GERMAN INSTITUTE FOR DEVELOPMENT POLICY

EU Fishery Agreements Policy and Cooperation on Development

On the situation with the Coherence Debate

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Reports and Expert Opinion 1/1999

Berlin 1999

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ISBN 3-88985-196-7

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Foreword

Since 1995/96 press reports have been accumulating on pirate practices of industrial fishing fleets in the 200 mile zones of developing States and on the socio-economic consequences and those for marine ecology. Advisory expert literature has also been drawn up proving and/or attempting to prove cases of overfishing and the repercussions this has on marine ecology and socio-economic effects.

The question is posed of the effects catches by fleets from industrial countries operating under fishing agreements in the waters of developing countries have on development cooperation measures achieving their objectives. This reflects meanwhile both fears as well as a level of knowledge and awareness in the fishery sectors of the developing States concerned. At the same time public debate is intensifying in the industrial countries in which doubt about the wisdom of their own political practice of subsidizing fisheries is becoming ever more pressing. The reduction of subsidies for the fishing industry will probably be on the agenda of the next WTO round. Both industrial and newly industrialized, developing and transition countries are involved in worldwide contract fishing. The debate relating to the EU addresses only part of the global problem.

In this study a cross-section analysis is made on behalf of the German Ministry for Economic Cooperation and Development of existing expert opinions on the "EU Fisheries Policy/Development Policy Cooperation" coherence problems. The major results, doubts and recommendations of the expert literature are summarized in a succinct overview. In view of the extent of the material an evaluation in monograph form was not intended, nor possible, on account of the unavailability of many works. Catch statistics are also not available from both the developing States and the EU distant water fleet practising contract fishing in the 200 mile EEZ of some 15 developing States. This severely limits the opportunities for quantitative analysis.

Initial considerations have also been given to the world market and to the export promotion of fish, for apart from the question of subsidies it is the expansion of demand in industrialized and developing States that is the determining driving force in worldwide trends towards depletion of fishery potentials. Apart from some very few national analyses of demand there is hardly so far any market-analytical secondary literature on this set of problems. With the increasing liberalization of the world market the promotion of exports is becoming a chief topic of development cooperation in the fishing industry.

Berlin, February 1999 Hartmut Brandt

Abbreviations

ACP	African, Caribbean and Pacific countries associated with the European Union in the Convention of Lomé
ASCM	Agreement on Subsidies and Countervailing Measures
EEZ	Exclusive economic zone of 200 nautical mile, established in the International Law of the Sea Convention of 1982
BMZ	Federal Ministry for Economic Cooperation and Development
GRT	Gross registered tonnage
CECAF	Committee for Eastern Central Atlantic Fisheries
CPUE	Catch per unit of effort
CRODT	Centre de la Recherche Océanographique de Dakar-Thiaroye
DWF	Distant water fleet
ECU	European Currency Unit
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FCFA	Franc de la Communauté Financière Africaine
GATT	General Agreement on Tariffs and Trade
LOS	Law of the Sea Convention
MEY	Maximum economic yield
MSY	Maximum sustainable yield
OECD	Organization for Economic Cooperation and Development
SMCP	Quasi-state-owned marketing company for Cephalopods in Mauritania
TAC	Total allowable catch
WTO	World Trade Organization

Summary

Overfished oceans

The long-term core problem of the world fishing industry is a process of depletion of fishing potential through overfishing driven by a rapidly growing demand for fish, technical progress, excessive catch capacities and massive subsidizing of the fishing fleets. There is also as a rule weak fisheries management, particularly in developing States which are incapable of setting and enforcing fairly rational catch quotas. In the course of this development since 1970 one fishery after another from the North Atlantic and North Pacific southwards has been either overfished or at least fully exploited. This process has in the meantime reached what might be called a chronic stage. A worldwide fleet overcapacity, amounting to up to 60% of the tonnage, overburdens fishery potentials. In 1994 69% of the fisheries investigated were showing stagnating or falling yields: 44% are fully exploited, 25% overfished and 31% still allow increases in catches. Distant water fleets from countries of all continents play a significant part in depletion of the richest fisheries of a number of developing States through continuous overfishing. Through fishery agreements they acquire access rights to the fisheries of developing States within the 200 mile EEZ. The problem is best understood against the background of the expanding worldwide demand for fish.

World market

Seen as a whole, and apart from short to medium-term market disturbances, world markets for fish are characterized by a clear tendency for the supply of caught fish for human consumption to become ever scarcer in relation to demand (ex vessel prices: 1.5 to 3.0 US $/kg, top qualities: 30 US $/kg), though there is no question yet of such tendencies for supply to become scarce in the case of industrial fish (ex vessel prices: 0.15 to 0.40 US $/kg and aquaculture products. World production for human consumption in marine fishing has been stagnant now for about 10 years with an actual maximum of 55 - 60m tonnes a year. The major opportunities for increasing supply lie in aquaculture, the production of which over the last decade has reached rates of physical growth of more than 10% p.a. and in 1997 stood at 29.5m tonnes or 24% of total world fish production.

So as domestic demand in the industrial countries rose faster than stagnating domestic production, world trade in fish and fish products has increased very rapidly since the mid-70s. At present net exports of the developing States amount to at least 17bn US $ a year. The real export prices for fish and fish products remained about constant worldwide from 1983 to 1996. This does not reveal different trends for different product groups. Real prices for industrial fish and aquaculture products declined, as did farm prices. The trend with real prices for fish for consumption from fishing has been slightly upwards over the last twenty years. In 1998/99 ex vessel prices for white fish meat doubled despite the world economy being in a weak state. Markets, going by their price curves, are not integrated or only poorly so, even when it is a question of the same type of fish and transformation stage in different market places.

The EU covers now only about 50% of its fish consumption from within its own EEZ. Customs duties for "white fish" amount to 10 to 12%. However, about 60% of fish imports come under special preferential arrangements such as the Lomé Convention. Minimum ex vessel prices for the most important species are set annually, though so low that only on very few occasions do relatively small quantities have to be removed from the market. Since 1991/92 there has been a slide in prices for fish for consumption particularly in European markets due to a rapidly increasing supply of farmed salmon and the (probably heavily dumped) supply from Eastern Europe from fishing. Most recently ex vessel prices have again settled down in the secular trend, because the reality of capital costs is making itself felt in Eastern Europe and because on the demand side the superior quality of wild compared with farmed salmon is clearly being appreciated.

The Uruguay Round brought substantial reductions of tariffs for fish and fish products in the largest importing countries: Japan by on average 24.6%, the USA by 20.6%, the EU by 17.4%. In the case of canned fish on the other hand no ap-

preciable reduction in duties was achieved with the exception of tuna and sardines, and it remains to be seen what will be done with non-tariff import regulations. Even though the exports of ACP countries to the EU might be suffering from henceforth keener price competition from Asiatic and Latin American countries (due to erosion of the Lomé preferences), the liberalization of trade will strengthen worldwide the price incentives for increasing effort on fishing and for overfishing.

Worldwide fishing subsidies represent, according to cautious estimates, 20 to 25% of primary producers' revenue. There have not yet been any studies on their influence on the level of world market prices.

Coherence debate

The depletion cycle of fisheries typically starts with high yields and excessive investment and/or fishing and processing capacities. Then for a few years rising ex vessel prices (over)compensate for the declining harvests. Finally, as the volume continues to fall, demand no longer produces this compensation effect because it has become price elastic, or backspread sets in from other markets. Sales drop and government subsidies plus half-hearted fishery management stabilize a situation of chronic overfishing which both socially and ecologically as well as economically lags far behind the possibilities for a reasonably rational overall solution.

Data and studies of the sub-Saharan fisheries in the Atlantic show that this process is in full swing here too and in part far advanced (in particular with demersal species). Over the last decade distant water fleets have accounted for about half the yield here. A comparison of the countries shows that only strict fisheries management, backed by firm political will and equipped with the necessary *hardware*, as central element of a fisheries development policy, can ensure reasonably rational exploitation of the fishery potential. Even then the usable potential can fluctuate sharply with ocean currents, water temperatures and wind conditions, as for example demonstrated by most recent experience in the Namibian fisheries. For the same reasons it is hardly possible in the case of individual fisheries to prove conclusively firstly overfishing and secondly the share of the EU fleet in this in such a way that there are no facts and arguments to cast doubts on this proof. Overfishing as in all previous cases is generally only recognized when it is an accomplished fact - an accomplished fact above all as regards profitability.

The problem cannot be solved without adequate political will on the part of the coastal States concerned. Even withdrawal of a single distant water fleet - say that of the EU - helps little, since the price, overcapacity, technology and subsidy-induced competition of the fishing fleets over fishing rights is not eliminated by this: because catch capacities are interchangeable worldwide and can be shifted from one fishery to another (by sale, disposal in the course of development cooperation, changing flags and new fishery agreements). Retiring fleets are quickly replaced as long as physical fishery agreements, prices, costs and subsidies cover part of the fixed costs or even enable a profit. Where reasonably rational TACs are not set or enforced competition among the fleets follows the same exploitation logic as the average fisherman.

The EU fishery agreements policy procures for part of its own oversize fleet capacity access and harvest rights within the EEZs of other countries. To this end compensation payments of about 280m ECU p.a. are currently made to developing States by the EU Commission. It is mainly fishing enterprises from Spain, Portugal and France that benefit from this subsidized access; anyhow, 25,000 jobs on board some 1000 vessels and 25,000 to 50,000 upstream and downstream jobs depend on fishing by agreement. Some 25% of the fish consumed in the EU is at present landed by its distant water fleets. With the set target decided on of reducing fishing effort within its own EEZ by 30% by the year 2001, political pressure on the Commission should further increase to secure fishing rights outside its own EEZ, for catch capacities will not be phased out simultaneously and proportionally, ex vessel prices will increase (or have already just about doubled in 1998/99) and opportunities for profit should increase with ex vessel prices.
The coherence requirement regarding the relationship between EU development policy on the one hand and its other policies, in particular its

fishery agreements policy, affecting developing States on the other derives mainly from the EC Treaty (Arts. 130u, 130v). Under the terms of reference of the Treaty the development policy objectives of the EU are to be "considered" in all other aims it pursues. To consider in the English language text of the Treaty is: *"to take account of"*. This does not of course exclude variants in perception and actual decisions when weighting *trade offs*. The Maastricht provisions regarding coherence problems can thus be broadly interpreted in political practice. However, the EU is clearly subject to the legal requirement to shape its policies in coherence with the aims of its development cooperation work.

A case of general incoherence can be claimed where other EU policies demonstrably and significantly counteract development policy objectives (sustained economic and social development, harmonious and gradual integration into the world economy, the fight against poverty, nature conservancy requirements). If achievement of the objectives of fisheries-related measures of development cooperation is thereby reduced or prevented, there is a case of project-related or sectoral incoherence. In the coherence debate on the fishing industry there is talk of possible negative effects of EU fishery agreements on the employment situation and food conditions in the partner countries, i.e. of the problems of general incoherence. Then there are questions of project-related incoherence, as the EU normally promotes development cooperation measures in the fishery sector at the same time.

In the event of withdrawal of the EU distant water fleet on the grounds of overfishing and incoherence competing fleets would, subject to their financial cost-performance calculations which of course are largely determined by subsidies, quickly pick up the agreed volumes in question. After such a withdrawal the EU would be free of the charge of incoherence in question, but little would have changed in the fishing industry and development policy situation of the partner country. This problem of competition between fleets can only be solved when the coastal State concerned becomes able or is enabled to determine its TACs within the framework of a balanced fishery development policy and to police and enforce individual catch quotas.

There is also incoherence where the EU fleet can be demonstrated to contribute to overfishing through fishing practices in violation of agreements and catches in excess of agreed volumes. If one goes by the "grey" literature, the effects of such violations of agreements on fisheries must be considerable in many cases. Of course no one has so far been able to prove this quantitatively. There remains, however, the very justified question from the development policy point of view of why the EU does not install at least a reliable system for the statistical recording and monitoring of landings of its distant water fleet?

Conclusions and recommendations

If a look is taken at trends in world markets and the discussion on international fisheries policy, it might be supposed that worldwide catch capacities will probably be run down in initial steps as early as in the next ten years. At the same time the markets of the developing States will become more and more integrated in the world market because the fleet subsidies that are distorting competition (currently representing up to 25% of the catch proceeds worldwide) will probably be dismantled, import demand will continue to expand rapidly and the WTO process for the liberalization of trade will continue, and in addition many developing States will be able to expand their export potential. In the course of these changes the consumption of fish and with it the supply of protein to poverty groups in some 30 developing States will depend more and more on the shaping of national fishing policies, starting with fisheries management through to pricing and commercial policy.

These considerations lead to a basic conclusion from the point of view of development policy. The coastal States would have to set their TACs rationally from the biological and socio-economic points of view, say of the order of the fishing potential and allowing a safety margin, and to effectively police and enforce observance by the distant water fleets and their own fleet. Where cost-performance considerations do not make this appear feasible regionalization of fisheries management supported with development cooperation funds is available as a solution.

At the same time the EU should strictly monitor its own distant water fishermen. In this way not only could coherence be maintained, but the fishery agreements could even provide the framework of a coordinated and coherent EU fisheries development and agreement policy.

The literature of expert opinions on coherence problems between EU fishery agreements policy and development policy offers a wealth of requirements and recommendations which are not to be repeated here in full. Merely the following central recommendations, as viewed by the rapporteur, are addressed below even though their implementation is not possible in the short term and not without overcoming major political difficulties. It is a question of the most important items of an agenda for the next ten years:

1. Development policy on the one hand should not allow itself to become neutralized in the incoherence debate by assuming case by case for a few years the burden of strictly biological proof of incoherence regarding fisheries; for if the proof were to finally succeed without any doubt with the 12th expert opinion, fisheries potentials will have long been ruined - as worldwide experience over the last twenty years adequately demonstrates time and time again.

2. Development policy should in addition to the biological estimates of fishery stocks rather adopt as its own the alarm messages of artisanal fishermen, of scientists, national fishery institutes and authorities as well as international organizations and continue to plead them emphatically and persistently in public; for these sources are to be taken seriously on account of their collective expert knowledge and therefore uprated politically. Nevertheless, the economic and social consequences of overfishing are serious for employment, incomes and feeding of poverty groups. However, development policy should not unilaterally rely on the statements of individual interest groups: "A 'contingency approach' in the policy must not become so remote from the provable facts that in the end it is only the loudest voices that are still heard (this applies both to the fleet owner lobby and to the nature conservation lobby)".

3. Development policy should not abandon itself to the illusion that biological proof of overfishing also demonstrates at the same time incoherence politically. EU fishery agreements policy can - if it so wants - claim with good reason that it has indeed "taken account of" the development policy consequences, and that it is foreseeable that with the withdrawal of its own fleet another would appear on the scene with even harsher consequences for the contracting party; it is consequently necessary, if incoherence is to be eliminated, to encourage the fishery policies of the contracting party countries and to look to the international causes of overfishing. Development policy should in this conclusion take the EU Commission at its word and in addition point more clearly than before to incoherence through fishing practices and catch volumes of the EU fleet contrary to agreements, for the alternative in this respect is not withdrawal of the fleet, but fishing in line with agreements.

4. As the distant water fleets only demand fishery agreements insofar as they can make a profit in this way or in marginal cases cover part of the fixed costs, it is urgent to reduce subsidies to the fleets and worldwide overcapacities. Development policy should support this demand in the international and internal EU discussion forcefully and persistently. Effective development policy PR work should be intensified to this end.

5. Development policy should support studies being conducted for the main distant water fleets which will arrive at an estimate of to what extent subsidizing is influencing the size of distant sea catches.

6. EU development policy work should develop the elements of a cost-effective fisheries management for use by its contracting fishery partners. A number of measures are necessary for this: study group for coming up with a concept, studies of specific measures, concepts for development of sectors and pilot projects.

7. Future EU fishery agreements should each be signed only on the basis of a fishery sector

development policy analysis: no fishery sector development policy analysis, no fishery agreement.

8. EU fishery agreements should only be signed on the basis of a fisheries policy of the contracting party appropriate for the location! Accompanying development policy measures should therefore be implemented in basic biological research and in the setting up of a fisheries policy regarding concept, personnel and hardware where there are bottlenecks in fisheries management.

9. The EU should energetically support international efforts to strengthen joint regional fishery management by several neighbouring developing States through development policy measures and through its fishery agreements policy.

10. Development cooperation should insist on statistically correct records of landings of the EU distant water fleet. In view of the costs of the fishery agreements policy and the development policy effects of any overfishing, it cannot be accepted that it is possible in EU agricultural policy to record the last hectare of potatoes and to keep a check on the life of each calf, while it is said not to be possible to draw up correct statistics of distant water fleet landings within the framework of EU fisheries policy.

11. Likewise development policy measures for promoting exports of fish and fish products should be carried out only within the framework of a reasonably (socially, ecologically and economically) balanced fisheries development policy. Otherwise the trend of prices would in many cases lead to overfishing. The pressure of demand will make itself felt in the price trends and thus profit incentives all the more strongly, the more the worldwide fishing potential is exhausted by overfishing and the more closely the respective developing State becomes integrated in the world market.

12. The promotion of exports should concentrate on high value species. The small pelagic species that are of key importance in feeding the poor and average earners (known as industrial fish) should be managed primarily for providing food for the domestic market. TACs in this respect should therefore allow for reasonable safety margins in respect of natural fluctuations in the biomass of stocks.

1 Conceptual and contractual principles of the international fishing industry discussion

1.1 *Tragedy of the Commons* in fishing

Up to the beginning of 1983 there was free access outside the traditional three-mile territorial waters limit to the fisheries of the world's seas for one and all without any restrictions regarding location, volumes or technology. The Law of the Sea Convention of 1982, which finally came into force in 1994, fundamentally changed this state of affairs (cf. subsection 1.3). Coastal States acquired among other things the right of disposal over the fishery resources in an exclusive economic zone of 200 nautical miles seaward from the coast (200 mile EEZ). The following discussion of overutilization or destruction in principle of "free resources" therefore no longer fully applies to the reality of the fishing industry, as the fisheries have since 1994 at the latest no longer been free. However, weak policies of controls and sanctions in the case of many developing States still lead to a watered-down or latent "Tragedy of the Commons", in this case: a tendency towards overfishing and reduction of the sustainable fishery potential (cf. subsection 1.2 for the definitions). The following analysis can therefore still make quite a significant contribution to an understanding of the basic fishing industry problems of many developing States.

Freedom of the Commons denotes the legal situation (or situation under international law) regarding free enjoyment of resources, free in the sense that no private-sector costs are associated with these resources, even though there are definitely world or national economic costs associated with this enjoyment.[1] Experience to date shows that under free-market conditions free access to resources has led to depletion and in extreme cases to destruction of the free resources. That traditional subsistence economy production systems had solved these problems in most cases through social-institutional restrictions on access and rules of use had an important reason: under pre-industrial conditions there were as a rule no or only very "thin" markets in which free returns could be made. Market integration of production, however, forced out the traditional norms and arrangements for the use and enjoyment of resources and finally led to their privatization.

