

Consensus conference on
'Sustainable production of seafood for European consumers'
Copenhagen, 6-7 November 1997

SUSTAINABILITY AND CONSUMPTION

Research needs beyond fisheries economics

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Abstract

The paper reviews the topics of sustainability, consumption and research. Sustainability is viewed as a holistic concept. It is therefore questioned to which extent today's science, which is largely monodisciplinary can meet the expected knowledge requirements. The EU consumption of seafood depends for about 50% on imports. It could be questioned whether this level of consumption is sustainable. The 'research establishment' is sometimes even an obstacle to innovative development of knowledge because monodisciplinary research into ever greater details is considered as the state-of-art to be pursued further. Communication of results among researchers as well as to the society at large leaves a lot to be desired.

Research needs are identified in a six-dimensional 'force field'. The relevant dimensions are ecology, economics, culture, policy, technology and space (incl. time). Whether a specific situation can be considered sustainable is determined by these dimensions as well as by their mutual relations.

The paper concludes that current monodisciplinary research should be complemented with a coherent multi-disciplinary research programme. In this programme attention should be given first to the development of appropriate concepts and methods, which currently do not exist. Furthermore intensive involvement of end-users of the research results must be promoted through establishing solid, regular channels of communication.

Innovative research is not without risks. Research into sustainability addresses fundamental questions, which may not be resolved in short term. Therefore some priorities should be process oriented (instead of result oriented). Proper organization of the research process itself is the only guarantee to answering complex and unforeseen questions in the future.

Keynote sentences

1. Sustainability is a holistic concept.
2. EU consumption of seafood may not be sustainable in the long run.
3. Current monodisciplinary research practices are too narrow to address sustainability.
4. Research establishment itself stand in the way of multidisciplinary.
5. Effective communication of research results should be viewed as an integral part of the research process.
6. Involvement of the fishing sector in the research process and exploitation of its knowledge may promote the acceptance and application of the research results.

1. Introduction

The objective of this paper is to present some views on the future priorities of fisheries related research which should contribute to sustainable use of marine resources and satisfaction of consumer needs. The first part of the paper reviews the topic of sustainability, consumption and research in their own right and in their mutual relations. The second part specifies some major questions regarding sustainable fisheries and consumption as far as possible in a holistic manner. Finally, proposals are made as to the priorities of the 5th Framework Programme.

The organizers of the conference have requested discussion papers. Therefore some arguments are put forward strongly, without attempts to qualify them.

2. Sustainability and scientific research

This conference deals with three major topics: sustainability, consumption and scientific research. The fact that it focuses on fisheries is in fact of lesser relevance, because the fundamental issues regarding these topics may be encountered in many different fields. Some comments must be made about these topics first because they have direct bearing on the research priorities which should be specified.

The pretension that it is feasible today to do scientific research into sustainability may be a 'contradictio interminis' for reasons which are elaborated below.

Today, sustainability seems to be on everybody's lips. When you ask what it is, the answer often is only a reformulation or a synonym: equilibrium, balance, precautionary principle, regenerating power, availability to future generations, etc. Even some quantitative indicators have been formulated: amount of fish of a certain species in the sea, numbers of birds, etc. This is not very satisfactory because these formulations are not operational. They cannot be easily translated into guidelines for everyday life.

The politicians and the general public expect that the sustainability issue can be resolved by science. It is the scientists who should have the necessary knowledge. It does not seem very likely that science will ever give a satisfactory response on sustainability (apart from philosophy). It is almost certain that today's science is not capable to do so. However, it cannot be ruled out that waiting for scientific evidence is just an escape from facing up to responsible behaviour.

What is science. According to Oxford Pocket Dictionary: "*science is a branch of knowledge involving systematized observation of and experiment with phenomena*". It is a branch of knowledge. It is not the only way to obtain knowledge? However, the adjective scientific has been given something 'holy', as if other sources of knowledge were inferior. This is in a sense surprising because quest for knowledge should be open also to developing new (or may be rediscovering old) ways to acquire this knowledge. Could this possibly threaten the vested interests of established knowledge producers?

