologies to the business sector, and the new initiatives and activities which may be developed in connection to the sea.

Finally, the creation and improvement of mechanisms for dialogue in the fisheries socio-economic system was felt as a critical demand of the sector. The response to this should include an observatory of socio-economic conditions in the fisheries dependent communities, and the organisation of a sectoral committee for industrial relations involving all the different social partners.

5.   Conclusions

The fisheries socio-economic system in Portugal - as in many other parts of Europe - is in deep crisis. The dominant technocratic perspective on decision-making is unable to prevent the continuing depletion of the natural resource base and the degradation of fish stocks. This is clearly shown by the position of several fish experts that state in their replies to the Delphi inquiry that in the short and medium term environmental change will play the main role. For long-term predictions, such as analysing risks of a stock collapse, the influence of the spawning bio-mass must be taken into account (cf. Laurec, 1998: 247). Meanwhile, demand for products from the system is increasing.

The social fabric of fisheries-dependent communities is also suffering serious damage: with the depletion of natural resources, economic income is also decreasing. Unemployment, social exclusion and occupational re-structuring policies emerge. Once again, the technocratic approach to fisheries management has offered no solutions so far. It is essential, therefore, to turn away from the existing approach and to develop new forms of intervention and policy making. In short, it is important to provide a new vision with different alternatives in order to support choice and also to promote the systematic dissemination of information to stimulate knowledge and negotiation.

This implies change not only to the policy process, but also in the attitudes of the social actors and in the preoccupations of fisheries-related research. An integrated approach is required, based on participatory action and the development of an integrated information network. This new approach will be able to work out the multiple dimensions of what is an immensely complex problem. And must attempt to create convergence from among the divergent views of the different interest groups involved.

A new policy for fisheries must be based on information-rich planning systems, on the concept of co-management of scarce common resources and also on the promotion of new modes of business organisation and consumer behaviour. Responsibilities for management must be shared and the short-term planning horizons of fishermen and industrialists should be replaced by agreed long-term objectives for the sector. Negotiation among the social actors is a key factor in mediating socially responsible decisions.

Ultimately, a balanced planning strategy must take due account of the processes of social change and dependence on fisheries. Otherwise, the planning process will degenerate into a 'lose-lose' game. This orientation can be achieved through the use of foresight tools that may help the social partners to act in accordance with existing opportunities and perceived problems.

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