In ocean fishing, however, this can be repeated in only a limited fashion, as a stock of fish in the ocean is a rapidly changing variable that can only be defined in relation to a point in time. It can only be possessed insofar as it has been caught. If the rights of access and fishing are not now to a certain extent privatized as an alternative and thereby limited by the government to a lasting rational overall level, there will in the end, with rising demand, be a depletion of the resources, a result that Harding fittingly called *tragedy of the commons*: "*Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.*"[2] Thus in a free fishery the individual user optimizes his share of the total yield in the short term without regard for its sustainability, as long as he can hope for an economically attractive market price, for what he does not himself take today, another will take today or tomorrow. Where there are no private rights of use and enjoyment, the market is unable to assess the resources and thus put forward any cost arguments for careful utilization of the resources.

It was in precisely this situation that ocean fishing found itself up to 1982, as long namely as the unrestricted freedom of the world's seas prevailed and anyone could fish outside the three-mile limit, as much and where he wanted. The trend in fish prices and practices with subsidies provided an incentive to increase catch capacities and fishery agreements. Location and fishing techniques were improving continuously and the modern fishing fleets overfished the stocks in one region after another (cf. subsection 3.2).

1.2 The concept of sustainability

"While there is general agreement that resource conservation is necessary for sustainability, the concept of sustainability must involve more, since there are an infinite number of different use options that will result in biologically sustainable

1 Harding (1968).

2 ibid., p. 38.

yield."[3] This basic recognition applies to the management of all renewable resources through systems of use. Each system of use is assigned a specific sustained state of equilibrium between depletion and renewal of the resources and their production capacity and a sustained yield in kind. Of course, after a change of system of use, e.g. intensification in farming, new sustained resource levels and yields in kind set in only after a time-lag. In the long term though it is always the case that the level of resources as an indirect input is crucial in helping determine the sustained level of yield.

Fishing industry analyses accordingly take as their starting point a functional concept of sustained yield from fishing, which as a long-term standard value is materially dependent on the reproduction conditions of a fishery and the costs of fishing. There is therefore assumed for a fishery, which is defined as a reproductively coherent stock of a fish species in an area of sea, a functional relation between physical effort of fishing (measured e.g. in kWh or tonne days) and sustainable yield from fishing. If completely price-elastic demand is accepted initially as a rough simplification, i.e. independence of fish prices from fishery yield, then the only difference between volume fish harvest and corresponding revenue is the constant price as multiplier.

This formalized comparison of sustainable fishing revenue and the associated costs of the corresponding effort on fishing (cf. Diagram 1) then illustrates some basic interrelated effects of the fishing industry. The OMA curve represents sustainable revenue from fishing over the corresponding physical effort. The latter, of course, is in practice a function of time. At point 0 the fishery is not exploited and the fish stock has a maximum average biomass. At effort level E_1 the maximum sustainable yield and revenue are achieved. At effort E_n the fishery would be so heavily overfished that no sustainable yield and revenue would be achieved any longer. The variable costs (VC) and the total production costs (TC) increase with the physical effort. The section of the coordinate OR_m represents the total fixed costs which can primarily be counted as capital costs. The sustainable profit maximum is at effort E_2 and revenue R_2. Here the sustainable marginal revenue equals the marginal costs. At effort E_3 is the upper loss threshold of fishing and at E_4 the upper production limit. At these points the sustainable total revenue still just covers the corresponding variable and total costs. The sustainable profit maximum and the maximum stock yield QP of the whole fishery lie below effort E_1. The more efficient the search and fishing technology becomes and the narrower the ratio of fish price to input prices becomes, the closer E_2 approaches E_1.

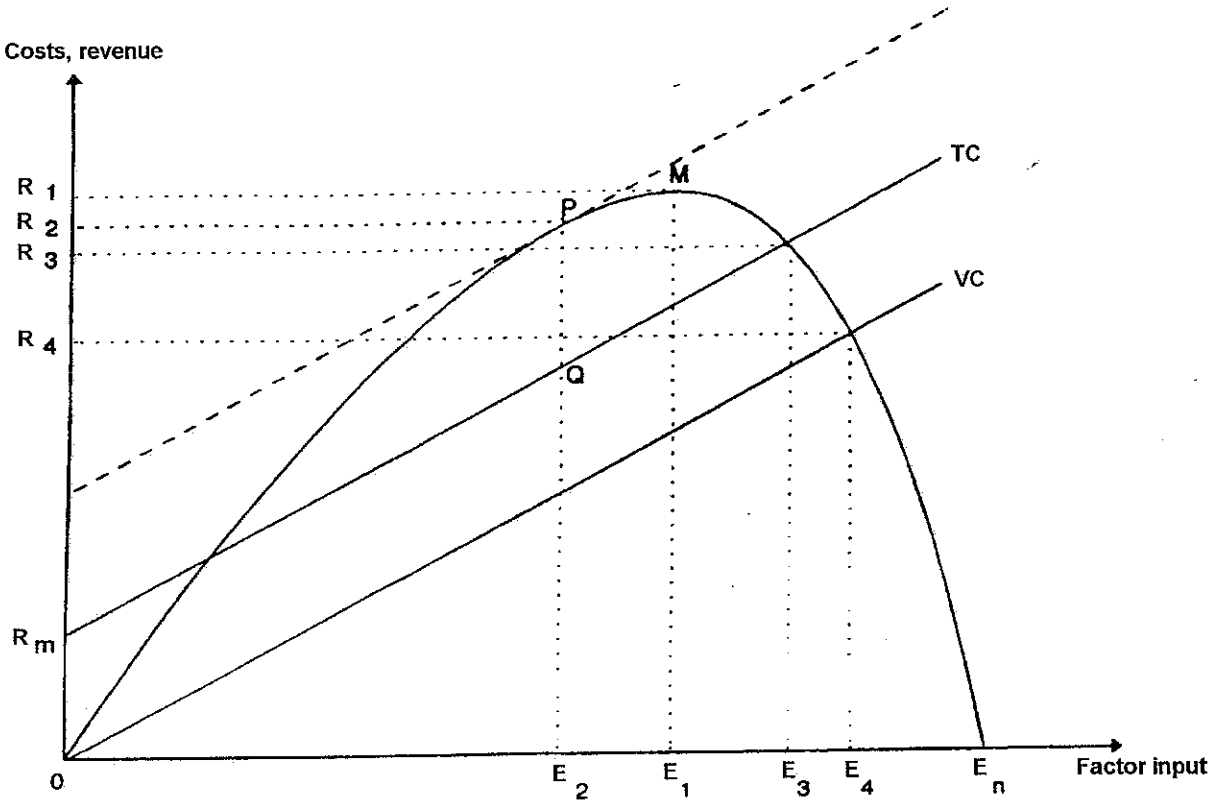
As long as the state has not set and enforced any limits on total effort and/or total fishery yield, the total expenditure on a fishery as a rule is driven up way above the point of maximum sustainable yield, in a borderline case beyond E_4, for each individual fishing enterprise makes its investment and short-term decisions in the light of the freedom of fishery access and unaware of the aggregative reactions of competing enterprises and the sustainable fishery yield curve. At the end of this race for the free stock yield then are regularly plundering of stocks, depletion of the fishery and economic ruin for the submarginal fishing enterprises in this situation. This also mainly because the service life of a fishing vessel is calculated at twenty to thirty years and the decline in fishery yield as a result of overfishing as a rule follows with a few years delay the growth in capacity. Technical progress, booming fish markets and state subsidy programmes can considerably accelerate even more this race to the "tragedy of the commons". Particularly where rising ex vessel prices in real terms and state subsidizing of costs act together, the profitability of the enterprise keeps providing incentives to overfish, even if the physical fish yields have already fallen way below their sustainable maximum.

If the simplification of constant fish prices and completely price-elastic demand is dropped and the possibility allowed for of rather price-inelastic demand down line (processing, wholesale), then the revenue-cost diagram changes appreciably. Two considerations in particular are to be noted:

- With a price-demand elasticity between -1 and 0 the revenue maximum E_1 also shifts towards E_n, and the sustainable revenue function be-

3 Charles (1994), p. 204.

Diagram 1: Systematic basic correlation of fishing industry reasoning: sustainable total revenue and total costs over physical factor input with completely price-elastic demand



PQ = stock yield

Source: Own Draft

comes more skew to the left, the closer own price elasticity approaches zero.

- Rising demand (due to a rising number of consumers and rising real per-capita incomes) sends the trend in fish prices up, if the volume produced can no longer be lastingly increased. With relatively rising fish prices sustainable fishing revenue grows and thus also in time the pressure to exploit. Point E_3 moves towards E_n.

In fishing industry practice both effects (combined) can already be seen in all clarity (cf. subsection 3.2.2). However, in the discussion on the fishing industry it has until now hardly been considered that, for the two reasons mentioned in the case of high value fish species, the free play of forces in today's world market situation of necessity leads grimly to the threshold of destruction of stocks, if the state does not intervene beforehand to regulate catch volumes. It is consequently not only national economic reasons that, as has already been shown, speak for state intervention, but as a rule also solid socio-economic and environmental arguments.

The socially, ecologically and economically irrational result of free access to resources can in the light of all available experience and with today's price ratios and technical possibilities only be avoided if government fisheries policy ensures that a fishing yield and effort considered biologically and politically acceptable is not exceeded. Of course, this task is considerably more complex

in practice than in a simple revenue-cost calculation, for the environmental and thus exogenous reproduction conditions of a fishery are in no way constant, but as a rule rather variable: changing ocean currents, water temperatures, pollution, fishing of predatory fish stocks and in some cases also unexplained and endogenous stock cycles. The necessary policy cycle regarding volumes in relation to individual fisheries becomes established only after many years of statistically well documented experience. In addition, the social and structural conditions of the respective fishing industry are of course of considerable, if not decisive influence in fisheries policy decisions. The following effect in particular makes itself felt: "*Managers, under constant political pressure for greater harvests because of their short-term benefits to society (jobs and profits), allow harvests to increase when fishery scientists cannot specify with certainty that the next increase will lead to overfishing and collapse. This is a one-way ratchet effect for two reasons: There is rarely political pressure for lower harvest rates (fewer jobs and lower profits in the immediate future), and the burden of proving whether higher harvests are harmful falls on the fishery managers, not the fishing industry. The result is a continuous, unidirectional increase in fishing effort, and in some cases fishery collapse.*"[4]

In fisheries policy the concept of a sustainable maximum yield must take into account both the constantly changing stock and reproduction data including a safety margin and the social and structural conditions of the fishery sector. To a certain extent people are always trying again to solve conflicts as far as possible without ruining the fisheries potential in doing so. In developing States this task is rather more difficult than in the industrial countries because the ecology of tropical seas is subject to comparatively large exogenous fluctuations (cf. subsection 3.1.1), because the statistics of the fishing industry as a rule still show considerable deficits and because there is a lack of vessels and equipment for reasonably efficient policing and inspection of catches.

Talk of overfishing depends on the preferred definition, being when either the MEY (maximum economic yield) or the MSY (maximum sustainable yield) is exceeded in the long-term. In the second case it is physical overfishing, in the first case economic overfishing. MEY depends, as explained, on price ratios and the technologies used. In this study the maximum sustainable yield (MSY) is defined as the potential of a fishery and a fishing effort that exceeds this as overfishing. Overfishing, therefore, can be seen both in fishing effort and in fish harvest. According to how the data look, a distinction between economic and physical overfishing in many cases in practice cannot be made with sufficient reliability. Of course, other definitions of overfishing are possible and are common depending on how one looks at things and the purpose of analysis.[5]

1.3 International conventions and declarations on marine fishing

The two first UN Conferences on the Law of the Sea in 1958 and 1960 produced no significant results. The third Conference on the Law of the Sea ended after ten years of negotiations in April 1982 with revolutionary changes in the international Law of the Sea, in particular also in respect of marine fishing. The recognition of an exclusive economic zone (EEZ) of 200 nautical miles seaward from the coastline gave the coastal States among other things the right of disposal over use and enjoyment of the fisheries in their respective EEZ. The coastal States hereby successfully refused foreign fishing fleets the previously free-of-charge access to the 200 mile EEZ (Art. 57 LOS). The Law of the Sea Convention of 1982 nationalized 85 to 95% of worldwide sea fish stocks. The 10 States with the longest coasts have today (de facto since the mid-80s) about 50% of worldwide EEZs. The Convention finally came into force in November 1994 after being ratified by a sufficient number of signatory states (at least 60), including the Federal Republic of Germany.[6]

Art. 61 LOS obliges coastal States to implement proper conservation and management measures to avoid overfishing (*overexploitation*) or restore fish stocks to a level at which reproduction is not

4 Botsford et al. (1997), p. 512

5 Mention could be made here of the minimum biomass of a fishery and its age structure.

6 Werbke (1993), 422 ff.

endangered. The target level for fishery yield and effort is mentioned as being the *maximum sustainable yield* (MSY), not the *maximum economic yield* (MEY). Art. 62 LOS stipulates that the difference between target catch or *total allowable catch* (TAC) of the respective coastal State and the domestic fleet's capacity to harvest must be made available to the distant water fishing fleets of other states within the framework of fishery agreements.

Arts. 61 and 62 thus leave the coastal States considerable leeway in setting the fishery agreement volume. If needed or in the case of conflicts of interest between a coastal State and states with distant water fleets this leeway can be widened considerably by manipulation of fishing statistics or even interpretation. It can be foreseen that the said leeway may one day, in view of future scarcity of fishery resources, be used to impose advantageous export prices and/or fishery agreements by means of monopoly practices. However, on the other side the distant water fleets are heavily adjusting their catch data downwards (cf. subsection 3.1).

Nationalization of more than 90% of marine fish stocks, however, has in no way got rid of international conflicts of interest in marine fishing. Nowadays there are disputes about the exploitation of *joint stocks* and *highly migratory stocks*. These are fisheries which in the biological sense are to be approached as a population and which extend beyond the limits of the EEZ between neighbouring States or out to the high seas.[7] Then there are highly migratory species such as tuna and cod which basically cannot be nationalized. The magnitude of the problem of migratory fish stocks is seen for example in the North East Atlantic where 80% of all fisheries are classified as *joint stocks*. There are similar problems in the North Pacific and many other ocean regions. The coastal States of course then find this particularly irksome when the fishery stocks because of their migratory behaviour can be siphoned off from outside as it were: a foreign distant water fleet e.g. lies off the EEZ and fishes an area of the adjacent high seas intensively, which is filled up again from the stock of the EEZ through migration. This problem can of course also occur between the EEZs of neighbouring States.

The thrust of an international fisheries policy nurturing stocks has been under discussion for years within UNO, in particular the FAO. An interim result was the Consensus of Rome on World Fisheries of 15.3.1995, in which the fishery ministers (without legal commitment) call for:

- "reducing fishing to environmentally compatible level where stocks are overfished or exhausted,
- checking and, if necessary, dismantling fishing fleet capacities,
- strengthening international cooperation within the framework of regional and subregional fishing organizations,
- supporting developing States in environmentally compatible fishing,
- encouraging states to build up an ecologically compatible aquaculture as an important contribution to providing food."[8]

This code of behaviour for responsible fishing is supported by the Agreement to Promote the Observance of International Conservation and Control Measures on the High Seas that was signed at the 27th session of the FAO Conference in November 1993.[9] This agreement and the above-mentioned code of behaviour outline the thrust of the international agenda for the next decade. The questions of quotas, policing and sanction mechanisms regarding straddling stocks and on the open sea beyond the 200 mile EEZ will not of course be solved by them.

The most recent result of the international discussion process is the "International Agreement on the Control of Deep Sea Fishing" negotiated in August 1995 by 99 states, which ought to contribute decisively to the ending of overfishing of highly migratory species and straddling fish stocks. It embodies in international maritime law for the first time a ban on defying the technical restrictions provided for within the framework of regional fishing organizations and exceeding

7 Sullivan (1984).

8 FAO-Aktuell (1995).

9 EC (1996).

quotas or infringing access rights of member states concerned to individual straddling fisheries (even outside the 200 mile EEZ). The EC ratified the Agreement on 8.4.1998 (EC 1998), which also represents in particular a strengthening of international and regional fishing organizations. However, the agreement has still not been ratified by most fishing nations.

A description of the large number of regional fishing organizations is omitted as it falls outside the scope of this study.

Arts. 58 to 63 of the **Lomé Convention IV** define the objectives and instrumentation of the EU fisheries development policy, while arts. 64 to 68 mainly relate to bilateral fishery agreement policy with ACP States. Art. 59 demands among other things "the strengthening of means for the protection of fishery resources ..., the promotion of rational use of the fishery resources of ACP States ..., ... appreciation of the importance of fishing for the improvement of food safety, the nutritional level and the socio-economic conditions of the population groups in question, ...". Art. 60 mentions fisheries production, protection of fishery resources and processing and marketing of fishery resources as being key aspects for promotion. Coherence between agreement and development policy in the fishing sector, however, is not expressly required in the Lomé Convention.[10] **Lomé V** will probably stick to the same limits.

2 EU fishery agreement policy and coherence debate

2.1 Fishery agreements

12 of the 14 or 15 fishery agreements between EU and ACP States are currently being used (cf. Overview 1). There are also agreements with Morocco and Argentina, 5 agreements in the North Atlantic and 5 with Baltic States.[11] The EU paid the developing States for these agreements in 1997 some 285m ECU (about 30% of all fisheries policy expenditure) as compensation for access rights. The compensation payments by the EU benefited both large fishing enterprises in Spain, Portugal and France as well as many small enterprises from the Iberian Peninsula which fish primarily in Morocco's 200 mile EEZ. The owners helped by the agreements for their part paid in addition some 70m ECU in licence fees direct to the developing States.

By resolution of the Council of Ministers of 15 April 1997 fishing effort in the European EEZs is to be reduced by 30% by the year 2001 in order to keep catches stable in this way and to increase them in the long term. The Member States can choose whether they want to achieve this target by decommissioning fishing tonnage or shortening fishing times at sea.[12] It can be envisaged that the EU States with the largest fishing fleets will in this situation have to press for continuation of the previous fishing agreement volumes in order to continue supplying their domestic markets inexpensively, to utilize domestic processing capacities and to keep 25,000 of the fishermen dependent on distant water catches employed and to maintain at least 25,000 jobs in upstream and downstream sectors.

The EU with its fishery agreement policy is pursuing four unexpressed aims:[13]

- reduction of fishing effort in its own EEZ,
- supply of the growing domestic demand at "fair" prices,
- replacement of the declining fishery harvests of its own EEZ by contracted catches and temporary withdrawal of own fishing capacity until own stocks permit more fishing again,
- avoidance of conflicts in allocating internal EU TACs and the run-down of excess fishing capacities.