The same dictionary describes research as a '*systematic investigation into and study of materials in order to establish facts and reach new conclusions*'. In this description we face a few unclear concepts: What is considered systematic? What are facts? What can we call a conclusion? And, how definitive can facts and conclusions be? This illustrates the point made by Robert Pirsig in his book 'Zen and the art of motorcycle maintenance' (p.118). Put freely he states that '*the purpose of scientific method is to select from among a multitude of hypothesis, but the number of hypothesis grows faster than the experimental method can handle. It is clear that all hypothesis cannot be tested and ...the scientific method falls short of its goal of establishing proven knowledge...*' These observations should not be interpreted as if research would not contribute to knowledge building, but rather it points to (possibly self-evident) limitations of research and expectations which research can or cannot satisfy.

At times of on-going cuts in national research funds expectations as to obtaining relevant research results should be adjusted accordingly.

The final problem with scientific research is the scientific establishment itself. The research which is recognized as scientific and can be published in so called scientific journals must stick to well described

approaches, because otherwise it is not 'scientific'. We are in a situation where narrow definitions of method exclude potentially new knowledge. Established scientific methods have proven very effective in a large number of fields. But they should not claim predominancy over all other methods. The attention given to 'indigenous knowledge' in the forests of Brazil recently is just one example. Such knowledge may also exist in Europe, but it is consistently disregarded, because it does not fit the accepted definition of science. Established methods are based on monodisciplinary approaches. Their applicability to holistic multi-disciplinary research is uncertain.

In the beginning I have stated that currently scientific research into sustainability may be a 'contradictio interminis'. Why? Because sustainability is intrinsically a holistic concept. Research into sustainability cannot easily assume that certain phenomena are irrelevant. Does mainstream science know how to deal with holistic concepts? Universities teach specialisation, not integration. Researchers prefer the apparent complexity of the detail, because it provides them the possibilities to publish. Broad multidisciplinary research can not be published, because it does not go 'deep enough'. New types of research are not interesting for researchers because they do not offer a way to scientific status. Instead, highly specialized 'scientific' journals publish articles which can be read by a dozen of similarly focussed specialists in the rest of the world. Broad and critical academic discussion is becoming rare. Again, relevance of some of this research is unquestionable. But does it contribute to greater clarity in relation to sustainability?

One reason why science in general and natural science in particular cannot provide definitive answers regarding sustainability is that what is considered sustainable is a matter of perception. This perception is implicitly contained in the organization of the society itself (e.g. market as a major organizing force), in the priorities which it pursues (e.g. short or long term) and in the beliefs of its ability (e.g. feasibility of technical solutions). The perception is the basis for the values attributed to various environment 'aspects', e.g. fish stocks. Such values may range from utility to existence values. The utility value can be also interpreted as economic value for consumption.

To consume means (according to the same source) to eat and drink, but also to use up and to destroy. If our language is an expression of the concepts in which we think, the concept of sustainable consumption may be rather alien to us. Some 50% of the consumption of seafood in the EU is imported from third countries. Is this a sustainable consumption pattern? Is there so much fish produced sustainably elsewhere? According to FAO most fish stocks in the world are fully exploited and the demand for fish is growing with rising incomes. The shortage of fish products on the EU market may be resolved by increasing aquaculture production. However, this activity also must be viewed from sustainability point of view. Economic growth is explicitly on the agenda of the 5th Framework Programme. When it comes to fisheries, feasibility of growth should be questioned.