Some 25% of fish consumed in the EU is caught within the framework of the fishery agreements. If the agreements were suspended, this would in no way mean a corresponding shortage in supply, for the enterprises could contract for own account and/or the developing States could increase their

10 BMZ (1991).

11 Hansen (1998).

12 ibid., p. 17.

13 NRI et al. (1997).

Overview 1: Fishing agreements with ACP States, the protocols of which are being applied (situation at 15 March 1998)

Country	Date of basic agreement	Current protocol	Type of agreement	Total financial consideration (Ecus/year)*	Demersal fishing (GRT)	Tuna fishing (Number of vessels)	Pelagic fishing (Number of vessels)
Angola	11.2.1989	3.5.1996 →2.5.1999	Mixed	13,350,000	10,300	31	2
Cape Verde	6.9.1991	6.9.1997 →5.9.2000	Tuna	510,580	---	76	---
Guinea Bissau	27.2.1980	16.6.1997 →15.6.2001	Mixed	9,000,000	12,600	89	---
Guinea Conakry	30.4.1983	1.1.1998 →31.12.1999	Mixed	3,250,000	5,000	74	---
Guinea Equatorial	3.12.1984	1.7.1997 →30.6.2000	Tuna	320,000	---	68	---
Ivory Coast	20.7.1998	1.7.1997 →30.6.2000	Mixed	1,000,000	600	60	---
Madagascar	21.5.1986	21.5.1998 →20.5.2001	Tuna	760,000	---	75	---
Mauritania	14.5.1987	1.8.1996 →31.7.2001	Mixed	53,360,000	36,500	57	22
Mauritius	29.11.1990	1.12.1996 →30.11.1999	Mixed	582,000	100	43	---
São Tome e Principe	18.4.1985	1.6.1996 →31.5.1999	Tuna	725,000	---	48	---
Senegal	15.6.1979	1.5.1997 →30.4.2001	Mixed	12,000,000	10,000	76	22
Seychelles	23.3.1984	18.1.1996 →17.1.1999	Tuna	3,300,000	---	57	---

* This consideration includes the financing of development measures in the fishing sector (research, policing training, etc.).

Source: EU Commission, unpublished data

exports. This addresses an important field of future development cooperation (cf. section 4).

The fishery agreement with Morocco is of the *access for tariff concessions and compensations* type. The agreements with the ACP States are of the *access for compensation* type. The latter contain up 10% technical cooperation payments, scholarships and other EU payments. In this way the EU among all fishery contracting parties at least produces the most beneficial and varied compensations. In contrast with these "first generation agreements" in the case of Argentina it is a so-called "second generation agreement" in which, in addition to compensation payments, extensive subsidies are provided for mixed companies under Argentine law (together with EU companies) and technical development payments made for the development of fisheries research and policy.

The compensation payments are considered internationally as payments for export services. The coastal States insist therefore on free use of the funds. The EU has not succeeded so far in establishing that a part only of the compensation payments also be used in addition to the abovementioned technical development payments by the EU for developing the fishing sectors of the partner States.

The fishery agreements with the ACP States and their exploitation in practice by the EU distant water fleet have long been the subject of well-founded suspicion of contributing to overfishing in a number of fisheries of the partner States.[14] Even in the case of the agreement with Argentina concerns meanwhile crop up regarding the sustainability of the current fishery yield: "*However, the Argentine experience needs to be more closely analysed as the government is now said to be having to cut fishing effort and cut quotas.*"[15] It must be recorded, however, that the EU fishery agreements allow protective measures to be taken ad hoc in the case of overfishing. Angola, Guinea-Bissau, Mauritania and Senegal are the most important fishery agreement partners among the ACP States. Apart from Angola there are estimates available which show that the majority of their fisheries are being fully exploited or overfished (cf. Overiew 2). Namibia, pointing to the build-up of its own fishing fleet and fish processing industry and the need for fish stocks to recover (cf. subsection 3.2.3.2) has refused the EU a fishing agreement.

In 1997 the EU paid contract fishery compensation payments of 88.7m ECU to 14 African States (Morocco not included). In the same year the European Development Fund paid 71.6m ECU for fishery products with the same 14 States. This was, however, the sum total for projects running many years.[16] Mölsä estimates that about 50% of all EU funds for fishing industry development cooperation is handled by the European Development Fund.[17]

The individual fishing agreements between EU and ACP States differ in subject matter. It could now be demanded that they be examined as to whether their subject matter is coherent or not. This in the opinion of the rapporteur is too late, as incoherence always occurs indirectly in that the EU fleet through its catch volume and/or fishing technique contributes to a reduction of the sustainable fishery yield of a contracting party. Of course, such a result could be assisted by provisions of an agreement, but to demonstrate this in each case it is first necessary for the fishery potential, the total fishery harvest and the share (and the fishing technique actually used) of the EU fleet to be known. In the specific case of incoherence it will of course also be checked whether inadequate wordings of the agreement or breach of the contractual provisions has assisted or caused the result.

Hansen analysed the fishery agreements between the EU and the ACP States from the points of view of access or fishing rights and compensation payments made.[18] It emerged that the so-called first-generation agreements (*access for compenation type*) in some cases do not quantify the maximum permissible catch volumes, but merely define access rights as average catch capacities (measured as GRT/month). In the specific case

14 Hansen (1998); House of Lords (1996); Porter (1997); Mölsä (1997).

15 NRI et al. (1997),m p. 52.

16 International Agricultural Centre (1997), p. 2.

17 Mölsä (1997), p. 10.

18 Hansen (1998), pp. 36 ff.

of overfishing by EU fishing vessels or incoherence this would certainly be a central point of criticism.

2.2 Coherence debate

2.2.1 Preliminary remarks on the problems of coherence

Government policies are defined by proclaimable objectives, instrumentation and budget estimates. By general understanding of the term there is incoherence when policies in achieving their objective mutually impede or neutralize each other. This normally involves partial obstruction, i.e. part I of policy A is not achieved as policy B prevents this. This situation may already have been created when defining the objectives of one or another policy or be due to unforeseen effects of instruments used. In the first case there is primarily a conflict of political aims which if necessary can be remedied by modified instrumentation or substantial political discussion.

Where political coherence is required contractually and serious incoherences are found by government or even in society's understanding, then the political conflict must be discussed and, if necessary, reworked.

Solutions to conflicts are the more difficult to achieve, the more unclear the target and secondary effects of the policies under discussion. Such ambiguities exist, for example, where ecological and socio-economic effects intermesh. Ambiguities regarding the points at issue are then legitimately instrumentalized by political interest groups.

Coherence debates are inevitably mainly political disputes. Scientific advice can sort the problem fields and clarify empirical questions, but only rarely comprehensively and consistently. Frequently each political view presents its own scientific analysis. In the end politics must do away with such clear-cut ambivalence – and no one can do this job for it.

Development policy objectives conflict in the case of incoherence with the effects of significant other policies (e.g. agricultural, trade, fishery agreements policies). The demonstration of incoherence is correspondingly lengthy and expensive. Experience to date with the development policy incoherence debate confirms this impression. Ten years can pass between first establishing incoherence and the presentation of convincing evidence and adjustment. It is therefore all the more important to point out and prove incoherence from the development policy point of view early on, persistently and with the necessary emphasis.

The fishing sector contributes to added value, employment, earning of foreign currency and to the supply of food. As the fishing sector's supply of food comprises in particular essential amino acids, this is an important contribution to a qualitatively balanced diet.[19]

Fisheries are used to supply the domestic market, for export purposes and through fishery agreements to allow foreign fishing fleets fishing rights in return for payment. Because of management difficulties specific to the sector fishery resources tend to be fished beyond any reasonable measure. The shaping of fishing effort and yield over time and marketing of the harvest determine the contributions to development objectives.

Where foreign fleets under fishing agreements sharply reduce the sustainable fishery yield through overfishing, all above-mentioned target contributions of the fishing sector can be reduced, in particular the contributions to employment and nutrition. If the distant water fleet of the EU contributes to overfishing of the EEZ of a State, with which it is also implementing development cooperation measures, there is incoherence:

- general incoherence as regards objectives of both development policy and environmental policy,
- sector-specific incoherence if fishing industry projects are carried out at the same time.

The extent of sector-specific incoherence would, judging by the extensive EU development cooperation funds flowing into the fisheries, be con-

19 At the World Food Summit in Rome in 1996 the signatory States undertook to clarify subjectwise and progressively to implement the right to food.

siderable, as Hansen demonstrates in a detailed analysis.[20,21] However, to limit the debate to cases of sector-specific incoherence deals only in part with the above-described terms of reference.

Overfishing and the EU fleet's part in this are if possible to be comprehensively proved biologically. This requires data that as a rule are not sufficiently available. And so it happens that in fisheries policy practice overfishing is only considered as sufficiently proven when the yield potential has collapsed economically (cf. subsection 3.2.2): in practice the unprofitability of fishing becomes the criterion for overfishing, provided this is not concealed by subsidies. The *ratchet effect* in relation to fishing effort is the most important mechanism in this respect (cf. subsection 1.2).

For this reason proponents of development policy objectives should already sound the alarm beforehand; for besides the comprehensive biological proof of the fisheries, there are other, earlier and more easily measurable criteria, e.g.:

- reports by artisanal fishing on its productivity and harvest trends,
- corresponding reports of the domestic industrial fishing industry,
- biological studies of the trend of stocks as regards biomass and age breakdown.

2.2.2 Coherence requirement of the EU Treaty

Art. 130u of the EU Treaty mentions the following objectives for EU development cooperation:

- sustained economic and social development,
- harmonious, gradual integration into the world economy,
- the fight against poverty.

Art. 130v says: "The Community shall take account of the objectives of art. 130u in the policies it pursues which can affect developing States". The EU is thus legally required to shape its policies of relevance for developing States coherently with the objectives of its development cooperation with these States.[22] Of course "*shall take account of*" leaves plenty of room for manoeuvre when assessing the validity of data, estimates of related effects and weighting of *trade offs* between development policy objectives and competing ones. When interests compete in EU fisheries (agreement) policy incoherence is normally only conceded politically when the fisheries in question are heavily overfished and development policy damage (socially, economically, environmentally) has therefore fully set in. Such a result can only be prevented politically, and a public debate of widespread impact is a crucial instrument here.

The Amsterdam Conference (Maastricht II) led among other things to inclusion of art. 3c in the EU Treaty. This requires full integration of the needs of protection of the environment in all political measures of the EU.[23] When evaluating its fundamental law the EU must in signing and fulfilling fishery agreements also keep an eye on overfishing for reasons of environmental policy. The above-mentioned problems of quantitative proof apply also in this connection. It is further complicated by the political-economic causal connection (cf. subsection 3.1.2): in view of the international competition between fleets and the weak policing and inspection policies of developing States is it to be expected that the pressure regarding overfishing will recede if the EU withdraws its distant water fleet from a fishery at risk or does not renew the fishery agreement with the coastal State in question?

In developing States sufficiently reliable catch statistics for fisheries are available only in exceptional cases. The same applies to biological analyses of fish stocks (cf. subsection 3.1.1). The catch results of distant water fleets operating under fishery agreements are similarly not documented statistically, or at best roughly estimated. This also applies to landings of the EU fleet from catches in the 200 mile EEZ of individual developing States. The rapporteur was unable to find

20 Hansen (1998), pp. 100 ff.

21 Cf. also Mölsä (1997), p. 2.

22 Schmidt (1997).

23 Thomas (1998), pp. 170 ff.

statistics for the EU distant water fleet broken down by national EEZs.
The following analysis, therefore, reflects the state of the discussion only insofar as the proofs of overfishing are uncertain and individual fleets' share in the catch in cases of proven or presumed overfishing are unknown. Strictly quantitative evidence of incoherence between EU fishery agreement policy and EU development cooperation work has for the reasons mentioned never yet been conclusively produced anywhere.

3 Overfishing in the 200 mile EEZ of developing States

3.1 Problems with data and basic causes

3.1.1 Problems with data on the biology of fisheries

It can no longer be disputed that overfishing is a main problem of the present and future world fishing industry (cf. subsection 3.2.1). There is also largely consensus on the main causes of overfishing:

- expansionary demand,
- insufficient policing and inspection of fishing fleets,
- TACs set too high,
- growing overcapacities of the fishing fleets,
- massive subsidies,
- advances in location and fishing techniques.

However, the margins of error with biological estimates of fish stocks and catch opportunities are great, even when the data situation is comparatively favourable. This lies in the complexity of the way the biological systems of growth and reproduction of stocks are connected and the erratic nature of exogenous influences (ocean currents, water temperature, little understood stock cycles).[24]

Fisheries policy in practice then normally assumes rather optimistic forecast variants when setting TACs, as it is under pressure from the social and structural situation of the fishing sector.[25] This tendency is still more marked in very many developing States than in industrial countries, because in developing States fishery agreements and/or fish exports provide the welcome opportunity of alleviating budget and foreign currency bottlenecks and because basic biological and fishing industry statistics because of their incompleteness and inaccuracy allow fisheries policy broad scope for interpretation when setting TACs.

The following data are necessary to be able to alleviate or predict the effects of fishing on future stocks and future fishing opportunities:

- biomass of a fishery,
- age make-up of the biomass,
- natural mortality of the age groups,
- mean growths in weight within the age groups,
- catches by age groups
  - by fleet fishing by agreement,
  - of domestic industrial fleet,
  - by artisanal fishing,
- empirical safety margins for taking account of erratic fluctuations,
- derivation of these safety margins from knowing the oceanographic fluctuations (current and temperature fluctuations) and interactions of species (predators, non-predacious).[26]

With these data it is possible to formulate dynamic overall models portraying the dependence of future fishery harvests on previous catches. When taking account of possibilities for economic utilization of the catches and costs rational sustainable fishing strategies can then be determined for average oceanographic situations that make allowance for economic and social criteria.

24 Hilborn / Walter (1992).

25 Botsford et al. (1997).

26 ibid. (1997), pp. 511 ff.

The more recent debate about the so-called *precautionary approach* shows that there is here not only a new conception of stock management from the fisheries biology point of view, but also from the standard fisheries policy one: "*The precautionary principle, as applied in other areas of environmental law, involves taking a conservative approach to management issues until there is compelling evidence that a less conservative approach would pose no added risk. The burden of proof that it is safe to be less conservative is then shifted to those favoring that option.*"[27] It no doubt gains a relative pre-eminence, the less the catch and stock statistics of a fishery or fishery sector are developed.

For fisheries of developing States, however, only more or less reliable data on development of the biomass and age make-up are available at best. Even these vary greatly with the ocean current, on which the nutrient content of the water and thus growth of the biomass throughout the whole marine food chain depends (cf. subsection 3.1.1). The intensity of the upwelling of nutrient-rich deep water varies with the strength of the north-east and south-east trade winds and this in turn with the global climate effect of El Niño.

Anyone wanting to satisfy empirically the above-mentioned needs for data must have taken the process into overfishing at least once, for the following sentence applies: "*You cannot predict MSY (maximum sustainable yield) without exceeding it.*"[28] This applies even more so to the practice of fisheries policy. Only when fishery yields all too obviously decline and the social-economic consequences become clearly visible is the condition of overfishing deemed proven at the level of fisheries policy. Even then, some won't acknowledge it, usually citing natural fluctuations.

3.1.2 Problem of causality

To produce evidence of the extent to which an individual fishery agreement contributes to overfishing is well-nigh impossible. At best it can be shown that there has been overfishing and that this or that contracting party has been involved in this result with a certain percentage of the total yield from the fishery. But would the overfishing have been less if it had not been involved? The fishery agreement policy of the EU has to ask itself this question taking account of the of its development policy objectives if challenged to a change in any given case. The answer is not so simple as might be thought at first glance.

In Africa's Atlantic EEZ 45% of the harvest was caught by artisanal fishing, 11% by own industrial fleets of the littoral States and 44% by contracted foreign fleets.[29] Besides the EU, fishery agreements had also been signed by Japan, South Korea, the USA and Eastern European States. There were also agreements of individual enterprises with African coastal States (Morocco, Ghana, Nigeria).

If the EU now had not signed or renewed its fishery agreements, would this have led to a corresponding reduction in fishing effort? Presumably in the short term only, for EU import demand and thus world market prices would have risen sharply. For this reason both private enterprises and other States would have picked up the contract volumes without much ado - and their fishing practice is presumably no more lenient on resources than that of the EU fleet.

If the latter then withdrew, the EU Commission would in fact be rid of the charge of incoherence, though in the last resort the fishing industry and development policy of the partner State would hardly have changed. Ad hoc foreign currency shortages of the developing States, expansionary world demand and interchangeability of catch capacities are after all the root causes of overfishing, which the EU is hardly able to influence. Only multilateral initiatives - possibly on a regional basis - and consolidation of the fishing policies of the developing States through development cooperation measures may provide a remedy.

If this line of argument may appear speculative at first sight, it is highly realistic if an eye is kept on import demand of the industrial countries and the world market. As the growth of import demand is

27 ibid. (1997), p. 514.

28 Hilborn / Walters (1992), p. 242.

29 NRI (1997), pp. 84 ff.

the central cause of overfishing, the problem can in the end only be solved if firstly the coastal States are enabled to rationally determine their TAC biologically and socio-economically and to police and enforce its observance. Secondly it requires regionalization of the fishery policies of neighbouring States for reasons of reducing marginal unit costs and managing straddling stocks. Thirdly subsidies of fishing fleet capacities must be dismantled worldwide, in particular in the industrial countries and a number of Asiatic developing states.[30]

3.2 Global experience and examples of cases

3.2.1 Global trend

Long-term global experience clearly confirms that since the beginning of the 70s there has been a continuously increasing overfishing problem on a worldwide scale with serious indirect socio-economic and environmental damage. Or have the fishing vessels and factory ships in Newfoundland, Southern Chile and a number of other fisheries (cf. subsection 3.2.1) not given up?

In the 50s and 60s the fishing fleets of the industrial countries overfished the bottom-living fish in the fishing grounds of the North Atlantic and North Pacific. Among the 16 most important ocean fisheries of the world 10 have been ruined for years to come, even if the stocks were to be consistently nurtured. Since the 70s and 80s the fisheries of the mid and South Atlantic and Pacific have been fished with increasing effort by the fishing fleets of the industrial countries and the rapidly growing fleets of the coastal States. An examination of available biological data material on fisheries in the Atlantic EEZ of Africa shows that here too the process of fishing industry development has already far advanced to overfishing in the case of demersal species (cf. subsection 3.2.3). Namibian waters were overfished in the 80s. In Morocco, Mauritania and Senegal the stock situation is critical. South Chilean waters are heavily overfished (cf. para. 3.2.2) and even in the Argentinian EEZ fishery harvests have been declining recently.