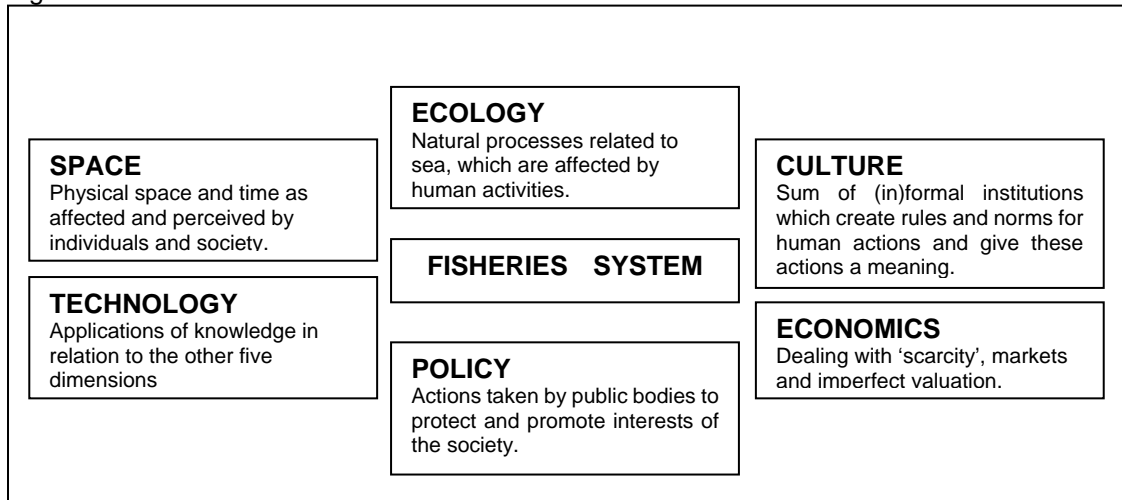
To summarize, the following generic research questions can be asked:

1. Do we know what sustainability is?
2. What are the limits of scientific determination of sustainability?
3. Are there currently methods for holistic scientific research?
4. Is scientific establishment interested in and capable of multi-disciplinarity?
5. Are the current fish consumption trends in the EU sustainable?

3. Research questions

In 1996 LEI-DLO together with several other institutes and universities has carried out a study about the research needs of the fisheries policy in the year 2010. The study has analysed the fisheries system in a six dimensional force field.

Fig. 1. Force field



This 'force field' is of a generic nature. Just about any issue can be put in its centre. It is just a visualisation of an increasingly accepted conclusion that some research topics have to be dealt within a comprehensive and holistic manner. Such approach calls for multidisciplinary science. Some doubts regarding its feasibility and acceptability to the scientific community today have been raised above.

In fig. 1 the research areas are not only expressed by the six forces (or dimensions), but just as much by the multitude of their relations. For example: economic interest affect political decisions, and this relation between economics and policy in its turn affects the fisheries system. The effect cannot be ascribed to policy or to economics alone.

The 'force field model' can be also applied to identification of the main questions regarding research into sustainable satisfaction of consumer needs in seafood products.

Sustainability

In the 'force field' the following questions could be raised regarding sustainable fisheries.

Ecology

- Is it feasible to express sustainable exploitation in a set of indicators?
- If so, can these indicators be translated into practice?
- How should ecosystem be valued?

Culture

- What are the perceptions of sustainability of the various actors: industry, administration, environmental movement, general public, etc.?
- How can these perceptions be consolidated?

Economics

- Where is the compatibility between short term economic interests and long term ecological sustainability?

Policy

- What is the political commitment to sustainability?