A survey by the BMZ among 39 German embassies in developing States confirms this estimate all along the line.[31] The embassies emphasize the importance of artisanal fishing for the food industry and employment policy: "In some coastal areas which are characterized by overfishing signs of malnutrition can be observed, as alternative options for providing food are not sufficiently available."[32] 27 of 29 embassies responding and 21 partner governments see their fishery resources threatened due to large fishing fleets and lack of fisheries policing. Fishery policies aimed at socio-economic and environmentally rational sustainability have failed for various reasons: fiscal bottlenecks, administrative personnel weaknesses, lack of supradepartmental coordination and in some countries also ad hoc pressures of a growing population to secure food. There are indeed fishery research, policing and inspection organizations in almost all countries, but financial resources and motivation leave a lot to be desired.

The BMZ concludes among other things "that in many partner States of the south there is obviously a lack of political will to implement a sustainable sector policy due to fiscal bottlenecks and administrative weaknesses. There is a strained relationship between EU fishing activity within the framework of existing fishery agreements and the sustained utilization of resources development policy is aiming for. Everything points to a conflict between interests on the part of the developing States of the south, in particular the coastal States in West Africa, and the EU on the one hand and the need for safeguarding resources in the medium and long term on the other."[33]

3.2.2 The depletion cycle taking examples of cases

Within the framework of a modified basic fishing industry model that takes account of cost breakdowns and price-demand reactions over the course of time (cf. Diagram 2) more recent cases suggest a breakdown of a typically 15 to 20-year

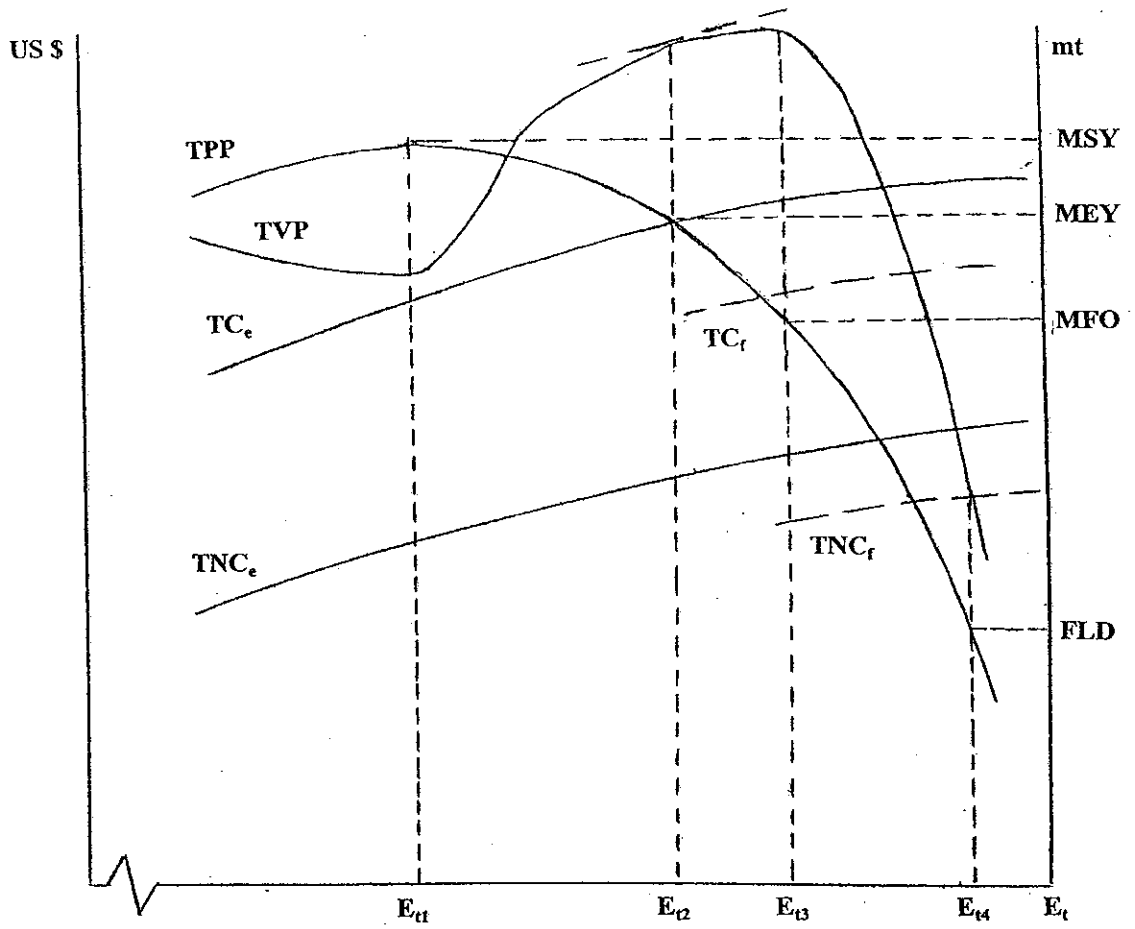
30 Cf. e.g. Pauly et al. (1998), p. 174.

31 BMZ (1998a).

32 ibid., p. 4.

33 BMZ (1998a), p. 8.

Diagram 2: Schaefer-Model with technical progress, subsidies, positive trend of real world price and price-inelastic demand (above MFO) for output of specific fishery



TPP: total physical product
TVP: total value product
TC_e: total economic cost
TC_f: total financial cost
TNC_e: total economic non capital cost
TNC_f: total financial non capital cost
MEY: maximum economic yield
MSY: maximum sustainable yield
MFO: maximum financial output
FLD: financial limit to degradation
E_t: fishing effort along a unidirectional time path

Source: Own Draft

cycle of overfishing into the following four phases:

- Phase I: bonanza
- Phase II: boom
- Phase III: bust
- Phase IV: subsidized, degraded equilibrium.

The important statement in this scenario is that a positive trend in real prices, price-inelastic demand in places down-line (wholesalers, processing), cost-reducing technical progress and subsidies can in the course of time lead to the brink of destruction for stocks, unless the state introduces and enforces limiting quotas.[34]

In Phase I a fishery until then unused ("undeveloped") far below its sustainable maximum yield is linked up to the world market, either by fishery agreements or by development of infrastructure, industry or market. The first private investments in view of the expansionary demand and unexhausted resources produce marvellous capital yields. There then comes an excessive surge in investment in Phase II which finally leads to overfishing and a decline in physical fishing yields. The processing and marketing undertakings during this process of depletion are increasingly prepared to pay higher ex vessel prices in competing for the ever scarcer volume. End-consumer demand reacts price-inelastically (cf. Table 1), which enables rising ex vessel prices to be passed onto end consumers. Rising ex vessel prices, however, enable fishing effort to be maintained or even increased for a few years yet because they compensate or overcompensate for the falling physical yields. At the end of this phase is collapse of the fishing industry, as declining catches are less and less compensated for by rising ex vessel prices. In Phase III business failures activate the lobby concerned and increasing redundancies the trade unions. Fishing capacity does indeed decrease, but increasing subsidies and perks normally retain it at a level that makes regeneration of the fish stocks and economically rational management difficult. Phase IV finally represents a permanent situation of latent overfishing, in which subsidies, remaining overcapacities and tightened policing and inspection measures stabilize the situation at a level that is not satisfactory either economically, socially or environmentally.

There is then the danger that such "chronically" overfished stocks fail completely, if unfavourable oceanographic changes occur as well. There are examples enough (herring, pilchard, wild salmon, cod, halibut).

In those cases where an appreciable part of the total harvest is taken by foreign fishing fleets, the course of events may be somewhat different. There at the end of Phase II the agreements are simply no longer renewed because the yields are no longer covering the overall costs. The foreign fleets therefore head off for new coasts.

This depletion cycle is very close to reality. Recent experience with the South Chilean coastal fisheries,[35] the demersal fisheries of Senegal,[36,37,38] the Mauritanian cephalopod fishery,[39] the Nile perch fishery of Lake Victoria[40,41] and a

34 The basic assumptions in Diagram 2 are the following: 1. The price elasticity of demand is above the volume demanded MFO >-1 and 0. Below the MFO is it <-1. 2. Below E_{II} the positive price trend reduces the effect on revenue of price-inelastic demand, above E_{II} trend and effect of revenue act additively (provided demand elasticity is >-1). 3. Costs rise in time on a diminishing scale with fishing effort due to technical progress. 4. Subsidizing capital and operating costs guarantees profitability up to widespread exhaustion of the fishery potential. 5. The TPP curve could be used as a sliding average covering several years, which certainly does not fully correspond to the concept of a *sustainable yield*. 6. Fishing effort and yield run parallel in time, an effort declining with time requires a modified model.

35 Schurmann (1996), pp. 1695 ff.

36 HIFI (1996).

37 Porter (1997).

38 Johnstone (1996).

39 Hansen (1998).

40 Castillo / Loury (1998).

41 Amooti (1968), pp. 21 ff.

Table 1: Elasticities of Fish Demand

Country		income/expenditure	own price	strongest substitute's price
Indonesia		0.54	-0.11	0.25
Ghana I[a]		0.83	-0.32	0.38
Ghana II[b]		1.13	-3.27	3.57
Norway		0.45	-0.47	0.25
Great Britain		0.76	-0.67	0.19
USA		0.31	-0.20	0.01
Spain		1.13	-0.66	-0.04
Germany[c]	ABL II	0.34	-0.47	n.a.
	ABL III	0.54	-0.29	n.a.
	NBL II	0.53	-0.89	n.a.
	NBL III	0.18	-0.33	n.a.

a before 1980
b after 1980
c ABL II: middle income four person household, old Federal States
ABL III: high income as above
NBL II: middle income four person household, new Federal States
NBL III: high income as above

Source: Kusumastano / Jolly (1997), Delgado / Lent (1992), Rickertsen (1996), Burton / Young (1992), Sommer (1998), Maschini / Meilke (1989), Garcia / Albisu (1995)

lot more new cases[42,43,44] best document the ways things are going.[45]
Booming world demand, liberalization of trade policies, subsidies, overcapacities and increasing integration of developing States' fisheries into the world market place increasing pressure of exploitation on the resources: "..., *demand is the key underlying factor.*"[46] Subsidies, price incentives, imperfect policing and inspection, technical progress in location and fishing techniques and conflicts of interests are all working in the same direction.

With development of the technique of aquaculture, which now also accommodates pelagic species, fishing effort could in future be bypassed to arrive at the small, pelagic species. On the Australian and Croatian coasts e.g. undersize tuna (*bluefin tuna*) are caught with seine nets, switched at sea to net cages, towed to the coast and fed there for six months with fresh sardines and the like. Exported to Japan by air freight farmed tuna fetches a price there of 30 US $/kg.[47] Other countries will follow this example. The rapid development in the farming of salmon and prawns has also only been possible with a corresponding increase in the consumption of feed (essentially fish meal).[48,49] This feed has to be obtained from the sea. So increasing exploitation pressure can be expected on the small pelagic shoaling fish (so-called industrial fish) as aquaculture expands. Where these species are overfished and become scarce there cannot fail to be a serious adverse effect on the supply of protein to the poorest population groups which can only afford inexpensive so-called industrial fish.

A look at the press also supports the view that all this is not farfetched, and that there is a first rate

42 Dewalt et al. (1996), pp. 1193 ff.

43 Hünninghaus (1996), pp. 129 ff.

44 FIAN (1997).

45 The FAO is developing a similar cycle in relation to oceanographically caused fluctuations. Cf. FAO (1994), p. 42.

46 HIFI (1996).

46 FIAN (1997).

46 The FAO is developing a similar cycle in relation to oceanographically caused fluctuations. Cf. FAO (1994), p. 42.

46 HIFI (1996).

47 Dujmusic (1998), pp. 36 ff.

48 FIAN (1997).

49 Safina (1998), p. 60.

world problem here with environmental, social and economic components.[50]

3.2.3 Sub-Saharan fisheries: regional overviews and sector studies

3.2.3.1 Regional overview

The fishing potential of the African Atlantic is concentrated in two main areas. The southern area comprises the 200 mile EEZ of the Republic of South Africa, Namibia and Angola up to a latitude of about 15° South. Here the interaction of the Benguela current and south-east trade wind produces the upwelling of nutrient-rich deep water which forms the basis of a high fishing potential. Similarly the Canaries current and north-east trade wind create the productive fishing grounds in the 200 mile EEZ from Morocco to Sierra Leone. Because of the natural conditions the biological systems in both cases are characterized by short food chains. The climatic El Niño phenomenon produces cyclical fluctuations in stock sizes and their oceanographic concentration. In the north and south both pelagic and demersal fisheries have proved to be easily overfishable when using modern fishing fleets.

Hansen and NRI et al. each give an overview of the basic situation of the fishing industry. Both works analyse an abundance of case studies of individual fisheries and arrive independently of each other at largely consistent results,[51,52] that are referred to here without constant reference to the sources. Morocco has been disregarded owing to the inadequate information and data base.

The fishery potential from Mauritania to the Congo (defined as MSY) is estimated at 2.8m tonnes per annum. The fish harvests shown by statistics have varied since 1970 between 2.5 and 3.9m tonnes. The catches of the former USSR fleets declined from 1.7m tonnes to 0.4m tonnes between 1990 and 1994. This involved mainly pelagic shoaling fish. In 1994 a total of only 2.9m tonnes was still caught. Of this 35% was accounted for by non-African distant water fleets and 25% by Moroccan fleets. The catches of distant water fleets are given far too low on account of the implications for fishery agreements of correct information,[53] only the magnitude of the statistical error being completely unclear. The conclusion remains that even after extensive withdrawal of the Russian fleet on an aggregative level on average all fisheries are being fished beyond their potential. The picture differs but is confirmed at the level of individual fisheries.

Tuna fish species, which have proved very resistant to overfishing due to their rapid growth and their fertility,[54] are barring one exception classified as fully exploited or overfished (cf. Overview 2).

The demersal species in shallow waters near to the coast are consistently classified as overfished. Artisanal fishing because of the short range of its vessels, which permits only limited fishing of the pelagic species and demersal stocks of the deeper continental shelf, is significantly involved here in some countries. In Ghana, for example, the yield of the artisanal fleet is of the same order of magnitude as the Fishing Industry Potential of the whole 200 mile EEZ, in Senegal it is about 70%. The demersal stocks of deeper waters are, except for a few fisheries, in most cases fully exploited to overfished.

The small pelagic shoaling fish have since withdrawal of the Russian fleet not yet been fully exploited again. The experience of Namibia (cf. subsection 3.2.3.2) before independence shows, however, how quickly overfishing and the El Niño effect in their interaction can lead to failure of the stocks.[55]

Even the behaviour of the EU distant water fleet confirms the overall picture of overfishing: "*In the early 1990s, the EU fishing fleet was using only 45 percent of the potential for fishing allowed under the agreement with Senegal and only 50 to 70 percent of the potential in Mauritania. The European Commission admitted to the Euro-*

50 Knickerbocker (1998).

51 Cf. Hansen (1998).

52 Cf. NRI et al. (1997).

53 Cf. Porter (1997).

54 I.e. the yields remain approximately at maximum level over a wide span of fishing effort.

55 H. Brandt (1995).

Overview 2: Degree of exploitation of the most important fisheries in West Africa acc. CECAF and ICCAT				
Species Types	Species / group names	Scientific names	Locality, Assessment, year	Level of Exploitation
Coastal Pelagic Species	Sardinellas	Sardinella aurita Sardinella maderensis	Morocco (1991) NW Africa (1993) W. Gulf of Guinea Congo, Gabon	moderate under-moderate full under
	Horse mackerels	Trachurus trachurus Trachurus trecae Decapterus rhoncus Decapterus macarellus Decapterus punctatus	NW Africa (1993) Congo, Gabon	moderate-full under
	Chub Mackerel	Scomber japonicus	Sahara-Mauritania (1993)	moderate
	Anchovy	Engaulis encrasicolus		
	Sardine	Sardina pilchardus		
	Bonga Shad	Ethmalosa fimbriata		
	Bigeye Scad	Selar crumenophthalmus		
	All species		Guinea	under
Coastal Demersal Species	Cephalopods	Sepia, cuttlefish Octopus, octopus	Morocco (1991) Mauritania (1991)	full-over full-over
	Shrimps	Penaeus notialis	Mauritania (1993) Gulf of Guinea	full over
	Groupers	Epinephelus spp		
	Seabreams	Dentex spp Pagellus spp Sparus spp Diplodus spp		
	Threadfin	Galeoides decadactylus		
	Grunts	Pomadasys incisus P. jubelini		
	Triggerfish	Balistes carolinensis		
	Croakers	Pseudotolithus senegalensis		
		P. typus		
	Soles	Cynoglossus spp Solea spp		
	All species		Mauritania (1988) Senegal (1994) The Gambia (1993) Cape Verde (1988) Guinea Sierra Leone (1991) W Gulf of Guinea	over (shelf) under (slope) over under under full full? full
Deep Water Species	Shrimps	Parapenaeus longirostis	Sierra Leone (1991) Morocco (1991)	full? stable?
	Lobsters	Panulirus mauritanicus Panulirus echinatus Panulirus charlstoni	Mauritania (1993) Cape Verde (1992)	over full
	Deep Sea Crab	Geryon maritae		
	Hake	Merluccius senegalensis Merluccius cadenati	Morocco (1991)	over (juveniles)
	Seabreams	Dentex macrophthalmus		
	Croaker	Penteroscion mbizi		
	Driftfish	Paracubicens ledanoisi		
Tuna	Skipjack	Katsuwonus pelamis	Eastern Atlantic (1994)	under-full
	Yellowfin	Thunnus albacores	Eastern Atlantic (1994)	full
	Bigeye	Thunnus obesus	Eastern Atlantic (1994)	over
Source: NRI et al. (1997)				

pean Court of Auditors that the lower utilisation of fishing was related to the depletion of stocks of demersal fish because of overfishing, particularly in Mauritania."[56] However, the drop in ex vessel prices in the period 1991 - 1996 could also be a contributory reason for the restraint of the EU fleet (cf. Diagram A1 – A4).

The overall situation can be reasonably summarized as follows: "*In summary, it is evident that several individual species are seriously depleted, notably in the most heavily fished waters of West Africa. Even in these most well-studied fisheries, ACP country negotiators have proven unable to maintain EU fishing activities within desirable levels.*"[57] Account then needs to be taken of the fact that the actual fish yield of the distant water fleets due to a lack of or weak policing and inspection is according to the literature considerably above the yields shown by the statistics.

3.2.3.2 Sector studies

In 1991 ex vessel prices of the following order were paid in West African markets:[58]

- small pelagic shoaling fish 100 - 400 US $/t
- cephalopods and demersal species 800 - 1000 US $/t
- tuna and crustacea 2000 - 6000 US $/t

The following outlined cases of individual States show that overfishing first becomes apparent, following the price gradient, with the high value species. Ss catches become no longer worth it here, there is a turn to the lesser value species, with rising ex vessel prices frequently compensating for the declining yield. They rose, for example, in Senegal's cephalopod fishery from 1.30 US $/t to 3.58 US $/t between 1991 and 1995.[59]

The doubling of ex vessel prices for demersal species in 1998/99 gives rise to fears.