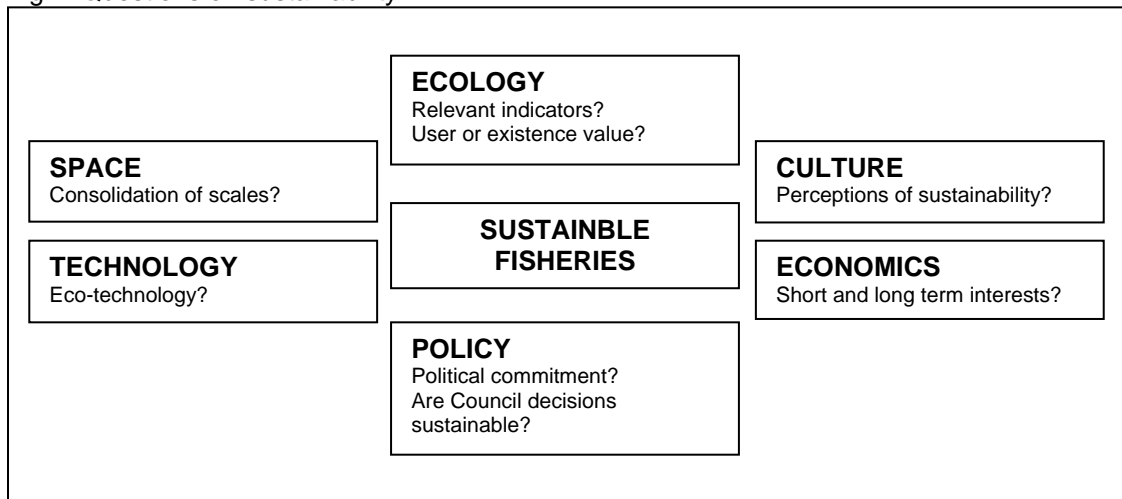
Technology

- What are the characteristics of eco-technology? How can they be put into practice?

Space

- How to consolidate the various scales in space and time which are relevant to the various phenomena?

Fig. 2 Questions on sustainability



Consumption

As for consumption, questions can be raised in a similar manner.

Ecology

- Where is the limit to consumption of the eco-system?
- Which are the relevant indicators?
- Which ecological indicators can be communicated effectively to the consumer?

Culture

- Which new products will be culturally accepted or rejected?
- Is restraint of consumption alien to our culture?

Economics

- What benefit can an integrated chain approach offer in a situation of limited availability of a natural resource like fish?
- What are the pros and cons to growth or restraint of fish consumption?

Policy

- How to deal with trade-offs between goods priced on basis of their utility and those which do not have an economic price, but only existence value?
- Should we produce more fish or consume less?
- Is there a political compromise between the desired price levels of producers and consumers?

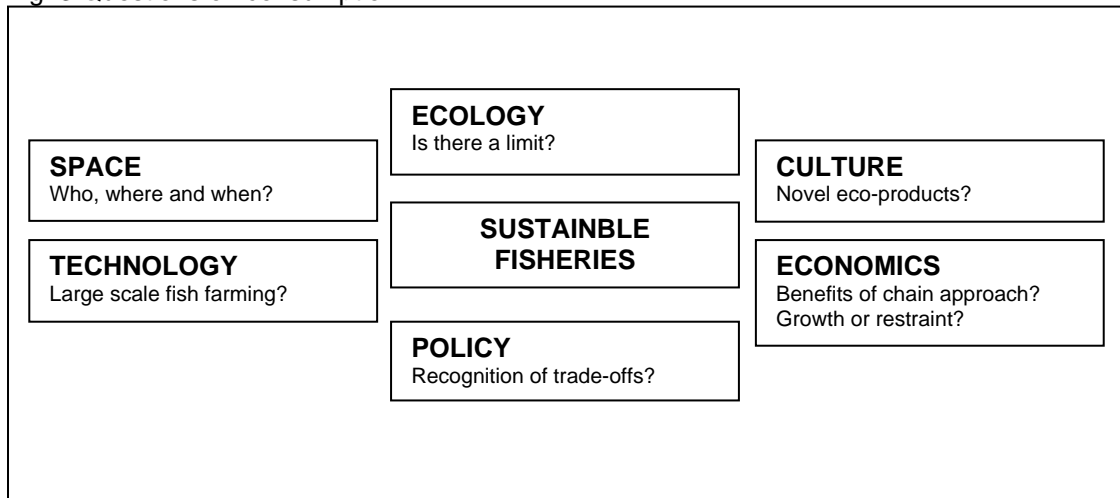
Technology

- Is large scale fish farming feasible and what are its consequences?
- Should the consumer prefer certain technologies over others. (Is dolphin free tuna really environmentally friendly?)

Space

- Consumption here and now or rather later and somewhere else?