Mauritania

The industrial fishing capacity rose from 407,000 GRT in 1992 to 526,000 GRT in 1997.[60] The number of fishing days rose from 45,000 to 65,000. About 550 industrial units are currently fishing in the EEZ, of which some 185 are in Mauritanian ownership or chartered by Mauritania. The export of cuttle and ground-fish is monopolized by a parastate enterprise (35% state-owned). The product is exported in frozen form. At the beginning of the 90s the fishing effort of Eastern European fleets aimed at the small pelagic species decreased sharply. In the meantime other fleets and ships chartered by Mauritania have again made up for this decrease. The artisanal fleet rose mainly due to arrivals from Senegal from 600 units in 1986 to over 4000 in the year 1998. It fishes mainly for demersal species. The artisanal share in the catch is around 4%.[61]

Catches of pelagic species on average over the last ten years were about 400,000 tonnes. In 1997 and 1998 about 500,000 tonnes were caught. Catches of hake shown were almost 15,000 tonnes in 1993, since when they have declined with 9500 tonnes in 1997 and probably about 9000 tonnes in 1998. Cephalopod catches have fallen from 41,000 tones in 1992 to 19,500 tonnes in 1997. The trend in productivity (cf. Diagram 3) shows serious overfishing, which can only be sustained economically due to sharply risen ex vessel prices. In 1997 average productivity was 26 kg/hour, while at the end of the 70s it was at 400 kg/hour.[62]

Estimates of the stock and yield situation of the Mauritanian fishery sector arrive at very different results. The World Bank quotes that the CPUE averaged over all fisheries had fallen to under 100 kg/hour in 1991 compared with 1482 kg/hour in 1964 and 1046 kg/hour in the period 1964 - 1968. Catches of most high value species declined by

56 Cf. NRI et al. (1997), p. 76.

57 Cf. NRI et al. (1997), p. 77.

58 Cf. NRI et al. (1997), p. 75.

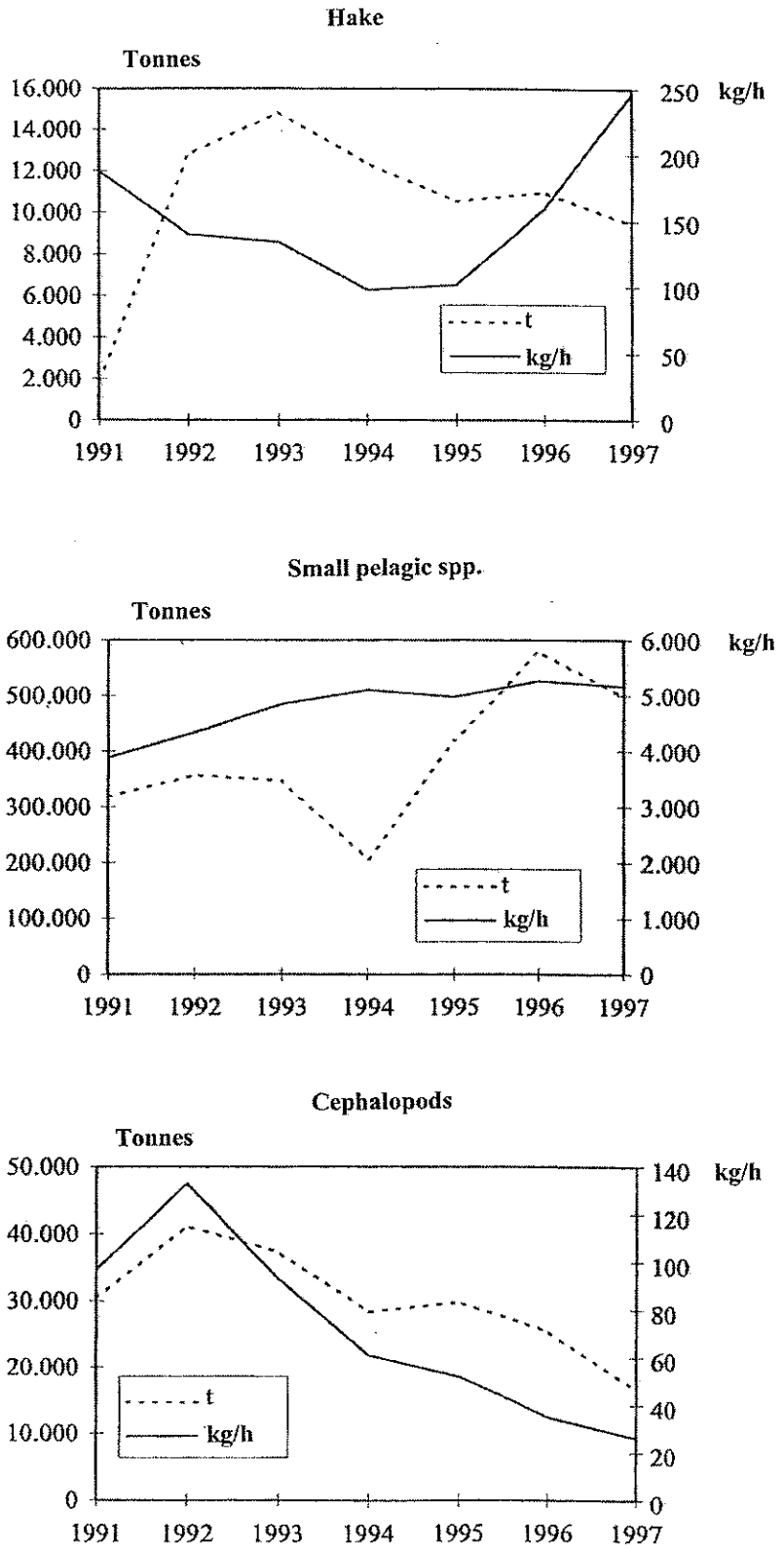
59 Cf. Hansen (1998), p. 118.

60 Cf. BMZ (1998b), pp. 14 ff.

61 Cf. WWF (1998), p. 35.

62 Cf. World Bank (1994), p. 5.

Diagram 3: Fishery Yield and CPUEa for selected specie



[a] catch per unit of effort

Quelle: BMZ (1998b)

Overview 3: Key data of the three latest fishery agreements between the EU and Mauritania			
Subject of contract	1990 - 1993	1993 - 1996	1996 - 2000
EU compensation payments p.a.	9.67m	8.67m	54.41m
Trawlers (demersal species) GRT	35,950	23,600	24,000
Tuna fishing vessels Units	53	46	57
Fishing vessels (pelagic species) Units	0	0	22
Source: Hansen (1998), pp. 37 ff.			

55 - 70% in the period 1977 - 1990, total catch by 18%.[63]

CECAF/FAO confirmed this estimate in 1995 and pointed out that demersal species are overfished in the northern part of the EEZ and in the southern part at least fully fished.[64] The fact that the EU fleet in recent years has made use of only 50 to 70% of its allowed catch capacity for demersal species points in the same direction.

A study commissioned by SMCP finally arrives at the result that the CPUE of Mauritanian trawling dropped by 75% from 1960 to 1990.

In contrast though the Mauritanian Fisheries Institute CNROP arrives at the result

- that the pelagic species are not overfished
- and the demersal species similarly not, apart from cephalopods and crustaceans.

The data available to the rapporteur indicate that the pelagic species are exploited below their potential, cephalopods are overfished and hake at least fully exploited (cf. Diagram 3). In the case of Mauritania therefore there is a clash of opinions typical of fisheries policy: unanimity will only prevail when the catches and CPUE have gone for good.

The compensation payments made by the EU have risen sevenfold compared with the previous agreement. Information on Mauritania's fishery agreements with other States and the share of individual fleets in the total fishery harvest cannot be produced at present. The contractually secured fishing rights of the EU apply from 1996 for the first time also to small pelagic species (cf. Overview 3). The EU enterprises use modern freezer trawlers. The catches are in part landed deep-frozen in West African ports. The rapporteur has no knowledge of catch and landing statistics for the EU fleet regarding the harvest obtained in Mauretanian waters. The same applies to the case of Senegal described below.

The weakening of sector structures appears to be most pronounced. There can be no verification on this occasion due to the nature of the data situation.

Senegal

The Senegalese fishing sector is a success story for artisanal fishing, demonstrating its ability to develop both technically and in export marketing. At the same time it transpires that departure of the distant water fleets and the predominance of artisanal fishing do not automatically solve the problem of overfishing. The main causes of overfishing are expansionary demand, technical progress, increasing world market integration of artisanal fishing and weak fisheries management, although whether distant water fleets or artisanal fishery and export trade serve demand is only of secondary importance.

In 1994 some 70% of the total fishery yield of Senegal was accounted for by the artisanal sector, 25% by the national industrial fleet and about 5%

63 Cf. World Bank (1994), pp. 5 ff.

64 Cf. BMZ (1998b), pp. 14 ff.

Overview 4: Key data of the three latest fishery agreements between the EU and Senegal			
Subject of contract	1992 - 1994	1994 - 1996	1997 - 2001
EU compensation payments p.a.	16.0m	9.0m	9.6m
Trawler (demersal species) GRT	30,600	13,000	10,000
Tuna fishing vessel units	79	64	76
Fishing vessel (pelagic species) units	0	0	22 (max. 25,000 GRT)
Source: Hansen (1998), pp. 37 pp.			

by distant water fleets.[65] The Senegalese share of the total harvest rose from 31% in 1970 to 95% in 1995.[66] The main part in this development was played by artisanal fishing which proved to be competitive and capable of modernization. The number of pirogues rose from 4500 in 1970 to about 11,000 in 1991. Mechanization and ice boxes today allow fishing trips of up to ten days, even beyond the 12 mile limit.

After a rapid build-up in the 70s the industrial fleet remained static from 1980 to 1991 at around 210 units. An increasing proportion was taken out of service in the 90s due to a lack of profitability. The fleet had in fact been built up with old units which on account of high running costs, declining CPUE and the high cost efficiency of the artisanal fishing competition proved to be no longer profitable.[67] The catch activities of industrial units from Russia, Korea and China operating as joint ventures are scarcely documented.

The total fishery potential is estimated at 368,000 tonnes p.a. The total harvest shown by the statistics was about 400,000 tonnes in 1994.

Senegal's fish exports in 1990 were about 125,000 tonnes and declined to 84,000 tonnes in 1993 due to overestimation by the FCFA. After the FCFA's adjustment down by 50%, exports again rose to about 110,000 tonnes. Of these about 10,000 tonnes were accounted for by fresh fish which were exported refrigerated by air freight. Artisanal fishing earns about 50% of export revenues.

Senegal's EEZ is classified by the FAO as largely overfished. Stocks in the further region of the eastern Atlantic are today 82% overfished.[68] The Senegalese Fishery Research Institute CRODT demonstrates overfishing by means of the declining biomass and the increase in the proportion of undersize fish being caught.[69] The demersal species close to the coast in particular are clearly being overfished.

The EU has continuously concluded fishery agreements with Senegal since 1980 (cf. Overview 4). The most recent agreement applies to the period 1997 - 2001. It increased the previous contract framework by 22 pelagic freezer trawlers (up to 25,000 GRT in fishing capacity on a monthly average over the year) which are specialized in fishing for small pelagic shoaling fish. Hansen notes after analysing opinions on fishery biology: "Small pelagic fish of low value are currently exploited moderately, ... As both domestic artisanal and industrial fishing caught these species in the past, the West African coastal populations in principle have sufficient potential available here. But this is being increasingly exploited within the framework of EU-ACP fishery agreements. For example, within the framework of the agreement between Senegal and the EU in 1997 highly subsidized European fleets were for the first time accorded catch volumes for pelagic spe-

65 Cf. HIFI (1996), p. 109.

66 Cf. WWF (1998), p. 35

67 Cf. NRI (1997), p. 147.

68 Cf. Hansen (1998), p. 52.

69 Cf. NRI (1997), p. 145.

cies. This cannot be justified in any way in view of the rapidly growing population in the West African countries. ... The agreements include practically no precautionary measures such as TACs, joint teams to assess resources or specific mechanisms for adjusting fishing effort."[70] The NRI points out that this agreement against the advice of CRODT extends to pelagic species and comes to the following assessment: "*Over the period 1979 to 1996, the EU signed 14 fisheries agreements with Senegal. As one stock after another has become depleted, the EU fleet has moved from species to species, following the pattern of 'fishing down the food chain' characteristic of many distant water fisheries. The DWF targeted shrimp, tuna and then coastal demersal species. They now target coastal pelagic stocks, the mainstay of the artisanal fishery and the main source of fish protein for the majority of the Senegalese population.*"[71]

According to 1994 data the overall situation looks as follows:

total fishery potential:	370,000 t
catches of small pelagic species for the Senegalese domestic market:	-200,000 t
other catches:	-200,000 t
overfishing	-30,000 t

If 25,000 GRT of latest freezer trawler capacity from the EU are now added that can take an additional 100,000 - 150,000 tonnes of fish with a total of only about 1000 fishing hours, what then? As in the case of the Mauritania agreement no catch and landing statistics for the EU fleet are available either for Senegal. Fish consumption in Senegal is 21 kg per capita p.a. 75% of consumption of animal protein comes from fish. The poorest third of the population cannot afford fish apart from inexpensive pelagic species! 85% of catches of the artisanal sector consists of small pelagic species for the domestic market! The artisanal sector today still employs 50,000 fishermen and provides 150,000 to 200,000 other jobs in upstream and downstream sectors!

Namibia

The Namibian EEZ is one of the most productive fishing grounds in the world due to very favourable natural conditions. The cold Benguela current runs in a width of 150 to 250 km north along the coast and in interaction with the south-east trade wind causes the upwelling of nutrient-rich deep water that forms the basis of the marine food chain.

During the time of the Protectorate Namibian fishery potential was plundered recklessly by the distant water fleets of South Africa and the former Eastern Bloc. When Namibia became independent in 1990 the potential completely collapsed through overfishing: in the case of pilchard (a shoaling fish like herring) and hake in 1979/81 (cf. Diagram 4), with anchovies and mackerel species somewhat later.[72]

After the introduction of conservation-aimed TACs and of strict policing and inspection of all fishery activity mature stocks of hake in 1992 reached about 500,000 tonnes, for pilchards about 700,000 tonnes (merely some 50% of the annual catches of 1968 - 1970). Because of the stock-conserving TACs only 25 and 15% respectively of mature stocks were caught. A glance at the fishery agreements of the 60s and 70s shows that 12 years after collapse of the fishery potential recovery to an economically favourable situation (MSY) had still not taken place.

Even so Namibia succeeded by strict fishery management, the build-up of a fishing fleet and the development of a processing industry in creating some 6000 new jobs in the period 1991 - 1995.

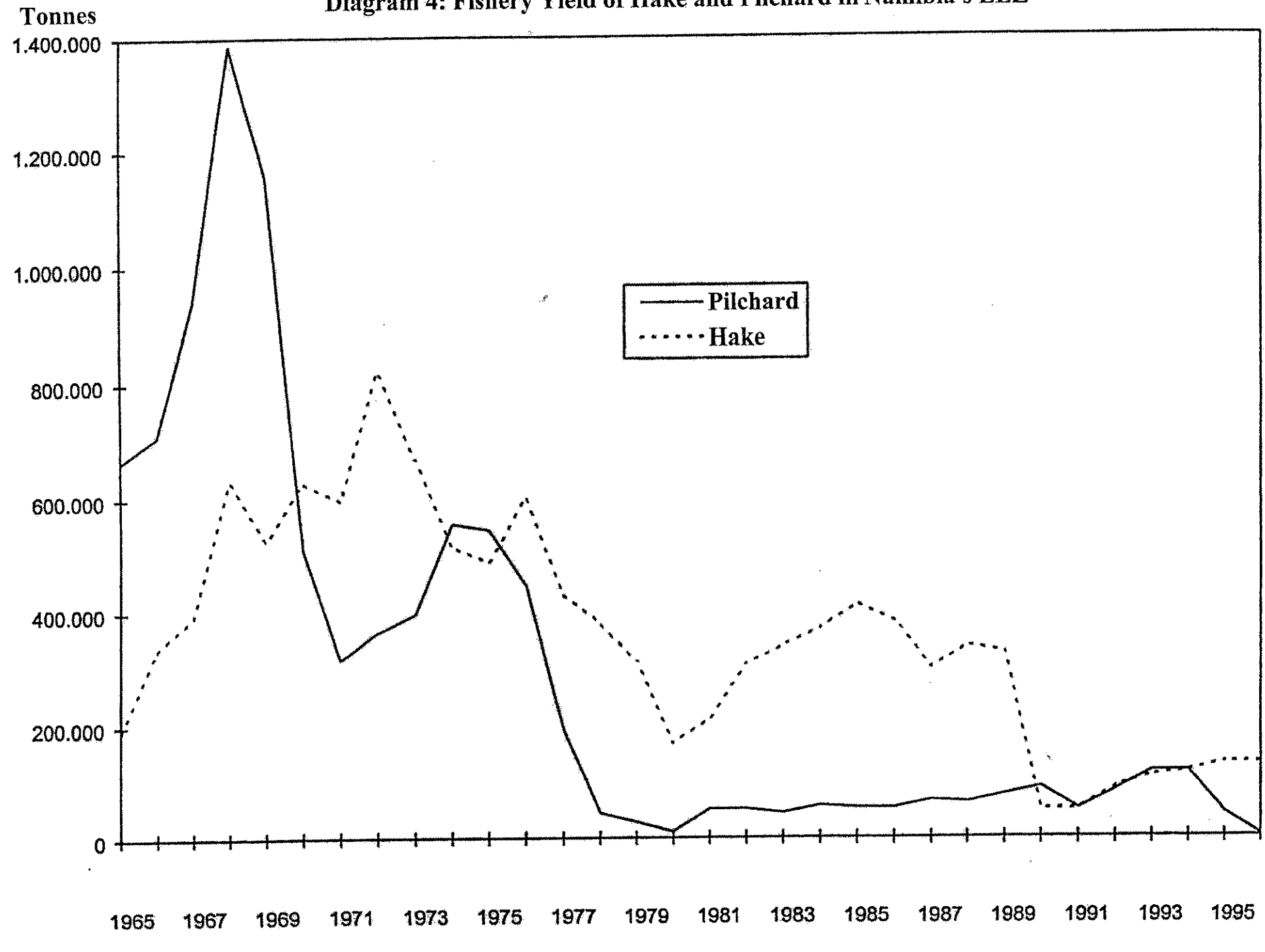
However, from 1995 to 1996 anomalies of the ocean current and a strong El Niño effect led to a renewed decline in fishing potential despite TACs designed to be conservationist. Pelagic stocks decreased and changed their migratory pattern.

70 Cf. Hansen (1998), pp. 53 ff.

71 Cf. NRI (1997), p. 148.

72 Cf. NRI (1997), pp. 148 ff.

Diagram 4: Fishery Yield of Hake and Pilchard in Namibia's EEZ



The case of Namibia demonstrates the following lessons:

- The devastating effect of overfishing on long-term fishery potential. Full recovery had not even been approximately reached after 12 years.
- The socio-economic success of a rational fisheries policy even in the regeneration phase of the fishery potential.
- The vulnerability of a pelagic fishery potential to adverse natural circumstances - even without plundering by distant water fleets.

4 Digression - world market

4.1 Fish production

World fish production in 1997 amounted to 122.0m tonnes:[73]

for human consumption from the sea	68.0m t
for human consumption from inland waters	25.0m t
industrial fish from the sea	29.0m t
Total	122.0m t

Fish production from the sea has been static for 15 years. Aquaculture production amounted to 10.4m tonnes in 1984 and 29.0m to 30.0m tonnes in 1997. This represents 24.2% of total world fish production and about 1/3 of production for human consumption.[74] 68% of aquaculture production was accounted for by China and more than 90% by Asia. Annual growth rates from 1984 to 1996 were 11.8% p.a. The production of prawns from aquaculture amounted to 932,000 tonnes (29%) out of world production of some 3.2m tonnes.[75]

The great hope for an increase in world fish production lies in the physical and technical potential of aquaculture. Its realization requires the ecologically and socio-economically balanced use of fresh-water and coastal resources. Apart from the comparatively very expensive options of making part of the previous industrial fish catch (30m tonnes) and the previous by-catch (35.0m tonnes) directly available for human food, the possibilities of increasing permanently the production of edible fish from fishing are very limited. Such utilization of by-catch and industrial fish would, however, cause considerable labour and investment costs and therefore only be profitable at significantly higher prices. For this reason aggretative production from fishing ought to react rather inelastically in the short to medium term to price changes and technical developments, as long as ex vessel prices remain within the spread of the last decade. This applies in particular to high-quality demersal species.

4.2 World trade

Since the middle of the 70s world trade in fish and fish products has increased rapidly (cf. Diagram 8). The main reason was the rapidly growing import demand of the industrial countries, just as their own fish production stagnated due to overfishing and final demand increased. The most important net importing States are Japan and the EU. In 1996 world gross exports were 44.3m tonnes with a value of 52.5bn US $.[76]

Average real export prices have about held their level in the period 1983 – 1996, a quite unusual result compared with the price trend for farm produce. The prices of different quality groups or species, however, have been very different in trend (cf. subsection 2.3).

The export trade of the developing States has risen very strongly over the last 15 years. The share of the developing States in world exports ought now to be already over 40%.[77] If the catches of contracted foreign fleets in the EEZ of

73 FAO (1999).

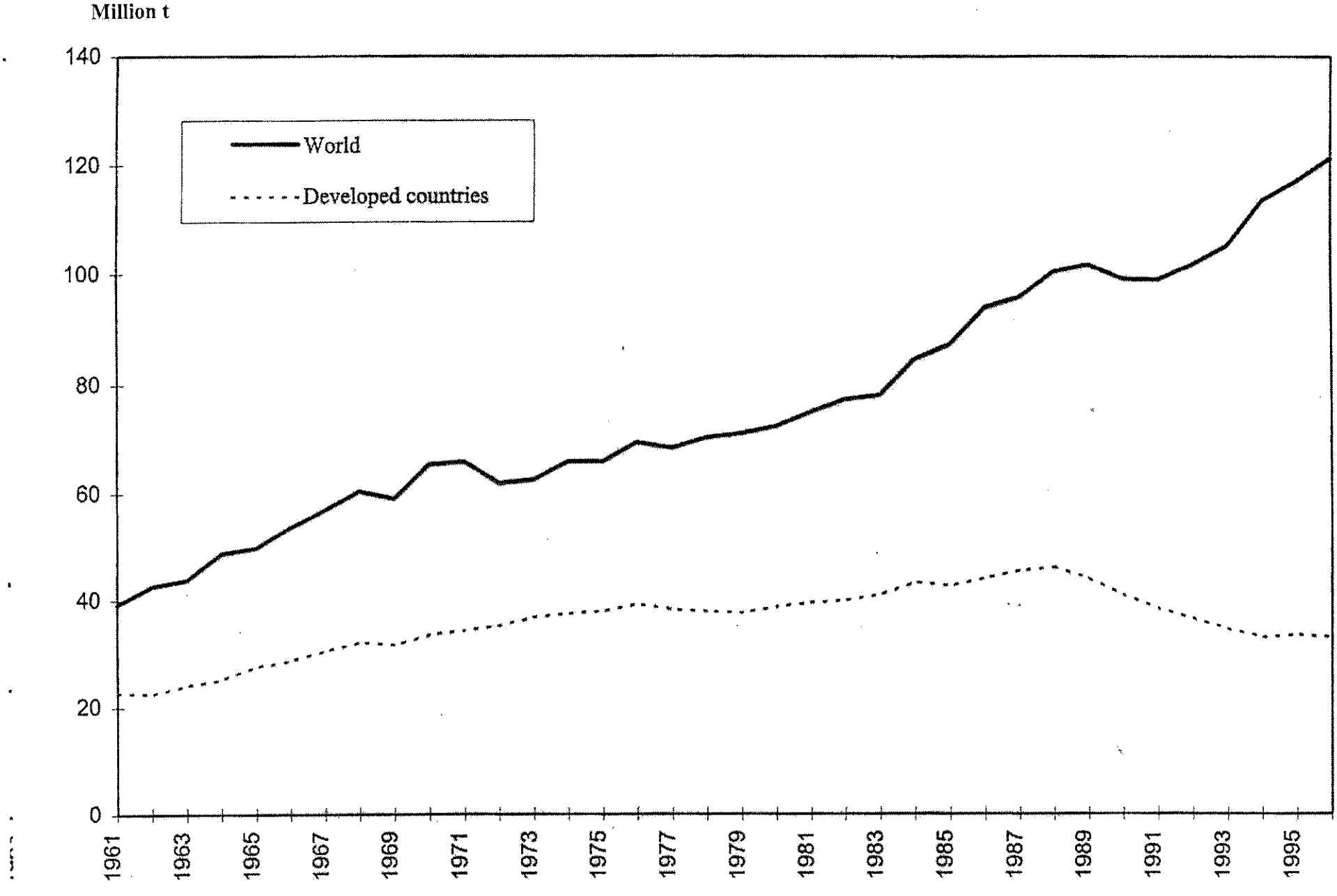
74 FAO (1997b).

75 FIAN (1997).

76 FAO (1999).

77 Globefish (1995).

Diagram 5: World Fisheries Yield, 1991 - 1996 (Million t)



Quelle: FAO, http:/www.marsource.maris.int./trade/Eurostat/FAO Database Gateway

the developing States are added to this, the actual share of exports is more than 50%.

Consumer preferences seem to be increasingly for fresh fish. The proportion of fresh fish by volume in world trade has risen from 19.4% to more than 29% within ten years (1983 - 1993). At present it stands at 33%. This development naturally also reflects the growing capacity and efficiency of the processing and commercial chains.

4.3 Price trends for fish species and price prospects

Qualitywise fish is a very heterogeneous product group. This is very clearly seen in the different price levels of the groups and their trend (cf. Diagrams 6, 7). At least four quality groups can be distinguished in an initial rough breakdown:[78]

- small shoaling pelagics: used mainly for producing fish meal, on the other hand the product group most in demand by populations with low purchasing power, ex vessel price level 0.40 to 0.50 DM/kg (cf. Diagram A1), real prices over the last twenty years in sharp decline (about 30% of worldwide fish yield);
- prawns and salmon (wild and farmed): prices still relatively high (cf. Diagram A2), but with a negative trend (about 30% of worldwide fish yield);
- High-quality bottom-living fish (cod, shellfish, saithe, hake, ling, redfish etc.): real prices up to 1990/91 rising (cf. Diagram A3), 1991 – 1996 falling prices due to increasing supply of farmed salmon and on account of (presumably subsidized) cheap exports from Eastern European countries, 1998/99 doubling of prices and their rise to the level of the long-term real price trend;
- Luxury group (e.g. tuna, halibut, crayfish, lobster): comparatively very high and volatile prices, for tuna up to 30 US $/kg ex vessel, for halibut up to 14 DM/kg ex vessel (cf. Diagram A4).

Apart from industrial fish and farmed fish the long-term trend in real prices has been very favourable for producers compared with prices for agricultural substitutes (beef, pork, chicken, lamb). Prices for farmed and industrial fish on the other hand have moved in line with farm prices. There are two main reasons for this: first there are still sustained production reserves for industrial fish - the world fishery potential is not yet fully exploited - and secondly fish meal and toasted coarse soybean meal are close substitutes in animal feed. The prices of both products are closely correlated. Fish meal is, apart from the capital costs, the most important cost factor in the farming of salmon and prawns (the production of which has expanded by more than 10% p.a. over the last ten years) and can hardly be substituted in this use.

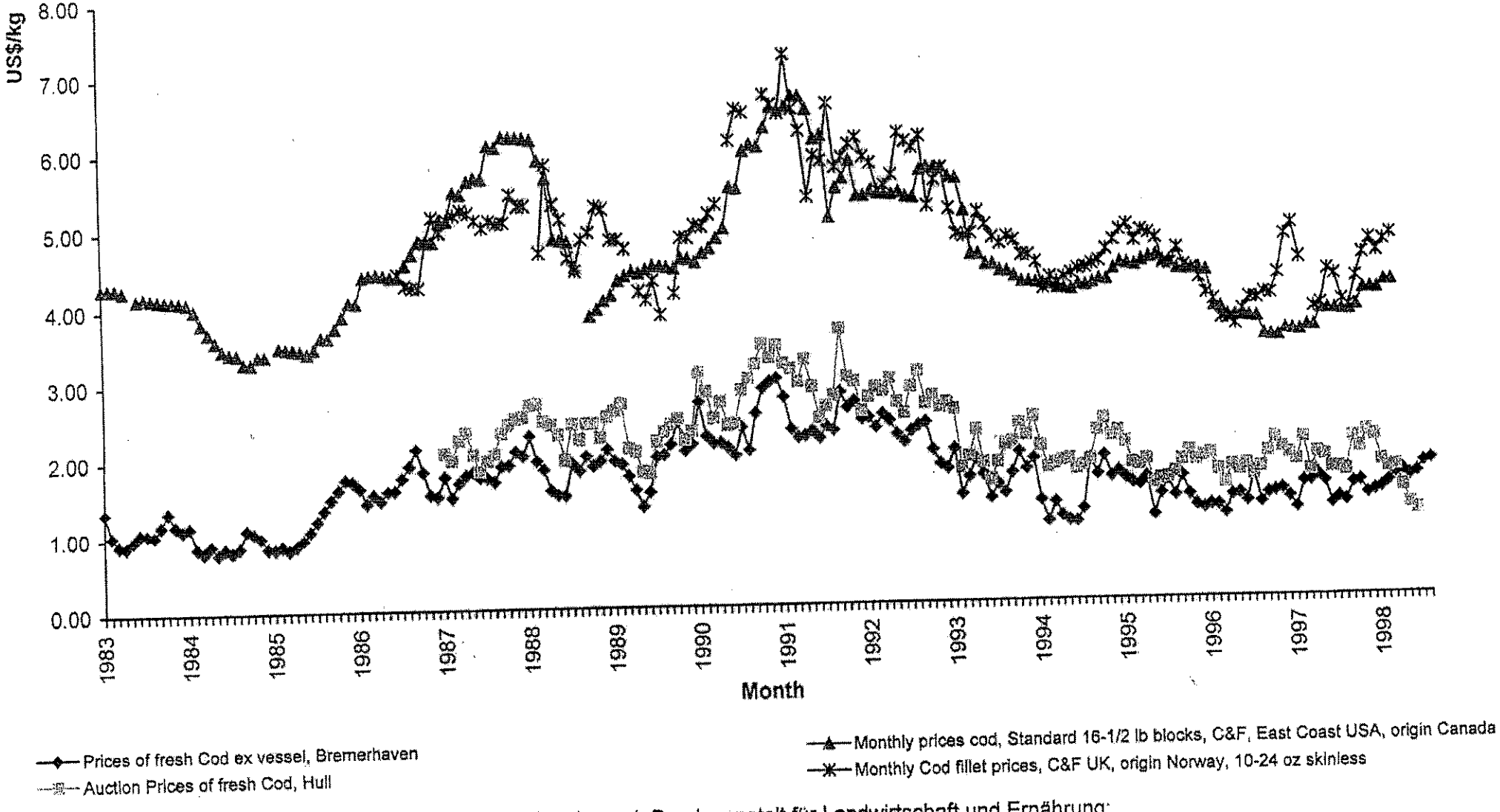
Measures in the fishing industry to change capacity are of a long-term nature as regards their effects on production. When it comes to investment they also have to take into account future trends in prices and natural fishery yields in addition to the financial (possibly subsidized) and social capital costs. Market and price forecasts as in agriculture are not yet available for the fishing industry. Anyone wanting an initial look ahead has to resort to the few parameters and structural data of supply and demand so far available.

Studies of the demand for fish - hardly available before 1990 - show in the first place comparatively high elasticities in relation to income, own price and price of substitutes (cf. Table 1) when these are compared with the corresponding parameters for the demand for farm products and secondly show rapid changeability in consumer preferences in the case of changes in income, advertising, change of age structure and awareness of health. Food scandals and corresponding press campaigns (BSE with beef, Nematoda with fish) in particular have a far-reaching influence on demand for fish and meat. For example, the massive imports of heavily subsidized beef of some West African countries have fundamentally changed the demand there for fish and meat.[79] Similarly the elasticities of demand between old and new federal states of Germany differ quite considerably - even within groups with the same income (cf. Table 1).

78 Brandt (1995).

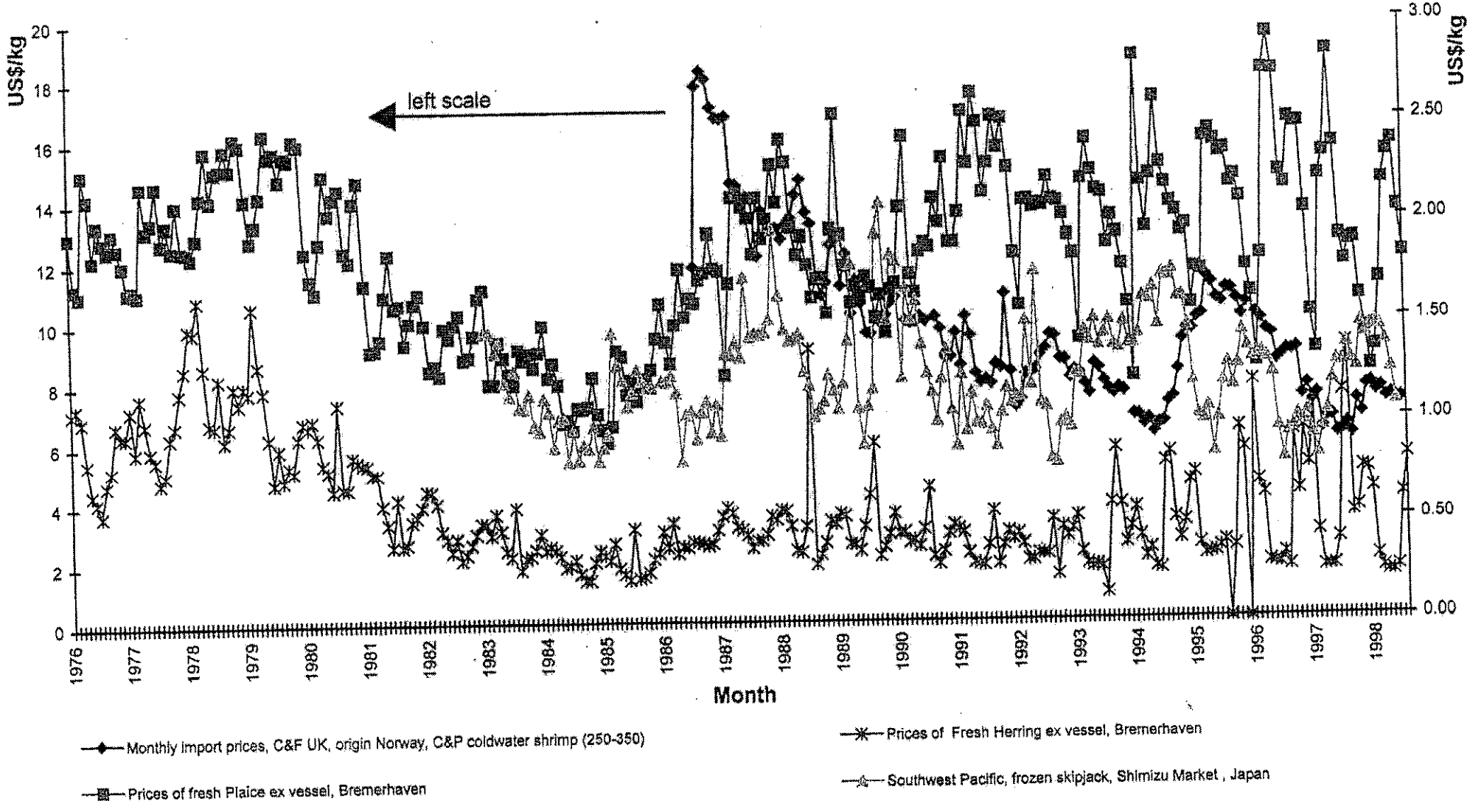
79 Brandt (1995).