Fig. 3 Questions on consumption



4. Research priorities

Limitations of scientific research need to be recognized, particularly in the short run. Sustainability of consumption of seafood will remain a matter of discussion for the time being because of limited knowledge of the ecosystem at large and the impossibility to deliver ever final and conclusive knowledge. Therefore scientific research should pursue a more humble role than looking for the ultimate truth. Also the users of the research results should take this explicitly into account.

Research priorities outlined below can be distinguished in two groups: a/ content and b/ form. Each topic is elaborated briefly below.

Content - what should be studied

- Multidisciplinary theory of fisheries
- Holistic indicators of sustainability
- Consolidation of scales in space and time
- Sustainable behaviour of individuals and institutions
- Novel seafoods

Form - how the research should take place

- Cooperation of social and natural sciences
- Dialogue with users
- Exploitation of all knowledge

Content

The on-going monodisciplinary research should be complemented by setting up comprehensive multidisciplinary cooperation. Such cooperation can be only effective if it takes place within a framework (or theory) to which all participants can relate. Developing a multidisciplinary theory of fisheries is therefore a first priority. Such initiative would also benefit many other fields related to environmental issues.

This theory should lead to a definition of practical indicators of sustainability. It can be expected that these indicators will have bearing on various dimensions of the above described force field at the same time. A major characteristic of these indicators will have to be the feasibility of their clear communication to the involved groups (fishermen, consumers, environmental interest groups, etc.). The indicators will have to be born and respected by these groups.

One of the major problems in reconciling economic needs of the industry and the ecological regeneration of fish stocks are the different scales in space and time which characterize them. Still other scales can be found in the areas of political decision making or shifts in consumption patterns. Research into the short and long term priorities of the involved stake-holders may provide indications as to how a greater consistency could be achieved and how human actions should be adjusted.

Related to the above points is the question of sustainable behaviour of individuals and institutions. The 'tragedy of the commons' is not only characteristic to the competition among fishermen, but also in the international arena (Council), in technological competition, etc. Research needs to be carried out into the cultural habits and institutional arrangements which maintain (or could contain) undesirable competition for scarce natural resources. A specific question in this respect regards the practical operationalization of the precautionary approach to the realities of every day life.

The high dependence of the EU market on imported fish products, along with general world wide trends in fish production and consumption calls for intensive scientific effort to develop economically feasible, culturally acceptable and ecologically responsible large scale fish farming. This effort should offer the EU consumers traditional as well as novel seafood products. Although the farming does not have to take place necessarily in the EU, it must not go at the expense of the environment elsewhere (e.g. destruction of mangrow forests for shrimp).

Organization / form

The force field shows clearly that each topic has to be addressed by natural as well as social sciences. Effective multidisciplinary cooperation will require appropriate organizational arrangements. It does not seem likely that cooperation can come about just through ad hoc projects or meetings. This would not be considered sufficient in monodisciplinary research either. Specific proposals need to be developed as to the possibilities of effective organization of multidisciplinary research.

Dialogue among disciplines needs to be complemented by structural on-going dialogue with the users of the research results. One of the most important and most difficult steps in applied research is the proper definition of the research questions. In practice it appears that these questions cannot be formulated neither by the users nor by the scientists alone. Formulation of the right question contains already the nucleus of the required answer. This answer is to be applied by the users to specific problems. Close involvement of the users in the research process is a guarantee that they will recognize the value of the research outcomes and will be more willing and capable to use them.

Finally, it should be recognized that among the various groups involved there is a vast, often dormant, knowledge. They have a potential to provide additional information for research purposes. Attention should be given to a more intensive cooperation between research and the fishing industry (and others) in order to use all knowledge available. The fishing fleets could provide a large variety of information in real time. Many fishermen have developed in-depth understanding of the environment in which they operate. Today this knowledge is discarded as unscientific.

Final remark

Fundamental as well as applied research is a risky enterprise. This is even more the case when new experimental approaches need to be followed. The priorities set out for the 5th Framework Programme in this paper certainly contain a fair amount of risk. Even if a fairly intensive programme would be supported along the sketched lines, very specific results probably cannot be expected in the short and medium run. Allocating resources to this need today is the only way to obtain the required knowledge in the beginning of the next century.

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