Diagram 6: Real Cod Prices at Different Transformation Stages, Monthly Average, in US$/kg
(from nominal prices with US Consumer Price Index: Jan. 1998 = 0)



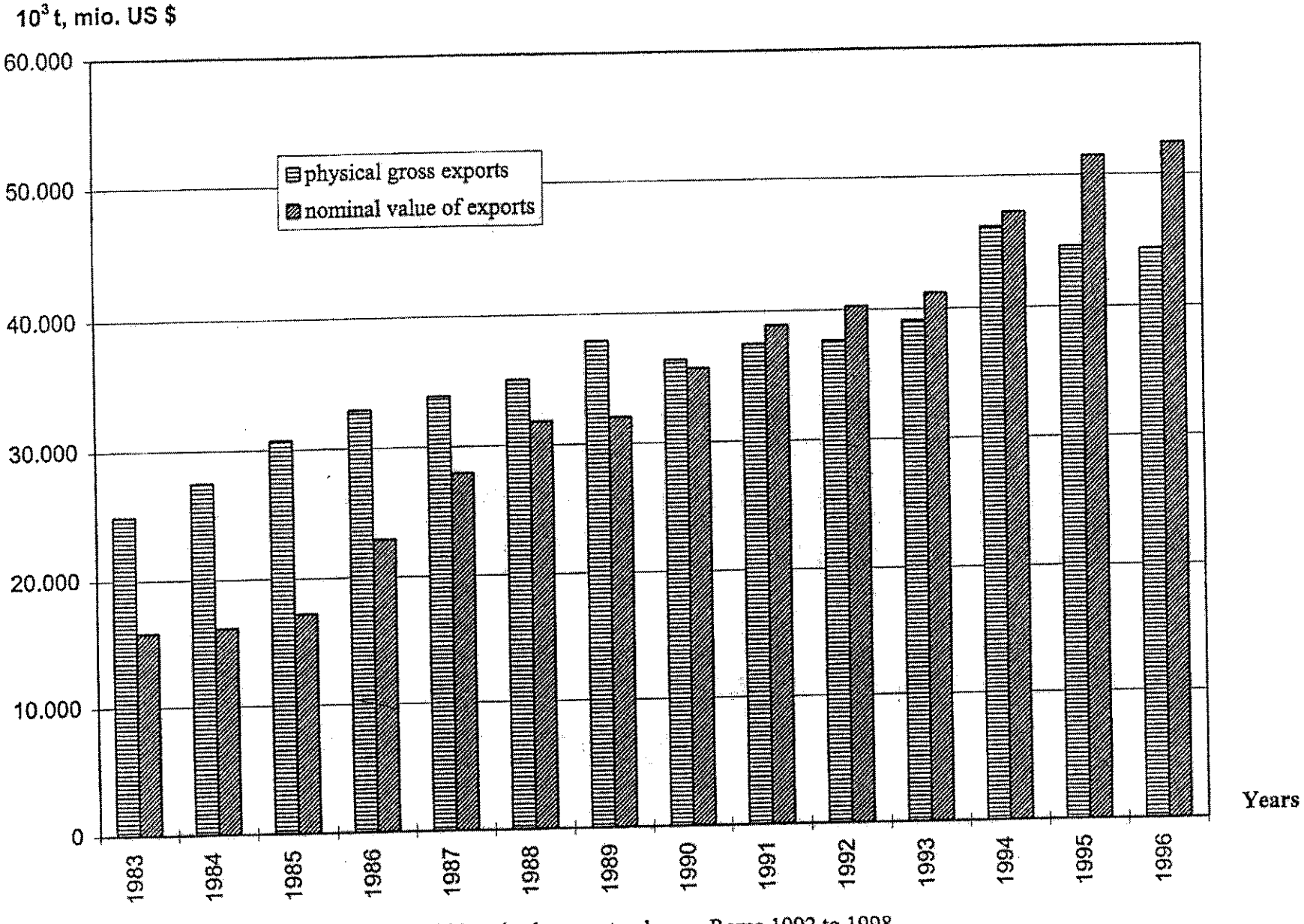
Sources: International Financial Statistics; Statistisches Bundesamt; Bundesanstalt für Landwirtschaft und Ernährung; Sea Fish Industry (1998); NMFS(B)/ITN- 1998; European Fish Price Report (1998)

Diagram 7: Real Prices for Different Fish Species, Transformation Stages and Markets, in US$/kg (from nominal prices with US Consumer Price Index: Jan. 1998 = 0)



Sources: International Financial Statistics; Statistisches Bundesamt; Bundesanstalt für Landwirtschaft und Ernährung; Infofish Trade News/Globefish- 1998; EPR- 1998;

Diagram 8: World Trade of Fish and Fish Products, 1983 - 1996



Source: FAO, Fishery Statistics, Yearbook 1992 and subsequent volumes, Rome 1992 to 1998

Raw FAO data indicates worldwide income elasticity of demand for fish of about 0.80.[80] Aggregative world demand according to estimates available so far probably reacts price inelastically. Quantitative estimates of demand are available for a few countries only. The same applies to the influence of meat prices on the demand for fish. Estimates of the price trend therefore are based merely on plausible or arbitrarily seized orders of magnitude and are not serious forecasts.

A rough estimate of prices[81] leads to different results, depending on assumed demand parameters and probable trend in supply.[82]

The environmental problems with aquaculture and the overfishing of high value species, however, indicate a clearly positive trend for future real prices. Two other aspects support this estimation. The financial cost advantages of the Eastern Europeans are shrinking and the worldwide practice of subsidizing fishing fleets will come increasingly under pressure in the international debate on trade policy.

It can also be assumed that the price gap between caught and farmed fish will become wider due to the continuing rapid increase in supply from aquaculture and changed consumer preferences with decreasing substitutability. The environmental effects of aquaculture and quality problems with aquaculture products will be increasingly perceived by consumers.[83,84] For this reason substitutability should decrease with a correspondingly changed structure of preferences. With decreasing substitutability between caught and farmed fish the price trends for the quality groups will diverge even more strongly than up to now.

4.4 Subsidies in the fishing industry

The capacity of the world fishing fleet is at present 25-26m GRT. The replacement value is about 80% of that of the world merchant fleet.[85] The industrial countries cut back their tonnage considerably in the period 1991-1997: the USA by 11%, Canada by 44%, Japan by 28%, the EU by 21%, the CIS by 12%. Due to the better technical equipment of new units, however, this does not mean that the catch capacities have fallen in line with the tonnage. The People's Republic of China and south-east Asian countries greatly increased their fleets in the same period, though to a large part with used vessels from industrial countries. The fishing fleet is thus of great significance for employment and the economic policy of many countries. It is above all the industrial countries that still have considerable overcapacities - measured against their own TACs. The EU e.g. could fully use its own TACs with 60% of its tonnage. However, there is also a problem of considerable overcapacities in East and South Asia. The FAO reckons on worldwide overcapacity of 30%. The WWF in a more recent study arrived at 60% overcapacity.

About 75% of fishing vessels, however, are more than twenty years old and must be scrapped in the next ten years due to age. New vessels though for their GRT have 1.5 - 3.0 times the catch capacity due to progress in shipbuilding and fishing and location techniques. Today the investment levels in 80% of all fisheries is above the capacity nec-

80 FAO (1998), Westlund (1995).

81 The following relation is taken as a basis:
$dS = dPop + dI \cdot Ei + dPo \cdot Epo + dPs \cdot Eps$
where: dS = annual increase in supply
dPop = annual growth in population (%)
dI = annual growth in real per capita income (%)
Ei = income elasticity of demand
dPo = annual change in the real product price (%)
Epo = direct price elasticity of demand
dPs = annual change in real price of strongest substitute's price (%)
Eps = cross price elasticity of the strongest substitute
Solved for dPo this gives:
$dPo = \frac{dS - dPop - dI \cdot Ei - dPs \cdot Eps}{Epo}$

82 When substituting an income elasticity of 0.80, direct price elasticity of –0.55, cross price elasticity of 0.25, a real price trend of the strongest substitute of –2.5% p.a., a population growth of 1.8% p.a. and a growth in real per capita income of 0.8% p.a. and an increase in supply of 2.5% p.a. this gives a trend in future real prices at consumer level of -1.2% p.a.. However, it is questionable whether this trend in supply over the last ten years can be maintained by aquaculture in future in view of rising environmental pollution. If for comparison an annual increase in supply of 0% is assumed, this gives a change in real prices at consumer level of 3.4% p.a.

83 von Oppel (1998), p. 37.

84 Luyken (1998), pp. 29 ff.

85 Ministry of Foreign Affairs (1995).

essary for cost-efficient MSY. There is the danger that worldwide overcapacity will increase further due to massive misinvestment on a worldwide scale. Massive subsidies in shipbuilding and in current fisheries policy favour such development.[86] This danger is seen at the WTO: "*It is the view of the WTO Secretariat and WTO members that the fisheries sector is subject to the ... disciplines of the Agreement on Subsidies and Countervailing Measures (ASCM).*"[87]

The FAO in 1989 drew up the following cost-performance comparison for the world's fishing fleet:

Capital costs	32.0bn US $
Running costs	92.0bn US $
Total costs	124.0bn US $
Producer revenue	70.0bn US $
Subsidies and losses	54.0bn US $

A rough study by the World Bank found worldwide subsidies of 14 - 20bn US $ p.a.[88] An accurate analysis country by country would probably lead to significantly higher results. This does not take into account, however, subsidies in the processing industry, in marketing and in the ex vessel prices. An analysis by the WWF arrives at the result that subsidies worldwide represent some 20 to 25% of primary fishing revenue.[89]

The price effects of this policy of subsidies ought not to be less on average than that for farm products. Until now, however, it has hardly been possible to quantify them, as demand parameters have up to now only been estimated in a few cases and there are no estimates of supply.[90]

4.5 Exports of developing States and conditions for access to the markets of industrialized countries

Net exports of developing States in fish and fish products amounted to 16.6bn US $ in 1997. The EU and Japan were the main importing countries.[91] Because of their free or favoured access to the market due to the Lomé Convention 63% of ACP exports go to the EU. They had a 6 to 7% share of imports there in 1993/94.

High-quality fresh fish is gaining an increasing share in South-North trade in the 90s. In 1997, for example, some 15,000 tonnes of fresh fish (1.1% of German imports) at an estimated value of 100m DM (cf. Table 2) were imported through Frankfurt Airport. The consumer paid about 25 DM/kg, the fisherman probably received about 3.50 DM/kg, and the air freight, depending on country of origin, was 1.80 to 3.50 DM/kg.

Table 2: Fresh Fish through Frankfurt Airport, 1997

Departure	Tons
Brazil	1,250
Gulf	500
Canada	500
Kenya	5,500
Namibia	1,500
Senegal	500
RSA	1,500
Uganda/Tanzania	500
USA	750
Others	2,500

GATT's Uruguay decisions after a five-year transition period will in 1999 have led to tariff cuts in the industrial countries for fish and fish products of on average 6.1 to 4.5% (cf. Table 3). At the same time the developing States are lowering their most-favoured tariff rates from 35.2 to 8.1%. The tariff peggings in the case of the EU and USA were set at 100%, for Japan at 99.7% and for the developing States at 93.1%.[92,93] Tariff cuts in the case of processed fish products remained slight though, apart from sardines and tuna.

86 Mann Borgese (1995).

87 Grynberg / Tsamenyi (1995), p. 127.

88 M. Milazzo (1998).

89 WWF (1998), p. 146.

90 CED (1998).

91 HIFI (1996).

92 Globefish (1995).

93 HIFI (1996), pp. 14 ff.

Table 3: Overall Tariff Cuts after the Uruguay Round			
Country/area	pre-UR in %	post-UR in %	cut in %
Japan	5.7	4.1	28.6
EU	12.9	10.7	7.4
USA	1.2	0.9	20.6
EFTA	1.7	1.4	17.9
Canada	3.2	2.1	34.4
Australia and New Zealand	0.7	0.5	28.3
LDCs and Economies ion Transition	35.20	8.10	76.9
Republic of Korea	20.06	13.11	34.66
Brazil	60.56	25.56	57.8
Source: Globefish (1995)			

The arrangements for non-tariff import restrictions were adjusted in a number of multilateral agreements:

- health and plant-health restrictions,
- technical trade restrictions,
- anti-dumping measures,
- import licensing,
- countervailing measures,
- safeguards.

It remains to be seen how these tools will be applied in future commercial policy practice.

One result of the Uruguay Round is the erosion of the EU trade preferences for the ACP countries. They are at present already under increasing pressure of competition from Asiatic and Latin American exporting countries. ACP shares in EU imports, that have been declining since 1994, ought to fall further. This applies mainly to the market segment for processed products. The EU's non-preferred fresh fish imports are still subject to tariff rates of 10-12% on the CIF price.

5 Comments on promoting the export of fish from developing States

5.1 Reduction of the distant water fleets and increase in world trade

The economic future of the distant water fleets appears rather unfavourable for the following reasons:

- Depletion of the worldwide fishery potential judging from the trend to date will be so advanced in the next decade that there will be fewer and fewer contractable (and therefore economic) catch opportunities for the distant water fleets.
- International management of the stocks outside the 200 mile EEZ will become subject to stricter quotas and policing.
- Distortions of competition in the rapidly expanding world fish market owing to subsidies will become a WTO topic.
- Criticism of the expensive and incoherent subsidy practices will increase in the industrial countries themselves.

In the course of this development according to the FAO catches of worldwide distant water and contract fishing more than halved from 1989 (9m tonnes) to 1996 (4.2m tonnes).[94]

However, the results of the Uruguay Round and of the further WTO proceedings and expansionary worldwide import demand will increasingly integrate the domestic markets of the developing States into the world market. In the course of these changes the consumption of fish and thus the supply of protein to poverty groups in some 30 developing States will depend more and more on the shaping of national fishery sector policies, in particular the management of fishing and pricing and trade policies:[95] overfishing would harm them at least in their role as consumers, while

94 FAO (1998), p. 8.

95 Brandt (1995), pp. 4 ff.

subsidized imports of frozen industrial fish (sardines, herring, horse mackerel, etc.) would benefit them - in any case provided the poor are not fishermen.

Promoting exports of high-quality fish from developing States through economic cooperation measures should encounter increasing interest in the next decade both in the exporting developing States and in the importing countries as market conditions change in the direction outlined above. Minimum requirements are to be met here regarding the necessary fisheries policy framework and the constant danger of damaging the fishery potentials by overfishing. These are starting points for economic cooperation.

5.2 Conditions for coherent promotion of exports

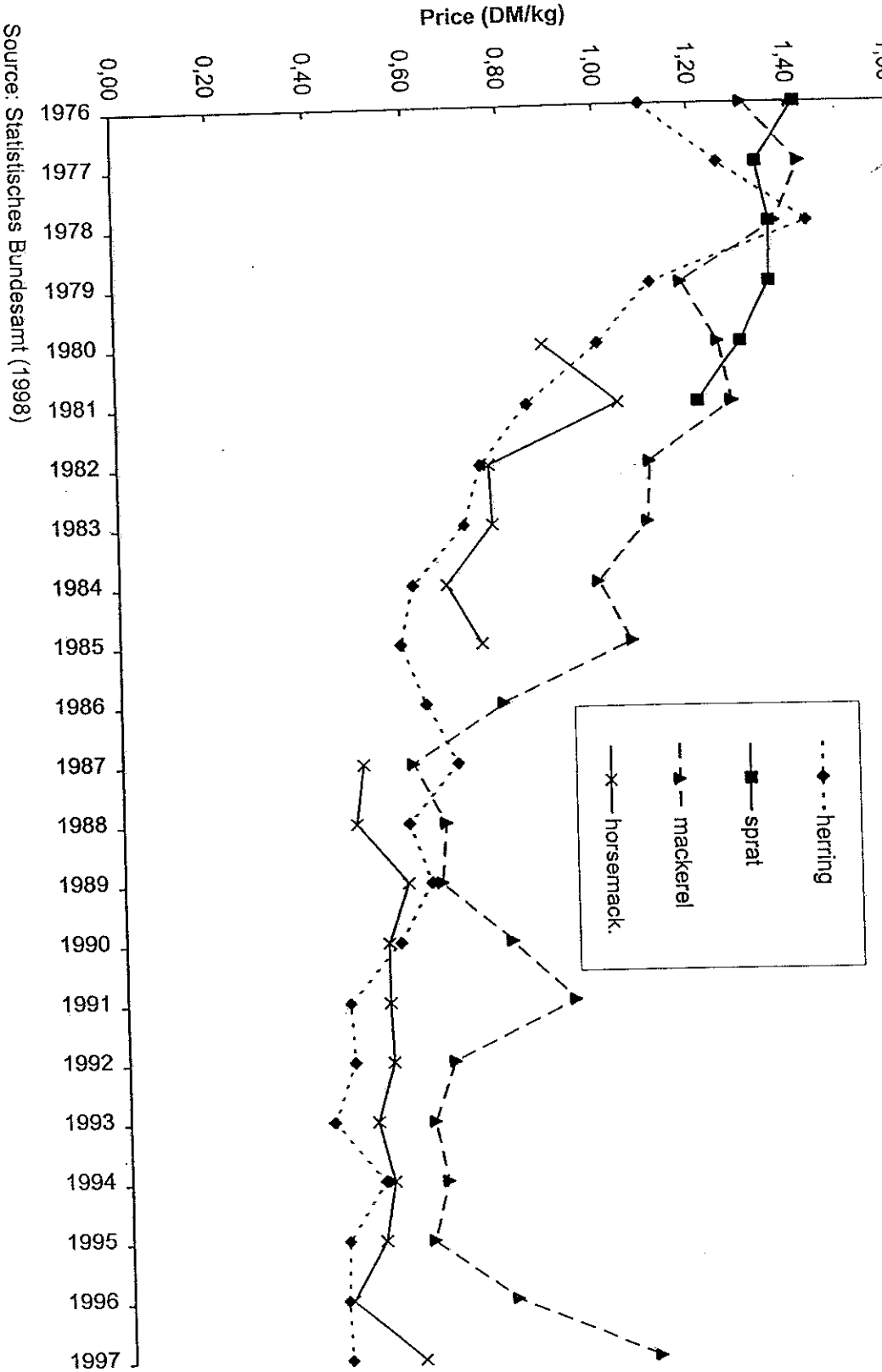
In the light of the above reasoning it is clear that even development measures for the promotion of fishing, processing, marketing and trade can be conducive to overfishing and where it is a question of industrial fish assist the supply of protein for poverty groups. Only a working minimum measure of biological stock control and of policing, inspection and collection of statistics on fishing effort and yield can prevent this if TACs are enforced on this basis that sustain the fishery potential.

Most recent experience promoting exports of Nile perch,[96] with the export-oriented promotion of South Chilean coastal fisheries and a number of other examples show that with lax fisheries management overfishing can also be the result of promoting exports and liberal pricing and trade policies (cf. subsection 3.2.2).

Economic cooperation measures promoting exports therefore are only to be drafted as part of a minimum sectoral programme that also ensures the said policing and inspection functions.[97]

96 Amooti (1968).

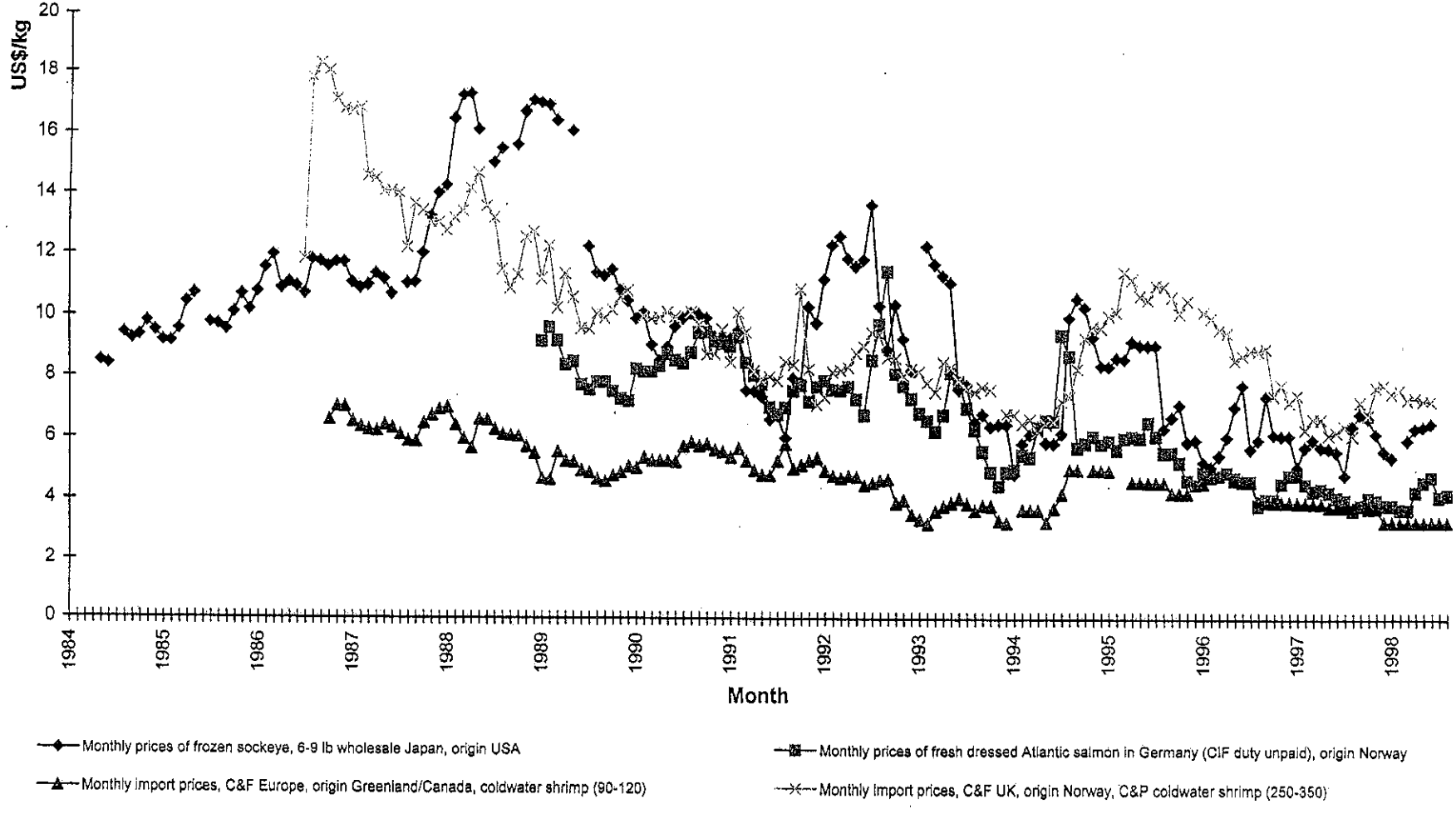
97 HIFI (1996).



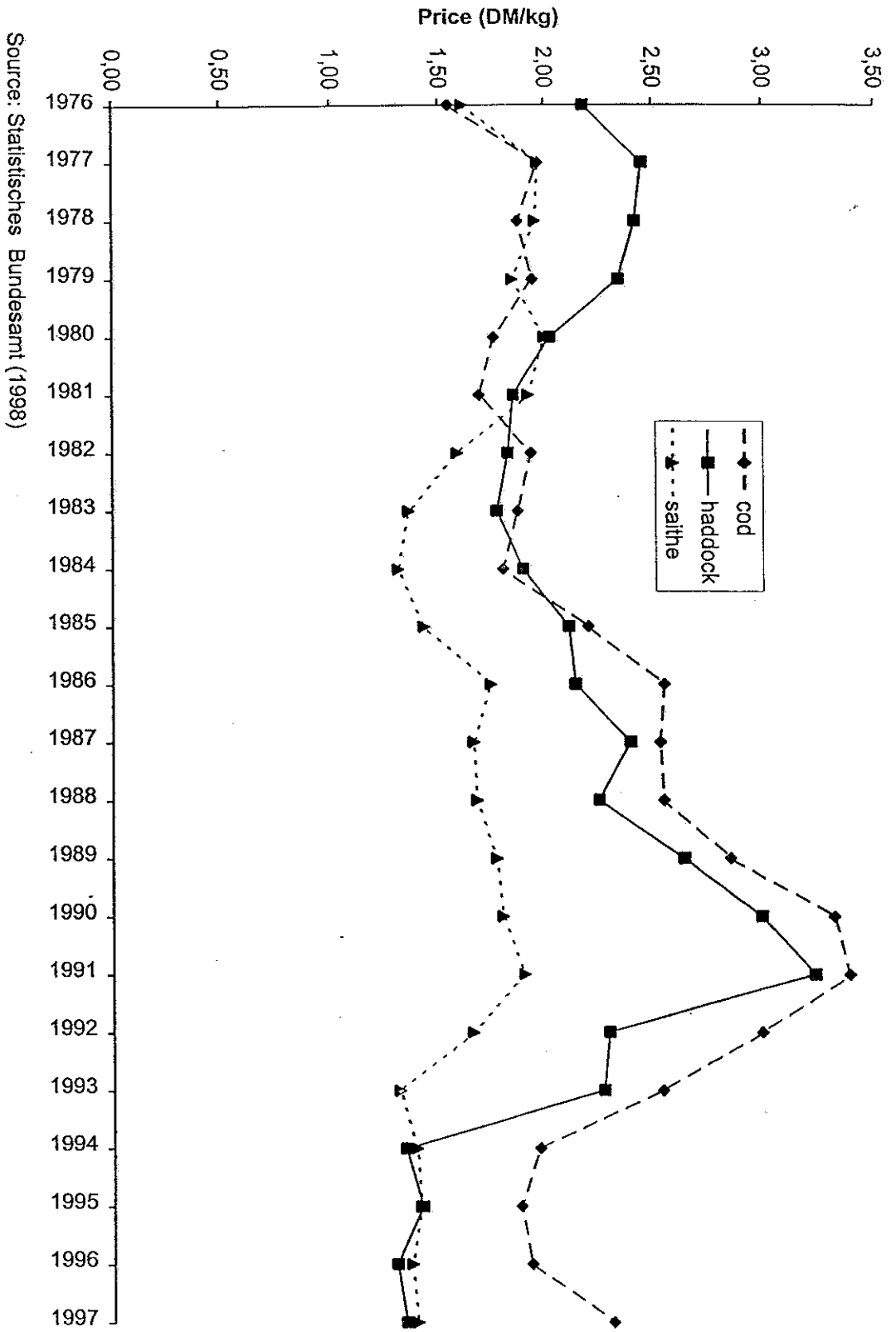
Source: Statistisches Bundesamt (1998)

Diagram A1: Real Fish Prices, Industrial Species, 1976-1997, Bremerhaven ex vessel (index 1996 = 100)

Diagram A2: Real World Market Prices for Shrimp and Salmon, in US $/kg (calculated with US-consumerprice index: Jan. 1998 = 100)



Sources: International Financial Statistics; EPR-1998; BANR-1998



Source: Statistisches Bundesamt (1998)

Diagram A3: Real Fish Prices, Medium Value Species, 1976-1997, Bremerhaven ex vessel (index 1996 = 100)

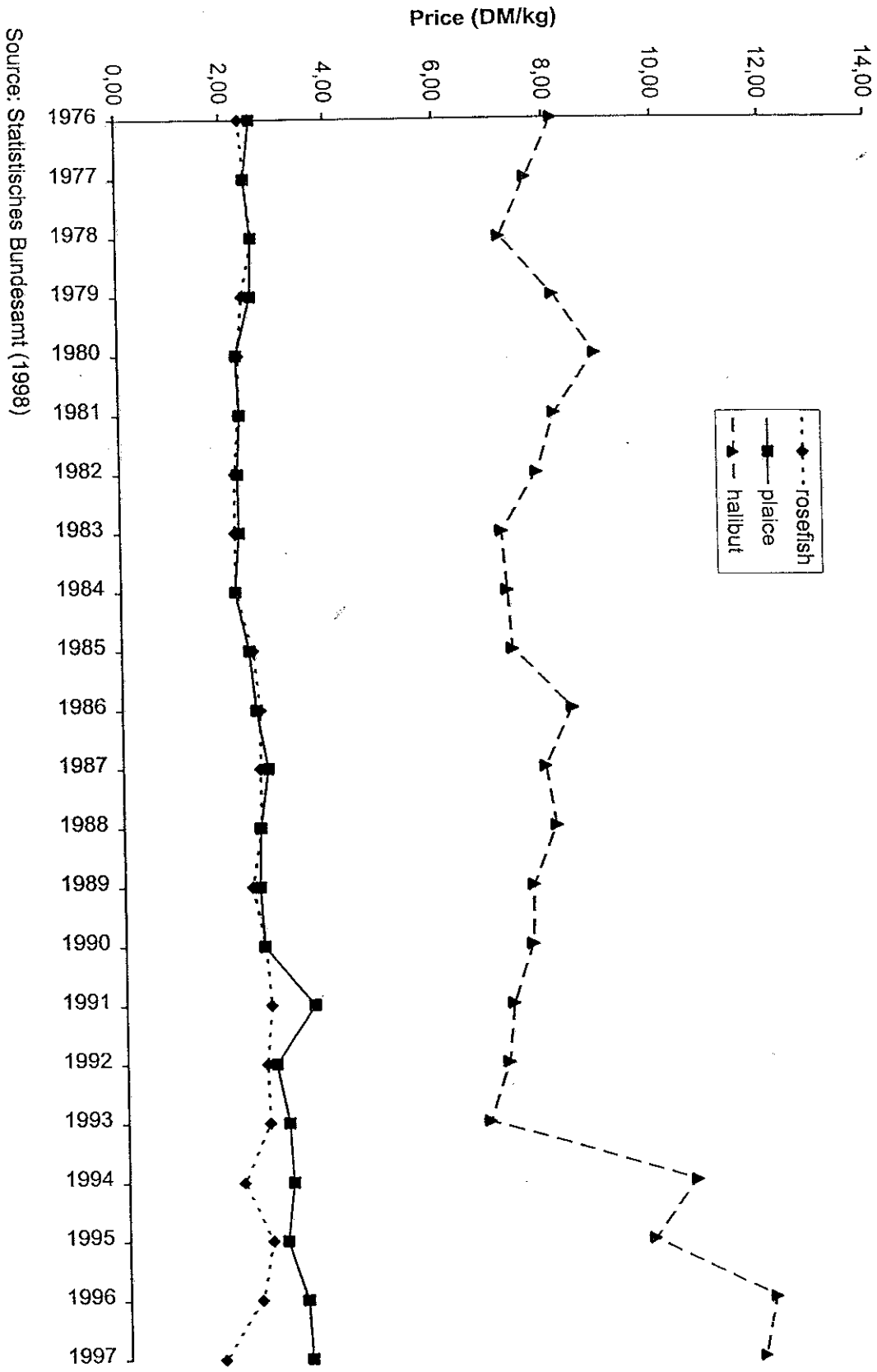


Diagram A4: Real Fish Prices, High Value Species, 1976-1997, Bremerhaven ex vessel (index 1996 = 100)

Source: Statistisches Bundesamt (1998)

Diagram A5: Real Prices, Fresh and Filleted Fish, 1976-1997, Bremerhaven ex vessel (index 1996 = 100)

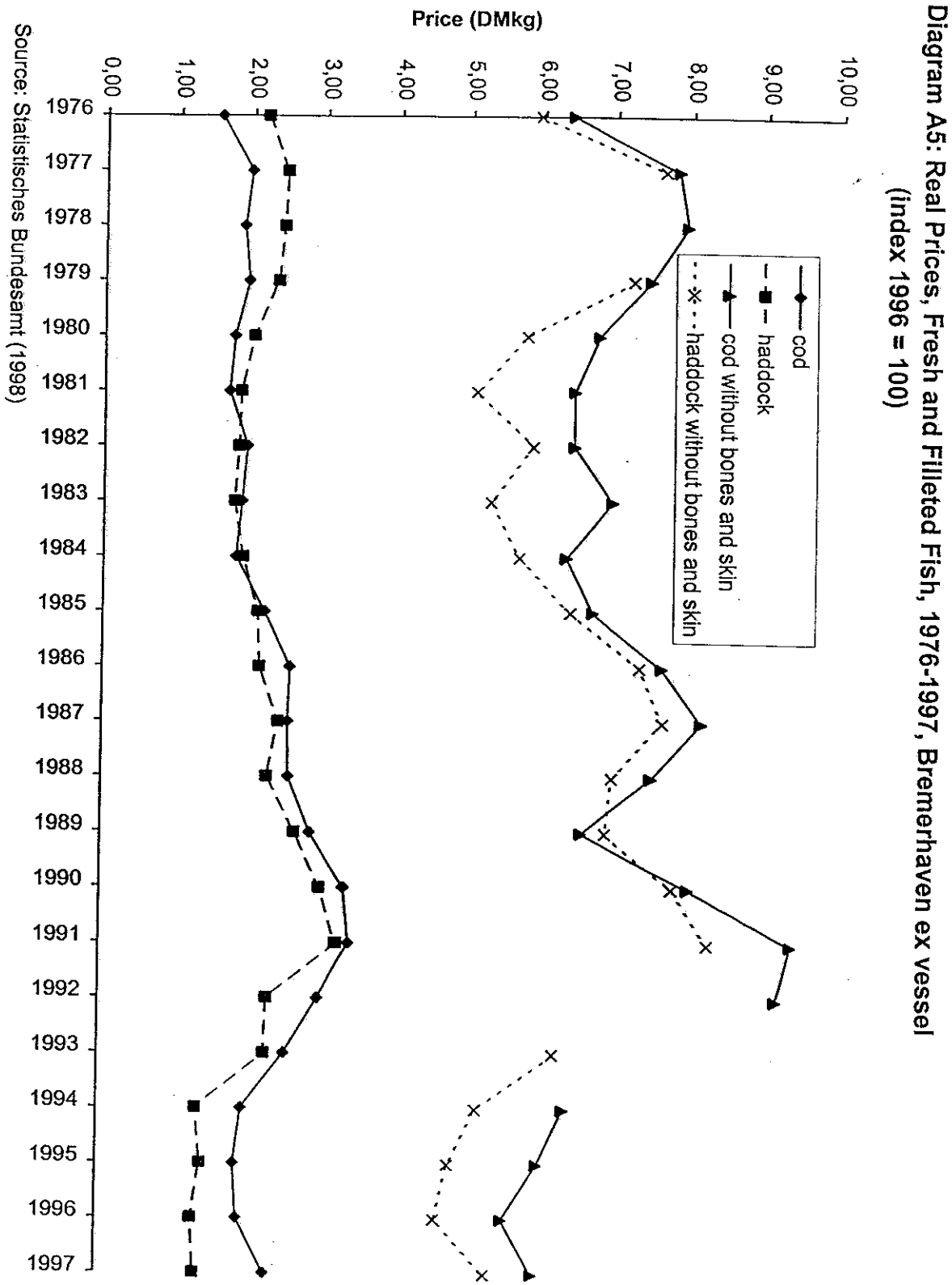
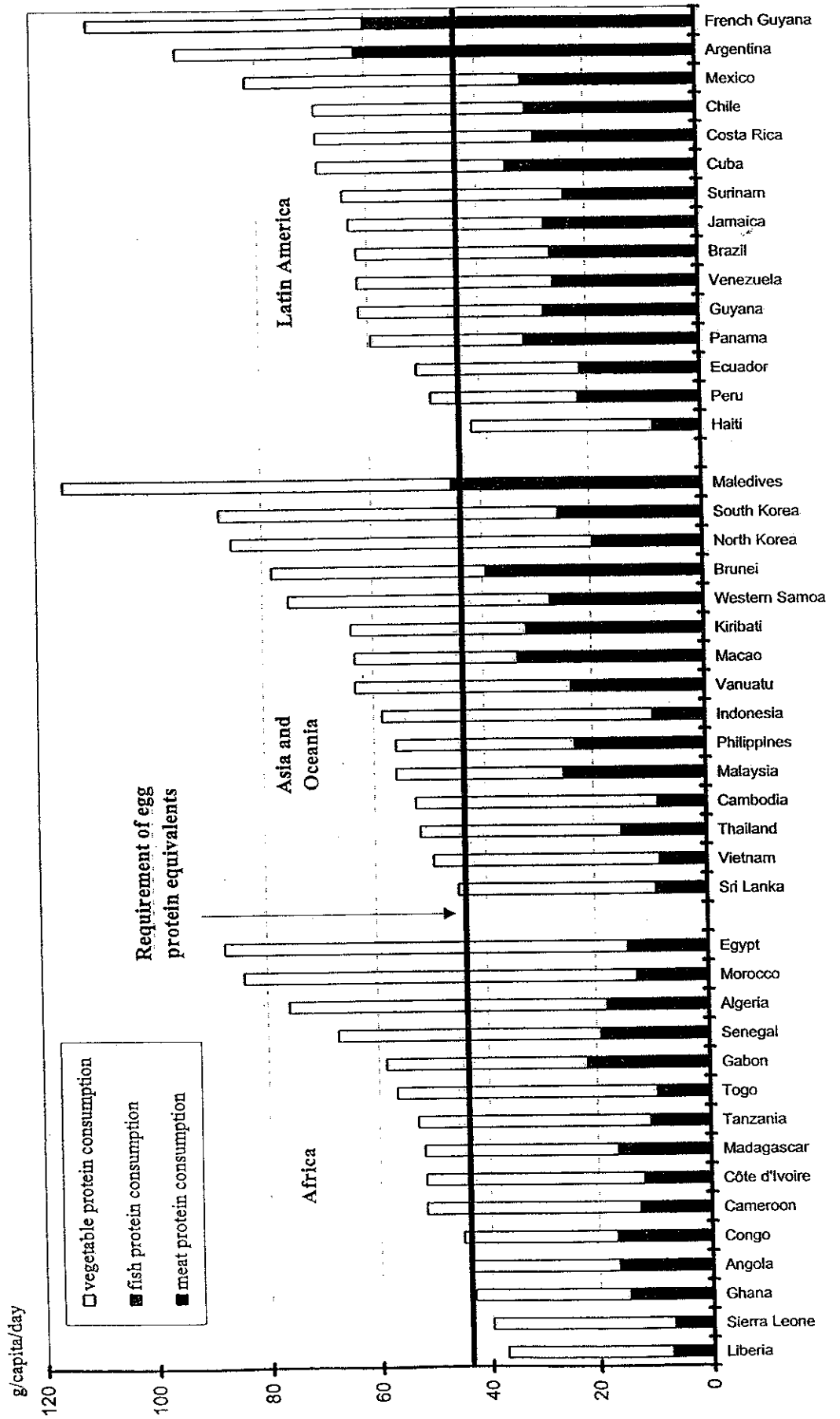


Diagram A9: Average Per Capita Protein Consumption and Requirement in Selected Countries, 1990 (g/capita/day)



Quelle: Brandt (1995)